ANSAC
AMERICAN NATURAL SODA ASH CORP.
8 Wright Street • Westport, CT 06880, USA • Tel. 203-226-9056 • Telex 4750189 or 179095

Material Safety Data Sheet

soda ash

PRODUCT IDENTIFICATION

Brand Name ..... soda ash
Chemical Name ..... Sodium carbonate
Common Name ..... Soda ash
Formula ..... Na_2CO_3
DOT Proper
Shipping Name ..... Not applicable
DOT Hazard
Class ..... Not applicable
DOT I.D. Number ..... Not applicable
Reportable Quantity (RQ) .. Not applicable
CAS Number 497-19-8

PHYSICAL AND CHEMICAL PROPERTIES

State ..... Granular solid
Melting Point C 851
Boiling Point C ..... Decomposes
Color ..... White
Odor ..... None
Bulk Density, lb/cu. ft. ..... 50 to 65
Weight Per Gallon ..... Not applicable
Specific Gravity @ 20C 2.5
Water Solubility, % by wt. @ 20C .. 22.6
Flash Point And Method ..... Not applicable
pH ..... Not applicable

HAZARDOUS INGREDIENTS

Chemical Name	Common Name(s)	CAS Number	Hazard
Sodium carbonate	Soda ash	497-19-8	Irritant to eyes, mucous membranes and skin.

PHYSICAL HAZARD INFORMATION

Explosive: No Upper Explosive Limit: Not applicable Lower Explosive Limit: Not applicable

Pyrophoric: No

Flammable: No Flammability Class: Not applicable

Combustible: No Organic Peroxide: No

Oxidizer: No Compressed Gas: No

Reactivity: Normally stable. May react violently with strong acids. Carbon dioxide gas and large quantities of heat can be evolved. Reacts with hydrated lime in the presence of moisture to form caustic soda, a corrosive.

Incompatibilities: Keep away from aluminum powder, fluorine, phosphorous pentoxide, sulfuric acid, ammoniacal silver nitrate and molten lithium.

Hazardous Decomposition: Soda ash decomposes at temperatures above 1000C, releasing carbon dioxide gas (CO_2). Carbon dioxide is an asphyxiant and may affect respiration rate or interfere with breathing. The sodium oxide residue sublimes at 1275C, forming vapors and mists of caustic soda on contact with moisture or water.

Conditions To Avoid: Do not expose to intense heat.

Reported As A Potential Carcinogen Or Carcinogen	☒ Not Applicable	☐ National Toxicology Program
	☐ OSHA	☐ International Agency For Research On Cancer

PRECAUTIONS FOR SAFE HANDLING AND USE

Avoid contact with eyes, skin, and clothing.
Avoid breathing dust.
Use with adequate ventilation.
Keep container closed when not in use.
Wash thoroughly after handling.

SPILL AND LEAK PROCEDURES

Soil Release:	Shovel and sweep up. Dispose of in a chemical waste facility as permitted by federal (RCRA), state and local regulations.
Water Spill:	Dilute and disperse with water jets, propellers or similar agitation techniques.
Air Spill:	Keep upwind. Treat impact site as appropriate for soil or water spill.
Occupational Spill:	Shovel and sweep up. As permitted, small spills may be washed to an industrial sewer. Large amounts can be disposed of in a chemical waste facility as permitted by federal, state and local regulations.
RCRA Waste Number:	Not applicable.

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

Ventilation:	Use general dilution and local exhaust ventilation techniques to meet nuisance dust exposure limit.
Respirator:	Use NIOSH/MSHA approved dust type respirator.
Eye Protection:	Use safety glasses or safety goggles. Ensure eyewash fountain is located in immediate work area.
Gloves:	Use gloves that will not allow alkaline solutions to penetrate.
Clothing:	Wear easily washable clothing. Change daily or more often if contaminated. Wash clothing before reuse.

HEALTH INFORMATION

Precautionary Information: CAUTION! Causes irritation. This product is a severe irritant to the eyes and a moderate irritant to the nose and skin.

Symptoms Of Exposure:
Eye, nose or skin irritation.
Burning sensation to nose, throat and eyes.
Redness of the skin.
Sneezing and coughing.

Restrictive Medical Conditions: Eye or skin disease and breathing or respiratory disorders will be aggravated by exposure to this chemical.

PRIMARY ROUTE(S) OF ENTRY

Eye and skin contact, inhalation (breathing), and ingestion (swallowing).

TOXICITY INFORMATION

Oral - rat LD_{50} 2463 mg/kg; Intraperitoneal - mouse LD_{50} 117 mg/kg;

Skin irritation - rabbit 50 mg/24 hour, moderate; Eye irritation - rabbit 100 mg/24 hour, severe.

EXPOSURE LIMITS

OSHA: Not established.
ACGIH: Not established.
Other: ACGIH - TLV-TWA for nuisance dust is 10 mg/m³ total dust or 5 mg/m³ respirable dust.

EMERGENCY PROCEDURES

Fire: This product is not flammable and does not support combustion.

Spill or Leak: Sweep up and shovel into containers for later disposal.

FIRST AID PROCEDURES

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Skin Contact: Flush with plenty of water. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Note To Physician: The chemical of exposure is sodium carbonate which is alkaline in solution.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)

SECTION 1. IDENTIFICATION OF PRODUCT

Trade Name and Synonym: HOUSEHOLD BLEACH

Date Issued: 11/07/95
Supercedes: 09/19/94
National Item#: 2610XX

Synonyms: LIQUID BLEACH, LIQUID CHLORINE

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	%	EXPOSURE LIMITS IN AIR ACGHI TLV	OSHA PEL	OTHER
SODIUM HYPOCHLORITE	7681-52-9	5.25	1 PPM (CHLORINE GAS)	1 PPM	N/A

SECTION 3. PHYSICAL DATA

Specific Gravity: 1.082 @ 20C
Vapor Pressure mm Hg @20: N/A
Water Solbility: 100%
Evaporation Rate (Butyl Acetate=1): N/A
Melting Point or Range: N/A
Boiling Point Or range F: N/A
Vapor Density (Air=1): N/A
PH: 12.5 MAX.
Appearance and Odor: PALE YELLOW LIQUID WITH TYPICAL BLEACH ODOR.

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point, F (Give Method): N/A
Flammable Limits in Air, Volume %: NON-FLAMMABLE LOWER: UPPER:
Fire Extinguishing Materials: USE WATER IN FLOODING QUANTITIES AS FOG.

Special Firefighting Procedures: WEAR NIOSH-APPROVED SELF CONTAINED BREATHING APPARATUS FOR CHLORINE GAS VAPORS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

Unusual Fire and Explosion Hazards: BLEACH DECOMPOSES WHEN HEATED TO TO HIGH TEMPERATURES.

SECTION 5. REACTIVITY DATA

Conditions to Avoid: HEAT
Incompatibility (Materials to Avoid): ACIDS, AMMONIA, ORGANIC COMPOUNDS, HEAVY METALS AND SALTS THEREOF, AND OXIDIZING OR REDUCING COMPOUNDS.
Hazardous Decomposition Products (Including Combustion Products): CHLORINE, CHLORINE DIOXIDE, CHLORAMINES. DECOMPOSITION PRODUCTS MAY CAUSE CONNTAINERS TO RUPTURE.
Hazardous Polymerization: WILL NOT OCCUR: X

Product Name: HOUSEHOLD BLEACH
Date Issued: 11/07/95
National Item #: 2610

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill Response Procedures (Including Employee protection Measures):
DILUTE WITH COPIOUS AMOUNTS OF WATER AND THEN MOP UP. AVOID SPLASHING INTO EYES. AVOID REPEATED OR PROLONGED SKIN CONTACT, AVOID INHALATION OF FUMES, STAY UP WIND OF SPILL.

Preparing Wastes for Disposl (Container Tapes, Neutraliration, etc.):
PRODUCT RINSATES THAT CANNOT BE USED SHOULD BE DILUTED WITH WATER BEFORE DISPOSAL IN A SANITARY SEWER. DO NOT RE-USE EMPTY CONTAINER. DISPOSE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

Note: THIS PRODUCT IS TOXIC TO FISH AND AQUATIC ORGANISMS. DO NOT DISCHARGE INTO LAKES, STREAMS, POUNDS, ESTUARIES, OCEANS OR PUBLIC WATERS UNLESS IN ACCORDANCE WITH THE REQUIREMENTS OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND THE PERMITTING AUTHORITY HAS BEEN NOTIFIED IN WRITING PRIOR TO DISCHARGE. DO NOT DISCHARGE EFFLUENT CONTAINING THIS PRODUCT TO SEWER SYSTEMS WITHOUT PREVIOUSLY NOTIFYING THE LOCAL SEWAGE TREATMENT PLANT AUTHORITY. FOR GUIDANCE CONTACT YOUR STATE WATER BOARD OR REGIONAL OFFICE OF THE EPA.

SECTION 7. HEALTH HAZARD DATA

Inhaled: INHALATION OF VAPORS MAY CAUSE BRONCHIAL IRRITATION, COUGHING, DIFFICULTY BREATHING, PULMONARY IRRITATION.

Contact With Skin or Eyes: ACCIDENTAL EYE CONTACT WITH LIQUID OR VAPOR MAY PRODUCE MODERATE TO SEVERE IRRITATION.

Absorbed Through Skin: MAY RESULT IN BLISTERING AND ECZEMA.

Swallowed: MAY CAUSE BURNING SENSATION AND CORROSION OF MUCOUS MEMBRANES, ESOPHAGEAL OR GASTRIC PERFORATION, LARYNGEAL EDEMA, VOMITING AND NAUSEA.

Acute: DEPENDING ON SOLUTION CONCENTRATION, MATERIAL MAY BE CORROSIVE TO SKIN. MUCOUS MEMBRANES AND EYES AND VAPORS MAY CAUSE RESPIRATORY ORGANS.

Chronic: MAY CAUSE DAMAGE OR INJURY TO EYES, SKIN AND RESPIRATORY ORGANS.

Primary Route(s) of Entry: EYES, SKIN, INHALATION

Product Name: HOUSEHOLD BLEACH
Date Issued: 11/07/95
National Item #: 2610

SECTION 8. FIRST AID

Eye Contact: FLUSH EYES WITH RUNNING WATER FOR AT LEAST 15 MINUTES, GET PROMPT MEDICAL ATTENTION.
Skin Contact: IMMEDIATELY REMOVE CONTAMINATED CLOTHING AND WASH THROUGHLY WITH RUNNING WATER. IF IRRITATION PERSISTS, CONTACT PHYSICIAN OR LOCAL POISON CONTROL CENTER.
Inhaled: IF EFFECTS OCCUR, REMOVE VICTIM TO FRESH AIR. PROVIDE SYMPTOMATIC CARE AND SUPPORT RESPIRATION. GET PROMPT MEDICAL ATTENTION.
Swallowed: IMMEDIATELY GIVE LARGE QUANTITIES OF WATER OR MILK TO DILUTE. DO NOT IDUCE VOMITING. GET PROMPT MEDICAL ATTENTION OR CALL POISON CONTROL CENTER IMMEDIATELY.
Suspect Cancer Agent? NO

SECTION 9. SPECIAL HANDLING PROCEDURES

Ventilation and Engineering Controls: PROVIDE ADEQUATE VENTILATION.
Respiratory Protection (Type): WEAR NIOSH-APPROVED RESPIRATORY PROTECTION. WEAR CHEMICAL CARTRIDGE (ACID GAS) RESPIRATOR.
Eye Protection (type): WEAR SPLASH-PROOF CHEMICAL RESISTANT SAFETY GOGGLES.
Gloves (Specify Material): WEAR PROTECTIVE CLOTHING INCLUDING RUBBER GLOVES, RUBBER BOOTS, AND FACE SHIELD.
Other Clothing and Equipment: SEE ABOVE
Work Practices, Hygienic Practices: PROVIDE EYE BATH AND EMERGENCY SHOWERS. LAUNDER WORK CLOTHES WHEN SOILED.
Other Handling and Storage Requirements: STORE IN COOL, DARK PLACE AWAY FROM HEAT AND LIGHT TO AVOID DETERIORATION. STORE BELOW 90F. KEEP CONTAINERS WELL CLOSED. PROVIDE ADEQUATE VENTILATION.

SECTION 10. ADDITIONAL INFORMATION

SARA TITLE III H&P RATINGS: Acute, YES: Chronic, NO: Fire, NO:
Press. Release: NO: Reactive, YES

NFPA RATING: HEALTH -2 FIRE -0 REACTIVITY -1 SPECIFIC- COR

HMIS RATING: HEALTH -2 FIRE -0 REACTIVITY -2 PERSONAL -B

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NATIONAL SANITARY SUPPLY CO.
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Manufacturer:
THE DIAL CORPORATION
111 WEST CLARENDON AVE.
PHOENIX, AZ 85077
EMERGENCY TEL.# 602-253-3334
GENERAL INF. 602-991-3000

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF PRODUCT*

Product Name: BORAXO POWDERED HAND SOAP Date Issued: 05/04/89
Chemical Family: BORATE AND SOAP
Formula: MIXTURE SOAP, BORAX, PERFUME National Item#: 1240XX
MSDS# L-113

SECTION 2. INGREDIENTS

	CAS NUMBER	PEL/TLV-SOURCE
SODIUM TETRABORATE, DECAHYDRATE/BORAX	1303-96-4	OSHA 8-HR TWA PEL, 103MG/M3 ACGIH TLV-TWA, 5MG/M3

*VALUES WERE SET TO PROTECT WORKERS FROM ACUTE IRRITANT EFFECTS ON SKIN AND MUCOUS MEMBRANES OF THE EYE, NOSE, AND OTHER SITES.

SECTION 3. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point : ND Specific Gravity (Wat r=1): 0.898
Vapor Density (Air=1): ND Melting Point: ND
Vapor Pressure (mm Hg.): ND pH 9.1 (% Solution)
Volatiles by Weight (%): ND Freezing Point: ND
Solubility in Water: APPROX. 5% @ 20C Evaporation Rate (*=1): ND
Appearance and Odor: WHITE, GRANULAR POWDER WITH SLIGHT FLORAL ODOR

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (F)/ Method Used): NONE
Flammable Limits: LEL= NONE UEL= NONE
Extinguishing Media: NONE REQUIRED. PRODUCT IS INHERENT FIRE RETARDANT.
Special Fire Fighting Procedures: NONE
Unusual Fire & Explosion Hazards: NONE

SECTION 5. REACTIVITY DATA

Stability: STABLE
Chemical Incompatibility :NONE
Hazardous Polymerization: WILL NOT OCCUR
Hazardous Decomposition :NONE

SECTION 6. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Eye Protection- NONE NECESSARY UNLESS DIRECT EYE CONTACT WITH THE PRODUCT IS EXPECTED OR UNLESS HIGH DUST LEVELS OF THE PRODUCT ARE PRODUCED. IN SUCH SITUATIONS, WEAR GLASSES OR GOGGLES AS APPROPRIATE.
Skin Protection- NONE NECESSARY UNLESS PROLONGED OR EXTENSIVE EXPOSURE TO THE PRODUCT IS EXPECTED OR UNLESS SKIN IS DAMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR BORAX IMPERMEABLE GLOVES, GARMENTS, OR SHOES AS APPROPRIATE.
Respiratory Protection- NONE NECESSARY EXCEPT IN AREAS WHERE AIRBORNE DUST CONCENTRATIONS OF SODIUM BORAX EXCEED ESTABLISHED WORKPLACE LIMITS. IN THOSE AREAS, WEAR APPROPRIATE NIOSH-APPROVED RESPIRATOR.
Handling: RETAIN PACKAGE INTERITY.
STORAGE: DRY INDOOR STORAGE.
Normal Clean Up: SWEEP OR VACUUM. RINSE AREA WITH WATER.
Waste Disposal: SANITARY SEWER OR SOLID WASTE. NOT A HAZARDOUS WASTE.

SECTION 7. HEALTH HAZARD DATA

Route of Entry: Inhalation - UNLIKELY UNDER NORMAL USE CONDITIONS
Skin - LIKELY
Ingestion - UNLIKELY UNDER NORMAL USE CONDITIONS.
Eye - UNLIKELY UNDER NORMAL USE CONDITIONS.

Health Hazards (Acute and Chronic):

Acute:

Inhalation - RESPIRATORY TRACT IRRITATION HAS BEEN REPORTED AMONG INDIVIDUALS EXPOSED TO HIGH DUST LEVELS OF SODIUM TETRABORATES.

Ingestion - THE ACUTE ORAL LD50 FOR THE PRODUCT IN RATS IS GREATER 5.81 G/KG BODY WEIGHT. THIS VALUE IS CONSISTENT WITH THE ACUTE ORAL TOXICITY IN RATS OF THE PRODUCT'S PREDOMINANT INGREDIENTS, BORAX AND SOAP. SEE PARAGRAPH BELOW FOR ADDITIONAL INFORMATION ON BORATE TOXICITY FOLLOWING EXPOSURE BY THIS AND OTHER ROUTES, WHICH ARE CONSIDERED RELEVANT FOR PREDICTING BOATE TOXICITY BY THIS ROUTE.

Skin- ALTHOUGH THE PRIMARY SKIN IRRITATION INDEX OF THE PRODUCT IN RABBITS IS 0, NO EFFECTS (16CFR 1500.41), PROLONGED CONTACT WITH AQUEOUS SOLUTIONS OF IT WOULD BE EXPECTED TO BE IRRITATING TO RABBIT, AND PROBABLY HUMAN, SKIN BECAUSE UNDER SIMILAR CONDITIONS SODIUM TETRABORATE AND SOAP ARE IRRITATING TO RABBIT SKIN. ALSO, OCCUPATIONAL EXPERIENCE WITH SODIUM TETRABORATES, SUGGEST PROLONGED SKIN CONTACT WITH THE DRY PRODUCT, WHICH CONTAINS A HIGH CONCENTRATION OF BORAX, WOULD BE IRRITATING OR DRYING TO THE SKIN.

THE ACUTE DERMAL LD50 FOR THE PRODUCT IN RABBITS IS GREATER THAN 2.0 G/KG BODY WEIGH (16 CFR 1500.40). SEE PARAGRAPH BELOW FOR ADDITIONAL INFORMATION ON BORATE TOXICITY FOLLOWING EXPOSURE BY THIS AND OTHER ROUTES, WHICH ARE CONSIDERED RELEVANT FOR PREDICTING BORATE TOXICITY BY THIS ROUTE.

Eyes- THE PRODUCT PRODUCES REVERSIBLE CONJUNCTIVITIS WHEN INSTILLED IN THE THE EYES OF RABBITS(16 CFR 1500.42). THIS EFFECT IS CONSISTENT WITH THE OCULAR EFFECTS OF SODIUM TETRABORATES AND SOAP.

Chronic: No for product.

Borate systemic toxicity. ACUTE AND CHRONIC EXPOSURE TO SODIUM BORATES OR BORIC ACID, WHICH IS CHEMICALLY AND TOXICOLOGICALLY SIMILAR TO SODIUM BORATES PRODUCE GASTROINTESTINAL, CENTRAL NERVOUS SYSTEM, SKIN, RENAL AND HEPATIC TOXICITY, AND DEATH IN HUMANS. CHRONIC EXPOSURE TO THESE COMPOUNDS PRODUCE GROWTH SUPPRESSION, TESTICULAR DEGENERATION, DEATH AND, POSSIBLY RED BLOOD CELL TOXICITY IN ANIMALS.

MOST BORATE POISONINGS AMONG HUMANS HAVE FOLLOWED INGESTION, INSTILLATION INTO A BODY CAVITY, OR APPLICATION TO DAMAGED OR DISEASED SKIN. MANY OF THE REPORTED CASES INVOLVED INFANTS, WHO MAY BE A SENSITIVE POPULATION TO BORATE TOXICITY. ALSO, RECENT PUBLISHED LITERATURE ON BORIC ACID INGESTIONS INDICATE THE TOXIC POTENCY OF THESE COMPOUNDS MAY BE DRAMATICALLY LESS THAN INDICATED IN SOME OF THE OLDER PRIMARY LITERATURE OR RECENT SECONDARY SOURCES.

Carcinogenicity*:	NTP	IARC MONOGRAPHS	OSHA REGULATED
	NL	NO	NO

*The product has not been tested for this effect.

Effects of Overexposure:

Inhalation - DRYNESS OF MOUTH, NOSE, AND THROAT, NOSE AND THROAT IRRITATION, NOSEBLEEDS, DRY COUGH, CHEST TIGHTNESS, SHORTNESS OF BREATH, AND DYSPNEA HAVE BEEN REPORTED AMOUNG WORKERS EXPOSED TO HIGH DUST LEVEL OF SODIUM TETRABORATES.

Ingestion- NAUSEA, ABDOMINAL PAIN, VOMITING, DIARRHEA, HEADACHE, LETHARGY, LIGHTHEADEDNESS, DELIRIUM, CONVULSIONS, COMA, DIMINISHED URINE OUTPUT, ALOPECIA, AND AN ERYTHEMATOUS DESQUAMATING RASH HAVE BEEN REPORTED AMONG INDIVIDUALS POISONED BY SODIUM TETRABORATES OR BORIC ACID.

Skin - IRRITATION AND CHAPPING.

Eyes - TEMPORARY BURNING, STINGING, OR IRRITATION.

Medical conditions generally aggravated by exposure: NONE

KMB00003131

Date Issued: 05/04/89

SECTION 8. FIRST AID & MEDICAL EMERGENCY PROCEDURES

Eye: FLUSH EYES WITH TEPID WATER, OCCASIONALLY LIFTING LIDS, UNTIL ALL VISIABLE MATERIAL HAS BEEN REMOVED. IF ANY MORE THAN TRANSITORY IRRITATION OR DISCOMFORT OCCUR, CALL A PHYSICIAN, PREFERABLY AN OPHTHALMOLOGIST.
Skin: RINSE ALL MATERIAL FROM THE SKIN.
Inhalation: REMOVE TO FRESH AIR.
Ingestion: FOR AMOUNTS EXCEEDING A TASTE, IMEDIATELY CALL A POISON CONTROL CENTER (E.G. 602-253-3334 OR A PHYSICIAN.

SECTION 9. CONTROL MEASURES - OCCUPATIONAL

Respiratory Protection (SPECIFY TYPE): WEAR APPROPRIATE NIOSH-APPROVED DUST RESPIRATOR IN AREAS WHERE AIRBORNE DUST CONCENTRATIONS OF BORAX EXCEED ESTABLISHED WORKPLACE LIMITS.
Ventilation: AS NECESSARY TO PREVENT AIRBORNE CONCENTRATIONS OF BORAX FROM EXCEEDING APPLICABLE WORKPLACE LIMITS.
Protective Gloves - NONE NECESSARY UNLESS PROLONGED EXPOSURE TO THE PRODUCT IS EXPECTED OR UNLESS SKIN IS DAMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR BORAX IMPERMEABLE GLOVES.
Eye Protection - NONE NECESSARY UNLESS DIRECT EYE CONTACT WITH THE PRODUCT IS EXPECTED OR UNLESS HIGH DUST LEVELS OF THE PRODUCT ARE PRODUCED. IN SUCH SITUATIONS, WEAR GLASSES OR GOGGLES AS APPROPRIATE.
Other Protective Clothing or Equipment - NONE NECESSARY UNLESS PROLONGED OR EXTENSIVE SKIN CONTACT IS EXPECTED OR UNLESS SKIN IS DAMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR APPROPRIATE BORAX IMPERMEABLE GARMENTS OR SHOES.
Work/Hygienic Practices: DO NOT EAT OR DRINK IN WORK AREA.
References:

American Conference of Governmental Industrial Hygienists. (1988). THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES F R 1988-1989. AMERICAN CONFERENCE OF GOVERMENTAL INDUSTRIAL HYGIENISTS, CINCINNATI, OH.

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Cosmetic Ingredient Reeview. (1983). FINIAL REPORT ON THE SAFETY ASSESSMENT OF SODIUM BORATE AND BORIC ACID. J.AM. COLL. TOXICOL. 2 (7), 87-125.

Litovitz, T. Klein-Schwartz, W. Oderda, G., and Schmitz, B. (1988). CLINICAL MANIESTATIONS OF TOXICITY IN A SERIES OF 784 BORIC ACID INGESTIONS. AM. J. EMERG. MED. 6 (3), 209-212.

Pfeiffer, C. C. and Jenney, E. H.(1950). THE PHARMACOLOGY OF BORIC ACID AND BORON COMPOUNDS. BULL, NAT. FORM. COMM. 18, 57-80

Stokinger, H.E. (1981). THE HALOGENS AND THE NONMETIALS BORON AND SILICON. IN: PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY. 3RD ED., (G.D. CLAYTON AND F.E. CLAYTON, EDS.) VOL. IIB. CHAP. 40, PP 2984-2987. JOHN WILEY AND SONS, INC., NEW YORK.

United States Occupational Safety and Health Administration. (1989). AIR CONTAMINATS. BORATES, TETRA, SODIUM SALTS (ANHYDROUS, PENTAHYDRATE, AND DECAHYDRATE). FED. REG. 54(12), 2451-2452.

SECTION 10. ENVIRONMENTAL IMPACT

Applicable Regulations: 16 CFR 500 DOT/EPA Hazard Class: NONE
Shipping Name: SEE PRODUCT NAME
EPA - SARA Title III Section 313: TOXIC CHEMICAL - NO
Note: N/A - NOT APPLICABLE ND - NOT DETERMINED NL- NOT LISTED
NIF - NO INFORMATION FOUND NE - NONE ESTABLISHED

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CHANGE: NEW ISSUE DATE PREPARED: 05/04/89

✓ 76 MP GEAR LUBE SAE 80W-90
✓ SYNCON EP PLUS GEAR OIL 220 (all grades)
✓ MORLINA OIL SD 220
✓ CHEVRON DELO 400 LE SAE 15W-40
✓ CHEVRON TEGRA SYN. GEAR LUBE ISO 460 & 150

✓ CHEVRON MACHINE OIL AW ISO 150
✓ CHEVRON DELO 400 MOTOR SAE 30
✓ SHELL FORMULA SAE 10W-30 MOTOR 2
✓ CHEVRON RYCON PREMIUM OIL ISO 46
✓ CHEVRON RANDO HD ISO 46
✓ CHEVRON OPEN GEAR GREASE
✓ PENRAY OPEN GEAR LUBE 7003
✓ CHEVRON HANDY OIL ISO 15

MSDS Table of Contents

Fuels & Lubricants

Acetylene	05.01.91
Chevron Automatic Transmission Fluid	01.12.90
Chevron Chain Bar Oil ISO 150	12.20.90
Chevron Cylinder Oil W ISO 460	12.21.90
Chevron Diesel Fuel No. 2	10.15.91
Chevron Gear Compound EP ISO 220	02.01.91
Chevron Hydraulic Oil AW ISO 32	12.21.90
✓ Chevron Hydraulic Oil AW ISO 46	12.21.90
Chevron Hydraulic Oil AW ISO 150	12.19.90
Chevron Pinion Grease MS-SP Spray Type	02.22.90
Chevron SRI Grease 2	11.21.89
Chevron Tractor Hydraulic Fluid	04.27.91
✓ Chevron Turbine Oil GST ISO 46	05.09.91
✓ Chevron Ulti-Plex Synthetic Grease	01.25.96
Chevron Ultra-Duty Grease 2	07.11.90
Chevron Ultra Gear Lubricant 220 — CONOCO MEGAFLOW AW HYDRAULIC OIL 46	09.15.89
Durex AFM Propylene Glycol Antifreeze	11.15.96
Regular Leaded Gasoline	04.21.93
Regular Unleaded Gasoline	04.11.90
Marvel Mystery Oil	11.25.85
Compressed Oxygen	10.01.91
Propane	no date
Shell Low-Sulfur Dieseline ® Oil	04.11.90
Shell No. 2 Furnace Oil	02.23.94
Sierra Antifreeze Coolant	~~no date~~ 6.1.92
Enerpac HF & HOF Hydraulic Oil	07.19.94
Betzdearborn TR81167 (Locomotive Coolant Additive)	06.30.98
Lubricant Sullube	03.03.03
Aerokrol (lubricant)	06.07.05

✓ SWEPCO OUTSIDE GEAR LUBE 607
✓ CHEVRON BLACK PEARL GREASE EP
✓ HENRY 208 WET PATCH ROOF CEMENT
✓ SHELL RETINAX LC2
✓ DIESEL EPA LOW SULFUR-DYED
✓ Atlas Copco RotoXtend Duty Fluid - Compressor oil 13.04.06
Retinax LC grease 2 - Sopus 6.21.04

Miscellaneous Fibry

Diamond or Cubic Boron Nitride Grinding Wheels	04.17.90
Resinoid Bonded Grinding Wheels	04.30.90
Sulfuric Acid	12.18.95
Safety yellow Gloss Quick Dry Alkyd 450	06.06.00
Flat White (paint)	11.03.97
Speed Rock	02.03.00
Aluumi-Arc Electrode	07.06.00
Four Bar Buffing Compound	08.19.88
Navy Gray Enamel/Alkyd	06.11.97
Marlin Blue Enamel/Alkyd	06.11.97
Flex Tred	07.26.01
Water Preservative	07.01.99
Rockite Cement	10.21.02
Rust Reformer	05.30.00
Dark Machine Gray	04.19.01
Mike-O-Cut #87, Tapping & Drilling Fluid	05.16.05
Red Primer	04.19.01
Safety Yellow 9904442	04.16.04

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Miscellaneous (continued)

Paint Spray Red		05.05.03
Flux Brazing #5		02.23.00
Flashlight Combo		10.17.01
Enviroseal 20		12.08.03
Jasco/Bix Premium Paint & Epoxy Remover		10.09.07
Paint, Promar 200 interior latex Eg-Shell enamel, extra white		3.5.10

Office Supplies

D-Q23 Developer	Fax Machine	09.01.85
~~T-Q23 Toner~~ FO-50ND	Fax Machine	09.01.85
Black Developer	~~Sharp~~ Copier Machine	11.01.96
Black Toner	~~Sharp~~ Copier Machine	11.01.96

Sharp toner Sharp

Safety Supplies — JASON

ABC Dry Chemical	03.01.01
Carbon Dioxide	06.01.99
Halon 1211	08.01.91
~~Hilco Pitch Cream~~ NA Removed	05.01.72
Premiere Ice Melter with PMA (Port of Portland De-Icer)	01.13.97
Regular Dry Chemical	08.01.91
Eye saline solutions #'s 400, 401, 433, 450, 451-463, 470, 471, 500-508, 510, 512, 520, 533, 534, 1050	03.10.99

3TOKOLAN
SKIN CARE CREAM

MSDS Table of Contents

Bonding Agents

Clear Silicone Adhesive Sealant	03.01.93
Magnabond 56, A and B	08.04.87
RTV Sealant Pressurized	08.01.88
HVU Adhesive Anchor	09.06.00
Set Cement Glue	02.03.00
Titanium Putty Resin	03.25.04
Retaining Compound	12.10.04

Cargoes

Bentonite Clay	04.28.93
Calcined petroleum Coke	09.01.90
Potassium Sulfate	07.16.96
Soda Ash	no date
Sodium Sulfite, Anhydrous	02.01.91
Potassium Chloride	no date

Cleaning Supplies

5-56 Aerosol #765-1442, #765-1443	07.01.86
Bio Clean (Cold Tank Cleaner)	08.31.95
Household Bleach	11.07.95
Blitz Airborne Insecticide	07.28.95
Boraxo Powerdered Hand Soap	05.04.89
QD Contact Cleaner	03.15.91
Contact Cleaner #765-1442, #765-1443	07.01.86
Heavy Duty Degreaser	11.01.85
Green Apple Dry Deodorizer (Aerosol Deodorant)	05.17.96
Happy Honeysuckle Air Freshener	04.13.94
Orange Twist (Aerosol Deodorant)	03.18.93
Para Dichlorobenze Blocks (Urinal Deodorant)	07.10.96
Poweder Fresh (Aerosol Deodorant)	12.03.97
Rain Forest Dry Deodorizer	05.17.96
Liquid Dial (Antimicrobial Soap)	04.21.93
Lemon Shine Aerosol (Furniture Polish)	08.03.93
Pink Velvet Liquid Detergent	02.09.90
Starbar Improved Golden malrin Fly Bait	04.01.96
Sud N Kleen Aerosol (Disinfectant Cleaner)	03.02.93
Wildcat All Purpose Cleaner & Degreaser	06.06.94
Zonk NBC Non-butyl Concentrated Cleaner/Degrease	06.01.95
Big O-Citrus Based Degreaser/Cleaner	08.31.95
Blue X Institutional Stength Cleaner	08.31.95
F-6 Flying Insect Killer (Aerosol)	09.23.99
Glass Cleaner (Bulk)	11.12.99
Clorox Germicidal Bleach	12.14.00
Urnex (Coffee Urn Cleaner)	04.25.90
Purell Instant Hand Sanitizer	10.15.07
Simple Green Cleaner	03.01.08
Golden Glo lotionized hand dishwash	09.22.08
Orange Tough Degreaser 40	09.22.08
Drano Crystals	07.22.08

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Cleaning Supplies (Continued)

Misty Insect Spray		01.27.08
Misty Dry Deodorizer		12.03.07
Lysol Professional Disinfectant Spray		08.19.02
A700-717, A719, A720, Dry Breeze - All		03.15.01
~~Sherwin Williams Promar 200 Interior Latex Eg-Shel B20 W 2251~~		03.05.10 moved to "misc" section
Comet Liquid Disinfecting Bathroom Cleaner	04.01.04	
Comet Liquid Surface Sanitizing Cleanser	10.01.07	
Spic & Span Cleaner, Disinfecting Liquid Hard Surface	08.01.05	
Mr. Clean Liquid Cleaner	11.01.99	
Mr. Clean Toilet Bowl Cleaner	03.01.02	
Spic & Span Glass Cleaner	08.01.01	
Comet Power	03.20.06	
Toilet Ring Remover	07.10.07	
Neutral Sanisol Cleaner/Disinfectant	07.10.07	
Sunshine 50:1 Non-Ammoniated Glass Cleaner	07.10.07	
Sanisol Cleaner Disinfectant Odor neutralizer	07.12.07	
Rinse Free Floor Cleaner & Brightener	07.06.07	
Kleenol 30	07.09.07	

BRUCE'S BINDER

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Fuels & Lubricants

Acetylene UN1001	~~05.01.91~~ 2.3.11
Chevron Automatic Transmission Fluid	01.12.90
~~Chevron Chain Bar Oil ISO 150~~ NA Removed	12.20.90
~~Chevron Cylinder Oil W ISO 460~~ NA Removed	12.21.90
~~Chevron Diesel Fuel No. 2~~ NA Removed	10.15.91
Chevron Gear Compound EP ISO 220	02.01.91
~~Chevron Hydraulic Oil AW ISO 32~~ NA Removed	12.21.90
Chevron Hydraulic Oil AW ISO 46	12.21.90
~~Chevron Hydraulic Oil AW ISO 150~~ NA removed	12.19.90
Chevron Pinion Grease MS-SP Spray Type	02.22.90
Chevron SRI Grease 2	11.21.89
~~Chevron Tractor Hydraulic Fluid~~ NA Removed	04.27.91
Chevron Turbine Oil GST ISO 46	05.09.91
Chevron Ulti-Plex Synthetic Grease	01.25.96
Chevron Ultra-Duty Grease 2	07.11.90
Chevron Ultra Gear Lubricant 220	09.15.89
Durex AFM Propylene Glycol Antifreeze	11.15.96
Regular Leaded Gasoline	04.21.93
Regular Unleaded Gasoline	04.11.90
Marvel Mystery Oil	11.25.85
Compressed Oxygen	10.01.91
Ferrellgas Propane	no date
~~Shell Low-Sulfur Dieseline ® Oil~~ NA Removed	04.11.90
~~Shell No. 2 Furnace Oil~~ NA Removed	02.23.94
Sierra Antifreeze Coolant	~~no date~~ 6.1.92
Enerpac HF & HOF Hydraulic Oil	07.19.94
Betzdearborn TR81167 (Locomotive Coolant Additive)	06.30.98
Lubricant Sullube	03.03.03
Aerokrol (lubricant)	06.07.05
DIESEL EPA LOW SULFUR-DYED	01.01.02

Miscellaneous

Diamond or Cubic Boron Nitride Grinding Wheels	04.17.90
Resinoid Bonded Grinding Wheels	04.30.90
Sulfuric Acid	12.18.95
Safety yellow Gloss Quick Dry Alkyd 450	06.06.00
Flat White (paint)	11.03.97
Speed Rock	02.03.00
Aluumi-Arc Electrode	07.06.00
Four Bar Buffing Compound	08.19.88
Navy Gray Enamel/Alkyd	06.11.97
Marlin Blue Enamel/Alkyd	06.11.97
Flex Tred	07.26.01
Water Preservative	07.01.99
Rockite Cement	10.21.02
Rust Reformer	05.30.00
Dark Machine Gray	04.19.01
Mike-O-Cut #87, Tapping & Drilling Fluid	05.16.05
Red Primer	04.19.01
Safety Yellow 9904442	04.16.04

KMB00003138

Material Safety Data Sheet

Acetylene

Airgas

Section 1. Chemical product and company identification

Product name : Acetylene

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Product use : Synthetic/Analytical chemistry.

Synonym : acetylen; acetylene ; ethine; ethyne; narcylen

MSDS # : 001001

Date of Preparation/Revision : **2/3/2011.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas.

Emergency overview : WARNING!

FLAMMABLE GAS.
MAY CAUSE FLASH FIRE.
MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

Keep away from heat, sparks and flame. Do not puncture or incinerate container. May cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container closed.

Contact with rapidly expanding gases can cause frostbite.

Target organs : May cause damage to the following organs: lungs, upper respiratory tract, central nervous system (CNS).

Routes of entry : Inhalation

Potential acute health effects

Eyes : Contact with rapidly expanding gas may cause burns or frostbite.

Skin : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Acts as a simple asphyxiant.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects

Chronic effects : May cause target organ damage, based on animal data.

Target organs : May cause damage to the following organs: lungs, upper respiratory tract, central nervous system (CNS).

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
Acetylene	74-86-2	100	**NIOSH REL (United States, 6/2009).** CEIL: 2662 mg/m³ CEIL: 2500 ppm

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training.If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : As this product is a gas, refer to the inhalation section.

Section 5. Fire-fighting measures

Flammability of the product : Flammable.

Auto-ignition temperature : 305°C (581°F)

Flash point : Closed cup: -18.15°C (-0.7°F).

Flammable limits : Lower: 2.5% Upper: 100%

Products of combustion : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Fire hazards in the presence of various substances : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials.

Fire-fighting media and instructions : In case of fire, use water spray (fog), foam or dry chemical.

In case of fire, allow gas to burn if flow cannot be shut off immediately. Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.

Contains gas under pressure. Flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see section 1 for emergency contact information and section 13 for waste disposal.

KMB00003140

Section 7. Handling and storage

Handling : Use only with adequate ventilation. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Keep container closed. Keep away from heat, sparks and flame. To avoid fire, eliminate ignition sources. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Storage : Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Segregate from oxidizing materials. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Product name

Ethyne

NIOSH REL (United States, 6/2009).
CEIL: 2662 mg/m³
CEIL: 2500 ppm

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : 26.04 g/mole

Molecular formula : C2-H2

Melting/freezing point : Sublimation temperature: -81.8°C (-115.2 to °F)

Critical temperature : 35.3°C (95.5°F)

Vapor pressure : 635 (psig)

Vapor density : 0.907 (Air = 1)

Specific Volume (ft ³/lb) : 14.7058

Gas Density (lb/ft ³) : 0.0691 (-80°C / -112 to °F)

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Extremely reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Chronic effects on humans : May cause damage to the following organs: lungs, upper respiratory tract, central nervous system (CNS).

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Products of degradation : Products of degradation: carbon oxides (CO, CO_2) and water.

Environmental fate : Not available.

Environmental hazards : This product shows a low bioaccumulation potential.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		**Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: 15 kg

Acetylene						
TDG Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		**Explosive Limit and Limited Quantity Index** 0 **Passenger Carrying Ship Index** 75 **Passenger Carrying Road or Rail Index** Forbidden **Special provisions** 38, 42
Mexico Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		-

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 15. Regulatory information

United States

U.S. Federal regulations : **TSCA 8(a) IUR**: Partial exemption
United States inventory (TSCA 8b): This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Ethyne
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Ethyne: Fire hazard, reactive, Sudden release of pressure, Immediate (acute) health hazard

Clean Air Act (CAA) 112 accidental release prevention - Flammable Substances: Acetylene

Clean Air Act (CAA) 112 regulated flammable substances: Ethyne

State regulations : **Connecticut Carcinogen Reporting**: This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is not listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.

Rhode Island Hazardous Substances: This material is not listed.

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

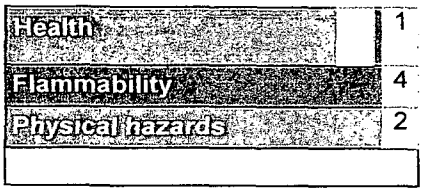
United States

Label requirements : FLAMMABLE GAS.
MAY CAUSE FLASH FIRE.
MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

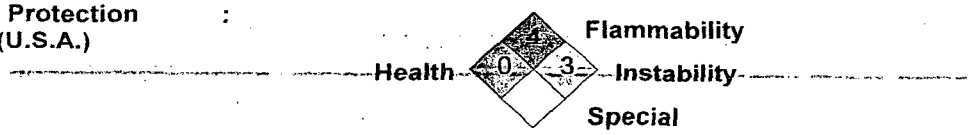
Canada

Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.

Hazardous Material Information System (U.S.A.) :



National Fire Protection Association (U.S.A.) :



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Megaflow® AW Hydraulic Oil

Material Safety Data Sheet

1. Product and Company Identification

Product Name: Megaflow® AW Hydraulic Oil

MSDS Number: 814637

Synonyms/Other Means of Identification:
Megaflow® AW Hydraulic Oil 22
Megaflow® AW Hydraulic Oil 32
Megaflow® AW Hydraulic Oil 46
Megaflow® AW Hydraulic Oil 68
Megaflow® AW Hydraulic Oil 100
Megaflow® AW Hydraulic Oil 150
Megaflow® AW Hydraulic Oil 220
Megaflow® AW Hydraulic Oil 320
Megaflow® AW Ultra-Clean Hydraulic Oil 32
Megaflow® AW Ultra-Clean Hydraulic Oil 46
Megaflow® AW Ultra-Clean Hydraulic Oil 68
Megaflow® AW Ultra-Clean Hydraulic Oil 100

Intended Use: Hydraulic Fluid

Manufacturer:
ConocoPhillips Lubricants
600 N. Dairy Ashford, 2W900
Houston, Texas 77079-1175

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

Customer Service: U.S.: 1-800-822-6457 or International: +1-83-2486-3363

Technical Information: 1-877-445-9198

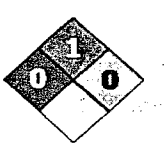
MSDS Information:
Phone: 800-762-0942
Email: MSDS@conocophillips.com
www.conocophillips.com

2. Hazards Identification

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA



Appearance: Clear and bright
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Repeated exposure may cause skin dryness or cracking. No harmful effects from skin absorption are expected.

Inhalation (Breathing): Not expected to be toxic.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Signs and Symptoms: Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders.

See Section 11 for additional Toxicity Information.

3. Composition / Information on Ingredients

Component	CASRN	Concentration[1]
Lubricant Base Oil (Petroleum)	VARIOUS	>99
Additives	PROPRIETARY	<1

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.
See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Avoid direct contact with material. For larges spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

7. Handling and Storage

Precautions for safe handling: Keep away from flames and hot surfaces. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

Spills will produce extremely slippery surfaces. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m³ STEL: 10 mg/m³ as Oil Mist, if generated	TWA: 5 mg/m³ as Oil Mist, if generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Clear and bright
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1 mm Hg
Vapor Density (air=1):	>1
Initial Boiling Point/Range:	No data
Melting/Freezing Point:	<5°F / <-15°C
Pour Point:	<5°F / <-15°C
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	0.87 @ 60°F (15.6°C)
Bulk Density:	7.3 lbs/gal
Viscosity:	4 - 24 cSt @ 100°C; 22 - 320 cSt @ 40°C
Evaporation Rate (nBuAc=1):	No data
Flash Point:	>302°F / >150°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Lower Explosive Limits (vol % in air):	No data
Upper Explosive Limits (vol % in air):	No data
Auto-ignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Toxicity:

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Lubricant Base Oil (Petroleum)

Acute Toxicity:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	> 5 g/kg	> 2 g/kg	> 5 mg/L

12. Ecological Information

Ecotoxicity: Experimental studies show that acute aquatic toxicity values are greater than 1000 mg/l. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of base oil components in soil and sediment.

Persistence and degradability: The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by *microorganisms, they are regarded as inherently biodegradable.*

Bioaccumulation Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to over 6, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)
Shipping Description: ***Not regulated***
Note: ***If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)***

International Maritime Dangerous Goods (IMDG)
Shipping Description: ***Not regulated***
Note: ***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.***

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: ***Not regulated***
Note: ***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.***

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---
Packaging Instruction # after 12/31/2010:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.

All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	03-Aug-2010
Status:	FINAL
Previous Issue Date:	14-Nov-2008
Revised Sections or Basis for Revision:	Periodic review and update
MSDS Number:	814637

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

MP Gear Lube

Material Safety Data Sheet

1. Product and Company Identification

Product Name:	MP Gear Lube
MSDS Number:	720260
Synonyms/Other Means of Identification:	76 MP Gear Lube, SAE 75W-90 76 MP Gear Lube, SAE 80W-90 76 MP Gear Lube, SAE 85W-140 76 MP Gear Lube, SAE 90 76 MP Gear Lube, SAE 140
Intended Use:	Automotive Gear Oil
Manufacturer:	ConocoPhillips Lubricants 600 N. Dairy Ashford, 2W900 Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	U.S.: 1-800-822-6457 or International: +1-83-2486-3363
Technical Information:	1-877-445-9198
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com www.conocophillips.com

2. Hazards Identification

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Clear amber
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Repeated exposure may cause skin dryness or cracking. No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available on acute toxicity.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Signs and Symptoms: Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders.

KMB00003151

See Section 11 for additional Toxicity Information.

3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	40 - 95
Additives	PROPRIETARY	5 - 60

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.
See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802). Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents).

7. Handling and Storage

Precautions for safe handling: Keep away from flames and hot surfaces. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m^3 STEL: 10 mg/m^3 as Oil Mist, if generated	TWA: 5 mg/m^3 as Oil Mist, if generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Clear amber
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1 mm Hg
Vapor Density (air=1):	>1
Initial Boiling Point/Range:	No data
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	0.87 - 0.91 @ 60°F (15.6°C)
Bulk Density:	7.24 - 7.58 lbs/gal
Viscosity:	14.0 - 32.0 cSt @ 100°C; 97 - 441 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	Minimum 302°F / 150°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Lower Explosive Limits (vol % in air):	No data
Upper Explosive Limits (vol % in air):	No data
Auto-ignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Toxicity:

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Acute Toxicity:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	> 5 g/kg	> 2 g/kg	> 5 mg/L

12. Ecological Information

Ecotoxicity: Experimental studies show that acute aquatic toxicity values are greater than 1000 mg/l. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of base oil components in soil and sediment.

Persistence and degradability: The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by microorganisms, they are regarded as inherently biodegradable.

Bioaccumulation Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to over 6, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)
Shipping Description: ***Not regulated***
Note: ***If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)***

International Maritime Dangerous Goods (IMDG)
Shipping Description: ***Not regulated***
Note: ***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.***

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: ***Not regulated***

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---
Packaging Instruction # after 12/31/2010:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Ethylene Oxide	1000 lb	10 lb
Propylene Oxide	10000 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Ethyl Acrylate	Cancer
1, 4-Dioxane	Cancer
Ethylene Oxide	Cancer Female Reproductive Toxicant
Propylene Oxide	Cancer

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.

All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	18-May-2010
Status:	FINAL
Previous Issue Date:	30-Aug-2007
Revised Sections or Basis for Revision:	Environmental hazards (Section 12) Regulatory information (Section 15)
MSDS Number:	720260

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
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Syncon® EP Plus Gear Oil (All Grades)

Material Safety Data Sheet

1. Product and Company Identification

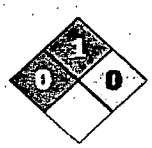
Product Name:	Syncon® EP Plus Gear Oil (All Grades)
MSDS Number:	778853
Synonyms:	Syncon® EP Plus Gear Oil 150, 220, 320, 460, 680
Intended Use:	Gear Lubricant
Manufacturer:	ConocoPhillips Lubricants 600 N. Dairy Ashford, 2W900 Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	U.S.: 800-822-6457 or International: +1-83-2486-3363
Technical Information:	800-766-0050
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/

2. Hazards Identification

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA



Appearance: Clear and bright
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. No harmful effects from skin absorption are expected.

Inhalation (Breathing): Not expected to be toxic.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Signs and Symptoms: Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea.

See Section 11 for additional Toxicity Information.

3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Synthetic Lubricant Base Oil	PROPRIETARY	>97
Additives	PROPRIETARY	<3

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: *Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup* of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents).

7. Handling and Storage

Precautions for safe handling: *Wash thoroughly after handling. Keep away from flames and hot surfaces. Use good personal hygiene* practices and wear appropriate personal protective equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Synthetic Lubricant Base Oil	5mg/m^3 TWA 10 mg/m^3 STEL as Oil Mist, if Generated	5 mg/m^3 TWA as Oil Mist, if Generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Clear and bright
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data

pH:	Not applicable
Vapor Pressure:	<1 mm Hg
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	<-22°F / <-30°C
Pour Point:	<-22°F / <-30°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	0.86 - 0.88 @ 68°F / 20°C
Bulk Density:	7.2 lbs/gal
Viscosity:	17 - 73 cSt @ 100°C; 139 - 740 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	No data
Flash Point:	>356°F / >180°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Toxicity:

No definitive information available on carcinogenicity, mutagenicity, target organ or developmental toxicity.

Acute Toxicity:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Synthetic Lubricant Base Oil	LD50 (rat) >5,000 mg/kg (similar material)	LD50 (rat) >2,000 mg/kg (similar material)	No data

12. Ecological Information

Ecotoxicity: Experimental studies with rainbow trout, daphnia, and fresh water algae indicate that synthetic base oils are not expected to be harmful to aquatic organisms.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, this material will float and spread over the surface at a rate dependent upon viscosity. The main fate process is expected to be slow biodegradation of individual components in soil and sediment.

Persistence and degradability: Synthetic base oils are not considered to be readily biodegradable but may be inherently biodegradable. They are expected to completely biodegrade over extended periods of time.

Bioaccumulation Potential: Not expected to bioaccumulate.

13. Disposal Considerations

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)

Shipping Description: ***Not regulated***
Note: ***If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)***

International Maritime Dangerous Goods (IMDG)

Shipping Description: ***Not regulated***
Note: ***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.***

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: ***Not regulated***
Note: ***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.***

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
Warning: This material may contain trace quantities (less than 1 ppm) of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Ethyl Acrylate	Cancer

Component	Type of Toxicity
Lead / Lead Compounds	Cancer Developmental Toxicant Female Reproductive Toxicant Male Reproductive Toxicant
Arsenic (Inorganic Arsenic Compounds)	Cancer
Cadmium / Cadmium Compounds	Cancer Developmental Toxicant Male Reproductive Toxicant

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	19-Nov-2009
Status:	Final
Previous Issue Date:	09-Oct-2006
Revised Sections or Basis for Revision:	NFPA ratings (Sections 2&5) Physical Properties (Section 9) Environmental hazards (Section 12) Regulatory information (Section 15)
MSDS Number:	778853

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Material Safety Data Sheet

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : **Morlina® Oil SD 220**
Uses : Machine oil.

Manufacturer/Supplier : **SOPUS Products**
PO BOX 4427
Houston, TX 77210-4427
USA
MSDS Request : 877-276-7285

Emergency Telephone Number
Spill Information : 877-242-7400
Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour : Clear pale yellow. Liquid at room temperature. Slight hydrocarbon.

Health Hazards : Not classified as dangerous for supply or conveyance.
Safety Hazards : Not classified as flammable but will burn.
Environmental Hazards : Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards
Inhalation : Under normal conditions of use, this is not expected to be a primary route of exposure.
Skin Contact : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Contact : May cause slight irritation to eyes.
Ingestion : Low toxicity if swallowed.
Other Information : Used oil may contain harmful impurities.
Signs and Symptoms : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Aggravated Medical Condition : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.
Environmental Hazards : Not classified as dangerous for the environment.

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Additional Information	:	Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST AID MEASURES

General Information	:	Not expected to be a health hazard when used under normal conditions.
Inhalation	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
Skin Contact	:	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
Eye Contact	:	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician	:	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point	:	Typical 218 °C / 424 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)(based on mineral oil)
Auto ignition temperature	:	> 320 °C / 608 °F
Specific Hazards	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
Suitable Extinguishing Media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

Protective measures	:	Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Clean Up Methods	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or

other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional Advice : Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

General Precautions : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Handling : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

Storage : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F

Recommended Materials : For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials : PVC.

Additional Information : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Mist.)		5 mg/m3	
Oil mist, mineral	ACGIH	STEL(Mist.)		10 mg/m3	

Exposure Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

Personal Protective Equipment : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of

		material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
Hand Protection	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Eye Protection	:	Wear safety glasses or full face shield if splashes are likely to occur.
Protective Clothing	:	Skin protection not ordinarily required beyond standard issue work clothes.
Monitoring Methods	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Environmental Exposure Controls	:	Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Clear pale yellow. Liquid at room temperature.
Odour	:	Slight hydrocarbon.
pH	:	Not applicable.
Initial Boiling Point and Boiling Range	:	> 280 °C / 536 °F estimated value(s)
Pour point	:	Typical 0 °C / 32 °F
Flash point	:	Typical 218 °C / 424 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	:	> 320 °C / 608 °F
Vapour pressure	:	< 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Specific gravity	:	Typical 0.88
Density	:	Typical 7.49 g/cm3
Water solubility	:	Negligible.
n-octanol/water partition coefficient (log Pow)	:	*> 6 (based on information on similar products)*

Kinematic viscosity	:	Typical 100 mm2/s at 40 °C / 104 °F
Vapour density (air=1)	:	> 1 (estimated value(s))
Evaporation rate (nBuAc=1)	:	Data not available

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to Avoid	:	Extremes of temperature and direct sunlight.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage.
Hazardous Polymerisation	:	Data not available
Sensitivity to Mechanical Impact	:	Data not available
Sensitivity to Static Discharge	:	Data not available

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg
Acute Dermal Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg
Acute Inhalation Toxicity	:	Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	:	Expected to be slightly irritating.
Eye Irritation	:	Expected to be slightly irritating.
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation.
Sensitisation	:	Not expected to be a skin sensitiser.
Repeated Dose Toxicity	:	Not expected to be a hazard.
Mutagenicity	:	Not considered a mutagenic hazard.
Carcinogenicity	:	Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	:	Not expected to be a hazard.
Additional Information	:	Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity	:	Poorly soluble mixture. May cause physical fouling of aquatic

organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Mobility	:	Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
Persistence/degradability	:	Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
Bioaccumulation	:	Contains components with the potential to bioaccumulate.
Other Adverse Effects	:	Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
Container Disposal	:	Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG
This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)
This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

EINECS	All components listed or polymer exempt.
TSCA	All components listed.
DSL	All components listed.

SARA Hazard Categories (311/312)
No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This product contains a chemical known to the State of California to cause cancer.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
MSDS Version Number	:	9.1
MSDS Effective Date	:	01/06/2009
MSDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
MSDS Distribution	:	The information in this document should be made available to all who may handle the product.
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Tegra® Synthetic Gear Lubricant ISO Grades

Product Use: Gear Lubricant
Product Number(s): CPS210452, CPS210453, CPS210454, CPS233916, CPS233917
Synonyms: Chevron Tegra® Synthetic Gear Lubricant ISO 150, Chevron Tegra® Synthetic Gear Lubricant ISO 220, Chevron Tegra® Synthetic Gear Lubricant ISO 320, Chevron Tegra® Synthetic Gear Lubricant ISO 460, Chevron Tegra® Synthetic Gear Lubricant ISO 680
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@Chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

This material contains no ingredients requiring disclosure under the regulatory criteria for this jurisdiction.

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a synthetic hydrocarbon oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

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Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 210 °C (410 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: *Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.*

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: *Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.*
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Keep out of the reach of children.
General Handling Information: *Avoid contaminating soil or releasing this material into sewage and drainage* systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it *may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be* dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty *containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or* disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other

substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless
Physical State: Liquid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): >1
Boiling Point: No Data Available
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Specific Gravity: 0.85 - 0.86 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: No Data Available
Volatile Organic Compounds (VOC) : <1 %weight (Approximate)
Viscosity: 135 cSt @ 40°C (104°F) (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.
DOT Shipping Description: PETROLEUM OIL, N.E.C.; NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER ICAO

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada),

EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: (Gear oil)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : INDUSTRIAL OIL 1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1,2,5,9,14,15,16
Revision Date: 02/21/2006

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

[image]

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Delo® 400 LE SAE 15W-40

Product Use: Engine Oil

Product Number(s): CPS222220

Company Identification

Chevron Products Company

a division of Chevron U.S.A. Inc.

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT

Highly refined mineral oil (C15 - C50)	Mixture	60 - 100 %weight
Zinc alkyl dithiophosphate	68649-42-3	1 - 5 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Not expected to be harmful if swallowed.

Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Cleveland Open Cup) 204 °C (399 °F) Minimum

Autoignition: No Data Available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Keep out of the reach of children.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other

substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	–	–
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	–	–	–

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)

Vapor Density (Air = 1): >1

Boiling Point: >315°C (599°F)

Solubility: Soluble in hydrocarbons; insoluble in water

Freezing Point: Not Applicable

Melting Point: Not Applicable

Specific Gravity: 0.87 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Density: 0.8806 kg/l @ 15°C (59°F) (Typical)

Viscosity: 15.3 mm2/s @ 100°C (212°F) (Min)

Evaporation Rate: No Data Available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or

possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3). During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

ENVIRONMENTAL FATE

Ready Biodegradability: This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE (AMENDMENT 34-08)

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc alkyl dithiophosphate	03, 06

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: DSL (Canada), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required. All other components are listed or exempted from listing on EINECS.

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), ENCS (Japan).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Motor oil)

WHMIS CLASSIFICATION:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : ENGINE OIL 1 - ENG1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 2,5,9,11,12,14,15,16.

Revision Date: July 15, 2009

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct *as of the date hereof. Since this information may be applied under conditions beyond our* control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Machine Oil AW

Product Use: Hydraulic Oil
Product Number(s): CPS232944, CPS232945, CPS232948, CPS232949
Synonyms: Chevron Machine Oil AW ISO 100, Chevron Machine Oil AW ISO 150, Chevron Machine Oil AW ISO 220, Chevron Machine Oil AW ISO 320
Company Identification
Chevron Products Company
Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevron-lubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevrontexaco.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	90 - 100 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

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SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 234 °C (453 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown

Physical State: Liquid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Boiling Point: >315.6°C (600°F)
Solubility: Soluble in hydrocarbon solvents; insoluble in water.
Freezing Point: Not Applicable
Specific Gravity: 0.87 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: 0.86 kg/l - 0.9 kg/l @ 15°C (59°F)
Viscosity: 90 cSt @ 40°C (104°F) (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	NO
2.	Delayed (Chronic) Health Effects:	NO
3.	Fire Hazard:	NO
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required.

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Lubricating oil)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products

KMB00003187

Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : INDUSTRIAL OIL 1 - IND1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 2.
Revision Date: January 15, 2007

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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Material Safety Data Sheet

[image]

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Delo® 400

Product Use: Engine Oil

Product Number(s): CPS235109, CPS235117, CPS235118, CPS235119, CPS235120, CPS235200

Synonyms: Chevron Delo® 400 SAE 10W, Chevron Delo® 400 SAE 10W-30, Chevron Delo® 400 SAE 20, Chevron Delo® 400 SAE 30, Chevron Delo® 400 SAE 40, Chevron Delo® 400 SAE 50

Company Identification

Chevron Products Company

a division of Chevron U.S.A. Inc.

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	60 - 100 %weight
Zinc alkyl dithiophosphate	68649-42-3	1 - 5 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Not expected to be harmful if swallowed.

Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Cleveland Open Cup) 200 °C (392 °F) Minimum

Autoignition: No Data Available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Keep out of the reach of children.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	–	–
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	–	–	–

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Varies depending on specification

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: <0.01 mmHg Maximum @ 37.8 °C (100 °F)

Vapor Density (Air = 1): >1 Minimum

Boiling Point: >315°C (599°F) Minimum

Solubility: Soluble in hydrocarbons; insoluble in water

Freezing Point: Not Applicable

Melting Point: Not Applicable

Specific Gravity: 0.87 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Volatile Organic

Compounds (VOC) : 1.1 %weight

Viscosity: 6.6 cSt @ 100°C (212°F) Minimum

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: No product toxicology data available.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent

extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3). During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE

Ready Biodegradability: This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: DATA NOT AVAILABLE; PETROLEUM LUBRICATING OIL; MAY BE REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc alkyl dithiophosphate 03, 06

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: TSCA (United States).

One or more components has been notified but may not be listed in the following chemical inventories: DSL (Canada). Secondary notification by the importer may be required.

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required. All other components are listed or exempted from listing on EINECS.

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Motor oil)

WHMIS CLASSIFICATION:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : ENGINE OIL 1 - ENG1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1,16.

Revision Date: December 08, 2008

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

KMB00003196

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : **FormulaShell Motor Oil SAE 10W-30**

Manufacturer/Supplier : **SOPUS Products**
PO Box 4427
Houston, TX 77210-4427
USA

MSDS Request : 877-276-7285

Emergency Telephone Number
Spill Information : 877-242-7400
Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Identity	CAS No.	Concentration
Distillates (petroleum), *hydrotreated light paraffinic*	64742-55-8	1.00 - 5.00 %

The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.
Highly refined mineral oils and additives.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour : Amber. Liquid at room temperature. Slight hydrocarbon.

Health Hazards : Not classified as dangerous for supply or conveyance.
Safety Hazards : Not classified as flammable but will burn.
Environmental Hazards : Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards
Inhalation : Under normal conditions of use, this is not expected to be a primary route of exposure.
Skin Contact : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Contact : May cause slight irritation to eyes.
Ingestion : Low toxicity if swallowed.
Other Information : Used oil may contain harmful impurities.
Signs and Symptoms : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Aggravated Medical Condition : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.

KMB00003198

Environmental Hazards	:	Not classified as dangerous for the environment.
Additional Information	:	Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST AID MEASURES

General Information	:	Not expected to be a health hazard when used under normal conditions.
Inhalation	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
Skin Contact	:	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
Eye Contact	:	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician	:	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point	:	Typical 400 °C / 752 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)(based on mineral oil)
Auto ignition temperature	:	> 320 °C / 608 °F
Specific Hazards	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
Suitable Extinguishing Media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

Protective measures	:	Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Clean Up Methods	:	Slippery when spilt. Avoid accidents, clean up immediately.

Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional Advice : Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

General Precautions : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Handling : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

Storage : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F

Recommended Materials : For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials : PVC.

Additional Information : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Mist.)		5 mg/m3	
Oil mist, mineral	ACGIH	STEL(Mist.)		10 mg/m3	
Distillates (petroleum), hydrotreated light paraffinic	ACGIH	TWA(Mist.)		5 mg/m3	
Distillates (petroleum), hydrotreated light paraffinic	ACGIH	STEL(Mist.)		10 mg/m3	

Exposure Controls	:	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
Personal Protective Equipment	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Respiratory Protection	:	No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65 °C (149 °F)].
Hand Protection	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Eye Protection	:	Wear safety glasses or full face shield if splashes are likely to occur.
Protective Clothing	:	Skin protection not ordinarily required beyond standard issue work clothes.
Monitoring Methods	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Environmental Exposure Controls	:	Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Amber. Liquid at room temperature.

Odour	:	Slight hydrocarbon.
pH	:	Data not available
Initial Boiling Point and Boiling Range	:	> 280 °C / 536 °F estimated value(s)
Pour point	:	Typical -20 °C / -4 °F
Flash point	:	Typical 400 °C / 752 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	:	> 320 °C / 608 °F
Vapour pressure	:	< 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Specific gravity	:	Typical 0.85
Density	:	Typical 7.43 g/cm3
Water solubility	:	Negligible.
n-octanol/water partition coefficient (log Pow)	:	> 6 (based on information on similar products)
Kinematic viscosity	:	Typical 50 mm2/s at 40 °C / 104 °F
Vapour density (air=1)	:	> 1 (estimated value(s))
Evaporation rate (nBuAc=1)	:	Data not available

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to Avoid	:	Extremes of temperature and direct sunlight.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	:	Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	:	Expected to be slightly irritating.
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation.
Sensitisation	:	Not expected to be a skin sensitiser.
Repeated Dose Toxicity	:	Not expected to be a hazard.
Mutagenicity	:	Not considered a mutagenic hazard.
Carcinogenicity	:	Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	:	Not expected to be a hazard.

Additional Information	:	Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. Continuous contact with used engine oils has caused skin cancer in animal tests.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity	:	Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.
Mobility	:	Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
Persistence/degradability	:	Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
Bioaccumulation	:	Contains components with the potential to bioaccumulate.
Other Adverse Effects	:	Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
Container Disposal	:	Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG
This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)
This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

DSL	All components listed.
EINECS	All components listed.
TSCA	All components listed.

SARA Hazard Categories (311/312)
No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

New Jersey Right-To-Know Chemical List

Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)	Listed.

Pennsylvannia Right-To-Know Chemical List

Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)	Listed.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
MSDS Version Number	:	8.0

Material Safety Data Sheet

MSDS Effective Date	:	07/07/2008
MSDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
MSDS Distribution	:	The information in this document should be made available to all who may handle the product.
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

KMB00003205

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Rykon® Oil AW

Product Number(s): CPS229001, CPS229002, CPS229003

Synonyms: CHEVRON Rykon® Oil AW ISO 32, CHEVRON Rykon® Oil AW ISO 46, CHEVRON Rykon® Oil AW ISO 68

Company Identification
ChevronTexaco Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevron-lubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Non-hazardous additive blend in refined oil	Mixture	100 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 170 °C (338 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Non-hazardous additive blend in refined oil	ACGIH	5 mg/m3	10 mg/m3	–	–
Non-hazardous additive blend in refined oil	OSHA Z-1	5 mg/m3	–	–	–

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Yellow
Physical State: Liquid
Odor: *Petroleum odor*
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Boiling Point: >315.6°C (600°F)
Solubility: *Soluble in hydrocarbon solvents; insoluble in water.*
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.86 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: 0.86 kg/l - 0.9 kg/l @ 15°C (59°F)
Viscosity: 28.8 cSt - 61.2 cSt @ 40°C (104°F) (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
The 96 hour(s) LC50 for rainbow trout (Oncorhynchus mykiss) is >1000 mg/l.
The 48 hour(s) EC50 for water flea (Daphnia magna) is >1000 mg/l.
This material is not expected to be harmful to aquatic organisms.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.
DOT Shipping Name: NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
DOT Hazard Class: NOT APPLICABLE
DOT Identification Number: NOT APPLICABLE
DOT Packing Group: NOT APPLICABLE
Additional Information: NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Name: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE
IMO/IMDG Hazard Class: NOT APPLICABLE
IMO/IMDG Identification Number: NOT APPLICABLE
IMO/IMDG Packing Group: NOT APPLICABLE

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	08=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).

CANADA: One or more components of this product are not on the Domestic Substances List (DSL). Volume tracking or notification by the Canadian Importer of Record may be required. Please contact ChevronTexaco Global Lubricants.
EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.
KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.
PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Hydraulic oil)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0
HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).
REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1, 5, 8, 11, 15

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - ChevronTexaco	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Rando® HD

Product Use: Hydraulic Oil

Product Number(s): CPS273277, CPS273278, CPS273279

Synonyms: Rando® HD ISO 32, Rando® HD ISO 46, Rando® HD ISO 68

Company Identification

Chevron Products Company

a division of Chevron U.S.A. Inc.

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center. Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT

Highly refined mineral oil (C15 - C50)	Mixture	90 - 100 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.

Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Cleveland Open Cup) 190 °C (374 °F) (Min)

Autoignition: No Data Available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible

Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	–	–
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	–	–	–

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Yellow

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)

Vapor Density (Air = 1): >1

Boiling Point: 315°C (599°F)

Solubility: Soluble in hydrocarbon solvents; insoluble in water.

Freezing Point: Not Applicable

Specific Gravity: 0.86 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Density: 0.86 kg/l - 0.87 kg/l @ 15°C (59°F)

Volatile Organic

Compounds (VOC) : <2.1 %weight

Viscosity: 32 cSt @ 40°C (104°F) (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: No product toxicology data available.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

48 hour(s) EC50: >1000 mg/l (Daphnia magna)

96 hour(s) LC50: >1000 mg/l (Oncorhynchus mykiss)

This material is not expected to be harmful to aquatic organisms.

ENVIRONMENTAL FATE

Ready Biodegradability: This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; MAY BE REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required. All other components are listed or exempted from listing on EINECS.

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Hydraulic oil)

WHMIS CLASSIFICATION:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : INDUSTRIAL OIL 1 - IND1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 12,14,15,16

Revision Date: February 24, 2009

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility

for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

KMB00003220

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Open Gear Grease

Product Use: Grease
Product Number(s): CPS230002
Company Identification
ChevronTexaco Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@Chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Asphalt	8052-42-4	60 - 80 %weight
Highly refined mineral oil (C15 - C50)	Mixture	10 - 30 %weight
Graphite	7782-42-5	1 - 5 %weight
Molybdenum disulphide	1317-33-5	1 - 5 %weight

SECTION 3 HAZARDS IDENTIFICATION

****
EMERGENCY OVERVIEW

- CAUSES EYE IRRITATION
****

IMMEDIATE HEALTH EFFECTS
Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the

recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, apply a waterless hand cleaner, mineral oil, or petroleum jelly. Then wash with soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 204 °C (399 °F) (Min)
Autoignition: > 316 °C (> 601 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Nitrogen .

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Clean up spills immediately, observing precautions in Exposure Controls/Personal Protection section.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not get in eyes.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice

2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Neoprene, Nitrile Rubber, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Asphalt	ACGIH	.5 mg/m3	–	–	–
Graphite	ACGIH	2 mg/m3	–	–	–
Graphite	OSHA Z-1	5 mg/m3	–	–	–
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	–	–
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	–	–	–
Molybdenum disulphide	ACGIH	3 mg/m3	–	–	–
Molybdenum disulphide	OSHA Z-1	5 mg/m3	–	–	–

The ACGIH TLV is 0.5 mg/m3 as the benzene extractable portion of the inhalable fraction of asphalt fume. The TLV may also be determined by unspecified 'equivalent' methods.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Black
Physical State: Semi-solid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure:
Vapor Density (Air = 1): >1
Boiling Point: No Data Available
Solubility: Negligible
Freezing Point: Not Applicable
Density: 0.97
Viscosity: No data available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: Material is dangerously unstable. See 'Conditions to Avoid' and/or 'Incompatibility With Other Materials' in this section.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:
There is concern about the carcinogenicity of chemical compounds found in asphalts. The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of asphalts in 1985 and again in 1987. At that time, they concluded there was inadequate evidence to decide that asphalts were carcinogenic to humans. Overall, findings from health monitoring studies of asphalt workers are not conclusive. However, asphalt fume condensates and certain chemical components of asphalt fume have been shown to cause cancer in mice when repeatedly applied to the skin and allowed to remain on the skin for a prolonged period of time. In addition, asphalt fume condensates have been shown to be weakly positive in Ames mutagenicity tests. Skin contact and breathing of fumes, mists and vapors should be reduced to a minimum.

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A HAZARDOUS MATERIAL

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A DANGEROUS GOOD

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A DANGEROUS GOOD

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Asphalt	05, 06, 07
Graphite	05, 07
Molybdenum disulphide	05, 06

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: ENCS (Japan).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Grease)

WHMIS CLASSIFICATION:
Class D, Division 2, Subdivision B: Toxic Material -
Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0 PPE: B
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : GREASE 4

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1-16
Revision Date: 07/16/2004

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MSDS Material Safety Data Sheet
THE PENRAY COMPANIES, INC.

PENRAY OPEN GEAR LUBE 7003

MSDS Number: 7003 Revision Date: 07/13/2006

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

The Penray Companies, Inc.

440 Denniston Ct.
Wheeling, IL 60090

Contact: EH&S Manager
Telephone Number: 847-459-5000
FAX Number: 847-459-5043
E-Mail:
Web penray.com

Product Name:	PENRAY OPEN GEAR LUBE 7003
Revision Date:	07/13/2006
MSDS Number:	7003
Common Name:	AEROSOL LUBRICANT CONTAINING XYLENE AND HYDROCARBON PROPELLANT

EMERGENCY PHONE NUMBER (800) 752-7869

NFPA 704M RATING :

HEALTH:2 FIRE:4 REACTIVITY: 0 SPECIAL:

O=INSIGNIFICANT 1=SLIGHT 2=MODERATE 3=HIGH 4=EXTREME

2 COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS #	PERCENT BY WEIGHT
PROPANE-ISOBUTANE-n-BUTANE	68476-86-8	25-30%
XYLENE	1330-20-7	25-35%
PETROLEUM HYDROCARBON	64741-53-3	5-15%

3 HAZARDS IDENTIFICATION

Route of Entry:	Skin absorption and inhalation
Target Organs:	Lungs, kidneys, liver and nervous system.
Inhalation:	Respiratory irritation and dizziness
Skin Contact:	Prolonged contact with skin can cause irritation. Repeated skin contact may cause persistent irritation and dermatitis
Eye Contact:	Will cause irritation upon contact.
Ingestion:	Product may cause discomfort, nausea,vomiting and diarrhea.

CHRONIC HEALTH EFFECTS : Over exposure to the ingredients in this product may cause liver abnormalities and kidney damage
CARCINOGENICITY: Product is not considered a carcinogen by OSHA, NTP or IARC.
MEDICAL CONDITIONS: Pre-existing eye or skin conditions may be aggravated by over-exposure to this product.

4 FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Seek medical attention. Inhalation hazard unlikely due to low volatility of product.

Skin Contact: Wash area with soap and water. seek medical attention if irritation persists

Eye Contact: Immediately flush eyes with plenty of water for 15 minutes. Seek medical attention.

Ingestion: DO NOT induce vomiting. Only give CONSCIOUS victim two glasses of water and seek medical attention. NEVER give UNCONSCIOUS anything by mouth.

5 FIRE FIGHTING MEASURES

Flash Point: BT 75-88 Degrees F
Flash Point Method: TCC

EXTINGUISHING MEDIA: Carbon Dioxide (CO2) Dry Chemical, Foam.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and can collect in low areas
FIRE FIGHTING INSTRUCTIONS: Containers can build up pressure if exposed to fire. Containers should be cooled with water supply.
FIRE FIGHTING EQUIPMENT: Self- contained breathing apparatus with full face piece operated in positive pressure mode.

6 ACCIDENTAL RELEASE MEASURES

SPILL/LEAK PROCEDURES: Notify safety personnel ,evacuate all unnecessary personnel and provide adequate ventilation. If feasible, and without risk,clean-up personnel should stop leak. All clean up personnel should wear proper personal protective equipment.
SMALL SPILLS:Clean with inert absorbent and place in recovery drums for disposal.
LARGE SPILLS: Dike to prevent further migration of material. DO NOT release into waterways or sewers. Follow applicable federal and state regulations.

7 HANDLING AND STORAGE

Handling Precautions: Wash thoroughly after handling. Do not get into eyes, on skin or on clothing.. Do not smoke while using this product.Do not use near excessive heat, sparks, or open flame.

Storage Requirements: Store in clean, dry locations away from excessive heat. Store in areas designated for the storage of Level III aerosols according to NFPA 30B (Manufacturing and Storage of Aerosol Products.)

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Eye wash station and safety shower.
Strong general ventilation or local exhaust.

Protective Equipment: EYE: Chemical splash goggles with indirect or no ventilation.
SKIN :Chemical resistant gloves such as nitrile.
RESPIRATORY: Organic vapor air purifying respiator if vapors are a nuisance or if the concentrations are above PEL or TLV.
Never eat drink or smoke in the work area.

MSDS Material Safety Data Sheet
THE PENRAY COMPANIES, INC.

PENRAY OPEN GEAR LUBE 7003

MSDS Number: 7003 Revision Date: 07/13/2006

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black liquid		
Physical State:	liquid	**Boiling Point:**	BT160-190- F
Odor:	solvent	**Freezing/Melting Pt.:**	
pH:		**Solubility:**	Not soluble in water
Vapor Pressure:	5.1 mmHG	**Spec Grav./Density:**	0.89
Vapor Density:	>1.0		

10 STABILITY AND REACTIVITY

Stability:	Material is stable.
Conditions to avoid:	Excessive heat and open flame.
Materials to avoid (incompatability):	Strong oxidizing agents.
Hazardous Decomposition products:	Carbon Monoxide and Carbon Dioxide
Hazardous Polymerization:	Cannot occur.

11 TOXICOLOGICAL INFORMATION

LD50
Xylene: 7.53 g/kg (oral)

12 ECOLOGICAL INFORMATION

No data.

13 DISPOSAL CONSIDERATIONS

As a waste, this product in its raw form DOES MEET the criteria of a hazardous waste as defined by RCRA (40CFR361). As a waste this product can be fuel blended at a fuel blending facility. Dispose of in accordance with all applicable state, federal and local regulations.

14 TRANSPORT INFORMATION

DOMESTIC:
CONSUMER COMMODITY ORM-D

EXPORT:
AEROSOL DISPENSERS, CLASS 2.1 UN1950, LIMITED QUANTITY

15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS
OSHA: Considered to be a hazardous material as defined by 29CFR1910.1200

EPA SARA TITLE III

Section 311-312 (40CFR370): If stored in excess of the threshold quantities, this product should be reported as a(n):
IMMEDIATE (acute) HEALTH HAZARD
DELAYED (chronic) HEALTH HAZARD
FIRE HAZARD
SUDDEN RELEASE HAZARD

Section 313(40CFR372) This product does not contains ingredients which are subject to the reporting requirements of SARA 313:
XYLENE

16 OTHER INFORMATION

CALIFORNIA PROPOSITION 65: This product does not contain ingredients which are on the current Proposition 65 list.

Notes:
NG= NOT GIVEN
BT= BETWEEN
<= LESS THAN
>= GREATER THAN

USERS RESPONSIBILITY;This MSDS provides environmental, health and safety information. This product is to be used in applications consistent with our product literature and container label. Individuals handling this product should be informed to the recommended safety precautions and have access to this MSDS. Please contact your local sales representative ot our EH&S Department for further information.

END OF MSDS

END OF MSDS DOCUMENT

Material Safety Data Sheet

- Click on the product name to go to the Salesfax description sheet.
- Click on the grade to go to the Salesfax typical test data sheet.

Chevron Handy Oil ISO 15

MSDS: 4608 Revision #: 3 Revision Date: 04/02/99

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEVRON Handy Oil ISO 15

PRODUCT NUMBER(S): CPS226807

COMPANY IDENTIFICATION

Chevron Products Company
Global Lubricants
555 Market St.
Room 803
San Francisco, CA 94105-2870

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Emergency Information Centers
are located in U.S.A.
Int'l collect calls accepted

PRODUCT INFORMATION: MSDS Requests: (800) 414-MSDS or (800) 414-6737
Environmental, Safety, & Health Info: (415) 894-0434
Product Information: (800) 582-3835

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % CHEVRON Handy Oil ISO 15

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
LUBRICATING BASE OIL CONTAINING ONE OR MORE OF THE FOLLOWING	> 95.00%		
HYDROTREATED DIST., HVY PARA Chemical Name: DISTILLATES, HYDROTREATED HEAVY PARAFFINIC CAS64742547		5 mg/m3 (mist) 10 mg/m3 (mist) 5 mg/m3 (mist)	ACGIH TWA ACGIH STEL OSHA PEL
HYDROTREATED DIST., LT NAPHTH Chemical Name: DISTILLATES, HYDROTREATED LIGHT NAPHTHENIC CAS64742536		5 mg/m3 (mist) 10 mg/m3 (mist) 5 mg/m3 (mist)	ACGIH TWA ACGIH STEL OSHA PEL
SOLVENT DEWAXED DIST., HVY PAR Chemical Name: DISTILLATES, SOLVENT DEWAXED HEAVY PARAFFINIC			

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CAS64742650	5 mg/m3 (mist) 10 mg/m3 (mist) 5 mg/m3 (mist)	ACGIH TWA ACGIH STEL OSHA PEL

ADDITIVES < 5.00%

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********

Pale yellow liquid.

- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE

****

POTENTIAL HEALTH EFFECTS
EYE:
Not expected to cause prolonged or significant eye irritation.
SKIN:
Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.
INGESTION:
If swallowed, this substance is considered practically non-toxic to internal organs. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.
INHALATION:
Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit.

4. FIRST AID MEASURES

EYE:
No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution remove contact lenses, if worn, and flush eyes with water.
SKIN:
No specific first aid measures are required because this material is not expected to be harmful if it contacts the skin. As a precaution, remove clothing and shoes if contaminated. Use a waterless hand cleaner, mineral oil, or petroleum jelly to remove the material. Then wash skin with soap and water. Wash or clean contaminated clothing and shoes before reuse.
INGESTION:
If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.
INHALATION:

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If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
NOTE TO PHYSICIANS:
Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.
FLAMMABLE PROPERTIES:
FLASH POINT: (COC) 302F (150C) min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog.
NFPA RATINGS: Health 1; Flammability 1; Reactivity 0.
FIRE FIGHTING INSTRUCTIONS:
This material will burn although it is not easily ignited.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887
International Collect Calls Accepted
ACCIDENTAL RELEASE MEASURES:
Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

7. HANDLING AND STORAGE

Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or properly disposed of. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water. Do not taste or swallow. Wash thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal

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protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
Use in a well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended mineral oil mist exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
SKIN PROTECTION:
No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances. Suggested materials for protective gloves include: <Viton> <Nitrile> <Silver Shield>
RESPIRATORY PROTECTION:
No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the recommended mineral oil mist exposure limits. If not wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: particulate.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Pale yellow liquid.

pH:	NDA
VAPOR PRESSURE:	NA
VAPOR DENSITY (AIR=1):	NA
BOILING POINT:	NA
FREEZING POINT:	NDA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	0.87 @ 15.6/15/6C
EVAPORATION RATE:	NA
VISCOSITY:	13.5 cSt @ 40C (min.)
PERCENT VOLATILE (VOL):	NA

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
No data available.
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
No data available.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

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11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
The eye irritation hazard is based on data for a similar material.
SKIN EFFECTS:
The skin irritation hazard is based on data for a similar material.
ACUTE ORAL EFFECTS:
The acute oral toxicity is based on data for a similar material.
ACUTE INHALATION EFFECTS:
The acute respiratory toxicity is based on data for a similar material.
ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
No data available.
ENVIRONMENTAL FATE:
This material is not expected to be readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS: NONE
DOT IDENTIFICATION NUMBER: NONE
DOT PACKING GROUP: N/A
ADDITIONAL INFO: Petroleum Lubricating Oil - Not Hazardous by U.S. DOT.
ADR/RID Hazard class - Not applicable.

15. REGULATORY INFORMATION

SARA 311 CATEGORIES: 1. Immediate (Acute) Health Effects: YES

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2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

DISTILLATES, HYDROTREATED LIGHT NAPHTHENIC
is found on lists: 02,14,15,17,
DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
is found on lists: 14,15,17,
DISTILLATES, SOLVENT DEWAXED HEAVY PARAFFINIC
is found on lists: 14,15,17,

EU RISK AND SAFETY LABEL PHRASES:
R53: May cause long-term adverse effects in the aquatic environment.
R65: Harmful: may cause lung damage if swallowed.
S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows:
PETROLEUM OIL.
WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

16. OTHER INFORMATION

NFPA RATINGS: Health 1; Flammability 1; Reactivity 0;
HMIS RATINGS: Health 1; Flammability 1; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
Changes have been made throughout this Material Safety Data Sheet. Please read the entire document.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed
NDA - No Data Available	NA - Not Applicable

KMB00003236

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

****

THIS IS THE LAST PAGE OF THIS MSDS

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KMB00003237

Material Safety Data Sheet

Prepared according to OSHA Hazard Communication Standard (29 CFR 1910.1200) and ANSI MSDS Standard (Z400.1). Complies with Canadian Workplace Hazardous Materials Information System (WHMIS) standards.

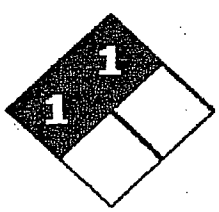
Revision Date 31-Aug-2006 **Revision Number** 3

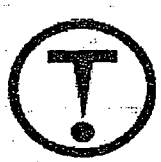
1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	SWEPCO 604 Outide Gear Lube
Product Code	W20701
Chemical Family	Petroleum hydrocarbon
Recommended Use	Lubricant
Supplier Address	Southwestern Petroleum Corporation, 534 North Main St, Fort Worth, TX 76106 USA 1-800-877-9372 www.swepcousa.com
Emergency Telephone Number	Chemtrec 1-800-424-9300 in US; Canutec 1-613-996-6666 in Canada.
UN-No	None

2. HAZARDS IDENTIFICATION

Emergency Overview Not expected to present a significant health hazard upon short term exposure. May cause skin irritation and/or dermatitis. May be harmful if swallowed. Product is combustible but will not readily ignite.





NFPA					
Health	1	**Flammability**	1	**Instability**	0
WHMIS	D2A - Other Very Toxic				
Appearance	Black	**Physical State**	Grease	**Odor**	Petroleum distillates

Principle Routes of Exposure Skin contact. Eye contact.

Acute Health Effects

Skin Avoid prolonged and/or repeated contact with skin. Prolonged and/or repeated contact with this material may produce skin irritation or inflammation. Personnel with pre-existing skin disorders should avoid contact with this product.

Eyes Contact with eyes may cause irritation

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Inhalation	None known.
Ingestion	Ingestion is not considered a likely route of exposure. Low order of acute oral toxicity, but minute amounts aspirated into the lungs during ingestion may cause mild to severe pulmonary injury and possibly death
Carcinogenic Effects	Carcinogenic effect of the complete mixture has not been evaluated. Information on individual ingredients which may have carcinogenic effects, if any, will be found in Section 3 & 11.
Chronic Health Effects	Reports have associated repeated and prolonged occupational overexposure to petroleum based products with liver, kidney, brain and nervous system damage. There is, however, no reported human evidence that these effects occur when exposure is maintained below OSHA and ACGIH limits.
Aggravated Medical Conditions	No information available

See Section 11 for additional toxicological information.

See Section 12 for ecological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

If any of the components of this product are defined as hazardous by OSHA Hazard Communication Standard 1910.1200 and are present at 1% or more (0.1% or more for carcinogens) or are considered hazardous components according to Canadian WHIMIS standards, they will be listed in this section. If no components appear in this section, no components of the product meet or exceed the reporting requirements.

Hazardous Components

Chemical Name	CAS-No	EINECS	Weight %	IARC	OSHA	NTP Carc	WHMIS
Carbon black	1333-86-4	215-609-9	20 - 39.99	Group 2B	X	-	D2A

CLARIFICATION -- While carbon black is considered a potential carcinogen in its respirable airborne form, it poses no risk of inhalation as used in this grease product.

4. FIRST AID MEASURES

Eye Contact	Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.
Skin Contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes
Inhalation	First aid is not required.
Ingestion	Consult a physician or Poison Control Center immediately. Do not induce vomiting without medical advice
Notes to Physician	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flammable Properties	Combustible material: may burn but does not ignite readily

Suitable Extinguishing Media	Water spray or fog, dry chemical, carbon dioxide (CO2) or foam. Cool containers with flooding quantities of water until well after fire is out.
Hazardous Combustion Products	No information available
Specific Hazards Arising from the Chemical	Keep product and empty container away from heat and sources of ignition
Protective Equipment and Precautions for Firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Avoid contact with skin, eyes and clothing
Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-up	Take up mechanically and collect in suitable container for disposal.
Other Information	Report spills as required to the appropriate authorities.

7. HANDLING AND STORAGE

Handling	*Handle in accordance with good industrial hygiene and safety practice*
Storage	Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines The table below lists known exposure levels for any components of this product which are considered hazardous. Keep in mind, however, that these exposure levels are for pure concentrations of these ingredients:

Chemical Name	ACGIH TLV	OSHA PEL	Quebec OEL	Ontario TWAEV	EU OEL
Carbon black	TWA: 3.5 mg/m³	TWA: 3.5 mg/m³	TWA: 3.5 mg/m³	TWA: 3.5 mg/m³	

CLARIFICATION -- While carbon black is considered a potential carcinogen in its respirable airborne form, it poses no risk of inhalation as used in this grease product.

Engineering Controls	Use in well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation or other engineering controls to control airborne levels below the recommended mineral oil mist exposure limits (ACGIH TLV TWA: 5 mg/m^3; ACGIH TLV STEL: 10 mg/m^3; OSHA PEL TWA: 5 mg/m^3).
Eye/face Protection	Safety glasses with side-shields
Skin Protection	Use protective gloves and clothing if contact with product is likely
Respiratory Protection	If personal exposure levels cannot be maintained below accepted exposure limits or if irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn

General Hygiene Considerations When using, do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Black	**Odor**	Petroleum distillates
Physical State	Grease	**pH**	No data available
Flash Point	>149°C	**Autoignition Temperature**	No data available
Boiling Point/Range	Not applicable	**Melting Point/Range**	Not applicable
Flammability Limits in Air, %	No data available		
Specific Gravity (Water=1)	1.1	**Solubility in Water**	Insoluble
Vapor Density (Air=1)	>10	**Volatiles, % Vol**	0

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended storage conditions
Conditions to Avoid	Keep away from open flames, hot surfaces and sources of ignition
Incompatible Materials	Strong oxidizing agents
Hazardous Decomposition Products	Hydrocarbons. Carbon monoxide. Hydrogen sulfide (H2S) may be produced above 250° F (121° C).
Hazardous Polymerization	Hazardous polymerization does not occur

11. TOXICOLOGICAL INFORMATION

Toxicity of this complete mixture has not been evaluated. If information is available on any of the individual components of the mixture, it is presented in this section. If no information appears in this section, there is no toxicological information available for any of the components of the mixture.

Acute Toxicity The table below indicates toxicological information for specific ingredients at concentrations indicated. If no table appears, no toxicological information was found.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Carbon black	15400 mg/kg (Rat)	3 g/kg (Rabbit)	

Chronic Toxicity Reports have associated repeated and prolonged occupational overexposure to petroleum based products with liver, kidney, brain and nervous system damage. There is, however, no reported human evidence that these effects occur when exposure is maintained below OSHA and ACGIH limits.

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. If no table appears, no toxicological information was found.

Chemical Name	ACGIH	IARC	NTP Carc	OSHA
Carbon black		Group 2B		X

CLARIFICATION -- While carbon black is considered a potential carcinogen in its respirable airborne form, it poses no risk of inhalation as used in this grease product.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity and biodegradability of this complete mixture have not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water and should not be considered readily biodegradable. If information is available on any of the individual components of the mixture, it is presented in this section. If no information appears in this section, there is no ecotoxicity or biodegradability information available for any of the components of the mixture.

Chemical Name	Freshwater Algae	Microtox	Water Flea	DOT Marine Pollutant
Carbon black			EC50 > 5600 mg/L 24 h	

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of contents/container in accordance with local regulation

14. TRANSPORT INFORMATION

DOT Not regulated

TDG Not regulated

MEX Not regulated

ICAO	Not regulated
IATA	Not regulated
IMDG/IMO	Not regulated
RID	Not regulated
ADR	Not regulated
ADN	Not regulated

15. REGULATORY INFORMATION

U.S. Regulations & Inventories The table below lists any regulatory or inventory listing information found for ingredients of this product which are considered hazardous. All other components are either listed on the inventories referenced or are exempt from listing. See Section 16 for explanation of column headings:

Chemical Name	CAS-No	TSCA	TSCA 12(b)	CERCLA/SARA 313 (de minimis concentration)	SARA Hazardous Substance Required Qty
Carbon black	1333-86-4	XU	-	-	-

U.S. State Right-to-Know Regulations The table below lists any regulatory or inventory listing information found for ingredients of this product which are considered hazardous. All other components are either listed on the inventories referenced or are exempt from listing. See Section 16 for explanation of column headings:

Chemical Name	Calif. Prop. 65	Massachusetts	New Jersey	Pennsylvania	Rhode Island
Carbon black	Carcinogen	X	X	X	X

Canada Regulations & Inventories The table below lists any regulatory or inventory listing information found for ingredients of this product which are considered hazardous. All other components are either listed on the inventories referenced or are exempt from listing. See Section 16 for explanation of column headings:

Chemical Name	CAS-No	DSL	NDSL	WHMIS
Carbon black	1333-86-4	X	-	D2A

This product has been classified in accordance with the hazard criteria of the Candian CPR (Controlled Products Regulations) and the MSDS contains all the information required by the CPR.

International Regulations & Inventories The table below lists any regulatory or inventory listing information found for ingredients of this product which are considered hazardous. All other components are either listed on the inventories referenced or are exempt from listing. See Section 16 for explanation of column headings:

Chemical Name	EINECS	AICS	CHINA	ENCS	PICCS
Carbon black	215-609-9	X	X	X	X

16. OTHER INFORMATION

Regulatory Lists Searched & Other Sources of Information

ACGIH - American Converence of Governmental Industrial Hygienists
ADN - European Agreement for International Carriage of Dangerous Goods by Inland Waterways

ADR - European Agreement for International Carriage of Dangerous Goods by Road
AICS - Australian Inventory of Chemical Substances
ANSI - American National Standards Institute
CAP65 - California Proposition 65 Hazard List
CAS - Chemical Abstract Services
CERCLA - Comprehensive Environmental Response, Compensation & Liability Act
CHINA - China Inventory
CPR - Canadian Controlled Products Regulations
DOT - United States Department of Transportation
DSL - Canada Domestic Substances List
EINECS - European Union (EU) European Inventory of Existing Commercial Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IMDG - International Maritime Dangerous Goods Code
MARTK - Massachusetts Right To Know List
NDSL - Canada Non-Domestic Substances List
NFPA - United States National Fire Protection Association
NIOSH - United States National Institute for Occupational Safety & Health
NJRTK - New Jersey Right To Know List
NTP - United States National Toxicology Program
OSHA - United States Occupational Safety & Health Administration
PARTK - Pennsylvania Right To Know List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
RCRA - United States Resources Conservation & Recovery Act
RID - European Agreement for International Carriage of Dangerous Goods by Rail
RIHSL - Rhode Island Hazardous Substance List
SARA - United States Superfund Amendments & Reauthorization Act
TDG - Canada Transportation of Dangerous Goods Act
TSCA - US Toxic Substances Control Act
WHMIS - Canada Workplace Hazardous Materials Information System

Definitions

EC50 - Effective Concentration (Concentration of a compound where 50% of the expected effect is observed.)
LC50 - Lethal Concentration (The concentration in water that will kill 50% of the test animals within a specific period of time, usually 96 hours.)
LD50 - Lethal Dose (The single dose that will kill 50% of the test animals by any route other than inhalation such as by ingestion or skin contact.)
OEL - Occupational Exposure Limit
PEL - Permissible Exposure Limits
STEL - Short Term Exposure Limit
TLV - Threshold Limit Value
TWA - Time Weighted Average
TWAEV - Time Weighted Average Exposure Value

Revision Date 31-Aug-2006

End of MSDS

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Black Pearl® Grease EP

Product Use: Grease
Product Number(s): CPS254590, CPS254591, CPS254592
Synonyms: Chevron Black Pearl® Grease EP NLGI 0, Chevron Black Pearl® Grease EP NLGI 1, Chevron Black Pearl® Grease EP NLGI 2
Company Identification
ChevronTexaco Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@Chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 80 %weight
Polyurea thickener		10 - 20 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, apply a waterless hand cleaner, mineral oil, or petroleum jelly. Then wash with soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 246 °C (475 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Nitrogen .

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Clean up spills immediately, observing precautions in Exposure Controls/Personal Protection section.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Neoprene, Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	–	–
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	–	–	–

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Black
Physical State: Semi-solid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: <1 mmHg @ 40 °C (104 °F)
Vapor Density (Air = 1): >1
Boiling Point: >315°C (599°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Melting Point: 205°C (401°F) (Min)
Viscosity: No data available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE

This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A HAZARDOUS MATERIAL

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A DANGEROUS GOOD

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING GREASE, NOT REGULATED AS A DANGEROUS GOOD

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: DSL (Canada), EINECS (European Union), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), IECSC (China), KECI (Korea), PICCS (Philippines).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Grease)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : GREASE 1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 2,8,9,16
Revision Date: 07/09/2004

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MATERIAL SAFETY DATA SHEET

Review Date: 06/21/2004

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: RETINAX® LC Grease 2

MSDS NUMBER: 856302E - 3
PRODUCT CODE(S): 5059909, 7042800000, 7042802120, 7042802400

MANUFACTURER
SOPUS Products
P.O. Box 4427
Houston, TX. 77210-4427

TELEPHONE NUMBERS
Spill Information: (877) 242-7400
Health Information: (877) 504-9351
MSDS Assistance Number: (877) 276-7285

SECTION 2 PRODUCT/INGREDIENTS

INGREDIENTS	CAS#	CONCENTRATION
Heavy Duty Grease		
Highly refined petroleum oils	Mixture	80 - 90 %weight
Lithium grease thickener	Mixture	5 - 15 %weight
Additives (1.0 % Zinc)	Mixture	5 - 10 %weight

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance & Odor: Amber, smooth grease. Slight Hydrocarbon Odor.
Health Hazards: No known immediate health hazards. High-pressure injection under the skin may cause serious damage.
Physical Hazards: No known physical hazards.
NFPA Rating (Health, Fire, Reactivity): 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

Inhalation:
Inhalation of vapors (generated at high temperatures only) or oil mist may cause mild irritation of the nose, throat, and respiratory tract. May cause irritation to the nose, throat and respiratory tract.

Eye Irritation:
May be irritating to the eyes causing a burning sensation, redness, swelling and/or blurred vision.

Skin Contact:
May be irritating to the skin causing a burning sensation, redness and/or swelling. Release of the material during high-pressure applications may result in injection under the skin causing possible extensive tissue damage which is difficult to heal. Other adverse effects not expected from brief skin contact.

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Ingestion:
Generally considered to have a low order of acute oral toxicity.

Other Health Effects:
Material may release hydrogen sulfide (H2S), a highly toxic and extremely flammable gas, when heated to 180 Degrees F or higher. H2S can cause irritation of the eyes and respiratory tract, headache, dizziness, nausea, vomitting, diarrhea, and pulmonary edema. The odor ("rotten egg") threshold is 0.02 ppm. Do not depend on sense of smell for warning; H2S rapidly deadens the sense of smell.

Signs and Symptoms:
Irritation as noted above. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection.

Aggravated Medical Conditions:
Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:
Move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin:
Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If material is injected under the skin, transport to the nearest medical facility for additional treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye:
Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.

Ingestion:
Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Note to Physician:
In general, emesis induction is unnecessary in high viscosity, low volatility products such as oils and greases.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >385 °F/>196.11 °C [Cleveland Open Cup]

Extinguishing Media:
Material will float and can be re-ignited on surface of water. Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water.

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Fire Fighting Instructions:
Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, NIOSH approved, self-contained breathing apparatus. This material is non-flammable.

Unusual Fire Hazards:
Material may ignite when preheated.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:
May burn although not readily ignitable.

Spill Management:
Scoop up excess grease. Clean area with appropriate cleaner.

Place in container for proper disposal.

Reporting:
CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:
Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Material may release hydrogen sulfide (H2S), a highly toxic and extremely flammable gas, when heated to 180 Degrees F or higher. H2S may collect in the headspace of the container.

Handling:
Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.

Storage:
Do not store in open or unlabeled containers. Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:
Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

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Chemical	Limit	TWA	STEL	Ceiling	Notation
Li-Hydroxystearate	ACGIH TLV	10 mg/m3			
Oil mist, mineral	ACGIH TLV	5 mg/m3	10 mg/m3		
Oil mist, mineral	OSHA PEL	5 mg/m3			

Decomposition Product	Limit	TWA	STEL	Ceiling	Notation
Hydrogen sulfide	ACGIH - TLV	10 ppmm	15 ppmm		
Hydrogen sulfide	OSHA - PEL_IS	10 ppmm	15 ppmm		

Decomposition Product	Method	Condition
Hydrogen sulfide	Elevated Temperatures	> 180 F.

Exposure Controls

Provide adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

Personal Protection

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:
Chemical Goggles, or Safety glasses with side shields

Skin Protection:
Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Neoprene, or Nitrile Rubber

Respiratory Protection:
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:
For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Amber, smooth grease. Slight Hydrocarbon Odor.
Substance Chemical Family: Lubricants

Drop Point	325 °F - 330 °F	**Flash Point**	> 385 °F [Cleveland Open Cup]

Odor	Slight Hydrocarbon Odor.	**Solubility (in Water)**	Negligible
Specific Gravity	0.903	**Stability**	Stable

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat and open flames.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:

Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Carbon Monoxide, Carbon Dioxide, Hydrogen Sulfideand other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

TEST	Result	OSHA Classification	Material Tested
Dermal LD50	>2 g/kg(Rabbit)	Non-Toxic	Based on components(s)
Oral LD50	>5 g/kg(Rat)	Non-Toxic	Based on components(s)

Carcinogenicity Classification

Chemical Name	NTP	IARC	ACGIH	OSHA
Heavy Duty Grease	No	Not Reviewed	No	No

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:
There is no ecological data available for this product. However, this product is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the

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material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

International Air Transport Association
Not regulated under IATA rules.

International Maritime Organization Classification
Not regulated under International Maritime Organization rules.

SECTION 15 REGULATORY INFORMATION

Federal Regulatory Status

OSHA Classification:
Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Ozone Depleting Substances (40 CFR 82 Clean Air Act):
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:
There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health	Delayed Health	Fire	Pressure	Reactivity
NO	NO	NO	NO	NO

SARA Toxic Release Inventory (TRI) (313):
There are no components in this product on the SARA 313 list.

Toxic Substances Control Act (TSCA) Status:
All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:
Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, Chinese Inventory, European EINECS, Korean Inventory,

State Regulation

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This material is not regulated by California Prop 65, New Jersey Right-to-Know Chemical List or Pennsylvania Right-To-Know Chemical List. However for details on your regulation requirements you should contact the appropriate agency in your state.

SECTION 16 OTHER INFORMATION

Revision#: 3
Review Date: 06/21/2004
Revision Date: 06/21/2004
Revisions since last change (discussion): This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). We encourage you to take the opportunity to read the MSDS and review the information contained therein.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODE(S): 5059909, 7042800000, 7042802120, 7042802400

RETINAX® LC Grease 2

CAUTION!

MAY CAUSE SKIN AND EYE IRRITATION. PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS. HIGH-PRESSURE INJECTION UNDER SKIN MAY CAUSE SERIOUS DAMAGE.

Precautionary Measures:
Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid breathing of vapors, fumes, or mist. Use only with adequate ventilation. Wash thoroughly after handling.

FIRST AID

Inhalation: If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.
Skin Contact: Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If material is injected under the skin, transport to the nearest medical facility for additional treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
Eye Contact: Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.
Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth.

FIRE

In case of fire, Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

SPILL OR LEAK

Scoop up excess grease. Clean area with appropriate cleaner.

CONTAINS: Highly refined petroleum oils, Mixture; Lithium grease thickener, Mixture; Additives (1.0 % Zinc), Mixture

NFPA Rating (Health, Fire, Reactivity): 0, 1, 0

TRANSPORTATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address

SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427

ADMINISTRATIVE INFORMATION	
MANUFACTURER ADDRESS:	SOPUS Products, P.O. Box 4427, Houston, TX. 77210-4427

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT : IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF SOPUS PRODUCTS AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF SOPUS PRODUCTS.

44525-12331-100R-12/06/2005

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MATERIAL SAFETY DATA SHEET

HE208 - WET PATCH ROOF CEMENT

1. Product And Company Identification

Supplier
HENRY COMPANY
909 N. Sepulveda Blvd., Suite 650
El Segundo, CA 90245-2724

Company Contact: Technical Services
Telephone Number: (800) 486-1278
Web Site: www.henry.com www.bakor.com

Manufacturer
HENRY COMPANY
909 N. Sepulveda Blvd., Suite 650
El Segundo, CA 90245-2724

Company Contact: Technical Services
Telephone Number: (800) 486-1278
Web Site: www.henry.com www.bakor.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: (800) 424-9300
CHEMTREC: (703) 527-3887
CANUTEC: (613) 996-6666

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: (800) 424-9300
CHEMTREC: (703) 527-3887
CANUTEC: (613) 996-6666

Issue Date: 06/10/2010

Product Name: HE208 - WET PATCH ROOF CEMENT
Product Code: HE208

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
1,2,4-trimethylbenzene	95-63-6		1 - 5
aromatic petroleum distillates	64742-95-6		1 - 5
petroleum asphalt	8052-42-4		30 - 60
attapulgite	12174-11-7		5 - 15
calcium carbonate	1317-65-3		15 - 35
cellulose fiber	9004-34-6		5 - 15
silica, quartz	14808-60-7		0.1 - 1
stoddard solvent	8052-41-3		10 - 30

Substances in this product have been pre-registered in accordance with the REACH Regulation - (EC) No. 1907/2006. See Section 15 for additional information.

EMERGENCY OVERVIEW

CAUTION! Combustible Liquid. Central nervous system depressant. Vapor may cause light-headedness, headache, nausea, loss of coordination and respiratory tract irritation. Causes skin irritation.

Appearance/Odor: Black paste, strong petroleum solvent odor

3. Hazards Identification

Primary Routes(s) Of Entry
Inhalation

Eye Hazards
May cause eye irritation (burning, tearing, redness or swelling).

3. Hazards Identification - Continued

Skin Hazards
May cause skin irritation and contact dermatitis upon prolonged contact. Dermal sensitization may occur from repeated and prolonged exposures.

Ingestion Hazards
May be harmful if swallowed. May cause gastric distress, vomiting and diarrhea.

Inhalation Hazards
Exposure to vapors may cause respiratory tract irritation. Inhalation of vapors or mists may cause central nervous system depression, light-headedness, headache, nausea and loss of coordination.

Chronic/Carcinogenicity Effects
This product or one of its ingredients present at 0.1% or more is listed as a carcinogen by NTP, IARC or OSHA. See Section 11 (Toxicological Information) for more details.

4. First Aid Measures

Eye
In case of contact, hold eyelids apart and immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately if irritation develops and persists.

Skin
Remove contaminated clothing and shoes. Wash affected areas with soap and water.

Ingestion
Get medical attention immediately. DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious victim. Call a physician or poison control center immediately.

Inhalation
Remove the person from the contaminated area to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately.

5. Fire Fighting Measures

Flash Point: 120 °F
Flash Point Method: Setaflash
Lower Explosive Limit: 0.9
Upper Explosive Limit: 6.0

Fire And Explosion Hazards
Combustible Liquid. Vapors are heavier than air and may spread long distances and ignite.Thermal decomposition (burning) may release irritating, corrosive and/or toxic gases, vapors and fumes.

Extinguishing Media
Chemical foam, carbon dioxide (CO2), or dry chemical. Do not use direct stream of water.

Fire Fighting Instructions
Firefighters should wear self-contained breathing apparatus and full protective gear.

6. Accidental Release Measures

Collect and dispose in accordance with applicable regulations.

7. Handling And Storage

Handling And Storage Precautions
Keep away from ignition sources. Keep containers tightly closed. Store in a cool, dry, well-ventilated area. Do not handle or store near heat, sparks, flame, strong oxidants or strong acids. Use only with adequate ventilation. Ground all containers.

8. Exposure Controls/Personal Protection

Engineering Controls
Use with adequate general and local exhaust ventilation. When used outdoors, stay well away from building air intakes or close and seal the intakes to prevent product from entering building.

Eye/Face Protection
Safety glasses with side shields or goggles recommended.

Skin Protection
Use with chemical-protective gloves to prevent skin contact.

Respiratory Protection
The level of respiratory protection needed should be based on the evaluation of chemical exposures by a health or safety professional. If required, use a NIOSH-approved air purifying respirator with organic vapor cartridge and particulate filter or supplied air respirator.

Occupational Exposure Limits for individual ingredients (if available) are listed below.

Ingredient(s) - Exposure Limits
1,2,4-trimethylbenzene
ACGIH TLV-TWA 25 ppm
aromatic petroleum distillates
OSHA PEL-TWA 500 ppm
petroleum asphalt
ACGIH TLV-TWA 0.5 mg/m3 (inhalable fraction, as benzene-soluble aerosol)
calcium carbonate
OSHA PEL-TWA 15 mg/m3 (total dust)
OSHA PEL-TWA 5 mg/m3 (respirable dust)
cellulose fiber
ACGIH TLV-TWA 10 mg/m3
silica, quartz
ACGIH TLV-TWA 0.025 mg/m3
OSHA PEL-TWA 30mg/m3 / (%SiO2+2) (total dust)
OSHA PEL-TWA 10 mg/m3/ (%SiO2+2) (respirable dust)
stoddard solvent
ACGIH TLV-TWA 100 ppm
OSHA PEL-TWA 500 ppm

9. Physical And Chemical Properties

Appearance
Black Paste

Odor
Strong Petroleum Solvent Odor

Chemical Type: Mixture
Physical State: Solid
Boiling Point: 310-400 °F
Specific Gravity: 1.14
Percent Volatiles: 22
Vapor Pressure: 2@68°F
Vapor Density: >1
pH Factor: not applicable
Solubility: insoluble in water
Evaporation Rate: <1

10. Stability And Reactivity

Stability: Stable
Hazardous Polymerization: Will not occur

Incompatible Materials
Avoid contact with strong oxidizing agents and acids.

Hazardous Decomposition Products
Toxic and irritating gases, vapors or fumes, carbon monoxide (CO), carbon dioxide (CO2).

11. Toxicological Information

Chronic/Carcinogenicity
IARC has concluded that the following chemicals in this product are carcinogenic to humans (Group 1): silica, quartz
ACGIH has designated the following chemicals in this product as suspected human carcinogens (A2): silica, quartz
NTP has listed the following chemicals in this product as known human carcinogens: silica, quartz

Risk of cancer depends on duration and level of exposure to this product as a dust.

Miscellaneous Toxicological Information
Toxicological testing has not been conducted for this product overall. Available toxicological data for individual ingredients are summarized below.

Ingredient(s) - Toxicological Data
1,2,4-trimethylbenzene
LD50 (oral, rat): 5000 mg/kg
LC50 (rat): 18 g/m3 (4-hour exposure)
aromatic petroleum distillates
LD50 (oral, rat): 2900 mg/kg
calcium carbonate
oral-rat LD50: 6450 mg/kg
cellulose fiber
LD50 (oral, rat): >2000 mg/kg
LC50 (rat): >5800 mg/m3 (4-hour exposure)
silica, quartz
iv-rat LD50: 500 mg/kg bw/Quartz (10-200 um)
stoddard solvent
oral-rat LD50: >5000 mg/kg
dermal-rabbit LD50: >3000 mg/kg
inhal-rat LC50: >5500 mg/m3 (880 ppm)
inhal-rat LC50: >1300 ppm

12. Ecological Information

No specific information available.

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Ground or Water Domestic Voyage

Not restricted if shipped in containers<450L (119 gallons)
Restricted if shipped in containers >450L (119 gallons)

14. Transport Information - Continued

US NA1993, Combustible liquid, n.o.s., (Petroleum Distillates mixture), Combustible liquid, III

Canada UN1999, Tars liquid, 3, III

Unless departs>flash point:

Both UN3256, Elevated Temperature liquid, flammable, n.o.s., (Petroleum Distillates mixture), 3, III

IMDG IMDG Code 2.3.2.5 - exempted from marking, labeling & testing of packages

IATA UN1999, Tars liquid, 3, III

DOT (Pictograms)

15. Regulatory Information

U.S. Regulatory Information

Asphalt may contain detectable amounts of chemicals known to the State of California to cause cancer or reproductive harm.

Ingredient(s) - U.S. Regulatory Information

1,2,4-trimethylbenzene
.SARA Title III - Section 313 Form "R"/TRI Reportable Chemical

Ingredient(s) - State Regulations

1,2,4-trimethylbenzene
New Jersey - Workplace Hazard
New Jersey - Environmental Hazard
Massachusetts - Hazardous Substance
New York City - Hazardous Substance
aromatic petroleum distillates
New Jersey - Workplace Hazard
Pennsylvania - Workplace Hazard
petroleum asphalt
New Jersey - Workplace Hazard
Pennsylvania - Workplace Hazard
Massachusetts - Hazardous Substance
New York City - Hazardous Substance
attapulgite
California - Proposition 65
calcium carbonate
Pennsylvania - Workplace Hazard
cellulose fiber
Pennsylvania - Workplace Hazard
silica, quartz
New Jersey - Workplace Hazard
Pennsylvania - Workplace Hazard
California - Proposition 65
Massachusetts - Hazardous Substance
stoddard solvent

15. Regulatory Information - Continued

Ingredient(s) - State Regulations - Continued

New Jersey - Workplace Hazard
Pennsylvania - Workplace Hazard
Massachusetts - Hazardous Substance
New York City - Hazardous Substance

Canadian Regulatory Information

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. WHMIS Classification: B3 - Combustible Liquid, D2A - Very Toxic

Ingredient(s) - Canadian Regulatory Information

1,2,4-trimethylbenzene
WHMIS - Ingredient Disclosure List
silica, quartz
WHMIS - Ingredient Disclosure List
stoddard solvent
WHMIS - Ingredient Disclosure List

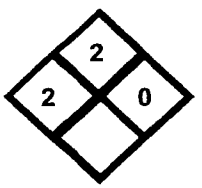
European Union (EU) Regulatory Information

REACH Pre-registration Information:

Substance (CAS#)	Reference Number
Asphalt (8052-42-4)	05-2114366982-36-0000
Stoddard Solvent (8052-41-3)	05-2114367025-53-0000
Calcium Carbonate (1317-65-3)	05-2114501824-55-0000
Cellulose (9004-34-6)	05-2114366989-22-0000
1,2,4-Trimethylbenzene (95-63-6)	05-2114501851-58-0000
1,3,5-Trimethylbenzene (108-67-8)	05-2114501879-40-0000
Xylene (1330-20-7)	05-2114367081-55-0000
Attapulgite (12174-11-7)	NA-Naturally Occurring Substanc

WHMIS - Canada (Pictograms)

NFPA



HMIS

HEALTH	2
FLAMMABILITY	2
REACTIVITY	0
PERSONAL PROTECTION	

16. Other Information

Revision/Preparer Information

This MSDS Supersedes A Previous MSDS Dated: 03/25/2010

HE208 - WET PATCH ROOF CEMENT

Disclaimer
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Safety Data Sheet

Roto-Xtend Duty Fluid

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code	0017 5201 20
Infosafe No.	ACN5C GB/eng/C
Issued Date	13/04/2006
Product Type/Use	Compressor oil.

Supplier

Atlas Copco Airpower nv
Boomsesteenweg 957
B-2610 Wilrijk
BELGIUM

Telephone Numbers

Emergency Tel.

+32 3 870 21 11

Telephone/Fax Number

Please contact the nearest Atlas Copco Sales Company or for urgent matters the Medical Service of Atlas Copco Airpower in Belgium (+32 3 870 21 05)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
Blend of polyolefins and additives.

Name	CAS	EINECS	Proportion	Hazard	R Phrase
Alkaryl amine	68411-46-1	270-128-1	1-5 %		R52/53
Dialkyl thiophosphate ester	268567-32-4		0.1-0.5 %	Xi	R41, R43, R52/53

Other Information
See Section 16 'Other Information' for full text of each relevant Risk Phrase.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

Environmental Hazards
Not classified as dangerous for the environment.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use. May cause an allergic skin reaction

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in sensitive individuals.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Wash out mouth with water and obtain medical attention. Do not induce vomiting.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may result in chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function.
Because entry wounds are small and may not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages
Absorb liquid with sand or earth. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

Clean-up Methods - Large Spillages
Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly

or in an absorbent. Dispose of as for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents.

Storage Temperatures
0°C Minimum. 50°C Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits
No Exposure Limit Established

Exposure Controls
The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity. Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).
Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective.

Respiratory Protection
Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.

Hand Protection
Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or

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combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection
Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken tools.

Body Protection
Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Straw. Pale yellow.
Physical State	Liquid at ambient temperature.
Odour	Characteristic.
pH Value	Data not available.
Vapour Pressure	Expected to be less than 0.5 Pa at 20°C.
Initial Boiling Point	Data not available.
Solubility in Water	Negligible.
Density	circa 842 kg/m3 at 15°C.
Flash Point	>230°C (COC).
Flammable Limits - Upper	10%(V/V) (typical).
Flammable Limits - Lower	1%(V/V) (typical).
Auto-Ignition Temperature	Expected to be above 320°C.
Kinematic Viscosity	46 mm2/s at 40°C.
Evaporation Rate	Data not available.
Vapour Density (Air=1)	Greater than 1.
Partition co-efficient, n-octanol/water	*Log Pow expected to be greater than 6.*
Pour Point	circa -60°C.

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If mists are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with this product can result in defatting of the skin, particularly at elevated temperatures. This can lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed. Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility
Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence / Degradability
Not expected to be readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation
Contains components with the potential to bioaccumulate.

Ecotoxicity
Poorly soluble mixture. May cause physical fouling of aquatic organisms. Product is expected to be practically non-toxic to aquatic organisms, LL/EL50 >100 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Recycle or dispose of in accordance with prevailing regulations, by a recognised collector or contractor. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.
EINECS	One component listed in ELINCS. All other components listed in EINECS or polymer exempt.
TSCA (USA)	All components in compliance.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Contains dialkyl thiophosphate ester. May produce an allergic reaction. Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
To assist harmonisation of sds authoring practices, a version number has been introduced.

References
European Model Code of Safe Practice in the Storage and Handling of Petroleum Products. EN 374-2:1994 Protective gloves against chemicals and micro-organisms
EN 149:2001 Respiratory protective devices - filtering half masks to protect against particles - requirements, testing, marking
EN 405:1992 Respiratory protective devices - valved filtering half masks to protect against gases or gases and particles - requirements, testing, marking.
EN 141:2000 Respiratory protective devices - gas filters and combined filters - requirements, testing, marking
EN 143:2000 Respiratory protective devices - particle filters - requirements, testing, marking
EN 166:1995 Personal eye-protection - specification.

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the Atlas Copco technical department.

List of R Phrases in Section 2
R41 Risk of serious damage to eyes.
R43 May cause sensitization by skin contact.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further Information
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.
... End Of SDS ...

KMB00003272

MSDS SUMMARY SHEET

Manufacturer:
Name: PHILLIPS PETROLEUM COMPANY
Address 1:
Address 2:
Address 3:
CSZ: BARTLESVILLE **State:** OK **Zipcode:** 74004
Emergency phone: (800) 424-9300
Business phone: 800-762-0942

Product:

Ferndale MSDS#: 1354 **Version # :** 6
Manufacturer MSDS#: 0041
Current? : 2002
Name:

NO. 2 DIESEL FUEL

Synonyms:

CARB **Diesel** TF3
CARB **Diesel**
CARB **Diesel** 10%
Diesel Fuel Oil
EPA Low Sulfur **Diesel** Fuel
EPA Low Sulfur **Diesel** Fuel – Dyed
EPA Off Road High Sulfur **Diesel** – Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 **Diesel** Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur **Diesel** – Dyed
No. 2 Low Sulfur **Diesel** - Dyed
No. 2 Low Sulfur **Diesel** - Undyed
Crude column 3rd IR
Crude column 3rd side cut
Atmospheric tower 3rd side cut
Ultra Low Sulfur **Diesel** No. 2
Finished **Diesel**
DHT Reactor Feed
Straight Run **Diesel**
Diesel
Middle Distillate

Product/Catalog Numbers:
MSDS Date: 01/01/2002 **(received:** 01/14/2002)

NFPA codes:
Health: 0 **Flammability:** 2 **Reactivity:** 0

MATERIAL SAFETY DATA SHEET
No. 2 Diesel Fuel

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 2 Diesel Fuel
Product Code: Multiple
SAP Code:
Synonyms:
1354
CARB Diesel TF3
CARB Diesel
CARB Diesel 10%
Diesel Fuel Oil
EPA Low Sulfur Diesel Fuel
EPA Low Sulfur Diesel Fuel – Dyed
EPA Off Road High Sulfur Diesel – Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 Diesel Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur Diesel – Dyed
No. 2 Low Sulfur Diesel - Dyed
No. 2 Low Sulfur Diesel – Undyed
No. 2 Ultra Low Sulfur Diesel – Dyed
No. 2 Ultra Low Sulfur Diesel - Undyed
Intended Use: Fuel
Chemical Family:
Responsible Party: Phillip's Petroleum Company
Bartlesville, Oklahoma 74004
For Additional MSDSs: 800-762-0942
Technical Information:

The intended use of this product is indicated above. If any additional use is known, please contact us at the Technical Information number listed.

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: 800-356-3120

Health Hazards/Precautionary Measures: Causes severe skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable liquid and vapor. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance: Straw-colored to dyed red
Physical Form: Liquid
Odor: Characteristic petroleum

HFPA Hazard Class:
Health: 0 (Least)
Flammability: 2 (Moderate)
Reactivity: 0 (Least)

HMIS Hazard Class
Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME		EXPOSURE GUIDELINE	
		Limits	Agency	Type
Diesel Fuel No. 2 CAS# 68476-34-6	100	100* mg/m3	ACGIH	TWA-SKIN
Naphthalene CAS# 91-20-3	<1	10ppm	ACGIH	TWA
		15ppm	ACGIH	STEL
		10ppm	OSHA	TWA
		250ppm	NIOSH	IDLH

All components are listed on the TSCA inventory

Tosco Low Sulfur No. 2 Diesel meets the specifications of 40 CFR 60.41 for low sulfur diesel fuel.

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

*Proposed ACGIH (1999)

3. HAZARDS IDENTIFICATION

Potential Health Effects:

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Severe skin irritant. Contact may cause redness, itching, burning, and severe skin damage. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin, leading to dermatitis (inflammation). Not actually toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): Low degree of toxicity by ingestion. ASPIRATION HAZARD – This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea, diarrhea and transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Cancer: Possible skin cancer hazard (see Sections 11 and 14).

Target Organs: There is limited evidence from animal studies that overexposure may cause injury to the kidney (see Section 11).

Developmental: Inadequate data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and kidney disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Immediately remove contaminated shoes, clothing, and constrictive jewelry and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard; Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: >125°F/>52°
OSHA Flammability Class: Combustible liquid
LEL %: 0.3 / UEL %; 10.0
Autoignition Temperature: 500°F/260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors (see Section 5). Spilled material may be absorbed into an appropriate material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharged. The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practices.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing or high pressure hydraulic oil equipment.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSIZ49.1 and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentration below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge maybe used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrants a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation and skin damage (see glove manufacturer literature for information on permeability). Depending on conditions of use, apron and/or arm covers may be necessary.

Eyes/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse. It is recommended that impervious clothing be worn when skin contact is possible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1atm).

Appearance: Straw-colored to dyed red
Physical State: Liquid
Odor: Characteristic petroleum
pH: unavailable
Vapor Pressure (mm Hg): 0.40
Vapor Densisty (air=1):>3
Boiling Point/Range: 320-700°F /160-371°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.81-0.88 @ 60°F
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 32.6-40.0 SUS @ 100°F
Bulk Density: 7.08 lbs/gal
Flash Point: >125°F / >52°C
Flammable/Expolsive Limits (%): LEL: 0.3 / UEL: 10.0

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions To Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc.

Hazardous Decomposition Products: The use of hydrocarbon fuels in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. ACGIH has included a TLV of 0.05 mg/m3 TWA for diesel exhaust particulate on its 1999 Notice of Intended Changes. See Section 11 for additional information on hazards of engine exhaust.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Diesel Fuel No. 2 (CAS# 68476-34-6)

Carcinogenicity: Chronic dermal application of certain middle distillate streams contained in diesel fuel No. 2 resulted in an increased incidence of skin tumors in mice. This material has not been identified as carcinogen by NTP, IARC, or OSHA. Diesel exhaust is a probable cancer hazard based on tests with laboratory animals.

Target Organ(s): Limited evidence of renal impairment has been noted from a few case reports involving excessive exposure to diesel fuel No. 2.

Naphthalene (CAS# 91-20-3)

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has not been identified as a carcinogen by IARC or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA "characteristic" hazardous waste due to the characteristic(s) of ignitability (D001) and benzene (D018). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this material, once it becomes a waste, is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent then the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container ?insate? could be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Diesel Fuel, NA1983
Non-Bulk Package Marking: Diesel Fuel, 3, NA 1993, III

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health:	Yes
Chronic Health:	Yes
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

SARA 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Component	CAS Number	Weight %
-- None known --		

California Proposition 65:

Warning: This material contains the following chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Effect
Benzene	Cancer, Developmental and Reproductive Toxicant
Toluene	Developmental Toxicant

Diesel engine exhaust, while not a component of this material, is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

Carcinogen Identification:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any. Diesel exhaust is a probable cancer hazard based on tests in laboratory animals. It has been identified as carcinogen by IARC.

EPA (CERCLA Reportable Quantity: None

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 05/15/01
Product Code: Multiple
Revised Sections: None
Previous Product Code: Multiple
MSDS Number: 0041

Disclaimer of Expressed and Implied Warranties:

The information presented in this Material Data Safety Sheet is based on data believed to be accurate as of the date this Material Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THE PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Tosco Refining Company *Ferndale Refinery*

UltraLow Sulfur Diesel Product Specification

Ferndale Product Code:34380xx (5) Product Code: ULSD2

(COMETS)

Specification	Unit	Limit	Test Procedure	Typical
Appearance				
Water & Sediment	Vol %	0.05 Max	D 2709	
Color	Number	3.0 Max	D 1500	
Haze Rating	Rating	2 Max	D 4176	
Composition				
Carbon Residue (Ramsbottom)	Wt %	0.35 Max	D 524, D 189	
Volatility				
90% Recovered	Deg; F	540 Min	D 86	
	Deg; F	640 Min	D 86	
Flash Point	Deg; F	125 Min (1)	D 93	130 F
Gravity	API	30 Min	D 287, D4052	
Fluidity				
Pour Point	Deg; F	See Season Table (6)	D 97	
Cloud Point	Deg; F	See Season Table (6)	D 2500	10 F
Viscosity @ 104F	cSt	1.9 Min	D 445	
	cSt	4.1 Max	D 445	
Lubricity, SLBOCLE	grams	3100 Min	D 6078	3300gm
Lubricity, HFRR	mm	.45	D 6079	
Combustion				
Cetane Index or Cetane Number (3,4)	Number	40.0 Min	D 976, D613	47.0
Corrosion				
Copper Strip, 3hr @ 50 deg C	Number	3 Max (2)	D 130	
Aromatics (4)	Vol %	35 Max	D 1319	25 %
Contaminants				
Total Sulfur	PPM	30 Max	D 2622, D4294	15-20ppm
Water & Sediment	Vol %	0.05 Max	D 1796	
Ash	Wt %	0.01 Max	D 482	
Additives				
Cetane Improver	Lb/MBbl	675 Max		
Dye		Undyed		

1. Minimum release specification is 125 deg. F. The refinery should target 135 deg. F.
2. Test result reported as a number and letter (e.g. 1a). Any letter is allowable as long as the number meets the spec shown.
3. Either specification must be met.
4. Either cetane index minimum or aromatics maximum must be met.
5. Winter cloud and pour specifications may be relaxed to the summer specifications by agreement with the customer.
6. Season Table

Month	Product Code	Pour Point	Cloud Point
Jan, Feb, Nov, Dec	WI	0 max (5)	14 max (5)
Mar - Oct	SU	15 max	24 max

Chevr

Material Safety Data Sheet

CHEVRON Automatic Transmission Fluid (DEXRON II) CPS226502

CARSON OIL COMPANY 3984662
P O BOX 10948
PORTLAND, OR 97210

MATERIAL ORDERED FOR:
PACKAGE PICK-UP W.B.
PORTLAND, OR 97210

Print Date: August 29, 1991

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

Minor change for indexing purposes only.

1. PRODUCT IDENTIFICATION

CHEVRON Automatic Transmission Fluid (DEXRON II)

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

PRODUCT NUMBER(S): CPS226502
PRODUCT INFORMATION: (800)582-3835

Revision Number: 14 Revision Date: 01/25/90 MSDS Number: 000021
NDA - No Data Available NA - Not Applicable

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (415)233-3737

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.
RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This hazard evaluation is based on data from similar materials.
INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be

minimized by wearing protective clothing.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required. However, if operating conditions create airborne concentrations which exceed the recommended exposure standards, the use of an approved respirator is required.

VENTILATION:

Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: (COC) 160C (320F) Min.
AUTOIGNITION: NDA
FLAMMABILITY: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Alcohol Foam and Water Fog.

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorous. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA.

STABILITY:

Stable.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

SPECIAL PRECAUTIONS:

DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Red liquid.
BOILING POINT: NDA
MELTING POINT: NA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.89 @ 15.6/15.6C
VAPOR PRESSURE: NA
PERCENT VOLATILE (VOLUME %): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 35.3 cst @ 40c

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Protective Equipment. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This substance is subject to the provisions of the Pennsylvania Worker and Community Right-to-Know Act. Specific chemical identities are trade secret under the provisions of 35 Pennsylvania Statute Section 7311.

Based upon information reviewed to date, this product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5mg/m3, the OSHA PEL is 5mg/m3.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Automatic Transmission Fluid (DEXRON II)

CONTAINING

> 85.0 % LUBRICATING BASE OIL

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895,CAS 64741964,CAS 64741975,CAS 64742014,CAS 64742525, CAS 64742536,CAS 64742547,CAS 64742627,CAS 64742650,CAS 72623837.

< 15.0 % ADDITIVES

TLV - Threshold Limit Value	PEL - Permissible Exposure Limit
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	CPS - CUSA Product Code
CC - Chevron Chemical Company	CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
NDA. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data from similar materials.
INGESTION:
NDA. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Chevron

Material Safety Data Sheet

CHEVRON Gear Compound EP ISO 220 CPS255070

CARSON OIL COMPANY 3991691
P.O. BOX 10948
PORTLAND, OR 97210

MATERIAL ORDERED FOR:
BULK LUBE OIL PICK-UP WE
PORTLAND, OR 97210

Print Date: June 08, 1991

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS.

This is a new Material Safety Data Sheet.

1. PRODUCT IDENTIFICATION

CHEVRON Gear Compound EP ISO 220

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

PRODUCT NUMBER(S): CPS255070
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (415)233-3737

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.
RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This hazard evaluation is based on data from similar materials.
INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be

minimized by wearing protective clothing.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required. However, if operating conditions create airborne concentrations which exceed the recommended exposure standards, the use of an approved respirator is required.

VENTILATION:

Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: (COC) 399F (204C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam and Water Fog.

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorous. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA

STABILITY:

Stable.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

SPECIAL PRECAUTIONS:

DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Dark green viscous liquid.
BOILING POINT: NA
MELTING POINT: NA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.89 @ 15.6/15.6C
VAPOR PRESSURE: NA
PERCENT VOLATILE (VOLUME %): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 207 cSt @ 40C

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Gear Compound EP ISO 220

CONTAINING

> 97.0 % LUBRICATING BASE OIL

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895,CAS 64741964,CAS 64741975,CAS 64742014,CAS 64742525, CAS 64742536,CAS 64742547,CAS 64742627,CAS 64742650,CAS 72623837.

< 3.0 % ADDITIVES

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	CPS - CUSA Product Code
CC - Chevron Chemical Company	CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

None of the components of this material are found on the regulatory lists shown below.

REGULATORY LISTS SEARCHED:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA TWA	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA Sect 4(e)
22=TSCA Sect 5(a)(e)(f)	23=TSCA Sect 6	24=TSCA Sect 12(b)
25=TSCA Sect 8(a)	26=TSCA Sect 8(d)	27=TSCA Sect 8(e)
28=Canadian WHMIS	29=OSHA CEILING	30=TSCA Sect 8 FYI

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

SKIN IRRITATION:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

DERMAL TOXICITY:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

RESPIRATORY/INHALATION:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

INGESTION:

No product toxicology data available. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Chevro

Material Safety Data Sheet

CHEVRON Hydraulic Oil AW ISO 46 CPS255674

CARSON OIL COMPANY 3991691
P.O. BOX 10948
PORTLAND, OR 97210

MATERIAL ORDERED FOR:
BULK LUBE OIL PICK-UP WB
PORTLAND, OR 97210

Print Date: May 09, 1991

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS.

This is a new Material Safety Data Sheet.

1. PRODUCT IDENTIFICATION

CHEVRON Hydraulic Oil AW ISO 46

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

PRODUCT NUMBER(S): CPS255674
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (415)233-3737

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

Note to Physician: Injection under the skin of materials similar to this product is associated with accidents involving high-pressure equipment. When ejected from this type of equipment, the material can easily penetrate the skin and leave a small, sometimes bloodless, puncture wound. Yet, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain in the affected part. Immediate treatment at surgical emergency center is recommended.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.
RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This substance may be irritating if inhaled. Signs and symptoms of respiratory tract irritation may include, but may not be limited to, one or more of the following: nasal discharge, sore throat, coughing, bronchitis, pulmonary edema and difficulty in breathing. This hazard evaluation is based on data from similar materials.

KMB00003295

INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create airborne concentrations which exceed the recommended exposure standards, the use of an approved respirator is required.
VENTILATION:
Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: (COC) >392F (200C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog
NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.
FIRE FIGHTING PROCEDURES:
For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor and may produce oxides of sulfur and phosphorus. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA

STABILITY:
Stable.

HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

SPECIAL PRECAUTIONS:
CAUTION! Do not use pressure to empty drum or explosion may result. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous material which may ignite with explosive violence if heated sufficiently.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Pale yellow liquid.
BOILING POINT: NA
MELTING POINT: NA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.88 @ 15.6/15.6C
VAPOR PRESSURE: NA
PERCENT VOLATILE (VOLUME %): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 41.4 cSt @ 40C (Min.)

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).

SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Hydraulic Oil AW ISO 46

CONTAINING

> 99.0 % LUBRICATING BASE OIL

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895,CAS 64741964,CAS 64741975,CAS 64742014,CAS 64742525, CAS 64742536,CAS 64742547,CAS 64742627,CAS 64742650,CAS 72623837.

< 1.0 % ADDITIVES

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
TWA - Time Weighted Average
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

None of the components of this material are found on the regulatory lists shown below.

REGULATORY LISTS SEARCHED:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL

16=ACGIH Calculated TLV	17=OSHA TWA	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA Sect 4(e)
22=TSCA Sect 5(a)(e)(f)	23=TSCA Sect 6	24=TSCA Sect 12(b)
25=TSCA Sect 8(a)	26=TSCA Sect 8(d)	27=TSCA Sect 8(e)
28=Canadian WHMIS	29=OSHA CEILING	30=TSCA Sect 8 FYI

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
INGESTION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular

purpose.

Emergency Number (800)457-2022 or (415)233-3737

Material Safety Data Sheet

CHEVRON Pinion Grease MS-SP Spray Type CPS253811

New Name: Open Gear Lube

PIONEER ENERGY
P.O. BOX 590
MADRAS, OR 97741

Print Date: March 08, 1991

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

Revise composition.

1. PRODUCT IDENTIFICATION

CHEVRON Pinion Grease MS-SP Spray Type

DANGER!
- **VAPOR HARMFUL**
- **CANCER SUSPECT AGENT**
- **CONTAINS METHYLENE CHLORIDE WHICH HAS CAUSED CANCER IN CERTAIN LABORATORY ANIMALS**
- **MAY CAUSE EYE AND SKIN IRRITATION**
- **EXTREMELY FLAMMABLE**
- **CONTENTS UNDER PRESSURE**
- **KEEP OUT OF REACH OF CHILDREN**

PRODUCT NUMBER(S): CPS253811
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

KMB00003301

2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (415)233-3737

EYE CONTACT:
Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. No additional first aid should be necessary, however, if irritation persists, see a doctor.
SKIN CONTACT:
Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.
INHALATION:
If respiratory irritation or any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.
INGESTION:
Not expected to be an ingestion problem, no first aid procedures are required.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
The eye irritation potential of this substance has not been determined. However, it may be slightly irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain, tears, swelling, redness, and blurred vision. Eye contact with the vapors, fumes, or spray mist from this substance could also cause similar signs and symptoms. This hazard evaluation is based on the known toxicity of the ingredients in this substance.
SKIN IRRITATION:
Expected to cause no more than minor skin irritation, but prolonged or frequently repeated skin contact may be harmful. Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material. This hazard evaluation is based on the known irritation potential of the ingredients in this substance.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on the known toxicity of the ingredients in this substance.
RESPIRATORY/INHALATION:
The inhalation toxicity of this substance has not been determined. However, it may be slightly toxic to internal organs if inhaled. The degree of injury will depend on the airborne concentration and duration of exposure. The target organ(s) is the nervous system. Signs and symptoms of central nervous system effects may include one or more of the

X-000021 (01-89)
KMB00003302

following: headache, dizziness, loss of appetite, weakness and loss of coordination. Signs and symptoms of respiratory tract irritation may include, but may not be limited to, one or more of the following: nasal discharge, sore throat, coughing, bronchitis, pulmonary edema and difficulty in breathing. This hazard evaluation is based on the known toxicity of the ingredients in this substance. Read the Additional Health Data section (12) of this document for more information.

INGESTION:

The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:

This material is under pressure. Wear chemical goggles or face shield during use.

SKIN PROTECTION:

Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.

RESPIRATORY PROTECTION:

Unless ventilation is adequate to keep airborne concentrations below recommended exposure standards, approved respiratory protection should be worn.

VENTILATION:

No special ventilation is usually necessary. However, if operating conditions create high airborne concentrations of this material, special ventilation may be needed.

5. FIRE PROTECTION

FLASH POINT: (TCC) -160F (-107C)
AUTOIGNITION: NDA
FLAMMABILITY: NDA
EXTINGUISHING MEDIA:
CO2, dry chemical, foam and water fog.

NFPA RATINGS: Health 1; Flammability 4; Reactivity 0; Special NDA;
HMIS RATINGS: Health 3; Flammability 4; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur and nitrogen. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
May produce toxic compounds of chlorine including phosgene.
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed.

DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous material which may ignite with explosive violence if heated sufficiently.

Exposure to heat or prolonged exposure to sun may cause container to burst. Do not puncture, incinerate, or store above 120 F.

Use this product outdoors, if possible. If you must use it indoors, open all windows and doors or use other means to ensure fresh air movement during application and drying. Do not use in unventilated areas.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Black grease.
BOILING POINT: NDA
MELTING POINT: NDA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.99 @ 15.6/15.6C
VAPOR PRESSURE: NDA
PERCENT VOLATILE (VOLUME %): NDA
VAPOR DENSITY (AIR=1): NDA
VISCOSITY: 25 - 30 @ 77F (Sec. Zahn #2 Cup)

DENSITY: 1.03g/ml @ 25C

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problem.

Clean up spills immediately, observing precautions in Protective Equipment section.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS#	COMPONENT/REGULATORY LIMITS
100.0 %	CHEVRON Pinion Grease MS-SP Spray Type
CONTAINING	
< 35.0 %	METHYLENE CHLORIDE
CAS75092	A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. 100ppm ACGIH TLV 500ppm ACGIH STEL 500ppm OSHA PEL CERCLA 302.4 RQ=1000 POUNDS
< 15.0 %	PROPANE
CAS74986	1000ppm OSHA PEL
< 15.0 %	ISOBUTANE
CAS75285	
< 15.0 %	LUBRICATING BASE OIL CONTAINING ONE OR MORE OF THE FOLLOWING

DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
CAS64742547

AND

DISTILLATES, HYDROTREATED LIGHT NAPHTHENIC
CAS64742536

PETROLEUM RESIN
CAS64742161

10.0 % ADDITIVES INCLUDING THE FOLLOWING

CALCIUM COMPLEX THICKENER

CARBON-BLACK
CAS1333864 3.5mg/m3 ACGIH TLV
3.5mg/m3 OSHA PEL

GRAPHITE
CAS7782425 2.5mg/m3 ACGIH TLV
5mg/m3 OSHA PEL

MOLYBDENUM DISULFIDE
CAS1317335

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
PEL - Permissible Exposure Limit
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: COMPRESSED GAS, N.O.S.
DOT HAZARD CLASS: FLAMMABLE GAS
DOT IDENTIFICATION NUMBER: UN1954

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; YES
2. Delayed (Chronic) Health Effects; YES
3. Fire Hazard; YES
4. Sudden Release of Pressure Hazard; YES
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

CARBON BLACK	02,10,14,17,28,
PROPANE	02,10,17,
DICHLOROMETHANE	01,02,04,08,10,11,14,15,17,21,24,26,28,
ISOBUTANE	02,10,
GRAPHITE	02,10,14,17,

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA. The hazard evaluation was based on data on the components.
SKIN IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
NDA. The hazard evaluation was based on data on the components.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data on the components.
INGESTION:
NDA. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains methylene chloride. Methylene chloride produced positive results in several in vitro mutagen assays. The National Toxicology Program (NTP) has concluded that methylene chloride causes cancer in the mouse but the evidence for cancer in the rat is equivocal. No definitive birth defects have been observed in pregnant rats and mice exposed to methylene chloride. There is no evidence that exposure to methylene chloride has caused cancer or reproductive damage in humans.

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Emergency Phone Number(800) 457-2022

Material Safety Data Sheet

CARSON OIL CO INC
P O BOX 10948
PORTLAND, OR 97210
Print Date: November 21, 1989

MATERIAL ORDERED FOR:
PACKAGE PICK-UP W.B.
PORTLAND, OR 97210

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

The Chevron MSDSs have been reformatted and expanded to provide you with useful hazard warnings and health evaluations and to facilitate your compliance with local, State and Federal regulations.

1. PRODUCT IDENTIFICATION

CHEVRON SRI Grease 2

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CHEVRON PRODUCT NUMBER(S): CPS254502
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

Note to Physician: Injection under the skin of materials similar to this product is associated with accidents involving high-pressure equipment. When ejected from this type of equipment, the material can easily penetrate the skin and leave a small, sometimes bloodless, puncture wound. Yet, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain in the affected part. Immediate treatment at surgical emergency center is recommended.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. May cause skin discoloration. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.

High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
RESPIRATORY/INHALATION:

The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This hazard evaluation is based on data from similar materials.

INGESTION:

The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:

No special eye protection is usually necessary.

SKIN PROTECTION:

No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required.

VENTILATION:

No special ventilation is necessary.

5. FIRE PROTECTION

FLASH POINT: NDA
AUTOIGNITION: NDA
FLAMMABILITY: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam and Water Fog.

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide and water vapor and may produce oxides of nitrogen. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA.

STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous material which may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbons; insoluble in water.
APPEARANCE: Green grease.
BOILING POINT: NA
MELTING POINT: NDA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.92 @ 20/20C
VAPOR PRESSURE: <1mm Hg @ 40C
PERCENT VOLATILE (VOLUME %): NDA
VAPOR DENSITY (AIR=1): MA

8. SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control

Act Chemical Substances Inventory.

This substance is subject to the provisions of the Pennsylvania Worker and Community Right-to-Know Act. Specific chemical identities are trade secret under the provisions of 35 Pennsylvania Statute Section 7311.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON SRI Grease 2

CONTAINING

> 85.0 % DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
CAS64742547

< 15.0 % ADDITIVES

TLV - Threshold Limit Value	PEL - Permissible Exposure Limit
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	CPS - CUSA Product Code
CC - Chevron Chemical Company	CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E

28=Canadian WHMIS

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
NDA. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data from similar materials.
INGESTION:
NDA. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils refined by a combination of severe hydrocracking and hydrotreating. The potential of paraffinic base oil prepared by this process to cause cancer has not been specifically addressed by the OSHA Hazard Communication Standard (29 CFR 1910.1200), the International Agency for Research on Cancer (IARC), nor the National Toxicology Program (NTP) Annual Report. However, the process conditions, chemical analyses, and the results of mutagenicity tests all support our opinion that this oil should not cause skin cancer.

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

CHEVRON Turbine Oil GST ISO 46 CPS253027

CARSON OIL COMPANY 3984662
P O BOX 10948
PORTLAND, OR 97210

MATERIAL ORDERED FOR:
PACKAGE PICK-UP W.B.
PORTLAND, OR 97210

Print Date: May 09, 1991

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS.

This is a new Material Safety Data Sheet.

1. PRODUCT IDENTIFICATION

CHEVRON Turbine Oil GST ISO 46

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

PRODUCT NUMBER(S): CPS253027
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID - EMERGENCY NUMBER (800)457-2022 OR (415)233-3737

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
If absorbed through the skin, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.
RESPIRATORY/INHALATION:
If inhaled, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.
INGESTION:
If swallowed, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.

RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create airborne concentrations which exceed the recommended exposure standards, the use of an approved respirator is required.
VENTILATION:
Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: (COC) 410F (210C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NDA Upper: NDA
EXTINGUISHING MEDIA:
CO2, dry chemical, foam and water fog.
NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.
FIRE FIGHTING PROCEDURES:
For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
NDA
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently.

CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Yellow liquid.
BOILING POINT: NDA
MELTING POINT: NDA
EVAPORATION: NDA
SPECIFIC GRAVITY: 0.87 @ 15.6/15.6C
VAPOR PRESSURE: NDA
PERCENT VOLATILE (VOLUME %): NDA
VAPOR DENSITY (AIR=1): NDA
VISCOSITY: 43.7 cSt @ 40C (Min.)

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This substance is subject to the provisions of the Pennsylvania Worker and Community Right-to-Know Act. Specific chemical identities are trade secret under the provisions of 35 Pennsylvania Statute Section 7311.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS#	COMPONENT/REGULATORY LIMITS
100.0 %	CHEVRON Turbine Oil GST ISO 46

CONTAINING

>	99.0 %	LUBRICATING BASE OIL

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895,CAS 64741964,CAS 64741975,CAS 64742014,CAS 64742525, CAS 64742536,CAS 64742547,CAS 64742627,CAS 64742650,CAS 72623837.

<	1.0 %	ADDITIVES

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	TPQ	- Threshold Planning Quantity
RQ	- Reportable Quantity	CPS	- CUSA Product Code
CC	- Chevron Chemical Company	CAS	- Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

None of the components of this material are found on the regulatory lists shown below.

REGULATORY LISTS SEARCHED:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA TWA	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA Sect 4(e)
22=TSCA Sect 5(a)(e)(f)	23=TSCA Sect 6	24=TSCA Sect 12(b)
25=TSCA Sect 8(a)	26=TSCA Sect 8(d)	28=Canadian WHMIS
29=OSHA CEILING		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
INGESTION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

RECEIVED
JAN 29 1996

Chevron

Material Safety Data Sheet

CHEVRON Ulti-Plex Synthetic Grease

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS.

This is a new Material Safety Data Sheet.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEVRON Ulti-Plex Synthetic Grease

PRODUCT NUMBER(S): CPS250188

COMPANY IDENTIFICATION

Chevron USA Products Company
Environmental, Safety, and Health
575 Market St.
San Francisco, CA 94105-2856

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)457-2022 or
(510)233-3737 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (202)483-7616

PRODUCT INFORMATION: (800)822-5823 MSDS Requests
(800)582-3835 Technical

Revision Number: 0 **Revision Date: 11/24/92** **MSDS Number: 005343**
NDA - No Data Available **NA - Not Applicable**

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

X-DOS051 108-8E

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

The proportion compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

100.0 % CHEVRON Ulti-Plex Synthetic Grease

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
SYNTHETIC BASE OIL	> 75.0%		
ADDITIVES	< 25.0%		

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	TPQ	- Threshold Planning Quantity
RQ	- Reportable Quantity	CPS	- CUSA Product Code
CC	- Chevron Chemical Company	CAS	- Chemical Abstract Service Number

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials. Read the Toxicology Information and Additional Health Data sections (10 and 13) of this document for more information.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.

High-Pressure Equipment Information: Accidental high-velocity injection

under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This hazard evaluation is based on data from similar materials.

INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. FIRST AID MEASURES

EMERGENCY NUMBER (24 hr): (800)457-2022 or (510)233-3737 (International)

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.

SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

Note to Physician: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.

INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

5. FIRE FIGHTING MEASURES

FLASH POINT: NDA
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NDA Upper: NDA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog

FIRE FIGHTING PROCEDURES:
For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained

breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.
NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association.

6. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (202)483-7616
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

7. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
NDA
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or drum may rupture with explosive force.

8. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended.
VENTILATION:
Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	NDA
ODOR:	NDA
PHYSICAL STATE:	NDA
pH:	NDA
VAPOR PRESSURE:	NDA
VAPOR DENSITY (AIR=1):	NDA
BOILING POINT:	NDA
FREEZING POINT:	NDA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	NDA
DENSITY:	0.873 g/cc
EVAPORATION RATE:	NDA
VISCOSITY:	410 cSt @ 40C
PERCENT VOLATILE (VOL):	NDA

10. TOXICOLOGICAL INFORMATION

EYE IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
No product toxicology data available. The hazard evaluation was based on data from similar materials.

RESPIRATORY/INHALATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
INGESTION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.

11. TRANSPORT INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE
DOT PACKING GROUP: NOT APPLICABLE

12. REGULATORY INFORMATION

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	21=TSCA Sect 4(e)
02=MASS RTK	12=CERCLA 302.4	22=TSCA Sect 5(a)(e)(f)
03=NTP Carcinogen	13=MN RTK	23=TSCA Sect 6
04=CA Prop 65-Carcin	14=ACGIH TWA	24=TSCA Sect 12(b)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	25=TSCA Sect 8(a)
06=IARC Group 1	16=ACGIH Calc TLV	26=TSCA Sect 8(d)
07=IARC Group 2A	17=OSHA TWA	28=Canadian WHMIS
08=IARC Group 2B	18=OSHA STEL	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

None of the components of this material are found on the regulatory lists indicated.

13. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual

Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water. See Chevron Material Safety Data Sheet No. 1793 for additional information on used motor oil.

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Emergency Phone Number(800) 457-2022

Chevron

Material Safety Data Sheet

CHEVRON Ultra-Duty Grease 2 **CPS254600**

CARSON OIL COMPANY 3991691
3125 NW 35TH AVE.
P O BOX 10948
PORTLAND, OR 97210

MATERIAL ORDERED FOR:
BULK LUBE OIL PICK-UP WB
PORTLAND, OR 97210

Print Date: July 11, 1990

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

Revised to update Section 9 - Composition.

1. PRODUCT IDENTIFICATION

CHEVRON Ultra-Duty Grease 2

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

PRODUCT NUMBER(S): CPS254600
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID - EMERGENCY PHONE NUMBER (800) 457-2022

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing. Note to Physician: Injection under the skin of materials similar to this product is associated with accidents involving high-pressure equipment. When ejected from this type of equipment, the material can easily penetrate the skin and leave a small, sometimes bloodless, puncture wound. Yet, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain in the affected part. Immediate treatment at surgical emergency center is recommended.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation.
SKIN IRRITATION:
Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled.
INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended.
VENTILATION:
Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: NA
AUTOIGNITION: NDA
FLAMMABILITY: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog
NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.
FIRE FIGHTING PROCEDURES:
For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorous. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
NDA
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:

Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Red grease.
BOILING POINT: NA
MELTING POINT: NDA
EVAPORATION: NA
SPECIFIC GRAVITY: NDA
VAPOR PRESSURE: NA
PERCENT VOLATILE (VOLUME %): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 22 cSt @ 100C (Min.)

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problem.

Clean up spills immediately, observing precautions in Protective Equipment section.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Ultra-Duty Grease 2

CONTAINING

> 70.0 % LUBRICATING BASE OIL

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895,CAS 64741964,CAS 64741975,CAS 64742014,CAS 64742525, CAS 64742536,CAS 64742547,CAS 64742627,CAS 64742650,CAS 72623837.

< 30.0 % ADDITIVES INCLUDING THE FOLLOWING

< 0.5 % SUBSTITUTED BENZOTRIAZOLE

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
TWA - Time Weighted Average
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

NO COMPONENTS OF THIS MATERIAL ARE FOUND ON THE REGULATORY LISTS SHOWN BELOW.

REGULATORY LISTS SEARCHED:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA TWA	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS	29=OSHA CEILING	

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
INGESTION:
No product toxicology data available. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

Experimental evidence indicates that substituted benzotriazole may cause allergic skin reactions. There is no evidence that human exposure to the low levels of the additive in this product will cause such skin reactions.

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Emergency Phone Number(800) 457-2022

Material Safety Data Sheet

CHEVRON Ultra Gear Lubricant 220 **CPS250007**

PRIESTLEY OIL & CHEMICAL
P O BOX 12570
PORTLAND, OR 97212
Print Date: April 01, 1990

MATERIAL ORDERED FOR:
PACKAGE PICK-UP W.B.
FOB WILLBRIDGE
PORTLAND, OR 97210

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

The Chevron MSDSs have been reformatted and expanded to provide you with useful hazard warnings and health evaluations and to facilitate your compliance with local, State and Federal regulations.

1. PRODUCT IDENTIFICATION

CHEVRON Ultra Gear Lubricant 220

- A HAZARD WARNING IS NOT REQUIRED FOR THIS PRODUCT UNDER OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CHEVRON PRODUCT NUMBER(S): CPS250007
PRODUCT INFORMATION: (800)582-3835

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.
INHALATION:
Since this material is not expected to be an immediate inhalation problem, no first aid procedures are required.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
This substance is not expected to cause prolonged or significant skin irritation. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if it gets on the skin. This hazard evaluation is based on data from similar materials.
RESPIRATORY/INHALATION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if inhaled. This hazard evaluation is based on data from similar materials.
INGESTION:
The systemic toxicity of this substance has not been determined. However, it should be practically non-toxic to internal organs if swallowed. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be

minimized by wearing protective clothing.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended.

VENTILATION:

Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standard.

5. FIRE PROTECTION

FLASH POINT: (COC) >400F (204) Min
AUTOIGNITION: NDA
FLAMMABILITY: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0; Special NDA;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen. Combustion may produce toxic compounds of boron. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA

STABILITY:

Stable.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

SPECIAL PRECAUTIONS:

DO NOT weld, heat or drill container. Residue may ignite with explosive violence if heated sufficiently. CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Amber to dark brown liquid.
BOILING POINT: NA
MELTING POINT: NA
EVAPORATION: NA
SPECIFIC GRAVITY: 0.91 @ 15.6/15.6C
VAPOR PRESSURE: NA
PERCENT VOLATILE (VOLUME %): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 198 cSt @ 40C (Min)

8. SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

Based upon information reviewed to date, this product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5mg/m3, the OSHA PEL is 5mg/m3.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Ultra Gear Lubricant 220

CONTAINING

> 90.0 % DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
CAS64742547

AND

HYDROTREATED BRIGHT STOCK BASE OILC LESS THAN 25
CAS72623837

< 10.0 % ADDITIVES

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
PEL - Permissible Exposure Limit
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
3. Fire Hazard; NO
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
NDA. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data from similar materials.
INGESTION:
NDA. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MATERIAL SAFETY DATA SHEET

Christenson Oil
P.O. Box 17339
Portland, Or. 97217
1(503)286-1673

Christenson Oil MSDS #DAFM

Product Code No.: NONE

MANUFACTURER:	TRANSPORTATION EMERGENCY:
CHRISTENSON OIL 3747 N. SUTTLE RD. PORTLAND, OR. 97217 (503)286-1673 CONTACT FOR FURTHER INFO: CALL (503)286-1673	CALL CHEMTREC (800)424-9300 CONTINENTAL U.S.

PRODUCT IDENTIFICATION

PRODUCT NAME	:	DUREX AFM PROPYLENE GLYCOL ANTIFREEZE
SYNONYMS	:	PG ANTIFREEZE
GENERIC NAME	:	HD DIESEL ANTIFREEZE
CHEMICAL FAMILY	:	GLYCOLS
DOT PROPER SHIPPING NAME	:	N/A
ID NUMBER	:	NONE

SECTION I - INGREDIENTS (% w/w, unless otherwise noted)

PROPYLENE GLYCOL	CAS#000057-55-6	90-95%
SODIUM HYDROXIDE	CAS#1310-73-2	0-2%
BENZOIC ACID	CAS#65-85-0	2-4%
INORGANIC/ORGANIC SALTS		2-4%
WATER		2-4%

THIS DOCUMENT IS PREPARED PURSUANT TO THE OSHA HAZARD COMMUNICATION STANDARD (20 CFR 1910.1200). IN ADDITION, OTHER SUBSTANCES NOT 'HAZARDOUS' PER THIS OSHA STANDARD MAY BE LISTED. WHERE PROPRIETARY INGREDIENT SHOWS, THE IDENTITY MAY BE MADE AVAILABLE AS PROVIDED IN THIS STANDARD.

KMB00003340

MATERIAL SAFETY DATA SHEETS

Christenson Oil MSDS#DAFM

SECTION II - EMERGENCY AND FIRST AIR PROCEDURES

EYE CONTACT:
IRRIGATE IMMEDIATELY WITH WATER FOR AT LEAST FIVE MINUTES. GET MEDICAL ATTENTION IF ANY IRRITATION PERSIST.

SKIN CONTACT:
WASH OFF IN FLOWING WATER OR SHOWER. NOT EXPECTED TO PRESENT A SIGNIFICANT SKIN HAZARD UNDER ANTICIPATED CONDITIONS OF NORMAL USE.

INHALATION (BREATHING):
REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL.

INGESTION (SWALLOWING):
INDUCE VOMITING IF LARGE AMOUNTS ARE INGESTED. CONSULT MEDICAL. NOT EXPECTED TO PRESENT A SIGNIFICANT INGESTION HAZARD UNDER ANTICIPATED CONDITIONS OF NORMAL USE.

NOTE PHYSICIAN:
NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE. TREATMENT BASED ON JUDGEMENT OF THE PHYSICIAN; IN RESPONSE TO REACTIONS OF THE PATIENT

SECTION III - POTENTIAL ADVERSE HEALTH EFFECTS

EYE CONTACT:
MAY CAUSE MINOR EYE IRRITATION.

SKIN ABSORPTION:
NO SIGNIFICANT SIGNS OR SYMPTOMS INDICATIVE OF ANY HEALTH HAZARD ARE EXPECTED TO OCCUR AS A RESULT OF SKIN ABSORPTION EXPOSURE.

SKIN IRRITATION:
NO SIGNIFICANT SIGNS OR SYMPTOMS INDICATIVE OF ANY ADVERSE HEALTH HAZARD ARE EXPECTED TO OCCUR AS A RESULT OF SKIN EXPOSURE.

INHALATION (BREATHING):
A SINGLE PROLONGED (HOURS) INHALATION EXPOSURE IS NOT LIKELY TO CAUSE ADVERSE EFFECTS. MISTS ARE NOT LIKELY TO BE HAZARDOUS.

INGESTION (SWALLOWING):
SINGLE DOSE ORAL TOXICITY IS LOW. THE LD50 FOR FEMALE RATS IS ABOUT 20.3 G/KG. NO SIGNIFICANT SIGNS OR SYMPTOMS INDICATIVE OF ANY ADVERSE HEALTH HAZARD ARE EXPECTED TO OCCUR AS A RESULT OF INGESTION.

MATERIAL SAFETY DATA SHEET

CHRISTENSON OIL MSDS#DAFM

SYSTEMIC AND OTHER EFFECTS:
REPEATED EXCESSIVE INGESTION MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. NO CARCINOGENIC EFFECTS HAVE BEEN SEEN IN LONG-TERM ANIMAL STUDIES. BIRTH DEFECTS ARE UNLIKELY. EXPOSURES HAVING NO ADVERSE EFFECTS ON THE EFFECTS ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS. IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION. RESULTS OF MUTAGENICITY TEST IN VITRO (TEST TUBE) AND IN ANIMALS HAVE BEEN NEGATIVE. NO CHRONIC HEALTH EFFECTS ARE EXPECTED FROM NORMAL USE.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:
GOOD GENERAL VENTILATION SUFFICIENT.

RESPIRATORY PROTECTION:
NO RESPIRATORY PROTECTION SHOULD BE NEEDED.

SKIN PROTECTION:
NO PRECAUTIONS OTHER THAN CLEAN BODY-COVERING SHOULD BE NEEDED.

EYE PROTECTION:
USE SAFETY GLASSES.

EXPOSURE GUIDELINE(S):
10 MG/M3 FOR PROPYLENE GLYCOL MIST. 400 PPM FOR PROPYLENE GLYCOL VAPORS. PROPYLENE GLYCOL: AIHA WEEL IS 50 PPM TOTAL, 10 MG/M3 AEROSOL ONLY.

SECTION V - REACTIVITY DATA

STABILITY (CONDITIONS TO AVOID):
STABLE OVER NORMAL OPERATING TEMPERATURE RANGE OF -30°F TO 25°F.

INCOMPATIBILITY (SPECIFIC MATERIALS TO AVOID):
OXIDIZING MATERIAL.

HAZARDOUS DECOMPOSITION PRODUCTS:
NONE.

HAZARDOUS POLYMERIZATION:
WILL NO OCCUR.

MATERIAL SAFETY DATA SHEET

CHRISTENSON OIL MSDS#DAFM

SECTION VI - SPILL OR LEAK PROCEDURES

****HIGHWAY OR RAILWAY SPILLS****
CALL CHEMTREC 800-424-9300 CONT. U.S.

ACTION TO TAKE FOR SPILLS/LEAKS:
COVER WITH ABSORBENT MATERIAL, SOAK UP AND SWEEP INTO BAG.

WASTE DISPOSAL METHOD:
INCINERATE OF BURY AWAY FROM WATER SUPPLIES IN ACCORDANCE WITH LOCAL REGULATIONS.

SECTION VII - STORAGE AND PRECAUTIONS

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
EXERCISE REASONABLE CARE AND CAUTION.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS			HAZARD RANKING	DOT FLAMMABILITY CLASSIFICATION	FLASH POINT
	HEALTH HAZARD:	0	0 = LEAST		
	FLAMMABILITY:	1	1 = SLIGHT		235°F, 113°C (TCC)
	REACTIVITY:	0	2 = MODERATE		
	OTHER:	N	3 = HIGH	N/A	
			4 = EXTREME		

EXTINGUISHING MEDIA:
WATER FOG, ALCOHOL RESISTANT, DRY CHEMICAL.

FIRE & EXPLOSION HAZARDS:
HEATED VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL TO A SOURCE OF IGNITION.

FIRE FIGHTING PROCEDURES:
FOR FIRES INVOLVING LARGE QUANTITIES OF PRODUCT WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL TURN-OUT GEAR.

FLAMMABLE LIMITS:
LFL: 2.6% @ 100C
UFL: 12.5% @ 130C

MATERIAL SAFETY DATA SHEET

CHRISTENSON OIL MSDS #DAFM

SECTION IX - PHYSICAL DATA

APPROX BOILING POINT	VAPOR DENSITY	EVAPORATION RATE	% VOLATILE
370F, 188C	2.62	< 1	NIL
% SOLUBILITY IN WATER	**SPECIFIC GRAVITY**	**APPEARANCE**	**ODOR**
100%	1.050	COLORLESS	ODORLESS LIQUID

SECTION X - PRECAUTONARY LABEL

NONE REQUIRED.

SECTION XI - REGULATORY INFORMATION (Not meant to be all-inclusive-selected regulations represented.)

NOTICE:

THE INFORMATION HEREIN IS PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE AS OF THE EFFECTIVE DATE SHOWN ABOVE. HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED IS GIVEN. REGULATORY REQUIREMENTS ARE SUBJECT TO CHANGE AND MAY DIFFER FROM ONE LOCATION TO ANOTHER; IT IS THE BUYERS RESPONSIBILITY TO ENSURE THAT ITS ACTIVITIES COMPLY WITH FEDERAL, STATE OR PROVINCIAL AND LOCAL LAWS. THE FOLLOWING SPECIFIC INFORMATION IS MADE FOR THE PURPOSE OF COMPLYING WITH NUMEROUS FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS AND REGULATIONS. SEE MSDS SHEET FOR HEALTH AND SAFETY INFORMATION.

U.S. REGULATIONS:

SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES: A DELAYED HEALTH HAZARD.

MATERIAL SAFETY DATA SHEET

CHRISTENSON OIL MSDS#DAFM

SECTION XII - DOCUMENTARY INFORMATION

ISSUE	:	November 8, 1993	PRODUCT CODE NO.	:	NONE
MSDS NO.	:	DAFM	PREV. PROD CODE NO.	:	NONE
			PREV. MSDS NO.	:	NONE

MATERIAL SAFETY DATA SHEET

97367 (4-85)

MSDS NUMBER ▶ 51,180-12 PAGE 1

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300	SHELL: 713-241-4819

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
2	4	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

*For acute and chronic health effects refer to the discussion in Section III

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW REQUIRES IT)

SECTION I	NAME
PRODUCT ▶	REGULAR LEADED GASOLINE
CHEMICAL NAME ▶	PETROL
CHEMICAL FAMILY ▶	HYDROCARBON
SHELL CODE ▶	02200 02201 02205 02206 02207 02208 02405

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	REGULAR LEADED GASOLINE	MIXTURE	100
1	ALKANES, CYCLOALKANES, ALKENES AND AROMATIC HYDROCARBONS	MIXTURE	BALANCE
2	XYLENE	1330-20-7	0-25
3	TOLUENE	108-88-3	0-25
4	BENZENE	71-43-2	0-4
5	N-HEXANE	110-54-3	0-3
6A	TETRAETHYL LEAD	78-00-2	<0.1 GM/GAL
6B	TETRAMETHYL LEAD	75-74-1	<0.1 GM/GAL
7	PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	0-5
8	CYCLOHEXANE	110-82-7	0-1
9	ETHYLBENZENE	100-41-4	0-3
10	NAPHTHALENE	91-20-4	0-1

NOTE: CONTENT OF GASOLINE COMPONENTS WILL VARY; INDIVIDUAL COMPONENTS MAY BE PRESENT FROM TRACE AMOUNTS UP TO THE MAXIMUM SHOWN.

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	>5 GM/KG (RAT)	>2 GM/KG (RABBIT)	>5 MG/L/4HR (RAT)
2	4.3 G/KG (RAT)	N/A	5000 PPM (RAT - 4 HR.)
3	636 MG/KG (RAT)	12.1 G/KG (RABBIT)	>26,700 PPM (RAT - 1 HR.) 400 PPM (MOUSE - 24 HR.)
4	930 MG/KG (RAT)	>8.3 G/KG (RABBIT)	10,000 PPM (RAT - 7 HR.)
5	28.7 G/KG (RAT)	N/A	77,000 PPM (RAT - 1 HR.)
7	12.7 G/KG (RAT)	N/A	18 G/M3 (RAT - 4 HR.)
8	12.7 G/KG(RAT)	N/A	LCLO=70 G/M3 (MOUSE - 2 HR.)
9	3.5 G/KG (RAT)	17.8 G/KG (RABBIT)	LCLO=4000 PPM (RAT - 4HR.)
10	490 MG/KG (RAT)	>2.5 G/KG (RAT) >20 G/KG (RABBIT)	N/A

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SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT
BASED ON PRODUCT TESTING PRODUCT IS MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT
PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN RESULTING IN SKIN IRRITATION AND DERMATITIS.

INHALATION
THIS PRODUCT MAY CAUSE IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT AND ADDITIONALLY, MAY PRODUCE LIVER AND KIDNEY DAMAGE. HIGH VAPOR CONCENTRATIONS MAY PRODUCE CNS DEPRESSION.

INGESTION
THIS PRODUCT MAY BE HARMFUL OR FATAL IF SWALLOWED. INGESTION OF PRODUCT MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONCIOUSNESS AND DEATH MAY OCCUR. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR. KIDNEY DAMAGE MAY BE EVIDENCED BY CHANGES IN URINE OUTPUT, URINE APPEARANCE OR EDEMA (SWELLING FROM FLUID RETENTION). LIVER DAMAGE MAY BE EVIDENCED BY LOSS OF APPETITE, JAUNDICE (YELLOWISH SKIN COLOR) AND SOMETIMES PAIN IN THE UPPER ABDOMEN ON THE RIGHT SIDE.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LIVER AND KIDNEY FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS
THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS DETERMINED THAT GASOLINE IS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B). IT HAS BEEN REPORTED THAT CHRONIC INHALATION EXPOSURE TO AN UNLEADED MOTOR GASOLINE, WHICH WAS FULLY VAPORIZED, HAS PRODUCED KIDNEY AND LIVER CANCERS IN SOME LABORATORY RODENTS. (SEE SECTION VI FOR FURTHER INFORMATION). THE TEST MATERIAL USED WAS BLENDED TO REPRESENT A TYPICAL UNLEADED MOTOR GASOLINE. BENZENE IS LISTED BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER AND OSHA AS A CHEMICAL CAUSALLY ASSOCIATED WITH CANCER IN HUMANS. ETHYL BENZENE HAS BEEN SHOWN TO CAUSE CANCER IN LABORATORY ANIMALS. BIRTH DEFECTS WERE NOTED IN RATS, BUT NOT RABBITS, AT DOSES WHICH CAUSED TOXIC EFFECTS IN THE MOTHERS. (SEE SECTION VI). NAPHTHALENE DID NOT CAUSE CANCER IN LIFETIME STUDIES IN RATS AND MICE CONDUCTED BY NTP.

SEE SECTION VI FOR SUPPLEMENTAL INFORMATION.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
P	300 PPM		300 PPM	500 PPM	500 PPM*
2	100 PPM		100 PPM	150 PPM	150 PPM*
3	100 PPM		50 PPM		150 PPM*
4	1 PPM		10 PPM**		5 PPM*
5	50 PPM		50 PPM		
6A	0.075 MG/M3		0.1 MG/M3		
6B	0.075 MG/M3		0.15 MG/M3		
8	300 PPM		300 PPM		
9	100 PPM		100 PPM	125 PPM	125 PPM*
10	10 PPM		10 PPM	15 PPM	15 PPM*

*OSHA PEL/STEL. **CLASSIFIED BY ACGIH AS A "SUSPECTED HUMAN CARCINOGEN" (A2). 6A-TETRAETHYL LEAD; 6B-TETRAMETHYL LEAD.

SECTION V EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.*

NOTE TO PHYSICIAN
*IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH MEDICAL SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

A CHRONIC INHALATION STUDY (REFERENCED IN SECTION III) SUPPORTED BY THE AMERICAN PETROLEUM INSTITUTE FOUND THAT FULLY VAPORIZED GASOLINE PRODUCED DOSE-RELATED INCIDENCE OF KIDNEY CANCER IN MALE RATS. IT HAS BEEN DETERMINED THAT MALE RATS DEVELOP THESE TUMORS IN A UNIQUE MANNER, VIA FORMATION OF ALPHA-2U GLOBULIN. HUMANS DO NOT FORM ALPHA-2U GLOBULIN AND THEREFORE TUMORS RESULTING FROM THIS MECHANISM ARE NOT RELEVANT TO HUMANS. GASOLINE EXPOSURE ALSO PRODUCED AN INCREASE OF LIVER CANCER AT THE HIGHEST DOSE (2056 PPM) IN FEMALE MICE. EXPOSURES WERE FOR 6 HRS/DAY, 5 DAYS/WEEK FOR A TOTAL OF 27 MONTHS. THE RELATIONSHIP AND SIGNIFICANCE TO MAN OF THE RESULTS OF THIS STUDY ARE NOT KNOWN.

INHALATION STUDIES ON GASOLINE VAPORS HAVE CAUSED CENTRAL NERVOUS SYSTEM EFFECTS IN DOGS AT 10,000 PPM. UNLEADED GASOLINE WAS EVALUATED FOR GENETIC ACTIVITY IN ASSAYS USING MICROBIAL CELLS, CULTURED MAMMALIAN CELLS AND RATS (BONE MARROW). THE RESULTS WERE ALL NEGATIVE. UNLEADED GASOLINE WAS CONSIDERED NON-MUTAGENIC UNDER THESE CONDITIONS.

INFORMATION ON GASOLINE CONSTITUENTS: XYLENE IS NOT KNOWN TO BE MUTAGENIC, CARCINOGENIC OR A SKIN SENSITIZER. HOWEVER, THE AVAILABLE EXPERIMENTAL DATA ARE LIMITED AND INSUFFICIENT TO ASSESS CARCINOGENIC POTENTIAL. XYLENE IS NOT LISTED AS A CARCINOGEN BY NTP, IARC OR OSHA. PROLONGED AND REPEATED EXPOSURES TO HIGH CONCENTRATIONS OF XYLENE HAVE RESULTED IN HEARING LOSS IN LABORATORY RATS. LABORATORY ANIMALS EXPOSED BY VARIOUS ROUTES IN HIGH DOSES OF XYLENE HAVE EXHIBITED EFFECTS IN LIVER, KIDNEYS, LUNGS, SPLEEN, HEART, BLOOD AND ADRENALS. RESULTS OF DEVELOPMENTAL TOXICITY STUDIES WITH LAB ANIMALS INDICATE XYLENE MAY INDUCE EMBRYOLETHAL, EMBRYOTOXIC OR TERATOGENIC EFFECTS. THESE STUDIES WERE GENERALLY LIMITED AND MOST OF THE EFFECTS MAY HAVE BEEN SECONDARY TO MATERNAL TOXICITY. LIMITED HUMAN STUDIES ADDRESSING THE SAME EFFECTS ARE NOT CONCLUSIVE.

WHILE THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTABLE LEVELS OF TOLUENE VAPORS (E.G., THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS, ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RHYTHMS. THIS LATTER EFFECTS WAS SHOWN TO BE ENHANCED BY HYPOXIA OR THE INJECTION OF ADRENALIN-LIKE AGENTS. PROLONGED AND REPEATED EXPOSURES TO HIGH CONCENTRATIONS OF TOLUENE HAVE RESULTED IN HEARING LOSS IN LABORATORY RATS.

TOLUENE IS NOT KNOWN TO BE MUTAGENIC OR CARCINOGENIC. HOWEVER, THE AVAILABLE HUMAN AND EXPERIMENTAL DATA ARE LIMITED AND INSUFFICIENT TO ASSESS CARCINOGENIC POTENTIAL. TOLUENE IS NOT, LISTED AS A CARCINOGEN BY NTP, IARC OR OSHA. INTENTIONAL ABUSE OF TOLUENE VAPORS HAS BEEN LINKED TO DAMAGE OF BRAIN, LIVER, KIDNEY AND TO DEATH. MANY CASE STUDIES INVOLVING ABUSE DURING PREGNANCY CLEARLY INDICATE THAT TOLUENE IS A DEVELOPMENTAL TOXICANT. DEVELOPMENTAL TOXIC EFFECTS COMPARABLE TO THOSE OBSERVED IN HUMANS HAVE BEEN SEEN IN LAB ANIMALS BUT THE EFFECTS WERE GENERALLY ASSOCIATED WITH MATERNAL TOXICITY.

BENZENE IS A CANCER HAZARD. PROLONGED AND REPEATED EXPOSURE MAY CAUSE SERIOUS INJURY TO BLOOD FORMING ORGANS AND IS ASSOCIATED WITH ANEMIA AND CERTAIN FORMS OF LEUKEMIA IN MAN. ANIMAL STUDIES ON BENZENE DEMONSTRATED IMMUNOTOXICITY, TESTICULAR EFFECTS AND ALTERATIONS IN REPRODUCTIVE CYCLES, EVIDENCE OF CHROMOSOMAL DAMAGE OR OTHER CHROMOSOMAL CHANGES, AND EMBRYO/FETOTOXICITY BUT NOT TERATOGENICITY.

STUDIES ON N-HEXANE IN LABORATORY ANIMALS HAVE SHOWN MILD, TRANSITORY EFFECTS ON THE SPLEEN AND BLOOD (WHITE BLOOD CELLS), AND EVIDENCE OF LUNG DAMAGE. IN ADDITION, FETOTOXICITY HAS BEEN DEMONSTRATED AT LEVELS PRODUCING MATERNAL TOXICITY. AT HIGH LEVELS, INHALATION EXPOSURE HAS RESULTED IN TESTICULAR AND EPIDIDYMAL ATROPHY.

CHRONIC EXPOSURE TO VAPORS OF A MIXTURE CONTAINING 50% PSEUDOCUMENE (AND POSSIBLY CONTAMINATED WITH BENZENE) CAUSED DECREASED WEIGHT GAIN AND BLOOD CHANGES (LYMPHOPENIA AND NEUTROPHILIA), LIVER, LUNG, SPLEEN, KIDNEY AND BONE MARROW EFFECTS IN RATS. PSEUDOCUMENE WAS NOT MUTAGENIC IN THE AMES TEST. REPEATED EXPOSURES OF RABBITS TO HIGH VAPOR CONCENTRATION OF CYCLOHEXANE CAUSED SLIGHT INCREASE IN BLOOD CLOTTING TIME AND MINOR MICROSCOPIC CHANGES IN LIVER AND KIDNEY. CYCLOHEXANE WAS NOT MUTAGENIC IN THE AMES TEST BUT CAUSED A DOSE-RELATED INCREASE IN SISTER CHROMATID EXCHANGE IN CULTURED HUMAN LYMPHOCYTE CELLS.

A CHRONIC FEEDING STUDY IN RATS WITH ETHYL BENZENE CAUSED CANCER (INCREASE IN TOTAL MALIGNANT TUMORS). DEVELOPMENTAL TOXICITY STUDIES IN RATS WITH ETHYL BENZENE SHOWED EVIDENCE OF SKELETAL AND OTHER MALFORMATIONS AT MATERNALLY TOXIC DOSES; SIMILAR EFFECTS WERE NOT SEEN IN RABBITS. ETHYL BENZENE WAS NOT MUTAGENIC IN: AMES TEST, YEAST, DROSOPHILA, SISTER CHROMATID EXCHANGE WITH CULTURED HUMAN LYMPHOCYTES CELLS AND IN VITRO CYTOGENETICS ASSAY WITH CHO CELLS. NAPHTHALENE WAS NOT MUTAGENIC IN THE AMES TEST OR MOUSE OR RAT CELL TRANSFORMATION ASSAY.

NO REPORTS OF LEAD TOXICITY HAVE BEEN ASSOCIATED WITH THIS PRODUCT. HOWEVER, ABUSE, SKIN CONTACT, OR EXCESSIVELY HIGH CONCENTRATIONS OF GASOLINE VAPOR MAY RESULT IN ABSORPTION OF LEAD INTO THE BLOODSTREAM, WHICH POTENTIALLY COULD RESULT IN LEAD TOXICITY OR ADVERSE REPRODUCTIVE EFFECT. SUFFICIENT LEAD ABSORPTION IS KNOWN TO CAUSE DAMAGE TO BONE MARROW (ANEMIA), NERVOUS SYSTEM (BRAIN AND PERIPHERAL NERVE), KIDNEY AND TOXICITY OF BOWEL (COLIC).

THE HANDLING PROCEDURES AND SAFETY PRECAUTIONS IN THIS MSDS SHOULD BE FOLLOWED TO MINIMIZE EMPLOYEE EXPOSURE.

SECTION VII PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)

SPECIFIC GRAVITY: 0.72-0.76 (H2O=1)

VAPOR PRESSURE: 7-14.5 PSI (MM HG) (REID)

MELTING POINT: FREEZE PT. - 72.0 (DEG F)

SOLUBILITY: NEGLIGIBLE (IN WATER)

VAPOR DENSITY: 3.5 (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

% VOLATILE BY VOL= 100 (@ 415 DEG. F)

APPEARANCE AND ODOR:
BRONZE COLOR, CLEAR AND BRIGHT LIQUID. HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
-40 DEG F TAG CLOSED TESTER

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: 1.3 UPPER: 7.6

EXTINGUISHING MEDIA
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
DANGER. EXTREMELY FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL AND ISOLATE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
VAPORS ARE HEAVIER THAN AIR ACCUMULATING IN LOW AREAS AND TRAVELING ALONG THE GROUND AWAY FROM THE HANDLING SITE. DO NOT WELD, HEAT OR DRILL ON OR NEAR CONTAINER. HOWEVER, IF EMERGENCY SITUATIONS REQUIRE DRILLING, ONLY TRAINED EMERGENCY PERSONNEL SHOULD DRILL.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, SPARKS, OPEN FLAMES AND STRONG OXIDIZING AGENTS. PREVENT VAPOR ACCUMULATION.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS CAN BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
UNDER CONDITIONS OF POTENTIAL HIGH EXPOSURE, THE USE OF A NIOSH-APPROVED RESPIRATOR IS RECOMMENDED. PER 29 CFR 1910.134 OR 29 CFR 1910.1028 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE RUBBER, POLYVINYL ALCOHOL OR VITON/NEOPRENE.

ADDITIONAL PROTECTIVE MEASURES
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
DANGER. EXTREMELY FLAMMABLE. ELIMINATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. *** LARGE SPILLS *** ISOLATE THE HAZARD AREA AND DENY ENTRY TO UNNECESSARY PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. WATER FOG MAY BE USEFUL IN SUPPRESSING VAPOR CLOUD; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTIONS AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

SECTION XII SPECIAL PRECAUTIONS

DANGER. EXTREMELY FLAMMABLE. AVOID HEAT, SPARKS, OPEN FLAMES, INCLUDING PILOT LIGHTS, AND STRONG OXIDIZING AGENTS. USE EXPLOSION-PROOF VENTILATION TO PREVENT VAPOR ACCUMULATION. ALL HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. HARMFUL OR FATAL IF SWALLOWED. DO NOT SIPHON GASOLINE BY MOUTH.

FOR USE AS A MOTOR FUEL ONLY. DO NOT USE AS A CLEANING SOLVENT OR FOR OTHER NON-MOTOR FUEL USES. WASH WITH SOAP, AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

IF A MAJOR SPILL OCCURS, GET UPWIND AND NOTIFY LOCAL EMERGENCY PERSONNEL. REMEMBER EXPLOSION AND FIRE IS THE MOST IMMEDIATE DANGER.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
CLASS 3 (FLAMMABLE LIQUID), UN1203, II

THE DOT INFORMATION IN THIS SECTION IS BASED UPON AN EVALUATION OF THE PRODUCT AGAINST THE REQUIREMENTS OF 49 CFR 172 & 173 AS REVISED BY HM-181.

D.O.T. PROPER SHIPPING NAME:
GASOLINE

OTHER REQUIREMENTS:
GUIDE NO. 27.

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
XYLENE (CAS NO: 1330-20-7)	0-25	NJ, MN, RI, FL, IL, PA, ME, MA, CA, CT, LA
TOLUENE (CAS NO: 108-88-3)	0-25	NJ, MN, RI, FL, IL, PA, ME, MA, CA, CT, LA, CA65
BENZENE (CAS NO: 71-43-2)	0-4	NJ, MN, RI, FL, PA, ME, MA, IL, CA, CT, LA, CA65
N-HEXANE (CAS NO: 110-54-3)	0-3	NJ, MN, RI, FI, IL, PA, ME, MA, CA, CT, LA
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE) (CAS NO: 95-63-6)	0-5	PA, CA, MA
CYCLOHEXANE (CAS NO: 110-82-7)	0-1	NJ, MN, RI, FL, IL, PA, ME, MA, CA, CT, LA
ETHYLBENZENE (CAS NO: 100-41-4)	0-3	NJ, RI, FL, IL, PA, ME, MA, CA, CT, LA
NAPHTHALENE (CAS NO: 91-20-3)	0-1	NJ, MN, RI, IL, PA, FL, ME, MA, CA, CT, LA
TETRATHYL LEAD (CAS NO: 78-00-2)	<0.1 GM/GAL	MA
TETRAMETHYL LEAD (CAS NO: 75-74-2)	<0.1 GM/GAL	MA

CA = CALIFORNIA HAZ. SUBST. LIST; CA65 = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT LIST; CT = CONNECTICUT TOX. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

THIS PRODUCT CONTAINS A CHEMICAL OR CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND/OR REPRODUCTIVE TOXICITY.

SECTION XVI SPECIAL NOTES

THE MSDS(S) FOR A NUMBER OF CLOSELY RELATED PRODUCTS HAVE BEEN COMBINED INTO THIS SINGLE MSDS. THIS IS ESSENTIALLY A NEW MSDS USING THE EXISTING MSDS NUMBER OF ONE OF THE PRODUCTS COMBINED TO CREATE THIS COMBINED MSDS. PLEASE NOTE THAT THE PRODUCT NAME AND MSDS NUMBER MAY BE DIFFERENT FROM THE ONE YOU PREVIOUSLY USED, BUT THAT ALL SHELL PRODUCT CODE NUMBERS HAVE REMAINED THE SAME.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: APRIL 21, 1993

J. C. WILLETT

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

THIS MATERIAL IS COVERED BY CERCLA'S PETROLEUM EXCLUSION. THEREFORE, RELEASES TO AIR, LAND OR WATER ARE NOT REPORTABLE UNDER EPA-CERCLA ("SUPERFUND").

SECTION IV RCRA INFORMATION

UNDER EPA - RCRA (40 CFR 261.21), IF THIS PRODUCT BECOMES A WASTEMATERIAL, IT WOULD BE AN IGNITABLE HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER D001. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

THIS PRODUCT CONTAINS BENZENE AT >0.5 MG/L. UNDER EPA - RCRA (40 CFR 261.24), A WASTE CONTAINING THIS CHEMICAL IS HAZARDOUS (HAZARDOUS WASTE NUMBER D018) IF IT EXHIBITS THE CHARACTERISTICS OF TOXICITY AS SHOWN BY THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP). REFER TO THE LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: APRIL 21, 1993

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

ENVIRONMENTAL DATA SHEET

EDS NUMBER ▶ 51,180-6 PAGE 1

97449 (9-87)

PRODUCT ▶	REGULAR LEADED GASOLINE
PRODUCT CODE ▶	02200 02201 02205 02206 02207 02208 02405

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	REGULAR LEADED GASOLINE	MIXTURE	100
1	ALKANES, CYCLOALKANES, ALKENES AND AROMATIC HYDROCARBONS	MIXTURE	BALANCE
2	XYLENE	1330-20-7	0-25
3	TOLUENE	108-88-3	0-25
4	BENZENE	71-43-2	0-4
5	N-HEXANE	110-54-3	0-3
6A	TETRAETHYL LEAD	78-00-2	<0.1 GM/GAL
6B	TETRAMETHYL LEAD	75-74-1	<0.1 GM/GAL
7	PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	0-5
8	CYCLOHEXANE	110-82-7	0-1
9	ETHYLBENZENE	100-41-4	0-3
10	NAPHTHALENE	91-20-3	0-1

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)
P					H-1, H-2, P-3
2			YES		
3			YES		
4			YES		
6A	10	100			
6B	1	100			
7			YES		
8			YES		
9			YES		
10			YES		

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

UNDER EPA-CWA, THIS PRODUCT IS CONSIDERED AN OIL UNDER SECTION 311. SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

ENVIRONMENTAL DATA SHEET

EDS NUMBER ▶ 51,270-3

97449 (9-87)

PRODUCT ▶	RU 2000(R) (REGULAR UNLEADED GASOLINE)
PRODUCT CODE ▶	02100

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	RU 2000 (REGULAR UNLEADED GASOLINE)	MIXTURE	100
1	ALKANES, CYCLOALKANES, ALKENES AND AROMATIC HYDROCARBONS	MIXTURE	BALANCE
2	TOLUENE	108-88-3	0-25
3	XYLENE	1330-20-7	0-25
4	BENZENE	71-43-2	0-5
5	N-HEXANE	110-54-3	0-3
6	TERT-BUTYL METHYL ETHER	1634-04-4	0-11
7	PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	0-5
8	CYCLOHEXANE	110-82-7	0-1
9	ETHYLBENZENE	100-41-4	0-3
10	NAPHTHALENE	91-20-3	0-1

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)
P					H-1, H-2, P-3
2			YES		
3			YES		
4			YES		
6			YES		
7			YES		
8			YES		
9			YES		
10			YES		

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

UNDER EPA-CWA, THIS PRODUCT IS CONSIDERED AN OIL UNDER SECTION 311. SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

THIS MATERIAL IS COVERED BY CERCLA'S PETROLEUM EXCLUSION, THEREFORE, RELEASES TO AIR, LAND OR WATER ARE NOT REPORTABLE UNDER EPA-CERCLA ("SUPERFUND").

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: FEBRUARY 12, 1993

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

THIS INFORMATION IS BEING SYSTEMATICALLY ADDED TO OUR MSDS. IT HAS PREVIOUSLY BEEN PROVIDED TO YOU IN VARIOUS WAYS, INCLUDING THE MSDS. THE NEW MSDS FORMAT IS INTENDED TO PROVIDE THE USER WITH THE INFORMATION IN A MORE CONVENIENT MANNER.

SECTION XVI **SPECIAL NOTES**

OTHER HEALTH EFFECTS (SECTION III) AND SECTION VI HAVE BEEN REVISED.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: APRIL 11, 1990

J. C. WILLETT

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTIONS AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

SECTION XII SPECIAL PRECAUTIONS

DANGER. EXTREMELY FLAMMABLE. AVOID HEAT, SPARKS, OPEN FLAMES, INCLUDING PILOT LIGHTS, AND STRONG OXIDIZING AGENTS. USE EXPLOSION-PROOF VENTILATION TO PREVENT VAPOR ACCUMULATION. ALL HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. HARMFUL OR FATAL IF SWALLOWED. DO NOT SIPHON GASOLINE BY MOUTH.

FOR USE AS A MOTOR FUEL ONLY. DO NOT USE AS A CLEANING SOLVENT OR FOR OTHER NON-MOTOR FUEL USES. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. UNDER NORMAL WORKING CONDITIONS AT SERVICE STATIONS, A RESPIRATOR IS NOT WARRANTED.

IF A MAJOR SPILL OCCURS, GET UPWIND AND NOTIFY LOCAL EMERGENCY PERSONNEL. REMEMBER EXPLOSION AND FIRE IS THE MOST IMMEDIATE DANGER.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
FLAMMABLE LIQUID

D.O.T. PROPER SHIPPING NAME:
GASOLINE

OTHER REQUIREMENTS:
D.O.T. I.D. #UN 1203, GUIDE NO. 27.

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES. COMPONENT 6 IS THE SUBJECT OF A TSCA SECTION 4 TEST RULE. EXPORT OF THIS PRODUCT IS THEREFORE PROHIBITED WITHOUT PRIOR NOTIFICATION TO EPA.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE EDS SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

INFORMATION ON PRODUCT:

A CHRONIC INHALATION STUDY (REFERENCED IN SECTION III) SUPPORTED BY THE AMERICAN PETROLEUM INSTITUTE FOUND THAT FULLY VAPORIZED UNLEADED GASOLINE EXPOSURE PRODUCED DOSE-RELATED INCIDENCES OF KIDNEY CANCER IN MALE RATS. GASOLINE EXPOSURE ALSO PRODUCED AN INCREASE OF LIVER CANCER AT THE HIGHEST DOSE (2056 PPM) IN FEMALE MICE. EXPOSURES WERE FOR 6 HRS/DAY, 5 DAYS/WEEK FOR A TOTAL OF 27 MONTHS. THE RELATIONSHIP AND SIGNIFICANCE TO MAN OF THE RESULTS OF THIS STUDY ARE NOT KNOWN.

INHALATION STUDIES ON GASOLINE VAPORS HAVE CAUSED CENTRAL NERVOUS SYSTEM EFFECTS IN DOGS AT 10,000 PPM.

UNLEADED GASOLINE WAS EVALUATED FOR GENETIC ACTIVITY IN ASSAYS USING MICROBIAL CELLS, CULTURED MAMMALIAN CELLS AND RATS (BONE MARROW). THE RESULTS WERE ALL NEGATIVE. UNLEADED GASOLINE WAS CONSIDERED NON-MUTAGENIC UNDER THESE CONDITIONS.

INFORMATION ON GASOLINE CONSTITUENTS:

LABORATORY ANIMALS EXPOSED BY VARIOUS ROUTES TO HIGH DOSES OF XYLENE SHOWED EVIDENCE OF EFFECTS IN THE LIVER, KIDNEYS, LUNGS, SPLEEN, HEART AND ADRENALS. RATS EXPOSED TO XYLENE VAPOR DURING PREGNANCY SHOWED EMBRYO/FETOTOXIC EFFECTS. MICE EXPOSED ORALLY TO DOSES PRODUCING MATERNAL TOXICITY ALSO SHOWED EMBRYO/FETOTOXIC EFFECTS. PROLONGED AND REPEATED EXPOSURES TO HIGH CONCENTRATIONS OF XYLENE HAVE RESULTED IN HEARING LOSS IN LABORATORY RATS.

WHILE THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTABLE LEVELS OF TOLUENE VAPORS (E.G., THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS, ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RHYTHMS. THIS LATTER EFFECT WAS SHOWN TO BE ENHANCED BY HYPOXIA OR THE INJECTION OF ADRENALIN-LIKE AGENTS. PROLONGED AND REPEATED EXPOSURES TO HIGH CONCENTRATIONS OF TOLUENE HAVE RESULTED IN HEARING LOSS IN LABORATORY RATS.

BENZENE IS A CANCER HAZARD. PROLONGED AND REPEATED EXPOSURE MAY CAUSE SERIOUS INJURY TO BLOOD FORMING ORGANS AND IS ASSOCIATED WITH ANEMIA AND CERTAIN FORMS OF LEUKEMIA IN MAN. ANIMAL STUDIES ON BENZENE DEMONSTRATED IMMUNOTOXICITY, TESTICULAR EFFECTS AND ALTERATIONS IN REPRODUCTIVE CYCLES, EVIDENCE OF CHROMOSOMAL DAMAGE OR OTHER CHROMOSOMAL CHANGES, AND EMBRYO/FETOTOXICITY BUT NOT TERATOGENICITY.

STUDIES ON N-HEXANE IN LABORATORY ANIMALS HAVE SHOWN MILD, TRANSITORY EFFECTS ON THE SPLEEN AND BLOOD (WHITE BLOOD CELLS), AND EVIDENCE OF LUNG DAMAGE. IN ADDITION, FETOTOXICITY HAS BEEN DEMONSTRATED AT LEVELS PRODUCING MATERNAL TOXICITY. AT HIGH LEVELS, INHALATION EXPOSURE HAS RESULTED IN TESTICULAR AND EPIDIDYMAL ATROPHY.

INGESTION OF TERT-BUTYL METHYL ETHER (MTBE) INDUCED CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION IN RATS. EXPOSURE TO MTBE VAPORS PRODUCED EMBRYO/FETOTOXICITY (INCLUDING AN INCREASED INCIDENCE IN CLEFT PALATE AT THE HIGHEST DOSE) IN MICE AT LEVELS PRODUCING MATERNAL TOXICITY. NO SUCH EFFECTS WERE NOTED I N A SIMILAR STUDY IN RABBITS. MTBE TESTED POSITIVE IN THE MOUSE LYMPHOMA ASSAY IN THE PRESENCE OF METABOLIC ACTIVATION.

THE HANDLING PROCEDURES AND SAFETY PRECAUTIONS IN THIS MSDS SHOULD BE FOLLOWED TO MINIMIZE EMPLOYEE EXPOSURE.

SECTION VII PHYSICAL DATA

BOILING POINT: 100-425 APPROX. (DEG F)	SPECIFIC GRAVITY: 0.72-0.76 (H2O=1)	VAPOR PRESSURE: 7-14.5 PSI (MM HG) (REID)
MELTING POINT: NOT AVAILABLE (DEG F)	SOLUBILITY: NEGLIGIBLE (IN WATER)	VAPOR DENSITY: 3.5 (AIR=1)
EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE		% VOLATILE BY VOL= 100 (@ 415 DEG. F)

APPEARANCE AND ODOR:
BRONZE COLOR; CLEAR AND BRIGHT LIQUID. HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
-40 DEG F TAG CLOSED TESTER

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: 1.3 UPPER: 7.6

EXTINGUISHING MEDIA
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
DANGER. EXTREMELY FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL AND ISOLATE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
VAPORS ARE HEAVIER THAN AIR ACCUMULATING IN LOW AREAS AND TRAVELING ALONG THE GROUND AWAY FROM THE HANDLING SITE. DO NOT WELD, HEAT OR DRILL ON OR NEAR CONTAINER. HOWEVER, IF EMERGENCY SITUATIONS REQUIRE DRILLING, ONLY TRAINED EMERGENCY PERSONNEL SHOULD DRILL.

SECTION IX REACTIVITY

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, SPARKS, OPEN FLAMES AND STRONG OXIDIZING AGENTS. PREVENT VAPOR ACCUMULATION.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS CAN BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
UNDER CONDITIONS OF POTENTIAL HIGH EXPOSURE, THE USE OF A NIOSH-APPROVED RESPIRATOR IS RECOMMENDED. PER 29 CFR 1910.134 OR 29 CFR 1910.1028 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS. FOR SERVICE STATION PERSONNEL PROTECTION, SEE SECTION XII.

OSHA HAS ESTABLISHED TRANSITIONAL OCCUPATIONAL EXPOSURE LIMITS FOR THIS PRODUCT AND/OR COMPONENTS OF THIS PRODUCT. REFER TO 29 CFR 1910.1000 FOR THESE TRANSITIONAL LIMITS AND REQUIREMENTS FOR MEETING THESE LIMITS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE RUBBER, POLYVINYL ALCOHOL OR VITON/NEOPRENE.

ADDITIONAL PROTECTIVE MEASURES
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
DANGER. EXTREMELY FLAMMABLE. ELIMINATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. *** LARGE SPILLS *** ISOLATE THE HAZARD AREA AND DENY ENTRY TO UNNECESSARY PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. WATER FOG MAY BE USEFUL IN SUPPRESSING VAPOR CLOUD; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER

RESULT IN ASPIRATION PNEUMONITIS.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONCIOUSNESS AND DEATH MAY OCCUR. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR. KIDNEY DAMAGE MAY BE EVIDENCED BY CHANGES IN URINE OUTPUT, URINE APPEARANCE OR EDEMA (SWELLING FROM FLUID RETENTION). LIVER DAMAGE MAY BE EVIDENCED BY LOSS OF APPETITE, JAUNDICE (YELLOWISH SKIN COLOR) AND SOMETIMES PAIN IN THE UPPER ABDOMEN ON THE RIGHT SIDE.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LIVER AND KIDNEY FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS
THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS DETERMINED THAT GASOLINE IS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B). IT HAS BEEN REPORTED THAT CHRONIC INHALATION EXPOSURE TO AN UNLEADED MOTOR GASOLINE, WHICH WAS FULLY VAPORIZED, HAS PRODUCED KIDNEY AND LIVER CANCERS IN SOME LABORATORY RODENTS. THE STUDIES WERE SPONSORED BY THE AMERICAN PETROLEUM INSTITUTE. THE API TEST MATERIAL USED WAS BLENDED TO REPRESENT A TYPICAL UNLEADED MOTOR GASOLINE. BENZENE IS LISTED BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER AND OSHA AS A CHEMICAL CAUSALLY ASSOCIATED WITH CANCER IN HUMANS.

SEE SECTION VI FOR SUPPLEMENTAL INFORMATION.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
P	300 PPM		300 PPM	500 PPM	500 PPM*
2	100 PPM		100 PPM	150 PPM	150 PPM*
3	100 PPM		100 PPM	150 PPM	150 PPM*
4	1 PPM		10 PPM**		5 PPM*
5	50 PPM		50 PPM		

*OSHA PEL/STEL. **CLASSIFIED BY ACGIH AS A "SUSPECTED HUMAN CARCINOGEN" (A2)

SECTION V EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.*

NOTE TO PHYSICIAN
*IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH MEDICAL SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

MATERIAL SAFETY DATA SHEET

713-241-4007

MSDS NUMBER ▶ 51,270-11 PAGE 1

97367 (4-85)

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300	SHELL: 713-241-4819

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
2	4	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

*For acute and chronic health effects refer to the discussion in Section III

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW REQUIRES IT)

SECTION I	NAME
PRODUCT ▶	RU 2000(R) (REGULAR UNLEADED GASOLINE)
CHEMICAL NAME ▶	PETROL
CHEMICAL FAMILY ▶	HYDROCARBON
SHELL CODE ▶	02100

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	RU 2000 (REGULAR UNLEADED GASOLINE)	MIXTURE	100
1	ALKANES, CYCLOALKANES, ALKENES AND AROMATIC HYDROCARBONS	MIXTURE	BALANCE
2	TOLUENE	108-88-3	0-25
3	XYLENE	1330-20-7	0-25
4	BENZENE	71-43-2	0-5
5	N-HEXANE	110-54-3	0-3
6	TERT-BUTYL METHYL ETHER	1634-04-4	0-11

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	>5 GM/KG (RAT)	>2 GM/KG (RABBIT)	>5 MG/L/4HR (RAT)

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT
BASED ON PRODUCT TESTING PRODUCT IS MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT
PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN RESULTING IN SKIN IRRITATION AND DERMATITIS.

INHALATION
THIS PRODUCT MAY CAUSE IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT AND ADDITIONALLY, MAY PRODUCE LIVER AND KIDNEY DAMAGE. HIGH VAPOR CONCENTRATIONS MAY PRODUCE CNS DEPRESSION.

INGESTION
THIS PRODUCT MAY BE HARMFUL OR FATAL IF SWALLOWED. INGESTION OF PRODUCT MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY

THE MARVEL OIL COMPANY, INC.
331 North Main Street
Port Chester, New York, 10573
914-937-4000

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Marvel Mystery Oil (005, 012, 013, 014, 015, 016, 017, 018)
REVISION DATE: 11/25/85
TRANSPORTATION EMERGENCY NO. 914-937-4000
CHEMICAL NAME: Fuel additive
NFPA CODE: CAS NO.: N/A-Mixture

SECTION 1-HAZARDOUS INGREDIENTS

Solvents-Mineral Spirits-30%-CAS # 64742-88-7
Napthenic base oil distillate-67%-CAS # 64742-54-5

SECTION 2-PHYSICAL DATA

Vapor pressure: 2mm Hg. @ 68
Specific gravity: .9
Water solubility: negligible
Percent volatile: not determined
Vapor density: not determined
Evaporation rate: not determined
Odor: Mild
Appearance: red color liquid

SECTION 3-FIRE AND EXPLOSION DATA

Flash point: 140 F
Upper flammable limit: not determined
Lower flammable limit: not determined
Extinguishing media: CO2, dry chemical, foam, water spray, water fog
Unusual fire & explosion hazards: do not store or mix with strong oxidants

SECTION 4-HEALTH HAZARD DATA

Eye irritation: mild
Skin irritation: mild irritation may occur with prolonged or repeated contact. Testing of similiar oils has produced skin tumors in experimental animals after prolonged and repeated contact.
Oral: Pulmonary aspiration hazard if swallowed

SECTION 5-EMERGENCY FIRST AID PROCEDURES

Eye: flush with water until irritation subsides
Skin: wash with soap and water
Oral: do not induce vomiting, give milk or water to dilute stomach contents

(Revision)

SECTION 6-STABILITY

Stability: stable
Incompatibity: oxidizing agents
Polymerization: will not occur

SECTION 7-SPILL OR LEAK PROCEDURES

Spill procedures:recover free liquid,add absorbent to spill area
Waste disposal:keep product out of sewers and watercourses
disposal should be in compliance with federal, state and local laws

SECTION 8-SPECIAL PROTECTION

Ventilation:mechanical ventilation as needed
Gloves:use chemical resistant gloves if needed to avoid prolonged or repeated skin contact
Eye protection:product minimally irritating to eyes,use saftey glasses when eye contact may occur
Other:use chemical resistant apron or other impervious clothing if needed to avoid prolonged or repeated skin contact

SECTION 9-SPECIAL PRECAUTIONS

Keep away from heat and open flame,contains refined petroleum distillates,if swallowed do not induce vomiting,if ingested call physican immediately

SECTION 10-TRANSPORTATION INFORMATION

DOT shipping name:petroleum lubricating oil
DOT hazard class:combustible liquid
DOT ID number:NA 1270
NMFC ID number:155250

MATERIAL SAFETY DATA SHEET

LIQUID CARBONIC INDUSTRIES

810 JORIE BLVD. • OAK BROOK, IL 60521-2216 • 708 572-7500

OXYGEN, COMPRESSED

DOT: UN 1072
HAZ.CL.: Division 2.2
LABELS: Nonflammable Gas, Oxidizer

October 1991

24 Hour Emergency Phone Numbers: (504) 673-8831; CHEMTREC (800) 424-9300

SECTION I--PRODUCT IDENTIFICATION

CHEMICAL NAME: Oxygen
COMMON NAME AND SYNONYMS: Oxygen, Compressed (D.O.T.); Gaseous Oxygen, GOX; Oxygen Gas
CHEMICAL FAMILY: Oxidizer FORMULA: O_2

SECTION II--HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO.	1991-1992 ACGIH TLV UNITS
Oxygen	99.5+	7782-44-7	None OSHA 1989 TWA - None Listed

SECTION III--PHYSICAL DATA

BOILING POINT (°F.): -297
VAPOR PRESSURE: @ 70°F *
VAPOR DENSITY (AIR=1): @ 70°F = 1.11
SOLUBILITY IN WATER: Slightly
APPEARANCE AND ODOR: Colorless, odorless gas
SPECIFIC GRAVITY (H_2O=1): N/A (Gas)
% VOLATILE BY VOLUME: N/A (Gas)
EVAPORATION RATE (BUTYL ACETATE=1): N/A (Gas)
* Above critical temperature

SECTION IV--FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): N/A
FLAMMABLE LIMITS: LEL N/A UEL N/A
EXTINGUISHING MEDIA:
Fires with oxygen as the oxidizer should be fought with copious quantities of water.

SPECIAL FIRE FIGHTING PROCEDURES: If possible, stop the source of oxygen which is supporting the fire. Use water spray to cool surrounding containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Vigorously accelerates combustion. Many compounds which are not flammable in air may burn in pure oxygen. If cylinders are involved in a fire, safely relocate or keep cool with water spray.

SECTION V--HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No
Carcinogenicity: NTP? No IARC Monographs? No OSHA? No

EFFECTS OF OVEREXPOSURE:
Inhalation: Oxygen is the vital element in the atmosphere in which we live and breathe. The atmosphere contains approximately 21 molar % oxygen. Breathing higher concentrations could lead to hyperoxia and pneumonia or could present a risk of inflammation of organic matter in the body.

Persons in ill health where such illness would be aggravated by exposure to higher than normal levels of oxygen should not be allowed to work with or handle this product.

(Continued on Supplemental Sheet)

KMB00003365

SECTION VI--REACTIVITY DATA

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: N/A

INCOMPATABILITY (MATERIALS TO AVOID): All flammable materials

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

SECTION VII--SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Stop leak if possible. Be cognizant of increased flammability possibility in high oxygen content environments. Evacuate personnel from affected area. Remove sources of heat and ignition.

WASTE DISPOSAL METHOD:
Locate leaking containers in a downwind location and allow to vent to atmosphere.

SECTION VIII--SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: N/A

VENTILATION: LOCAL EXHAUST (X) To prevent accumulation above
MECHANICAL (GENERAL) (X) 25 molar %

PROTECTIVE GLOVES: Any material EYE PROTECTION: Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT:
Safety shoes, safety shower. Use appropriate protective equipment when welding or cutting.

SECTION IX--SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Protect cylinders against physical damage. Store in cool, dry, well-ventilated area away from sources of heat or direct sunlight. Do not allow areas where cylinders are stored to exceed 125°F. Use a check valve or trap in the cylinder discharge line to prevent hazardous backflow. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Keep oil, grease and all flammables away. Do not store with flammable gases. Open oxygen valves slowly.

OTHER PRECAUTIONS:
Use only DOT or ASME coded vessels. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Oxygen equipment must be cleaned and degreased for oxygen service. Close valve after each use and when empty. Cylinders may not be refilled except by or with the consent of Liquid Carbonic. For further information refer to CGA Pamphlets P-1, G-4.1, and P-14 which have to do with cylinder handling, oxygen-rich atmospheres and cleaning for oxygen service.

(Continued on Supplemental Sheet)

No guaranty is made as to the accuracy of any data or statement contained herein. While this material is furnished in good faith, NO WARRANTY EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE. This material is offered only for your consideration, investigation and verification and Liquid Carbonic shall not in any event be liable for special, incidental or consequential damages in connection with its publication.

KMB00003366

SUPPLEMENTAL SHEET - OXYGEN MATERIAL SAFETY DATA SHEET

SECTION V--HEALTH HAZARD DATA - Continued

EMERGENCY AND FIRST AID PROCEDURES:

If Inhaled: Conscious persons should be assisted to an uncontaminated area and breathe fresh air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing (has experienced) hyperoxia.

Unconscious persons should be moved to an uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continued treatment should be symptomatic and supportive.

CAUTION: Welding or brazing may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z-49.1 "Safety in Welding and Cutting" published by the American Welding Society and OSHA safety regulations under 29 CFR 1910.252 "Welding, Cutting and Brazing." Also see ACGIH TLVs 1991-1992 Appendix B, Section B2, "Welding Fumes." ARC RAYS can injure eyes and burn skin.

SECTION IX--SPECIAL PRECAUTIONS

OTHER PRECAUTIONS: (Continued)

Consult manufacturer's MSDS sheet on welding consumables and related products for reactivity and health hazard data, and for further information regarding welding fumes.

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 NO. for gaseous oxygen = 0 0 0 (OX)

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KMB00003367

This MSDS should be attached or kept with the respective product with which it is associated.

3X670, 3X671, 3X673, 3X674, 3X676, 4Z729, 6Z008, 6Z009

JMB-4

MATERIAL SAFETY DATA SHEET
MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200. STANDARD MUST BE CONSULTED FOR SPECIFIC REQUIREMENTS.

U.S. DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
(NON-MANDATORY FORM)
FORM APPROVED
OMB NO. 1218-0072

NOTE: BLANK SPACES ARE NOT PERMITTED. IF ANY ITEM IS NOT APPLICABLE, OR NO INFORMATION IS AVAILABLE, THE SPACE MUST BE MARKED TO INDICATE THAT.

IDENTITY (AS USED ON LABEL AND LIST): PROPANE

SECTION I

SUPPLIERS NAME: BERNZ-O-MATIC
ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE): ONE BERNZOMATIC DRIVE
MEDINA, NY 14103

EMERGENCY TELEPHONE NUMBER: 716-798-4949
TELEPHONE NUMBER FOR INFORMATION: 716-798-4949
DATE PREPARED: JUNE 4, 1998
SIGNATURE OF PREPARER (OPTIONAL):

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY; COMMON NAME(S))	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED	% (OPTIONAL)
PROPANE (CAS #74-98-6)	1000 PPM	1000 PPM	NA	100

NFPA HAZARD RATINGS		HMIS RATINGS	
HEALTH	-1	HEALTH	-0
FLAMMABILITY	-4	FLAMMABILITY	-4
REACTIVITY	-0	REACTIVITY	-0

NOTE: WHEN PROPANE FUEL IS BURNED EFFICIENTLY THE NORMAL BY-PRODUCTS OF COMBUSTION ARE CO2 AND H2O. INEFFICIENT BURNING MAY ADD CO TO THE BY-PRODUCTS OF COMBUSTION.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIALS IS RELEASED OR SPILLED: REMOVE IGNITIO SOURCES AND VENTILATE AREA.

WASTE DISPOSAL METHOD: VENT GAS TO ATMOSPHERE IN FLAME FREE, SPARK FREE AR OUTDOORS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE AT TEMPERATURES BEL 120 F IN WELL VENTILATED, SPARK FREE, FLAME FREE AREA.

OTHER PRECAUTIONS: NONE

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): NOT REQUIRED WITH NORMAL USE.

VENTILATION:
LOCAL EXHAUST: N/A
MECHANICAL (GENERAL): N/A
SPECIAL: N/A
OTHER: N/A

PROTECTIVE GLOVES: NOT REQUIRED
EYE PROTECTION: NOT REQUIRED
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: NOT REQUIRED
WORK/HYGIENIC PRACTICES: N/A

SECTION IX - SHIPPING INFORMATION

WHMIS CLASSIFICATION: A - COMPRESSED GAS & B1 - FLAMMABLE GAS

DOT
PROPER SHIPPING NAME: PETROLEUM GAS, LIQUEFIED
HAZARD CLASSIFICATION: FLAMMABLE GAS
UN. NO.: 1075
CLASS: 2.1

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: -44

SPECIFIC GRAVITY (H2O=1): LIQUID AT 60 F: .51

VAPOR PRESSURE (MM HG) AT 100 F: 197 PSIG

MELTING POINT: N/A

VAPOR DENSITY (AIR=1) AT 1 ATM AT 60 F: 1.56

EVAPORATION RATE (BUTYL ACETATE=1): N/A

SOLUBILITY IN WATER: NOT SOLUBLE

APPEARANCE AND ODOR: COLORLESS - ROTTEN EGG ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): -156 F CLOSED CUP

FLAMMABLE LIMITS: LEL - 2.1 UEL - 9.5

EXTINGUISHING MEDIA: STOP FLOW OF GAS OR OXYGEN.

SPECIAL FIRE FIGHTING PROCEDURES: USE WATER TO COOL TANKS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: AUTO IGNITION TEMP. 842 F HEAVIER THAN AIR (VAPOR DENSITY 1.5); MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASHBACK.

SECTION V - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY (MATERIALS TO AVOID): N/A

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: NONE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: N/A

SECTION VI - HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION? - YES SKIN? - YES INGESTION? - NO

HEALTH HAZARDS (ACUTE AND CHRONIC): CONTACT WITH LIQUID PROPANE MAY CAUSE FROST BURNS.

CARCINOGENICITY: NTP? - N/A IARC MONOGRAPHS? - N/A OSHA REGULATED? - N/A

SIGNS AND SYMPTOMS OF EXPOSURE: HIGH CONCENTRATIONS MAY CAUSE HEADACHES AND DROWSINESS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NA

EMERGENCY AND FIRST AID PROCEDURES: REMOVE EXPOSED PERSON FROM CONTAMINATED AREA.

Section I **MATERIAL SAFETY DATA SHEET**

Supplier's Name: Suburban Propane Division of National Distillers & Chemical Corp.

Emergency Phone Number ___

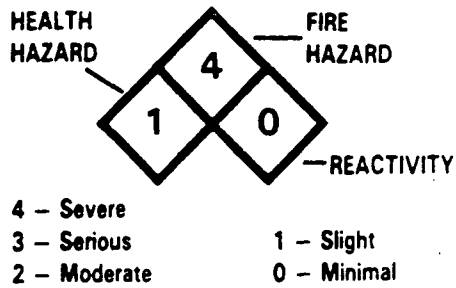
Address

Chemical Name: LIQUEFIED PETROLEUM GAS or PROPANE

Formula: C_3H_8

CAS Registry No.: 74-98-6 Chemical Family: Hydrocarbon

WARNING: Danger! Extremely flammable. Compressed Gas. Asphyxiant in high concentrations. Contact with liquid causes burns similar to frost bite. OSHA permissible exposure limit (PEL) 1000 ppm for an 8-hour workday.



Appearance and Odor: Vapor and liquid are colorless. Product contains an odorant (unpleasant odor).

Section II **HAZARDOUS INGREDIENTS**

Hazardous Mixtures: Air with 2.15 to 9.60 percent propane

Section III **PHYSICAL DATA**

Boiling Point: -44°F

Specific Gravity ($H_20=1$): 0.51

Vapor Density (air=1): 1.52

Solubility in Water: Slightly

Vapor Pressure (PSIG) at 100°F: 205

Percent, Volatile by Volume (%): 100

Evaporation rate: Gas at normal ambient temperatures

Section IV **FIRE AND EXPLOSION HAZARD DATA**

Flash Point: -156°F (CC)

Classification: Flammable Gas UN 1075

Flammable Limits - LFL: 2.15 UFL: 9.60 Extinguishing Media: Water spray-Class A-B-C or BC fire extinguisher. Special Fire Fighting Procedures: Stop flow of gas. Use water to keep fire exposed containers cool. Use water spray to disperse unignited gas or vapor. If ignition has occurred and no water available, tank metal may weaken from overheating. Evacuate area. If gas has not ignited, LP-Gas liquid or vapor may be dispersed by water spray or flooding.

Decomposition Products under Fire Conditions: Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" Container Warning: "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Section V **HEALTH HAZARD**

OSHA P.E.L.: 1000 PPM ACGIH TLV: 1000 PPM Effects of Overexposure: Inhalation - concentrations can lead to symptons ranging from dizziness to anesthesia and respiratory arrest. Eyes - moderate irritation. Emergency & First Aid procedures: Inhalation - remove to fresh air. Guard against self injury. Apply artificial respiration if breathing has stopped.

727 South 13th Street
Omaha, Nebraska 68102

800-432-9306
FAX 402-341-8654

MATERIAL SAFETY DATA SHEET

IDENTITY (As used on label and list): SIERRA ANTIFREEZE COOLANT
PRODUCT CODE: SIO1AF6P

NFPA HAZARD-IDENTIFICATION

		0 - Least
Health:	0	1 - Slight
Fire:	1	2 - Moderate
Reactivity:	0	3 - High
		4 - Extreme

Section I - General Information

Terminal Packaging Corporation
(Subsidiary of Warren Distribution)
2849 River Road
Council Bluffs, IA 51501

Emergency (402) 341-9397
Information (402) 341-9397
Chemtrec (800) 424-9300
Revised 6-1-92

Section II - Hazardous Ingredients

COMPONET NAME	%	CAS	PEL MIST	PEL VAPOR
Propylene Glycol	94	57-55-6	10mg/m3*	400ppm*
Water	3			
Proprietary additives	3			

- no established guidelines - recommendations only

Section III - Physical/Chemical Characteristics

Boiling Point (deg F): 365
Vapor Pressure (mm Hg): <0.1
Vapor Density (Air=1): 2.6
Evaporation Rate (n-butyl Acetate=1): Slight

Specific Gravity (H^2O=1): 1.04
Melting Point (deg F): -76
Solubility in Water: Complete

APPEARANCE AND ODOR: Colorless, slightly viscous almost odorless liquid.

Section IV - Fire and Explosion Hazard Data

Flash Point (deg F): 211

Flammable or explosive limits (approximate % by volume in air)
LEL: 2.4 UEL: 17.4
EXTINGUISHING MEDIA: carbon dioxide, dry chemical, alcohol type foam, water spray, water fog

SPECIAL FIRE FIGHTING PROCEDURES: Wear positive pressure, self-contained breathing apparatus and other protective apparatus as warranted. Fight fire from distance or protected location -heat may build up pressure and rupture closed containers. Liquid may form slippery film. Use water spray or fog for cooling, solid stream may spread fire as burning liquid will float on water. Avoid frothing/steam explosion.Notify authorities if liquid enters sewers/public waters.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air and travel long distances along ground before igniting and flashing back. Fine sprays and mists may be combustible at temperatures below normal flash point.

SectionV - Reactivity Data

STABILITY: Stable
CONDITIONS TO AVOID: Heat, sparks, open flame.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong alkalies, strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Carbon monoxide and other toxic vapors.

HAZARDOUS POLYMERIZATION: Not expected to occur.
CONDITIONS TO AVOID: n/a

Section VI - Health Hazard Data

EYE CONTACT: May cause minor eye irritation.

SKIN CONTACT: No significant adverse effects are expected under anticipated conditions of normal use. Repeated, prolonged exposure may cause slight flaking, tenderness, and softening of skin.

INHALATION: No significant adverse effects are expected under anticipated conditions of normal use. If effects do occur, refer to FIRST AID section.

INGESTION: No significant adverse effects are expected under anticipated conditions of normal use. Excessive ingestion may cause central nervous system effects.

CARCINOGENCITY: N/A

SIGNS AND SYMPTOMS OF OVEREXPOUSURE: As above
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Material and/or its emissions may aggravate preexisting eye disease.

OTHER HEALTH INFORMATION: None

Section VII - First Aid Procedures

EYE CONTACT: Immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain medical attention if pain, blinking, tears or redness persists.

SKIN CONTACT: Product is not expected to present a significant skin hazard under anticipated conditions of normal use.

INHALATION: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

INGESTION: If large quantity is swallowed, give a pint of lukewarm water if victim is completely conscious and alert. Do not induce vomiting because of corrosive effects. Obtain emergency medical attention.

Section VIII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Prevent flow to sewers and public waters as it may contaminate said water. Restrict water usage to prevent slip/fall hazard. Soak up small spills with inert solids. Dike and recover large land spills. Minimize dispersion of any spills on water (product may sink or float and/or biodegrade). Notify appropriate authorities if product enters any waterway.

WASTE DISPOSAL METHOD: Contaminated product/soil/water may be RCRA/OSHA hazardous waste due to potential combustibility. Landfill solids at permitted sites using registered transporters. Burn concentrated liquids, avoiding flameouts, and assuring emissions comply with applicable regulations. Dilute aqueous waste may biodegrade, but avoid overloading/poisoning plant biomass and assuring effluent complies with applicable regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in tightly closed and properly vented containers, away from heat, sparks, open flame, and strong oxidizing agents.

OTHER PRECAUTIONS: Use dry nitrogen or low dew point air for tank padding.

Section IX - Control Measures

RESPIRATORY PROTECTION: No special respiratory protection equipment is recommended under normal conditions of anticipated use with adequate ventilation.

VENTILATION: Adequate general ventilation is required, local exhaust is recommended if possible.

PROTECTIVE GLOVES: not required

EYE PROTECTION: Chemical splash goggles or full face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Contact lenses should not be worn.

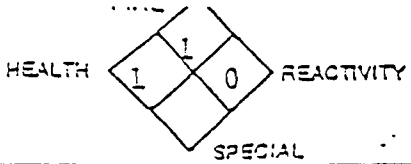
OTHER PROTECTIVE EQUIPMENT: None

WORK PRACTICES/ENGINEERING CONTROLS: Keep containers closed when not in use.

PERSONAL HYGIENE: If product handling results in skin contact, wash hands and other exposed areas with mild soap and water before eating, drinking, smoking, or using toilet facilities. Shower after work using plenty of soap and water. Promptly remove soiled clothing and wash thoroughly before reuse.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in the data sheet which we received from sources outside our company and we believe that information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implies.

EN 300



HAZARD CODE
0. INSIGNIFICANT
1. SLIGHT
2. MODERATE
3. HIGH
4. EXTREME

MATERIAL SAFETY DATA SHEET

This form complies with OSHA's Hazard Communication Standard 29 CFR 1910.1200

SECTION I – Material Identification

Identity ENERPAC HF & HOF HYDRAULIC OIL Date 07/19/94

Benz Oil, Inc. 2724 W. Hampton Ave. Milwaukee, WI 53209	Emergency Ph# (414) 442-2900 Informational Ph# (414) 442-2900

SECTION II – Hazardous Ingredients/Identity Information

Hazardous Components	OSHA PEL	ACGIH TLV	Other	Approx %
Mineral oil CAS # 64742-54-7	5mg/M3 for oil mist			99.0
Proprietary additive A[2]		eye irritant		0.75
Proprietary additive B[3]		non-hazardous		.25

This product and its indgredients are not hazardous and therefore it does not have a WHMIS hazard classification.

This product does not contain any of the hazardous chemicals listed in California Proposition 65.
All components of this material are on the US TSCA Inventory.

[2]NJ Trade Secret Registry # 800967-50937
[3]CAS # 9003-21-8

OSHA & ACGIH have set the exposure limit for mineral oil at 5mg/M3 for oil mist in air in an 8 hour work day. ACGIH lists a 10 mg/M3 STEL.

SECTION III – Physical/Chemical Characteristics

Initial Boiling Point min.	500°F	Specific Gravity (H_2O =1)	0.9
Vapor Pressure @ 20°C max.	0.01	Melting Point °F	NA
Vapor Density min. (AIR=1)	5	Evaporation Rate (Bu Ace =1)	NIL

Water Solubility: Very slight at room temperature

Appearance & Odor: Dark blue light bodied oil with a mild odor

SECTION IV – Fire & Explosion Hazard Data

Flash Point °F COC	400	Flammability Limits	LEL % 1	UEL % 6	

Extinguishing Media: Carbon dioxide, water spray, foam, dry chemical

Fire fighting procedures and explosion hazards

Directly spraying extinguishing media onto hot burning product may cause frothing and spreading of fire. Use self contained breathing apparatus for fighting fires in enclosed areas.

SECTION V – Reactivity Data

Stability	Stable	X	Hazardous	Will not occur	X
	Unstable		Polymerization	Will occur	

Incompatibility: Avoid contact with strong oxidants such as chlorine gas

Decomposition Products: Fumes, smoke, COx, SOx, NOx, when combusted

SECTION VI – Health Hazard Data

Routes of entry: Inhalation X Skin X Ingestion X

Health Hazards

Product has a low order of acute, oral, and dermal toxicity.
Product contacting the eyes may cause irritation.
Repeated skin contact may cause skin irritation or dermatitis because these types of products tend to remove natural emollients from the skin.

This product is not listed as a carcinogen by NTP, IARC or OSHA.

Symptoms of Exposure: Reddening and irritation of eyes or skin

Conditions Aggravated by Exposure: Pre-existing dermatitis or skin diseases

First Aid Procedures

Skin contact: Wash with a mild soap containing lanoline or other emollients.
Eye contact: Flush eyes with clear water for 15 minutes and contact a physician if irritation persists.
Ingestion: Do not induce vomiting. Contact a physician.
Inhalation: Remove to fresh air.

SECTION VII – Precautions for Safe Handling and Use

Spill, Leak & Disposal Procedures

Recover free product. Add sand, earth, or other absorbent to spill. Minimize skin contact. Keep product out of sewers and waterways. Advise authorities of large spills. Dispose of material in a licensed Landfill or incineration facility in accordance with local, state and federal regulations.

Handling & Storage Procedures

Store away from heat, sparks and other igniton sources. "Empty" containers retain residual oil. Do not pressurize, cut, weld, solder, drill, grind or expose drums to other ignition sources.

SECTION VIII – Control Measures

In most cases good personal hygeine is all that is needed for safe trouble-free use of this product. Splash goggles and oil resistant gloves maybe useful in certain applications. Under normal conditions of use, local exhaust provides sufficient ventillation. Use an organic vapor mask if TLV is exceeded.

9-9-03 Notes Brad Clinefelter

Met with Tom Jackson w/P.T. Rail, They use this mixed with locomotive coolant water (No antifreeze)

45724/864

They are to install leak catchment tank 9-10-03, drain and remove from T-4 site as needed

RAC

Locomotive Coolant Additive

BETZDEARBORN MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: 30-JUN-1998
PRINTED DATE: 30-JUN-1998

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : BETZDEARBORN TR81167

PRODUCT APPLICATION AREA: A CLOSED COOLING WATER CORROSION TREATMENT

COMPANY ADDRESS:
BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
7632-00-0	SODIUM NITRITE Oxidizer; toxic (by ingestion); potential blood toxin
7631-99-4	SODIUM NITRATE Oxidizer; potential blood toxin
10555-76-7	BORIC ACID SODIUM SALT TETRAHYDRATE Potential irritant (eyes and respiratory)
5834-52-0	SILICIC ACID,DISODIUM SALT (SODIUM METASILICATE) Corrosive (eyes and moist tissue)
107-96-0	3-MERCAPTOPROPIONIC ACID Corrosive (eyes and skin)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER

May cause moderate irritation to the skin. Severe irritant to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Oxidizer
Emergency Response Guide #140
Odor: Slight; Appearance: White To Yellow, Powder

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: Flood with water. Use of CO2 or foam may not be effective.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:
Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:
Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:
Primary route of exposure;Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:
May cause gastrointestinal irritation.

TARGET ORGANS:
Prolonged or repeated exposures may cause toxicity to the blood.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Causes irritation of the skin, eyes, and/or respiratory system.

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

4) FIRST AID MEASURES

SKIN CONTACT:
Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.
EYE CONTACT:
Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.
INHALATION:
Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
Flood with water. Use of CO2 or foam may not be effective.
HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition (destructive fires) yields elemental oxides.
FLASH POINT:
> 200F > 93C P-M(CC)
MISCELLANEOUS:
Oxidizer
UN1479;Emergency Response Guide #140

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:
Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids.
STORAGE:
Keep containers closed when not in use. Keep dry. Store at ambient temperatures.

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL NAME	EXPOSURE LIMITS
SODIUM NITRITE	PEL (OSHA): NOT DETERMINED TLV (ACGIH): NOT DETERMINED
SODIUM NITRATE	PEL (OSHA): NOT DETERMINED TLV (ACGIH): NOT DETERMINED
BORIC ACID SODIUM SALT TETRAHYDRATE	PEL (OSHA): NOT DETERMINED TLV (ACGIH): NOT DETERMINED
SILICIC ACID,DISODIUM SALT (SODIUM METASILICATE)	PEL (OSHA): NOT DETERMINED TLV (ACGIH): NOT DETERMINED
3-MERCAPTOPROPIONIC ACID	PEL (OSHA): NOT DETERMINED TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:
Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS. If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:
neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:
airtight chemical goggles

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

9) PHYSICAL AND CHEMICAL PROPERTIES

Density	65.000 lb/cu.	Vapor Pressure (mmHG)	< 0.1
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	~ 20.0

Odor	Slight
Appearance	White To Yellow
Physical State	Powder
Flash Point P-M(CC)	> 200F > 93C
pH 0.3% Sol. (approx.)	10.2
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:
Stable under normal storage conditions.
HAZARDOUS POLYMERIZATION:
Will not occur.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
Thermal decomposition (destructive fires) yields elemental oxides.
BETZ INTERNAL PUMPOUT/CLEANOUT CATEGORIES:
"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	
NOTE - Estimated value	~220 mg/kg
Dermal LD50 RABBIT:	
NOTE - Estimated value	>2,000 mg/kg

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY
No Data Available.

BIODEGRADATION
No Data Available.

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D001 = Ignitable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Oxidizer
UN / NA NUMBER: UN1479
DOT EMERGENCY RESPONSE GUIDE #: 140

15) REGULATORY INFORMATION

TSCA:
All components of this product are listed in the TSCA inventory.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
282 lbs due to SODIUM NITRITE;
SARA SECTION 312 HAZARD CLASS:
Immediate(acute);Delayed(Chronic);Fire
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
7632-00-0	SODIUM NITRITE	31.0-40.0%
7631-99-4	SODIUM NITRATE	21.0-30.0%

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

CONTINUED

PRODUCT NAME : BETZDEARBORN TR81167
EFFECTIVE DATE: 30-JUN-1998

16) OTHER INFORMATION

NFPA/HMIS

		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	OXY	DOT or NFPA Oxidizer
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	30-JUN-1998		** NEW **

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

24-HOUR EMERGENCY PHONE NUMBER: 989-636-4400

Product: LUBRICANT SULLUBE

Product Code: 42836

Effective Date: 11/17/98 Date Printed: 03/03/03 MSD: 005126

The Dow Chemical Company, Midland, MI 48674

Customer Information Center: 800-258-2436

2. COMPOSITION/INFORMATION ON INGREDIENTS

Proprietary blend containing a polyoxyalkylene glycol, a pentaerythritol ester, and other components.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

****
* Green viscous liquid. Low odor. No significant immediate hazards *
* for emergency response are known. *
* *
****

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)

EYE: Essentially nonirritating to eyes.

SKIN: Short single exposure may cause slight skin irritation. Prolonged or repeated exposure may cause slight skin irritation. Material may be handled at elevated temperatures; contact with heated material may cause thermal burns. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts.

INGESTION: Single dose oral toxicity is considered to be low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury.

INHALATION: At room temperature, vapors are minimal due to physical properties; a single exposure is not likely to be hazardous. If material is heated or mist is produced, concentrations may be attained that are sufficient to cause irritation and other effects.

SUBCHRONIC: For the major component, in animals, effects have been reported on the following organs: kidney and liver.

(Continued on Page 2)
* or (R) Indicates a Trademark of The Dow Chemical Company

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4. FIRST AID

EYE: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: 410F, 210C; 520F, 271C
METHOD USED: PMCC, COC
AUTOIGNITION TEMPERATURE: Not determined.

FLAMMABILITY LIMITS
LFL: Not determined
UFL: Not determined

HAZARDOUS COMBUSTION PRODUCTS: During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds.

OTHER FLAMMABILITY INFORMATION: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

EXTINGUISHING MEDIA: Water fog or fine spray. Carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream. May spread fire.

FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize pro-

(Continued on Page 3)
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5. FIRE FIGHTING MEASURES (CONTINUED)

perty damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Isolate area. May be a slipping hazard.

PROTECT THE ENVIRONMENT: Contain liquid to prevent contamination of soil, surface water or ground water.

CLEANUP: Contain spill if possible.

7. HANDLING AND STORAGE

HANDLING: Product on surfaces can cause slippery conditions.

STORAGE: Keep containers tightly closed when not in use. Store in stainless steel, polypropylene, polyethylene lined containers, Teflon, glass-lined container, aluminum, Plasite 3066 lined containers, Plasite 3070 lined containers, or 316 stainless steel.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: Use gloves impervious to this material. Use gloves with insulation for thermal protection, when needed.

RESPIRATORY PROTECTION: For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator.

(Continued on Page 4)
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Product Name: LUBRICANT SULLUBE
Product Code: 42836

Effective Date: 11/17/98 Date Printed: 03/03/03 MSD: 005126

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12. ECOLOGICAL INFORMATION (For detailed Ecological data, write or call the address or non-emergency number shown in Section 1)

ENVIRONMENTAL FATE:
MOVEMENT & PARTITIONING: No relevant information.

DEGRADATION & TRANSFORMATION: Material is ultimately biodegradable. Reaches more than 70% mineralization in OECD test(s) for inherent biodegradability. Biodegradation reached in Modified Zahn-Wellens/EMPA Test (OECD Test No. 302B) after 28 days: 86%.

ECOTOXICOLOGY: Material is moderately toxic to aquatic organisms on an acute basis (LC50 between 1 and 10 mg/L in most sensitive species). Acute LC50 for fathead minnow (Pimephales promelas) is 51 ppm. Acute LC50 for water flea Daphnia pulex is 2.8 ppm.

13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information)

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. THE DOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Center at 800-258-2436 or 989-832-1556 for further details.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.):

This product is not regulated by D.O.T. when shipped domestically by

(Continued on Page 6)
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Product Name: LUBRICANT SULLUBE
Product Code: 42836

Effective Date: 11/17/98 Date Printed: 03/03/03 MSD: 005126

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14. TRANSPORT INFORMATION (CONTINUED)

land.

CANADIAN TDG INFORMATION:
For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your Dow representative.

15. REGULATORY INFORMATION (Not meant to be all-inclusive--selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS
==========

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

(Continued on Page 7)
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Product Name: LUBRICANT SULLUBE
Product Code: 42836

Effective Date: 11/17/98 Date Printed: 03/03/03 MSD: 005126

REGULATORY INFORMATION: (CONTINUED)

STATE RIGHT-TO-KNOW: This product is not known to contain any substances subject to the disclosure requirements of

New Jersey
Pennsylvania

OSHA HAZARD COMMUNICATION STANDARD:

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

CANADIAN REGULATIONS
==========

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

This product is not a "Controlled Product" under WHMIS.

16. OTHER INFORMATION

REVISION INDICATOR: Revised Section 13, Disposal.

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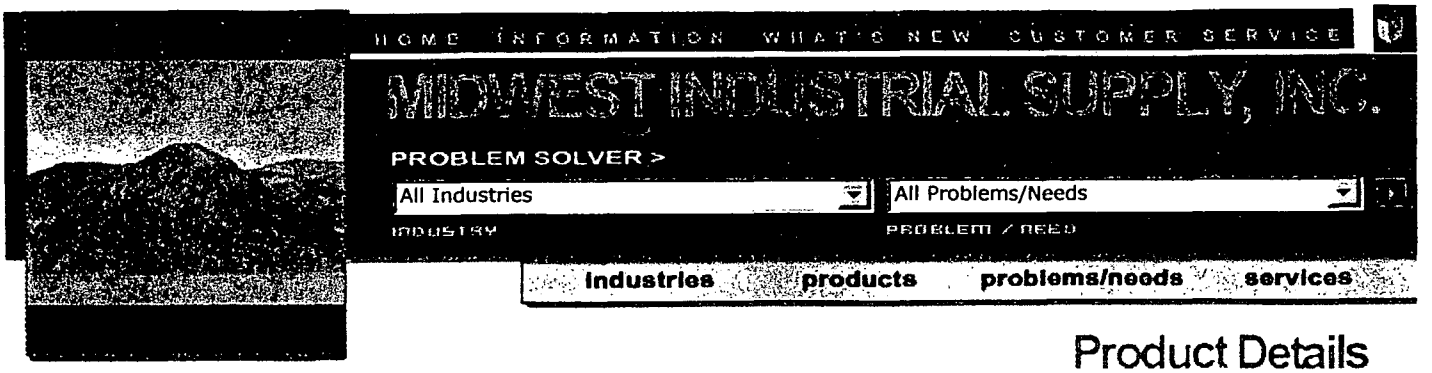
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.



Product Details

Research Another Product | REQUEST MATERIALS | REQUEST A QUOTE | CONTACT US / REQUEST INFO

GLIDEX® TRACK SWITCH LUBRICANT

Watch our new 3 minute movie for more information on Glidex®. CLICK HERE

Glidex® track switch agent is used for lubrication of railroad switches, slide plates, throw rods, couplers, movable bridges, overhead crane rails, couplers and more!
Developed by Midwest Industrial Supply, Inc., Glidex® is non-flammable, non-corrosive, safe to use and provides long-term effectiveness. Glidex® is not water soluble and therefore cannot be washed away by rainfall or melting snow.

Glidex® is a specially formulated product that is quite fluid, yet remains in place once it becomes "static". This "flowability" enables Glidex® to be easily applied by brushing, pouring, or spraying with a handsprayer. The treated surface is environmentally friendly and will not stain surrounding surface areas. It provides an adherent barrier that will keep metal components continuously lubricated and offer protection against mild ice formation. Dust and dirt will not build-up onto the treated areas and it will not "harden" with age. Ideal protection during wet weather or in inherently wet locations with poor drainage.

Glidex® is a better lubricant than other methods such as oil and liquid graphite because it stays on switches much longer. Depending on how often switches are used, a Glidex® treated switch can operate from one week to months before another treatment. Other lubricants need more frequent applications requiring crews to reapply lubricants more often. In addition, other methods need to be diluted.

SELECT:

Product Literature
MSDS
PRODUCT LITERATURE

Midwest Industrial Supply, Inc. Capabilities Worldwide
Midwest has built a reputation worldwide for excellence and distinctive competence by manufacturing the best products and turn-key systems to fill our customer's needs.

Glidex Brochure
Provides year round lubrication for railroad switches and is a specially formulated product that is quite fluid, yet remains in place once it becomes "static".

Applicators, Pricing and Availability Informatic

For more information contact Shannon Noble, Manager - Rail Products at **1-800-321-0699** or e-mail him at shannon@midwestind.com.

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BACK TO

MIDWEST INDUSTRIAL SUPPLY, INC.
P. O. BOX 8431
CANTON, OHIO 44711 U.S.A.

Emergency Phone Numbers: 330-456-3121

GLIDEX®

Track Switch Agent

MATERIAL SAFETY DATA SHEET

Please replace any other MSDS for this product with the attached MSDS.

PRODUCT: GLIDEX® Track Switch Agent

MSDS NUMBER: 2100

UPDATED EFFECTIVE DATE: February 03, 2003

PREVIOUS VERSION MSDS NUMBER: 2100

PREVIOUS VERSION DATE: all others

REASON FOR UPDATE: MSDS change to update date. No formulation changes or other MSDS changes.

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GLIDEX®

Track Switch Agent

MATERIAL SAFETY DATA SHEET

SECTION I -- IDENTIFICATION OF SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

TRADE NAME:	GLIDEX®
CHEMICAL NAME:	SYNTHETIC ORGANIC SWITCH LUBRICANT
SYNONYMS:	SWITCH LUBRICANT
CHEMICAL FAMILY:	N/A
MOLECULAR WEIGHT:	N/A
FORMULA:	N/A
CAS REGISTRY NO.:	PRODUCT A BLEND - NO NUMBER ASSIGNED

SECTION II -- COMPOSITION/INFORMATION ON INGREDIENTS

NAME	%	CAS REG. NO.
Severely hydrotreated, hydorcracked, hydroisomerized, high viscosity synthetic iso-alkane	>50%	178603-64-0

SECTION III -- HAZARDS IDENTIFICATION

Synthetic Product	This product is essentially non-hazardous. Excessive heating can form mists that may be irritating to breathing passages. Mist 8 hour TLV-TWA = 5mg/m^3 (ACGIH)

SECTION IV -- FIRST AID MEASURES

EYES:	Flush eyes with flowing water at least 15 minutes, get medical attention. Do not use any eye ointment. Remove contact lenses.
INHALATION:	Move subject to fresh air. Administer oxygen if breathing is difficult. Keep victim warn and at rest. Seek medical attention as soon as possible.
SKIN:	Flush with large amount of water or wash with soap and water. Seek medical attention if irritation persists.

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INGESTION: DO NOT induce vomiting because of aspiration into the lungs. GLIDEX® has a laxative effect and will be eliminated quickly. Seek medical attention.
NEVER GIVE FLUIDS OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS.

NOTE TO PHYSICIAN: Monitor respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis or pneumonitis.

SECTION V -- FIRE FIGHTING MEASURES

FLAMMABILITY: Nonflammable, but will burn on prolonged exposure to flame or high temperature.

FLASH POINT (TEST METHOD): >338^{0}F (>170^{0}C), open cup, ASTM D92, Cleveland

AUTOIGNITION TEMPERATURE: 664^{0}F (351^{0}C)

UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not cut, weld, heat of drill or pressurize empty container.

MATERIALS TO AVOID: Low fire hazard. Must be moderately heated before ignition will occur. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids.

PRODUCTS OF COMBUSTION: Carbon dioxide, carbon monoxide, smoke and irritating fumes as products of incomplete combustion.

EXTINGUISHING MEDIA AND INSTRUCTIONS:

SMALL FIRE: use dry chemicals, foam, CO_2.

LARGE FIRE: use water spray, fog of foam. For small outdoor fires portable extinguishers may be used and SCBA (self contained breathing apparatus) may not be required. For all indoor fires and any significant outdoor fires SCBA if required. Respiratory and eye protection are required for fire fighting personnel.

SECTION VI - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES:

ELIMINATE ALL IGNITION SOURCES. Stop leak without risk and contain spill. Absorb with inert absorbent materials such as clay or sand. Place absorbent in closed metal containers for later disposal or burn in appropriate facility. Keep spills out of sewers and open bodies of water.

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GLIDEX®

Track Switch Agent

MATERIAL SAFETY DATA SHEET

SECTION VII -- HANDLING AND STORAGE

STORAGE: Keep in a cool, dry, ventilated storage area and in closed containers. Keep away from sources of ignition and oxidizing materials.

HANDLING: KEEP AWAY FROM SOURCES OF IGNITION. Do not reuse empty containers. Practice good hygiene. Wash hands before eating. Launder clothes before reuse. Discard saturated leather goods.

SECTION VIII -- EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY PROTECTION: None required if good ventilation is maintained. If mist is generated by heating or spraying use a NIOSH approved organic respirator with a mist filter.

VENTILATION: Under normal handling conditions special ventilation is not necessary. If operation generates mist or fumes use ventilation of keep exposure to airborne contaminants below exposure limits.

EYE PROTECTION: Chemical splash, goggles recommended.

PROTECTIVE CLOTHING: Clothing to minimize skin contact, long sleeves, boots or shoes. For casual

contact PVC gloves are suitable, for prolonged contact use neoprene or nitrile gloves.

SECTION IX -- PHYSICAL AND CHEMICAL PROPERTIES

BOILING/MELTING POINT @ 760 mm Hg:	>600°F (>316^{0}C)
VAPOR PRESSURE mm Hg @ 20°C:	negligible at ambient temperature
SPECIFIC GRAVITY OR BULK DENSITY:	0.85 – 0.89
SOLUBILITY IN WATER:	insoluble in water
APPEARANCE:	viscous, reddish-brown liquid
ODOR:	none
pH:	N/A, not an aqueous solution or emulsion

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SECTION X -- STABILITY AND REACTIVITY

STABILITY:	Stable under normal handling conditions.
CHEMICAL INCOMPATIBILITY:	Can react with strong organic oxidizing materials..
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide, smoke, hydrocarbons and irritating fumes.
HAZARDOUS POLYMERIZATION:	Does not occur under normal industrial conditions.
CONDITIONS TO AVOID:	Excessive heat and flame.
CORROSIVE TO METAL:	No

SECTION XI -- TOXICOLOGICAL INFORMATION

EFFECTS OF OVEREXPOSURE

INHALATION: Inhalation is highly unlikely. However prolonged or repeated inhalation of heated fumes or mists may cause irritation to the respiratory tract. Product deposits in lungs may lead to fibrosis and reduced pulmonary function.

SKIN: It is not a skin irritant however prolonged or repeated contact may cause skin irritation, dermatitis or oil acne.

EYES: Prolonged or repeated contact may be irritating to eyes. Will not cause permanent damage.

INGESTION: Relatively non toxic to digestive tract.

MUTAGENIC: Mutagenic activity test are negative toward: Salmonella Typhimurium, Salmonella-Eschrichia coli and Chinese Hamster ovary.

REPRODUCTIVE TOXICITY: Based on data to date it does not pose a reproductive risk.

CARCINOGENICITY:

Based on studies to date GLIDEX® is not known to be carcinogenic to humans

ACGIH (mists) - Based on available human studies, exposure to product mist

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alone has not demonstrated to cause human effects at levels below 5 mg/m^3.
IARC - IARC group 3; cannot be classified as to carcinogenicity to humans.
NTP - No studies were found.
IRIS - No studies were found.
OSHA - OSHA PEL (8 hour TWA) = 5 mg/m^3 for synthetic product mists.

SECTION XII -- ECOLOGICAL INFORMATION

The product has the potential for degradation by hydroxyl radicals in the troposphere under the influence of sunlight, and by bacteria in soil water. Potential for food chain concentration is low.

The acute oral toxicity toward acquatic organisms is none to low: LC50 (rainbow trout) >500,000 ppm in 96 hours; LC50 (Mysidopsis bahai) >500,000 ppm in 96 hours. Passed the EPS 1/RM/24 Microtox test luminescent bacteria.

When used and applied properly GLIDEX® will not contribute BOD.

SECTION XIII -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:

Consult your local authorities for regulations. Preferred waste management: recycle or reuse, incinerate with energy recovery, disposal in a licensed facility. Disposal facility should be compliant with state, local and federal government regulations.

SECTION XIV -- TRANSPORTATION INFORMATION

D.O.T. PROPER SHIPPING NAME (49CFR172.101):	None
HAZARDOUS SUBSTANCE (40CFR116):	N/A
REPORTABLE QUANTITY (RQ):	N/A
D.O.T. HAZARD CLASSIFICATION (49CFR172.101):	Non-regulated
D.O.T. PLACARDS REQUIRED:	None
POISON CONSTITUENT (49CFR173.343):	N/A
BILL OF LADING DESCRIPTION:	Synthetic, organic track switch agent
C NO.:	N/A
UN/NA CODE:	N/A

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GLIDEX®

Track Switch Agent

MATERIAL SAFETY DATA SHEET

SECTION XV-- REGULATORY INFORMATION

EPA SARA Title III hazard class: None

OSHA HCS hazard class: Non-OSHA hazardous (29CFR1910.1200)

EPA SARA Title III Section 313 (40CFR372) Toxic Chemicals present in quantities greater than the "de minimus" level are: None

This product is not a "controlled product" under the Canadian Workplace Hazardous Material Information System (WHMIS)

SECTION XVI -- OTHER INFORMATION

ABBREVIATIONS AND SYMBOLS:

N.D. - Not Determined
N.A. - Not Applicable
N.T. - Not Tested
< - LESS THAN
> - MORE THAN

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For Aerokroil

Like 12

MATERIAL SAFETY DATA SHEET
SECTION I

Product Name or Number (as it appears on label): Aerokroil
Manufacturers Name: Kano Laboratories, Inc
Address: 1090 S. Thompson Lane, Nashville, TN 37211-2627
Emergency Telephone No: 615-833-4101
Manufacturer's DUNS No: N/A
Hazardous Material Description, Proper Shipping Name,
Hazard Class, Hazard ID No. (49 CFR 172.101): N/A, Petroleum Distillate, N/A, N/A
Additional Hazard Classes (as applicable): N/A
Chemical Family: Petroleum Lubricant
Formula: Proprietary

SECTION II - INGREDIENTS

CAS REGISTRY NO	%W	CHEMICAL NAME(S)	OHSA/ACGIH PEL/TLV PPM	LISTED AS A CARCINOGEN IN NTP, IARC OR OSHA 1910 (z) (Specify)
64742-46-7	30%- 50%	Petroleum Base Oil	5.0 mg/m3 TWA	No
78-92-2	1% - 10%	Hydrocarbon Solvent	50 TWA	No
64742-95-6	1% - 10%	Petroleum Solvent	50 TWA	No
111-76-2	1% - 10%	Aliphatic Hydrocarbon Solvent	50 TWA	No
	1% - 20%	Non-Hazardous Proprietary Mixture	-	No
64742-47-8	20%-40%	Petroleum Naphtha	100 TWA	No
123-42-2	1% - 10%	Hydrocarbon Solvent	75 STEL	No
115-10-6	1% - 15%	Dymel A (Propellant)	1000 TWA	No

All ingredients in Kroil are listed in the TOSCA inventory list

SECTION III - PHYSICAL DATA

Boiling Point: 250 degrees F
Vapor Pressure
Vapor Density (AIR=1): N/A
Solubility in Water: NIL
Percent Solid By Weight (%): 0
Specific Gravity (H2) = 1): .88
Percent Volatile by Volume (%): 60
Evaporation Rate (=1): But Acet less than 1
pH: 6.0 - 7.0
Material is: Liquid
NFPA 704 DESIGNATION
Flammability - 2
Health - 1
Reactivity - 0
Special Hazard -
Appearance & Odor: Liquid, slight reddish color, pleasant odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A Not Applicable to Aerosols
Flammable Limits: LEL - N/A UEL - N/A
Extinguishing Media: CO2, Dry Chemical, Foam
Special Fire Fighting Procedures: Usual procedure for solvents. Treat as combustible. Do not use water.
Unusual Fire & Explosion Hazards: Never use welding or cutting torch on or near cans or drums. Do not mix or store with strong oxidants. Store at room temperature.

SECTION V - HEALTH HAZARD DATA

Symptoms & Effects of Overexposure: EYE - burning & irritation. SKIN-dryness. Prolonged exposure may cause dermatitis. INHALATION may cause headache, dizziness, anesthesia, nausea, & upper respiratory irritation. INGESTION may cause lung irritation, nausea, vomiting & diarrhea. Harmful or fatal if swallowed. Primary Routes of Entry: Inhalation
Emergency and First Aid Procedures: EYE- Immediately flush with large amounts of water for 15 minutes. SKIN-wash with mild soap and water, apply skin cream. INHALATION- remove to fresh air. If breathing is difficult administer oxygen. if breathing stops give artificial respiration. Get medical attention. INGESTION- Contains hydrocarbon solvents and petroleum oil. Do not induce vomiting, call physician immediately. Minute amounts aspirated into lungs during ingestion may cause severe pulmonary damage. Do not administer epinephrine or adrenaline.

SECTION VI - REACTIVITY DATA

Stability: Stable Conditions To Avoid: Heat, Sparks, Open Flame, Strong Oxidants.
Incompatibility (materials to avoid): Strong Oxidizing Agents.
Hazardous Decomposition Products: Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide.
Hazardous Polymerization: Will not occur Conditions To Avoid: NA

SECTION VII - SPILL OR LEAK PROCEDURES

Steps To Be Taken In Case Material Is Released or Spilled: Wipe up immediately with absorbent rags, sweeping compound or other absorbent material. Remove or extinguish all flames and sparks. Do not flush into sewer. Waste Disposal Method: Bury saturated absorbent in approved landfill. Dispose of as any combustible fuel in accordance with local, state and federal regulations. Cercla (Superfund) Reportable Quantity (in lbs): NA RCRA Hazardous Waste No. (40 CFR 261.33): NA Volatile Organic Compound (VOC) (as packaged, minus water): NA Theoretical 7.8 lbs/gal Analytical: 7.8 lbs/gal

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection (specify type): NOISH approved respirator for vapors if desired.
Ventilation - Local Exhaust (specify rate): Normal Local Exhaust System. **Special:** None required. **Ventilation - Mechanical (General) (Specify Rate):** Normal Ventilation is sufficient. **Other:** None Required. **Protective Gloves:** Chemically resistant gloves if needed to protect skin. **Eye Protection:** If splash potential exists, wear chemical splash goggles. **Other Protective Equipment:** None needed.

SECTION IX - SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling and Storing: Keep away from excessive heat, sparks and open flame. Do not take internally. Do not leave container open. Store in cool area. **Other Precautions:** Use with proper ventilation. Wearing contact lenses is not advisable. If swallowed can enter lungs and may cause chemical pneumonitis. Do not administer epinephrine or adrenaline. Keep away from children and animals. Do not puncture containers.

The above information is based on information available at this time and is believed to be accurate. However, the data is provided without warranty, expressed or implied. It is the user's responsibility to determine safe conditions for use of this product. We expressly disclaim all liability for reliance thereon, and assume no liability with any use of this information.

Title: Chairman **Name (print):** P. R. Zimmerman
Date: March 14, 1995 **Signature:** P. R. Zimmerman

ITEM: 4ZF22 - OIL AIR TOOL QUART

PICK_REQ: 1112718106 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A4962**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A4962

Associated Grainger Item: 4ZF22 - OIL AIR TOOL QUART

603183-00 MOBIL ALMO 525

MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL ALMO 525

SUPPLIER:
EXXONMOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - HOUR HEALTH AND SAFETY EMERGENCY (CALL COLLECT): 609-737-4411

24 - HOUR TRANSPORTATION EMERGENCY:
CHEMTREC:
800-424-9300
202-483-7616

LUBES AND FUELS: 281-834-3296

PRODUCT AND TECHNICAL INFORMATION:

LUBRICANTS AND SPECIALTIES:
800-662-4525
800-443-9966

FUELS PRODUCTS: 800-947-9147

MSDS FAX ON DEMAND: 613-228-1467

MSDS INTERNET WEBSITE:
HTTP://EMMSDS.IHSSOLUTIONS.COM/

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS: NONE.

SEE SECTION 8 FOR EXPOSURE LIMITS (IF APPLICABLE).

3. HAZARDS IDENTIFICATION

THIS PRODUCT MAY BE CONSIDERED HAZARDOUS ACCORDING TO REGULATORY GUIDELINES (SEE SECTION 15).

EMERGENCY OVERVIEW: AMBER LIQUID.

DOT ERG NO.: NA

POTENTIAL HEALTH EFFECTS:
THIS PRODUCT MAY BE USED IN CERTAIN APPLICATIONS WHERE MISTING CAN OCCUR. EXPOSURE TO OIL MIST MAY RESULT IN EYE AND SKIN IRRITATION. EXCESSIVE EXPOSURE TO MISTS MAY CAUSE RESPIRATORY IRRITATION OR DAMAGE.

FOR FURTHER HEALTH EFFECTS/TOXICOLOGICAL DATA, SEE SECTION 11.

4. FIRST AID MEASURES

EYE CONTACT:
FLUSH THOROUGHLY WITH WATER. IF IRRITATION OCCURS, CALL A PHYSICIAN.

SKIN CONTACT:
WASH CONTACT AREAS WITH SOAP AND WATER. REMOVE AND CLEAN OIL SOAKED CLOTHING DAILY AND WASH AFFECTED AREA. (SEE SECTION 16 - INJECTION INJURY)

INHALATION:
IF RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, OR UNCONSCIOUSNESS OCCURS DUE TO EXCESSIVE VAPOR OR MIST EXPOSURE, SEEK IMMEDIATE MEDICAL ASSISTANCE. IF BREATHING HAS STOPPED, ASSIST VENTILATION WITH A MECHANICAL DEVICE OR MOUTH-TO-MOUTH RESUSCITATION.

INGESTION:
NOT EXPECTED TO BE A PROBLEM. SEEK MEDICAL ATTENTION IF DISCOMFORT OCCURS. DO NOT INDUCE VOMITING.

NOTE TO PHYSICIANS:
PRE-EXISTING CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE INCLUDE EMPHYSEMA
AND ASTHMA.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.

SPECIAL FIRE FIGHTING PROCEDURES:
WATER OR FOAM MAY CAUSE FROTHING. USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. WATER SPRAY MAY BE USED TO FLUSH SPILLS AWAY FROM EXPOSURE. PREVENT RUNOFF FROM FIRE CONTROL OR DILUTION FROM ENTERING STREAMS, SEWERS, OR DRINKING WATER SUPPLY.

SPECIAL PROTECTIVE EQUIPMENT:
FOR FIRES IN ENCLOSED AREAS, FIRE FIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

COMBUSTION PRODUCTS:
FUMES, SMOKE, CARBON MONOXIDE, SULFUR OXIDES, METAL OXIDES, ALDEHYDES AND OTHER DECOMPOSITION PRODUCTS, IN THE CASE OF INCOMPLETE COMBUSTION.

FLASH POINT C (F): >121 (250) (ASTM D-93).

FLAMMABLE LIMITS (APPROX. % VOL.IN AIR) -
LEL: 0.9%
UEL: 7.0%

NFPA HAZARD ID:
HEALTH: 0
FLAMMABILITY: 1
REACTIVITY: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES:
REPORT SPILLS/RELEASES AS REQUIRED TO APPROPRIATE AUTHORITIES. U.S. COAST GUARD AND EPA REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS/RELEASES THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. REPORT SPILL/RELEASE TO COAST GUARD NATIONAL RESPONSE CENTER TOLL FREE NUMBER (800) 424-8802. IN CASE OF ACCIDENT OR ROAD SPILL NOTIFY CHEMTREC (800) 424-9300

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL:
SHUT OFF SOURCE TAKING NORMAL SAFETY PRECAUTIONS. TAKE MEASURES TO MINIMIZE THE EFFECTS ON GROUND WATER. RECOVER BY PUMPING OR CONTAIN SPILLED MATERIAL WITH SAND OR OTHER SUITABLE ABSORBENT AND REMOVE MECHANICALLY INTO CONTAINERS. IF NECESSARY, DISPOSE OF ADSORBED RESIDUES AS DIRECTED IN SECTION 13.

WATER SPILL:
CONFINE THE SPILL IMMEDIATELY WITH BOOMS. WARN OTHER SHIPS IN THE VICINIT NOTIFY PORT AND OTHER RELEVANT AUTHORITIES. REMOVE FROM THE SURFACE BY SKIMMING OR WITH SUITABLE ABSORBENTS. IF PERMITTED BY REGULATORY AUTHORITIES THE USE OF SUITABLE DISPERSANTS SHOULD BE CONSIDERED WHERE RECOMMENDED IN LOCAL OIL SPILL PROCEDURES.

ENVIRONMENTAL PRECAUTIONS:
PREVENT MATERIAL FROM ENTERING SEWERS, WATER SOURCES OR LOW LYING AREAS; ADVISE THE RELEVANT AUTHORITIES IF IT HAS, OR IF IT CONTAMINATES SOIL/ VEGETATION.

PERSONAL PRECAUTIONS: SEE SECTION 8

7. HANDLING AND STORAGE

HANDLING:
AVOID INHALATION OF VAPORS OR MISTS. SEE SECTION 8 FOR ADDITIONAL PERSONAL PROTECTION ADVICE WHEN HANDLING THIS PRODUCT.

STORAGE:
KEEP CONTAINERS CLOSED WHEN NOT IN USE. DO NOT STORE IN OPEN OR UNLABELLED CONTAINERS. STORE AWAY FROM STRONG OXIDIZINGAGENTS AND COMBUSTIBLE MATERIALS. DO NOT STORE NEAR HEAT, SPARKS, FLAME OR STRONG OXIDANTS.

SPECIAL PRECAUTIONS: PREVENT SMALL SPILLS AND LEAKAGES TO AVOID SLIP HAZARD.

EMPTY CONTAINER WARNING:
EMPTY CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. DO NOT ATTEMPT TO REFILL OR CLEAN CONTAINER SINCE RESIDUE IS DIFFICULT TO REMOVE. EMPTY DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY RETURNED TO A DRUM RECONDITIONER. ALL CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:
WHENMISTS/AEROSOLS CAN OCCUR, THE FOLLOWING ARE RECOMMENDED:
5 MG/M3 (AS OIL MIST) - ACGIH THRESHOLD LIMIT VALUE (TLV)
10 MG/M3 (AS OIL MIST) - ACGIH SHORT TERM EXPOSURE LIMIT (STEL)
5 MG/M3 (AS OIL MIST) - OSHA PERMISSIBLE EXPOSURE LIMIT (PEL)

VENTILATION:
USE ADEQUATE VENTILATION, LOCAL EXHAUST, OR ENCLOSURES TO CONTROL BELOW EXPOSURE LIMITS.

RESPIRATORY PROTECTION:
WHEN VENTILATION IS NOT ADEQUATE, WEAR APPROVED RESPIRATOR.

EYE PROTECTION:
CHEMICAL TYPE GOGGLES SHOULD BE WORN DURING MISTING OPERATIONS. NORMAL INDUSTRIAL EYE PROTECTION PRACTICES SHOULD BE EMPLOYED FOR OTHER USE CONDITIONS.

SKIN PROTECTION:
NOT NORMALLY REQUIRED. WHEN SPLASHING OR LIQUID CONTACT CAN OCCUR FREQUENTLY, WEAR OIL RESISTANT GLOVES AND/OR OTHER PROTECTIVE CLOTHING. GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

9. PHYSICAL AND CHEMICAL PROPERTIES

TYPICAL PHYSICAL PROPERTIES ARE GIVEN BELOW. CONSULT PRODUCT DATA SHEET FOR SPECIFIC DETAILS.

APPEARANCE: LIQUID

COLOR: AMBER

ODOR: MILD

ODOR THRESHOLD-PPM: NE

pH: NA

BOILING POINT C (F): >316 (600)

MELTING POINT C (F): NA

FLASH POINT C (F): >121 (250) (ASTM D-93)

FLAMMABILITY (SOLIDS): NE

AUTO FLAMMABILITY C (F): NA

EXPLOSIVE PROPERTIES: NA

OXIDIZING PROPERTIES: NA

VAPOR PRESSURE-MM HG 20 C: <0.1

VAPOR DENSITY: >2.0

EVAPORATION RATE: NE

RELATIVE DENSITY, 15/4 C: 0.883

SOLUBILITY IN WATER: NEGLIGIBLE

PARTITION COEFFICIENT: NE

VISCOSITY AT 40 C, CST: 38.5

VISCOSITY AT 100 C, CST: 6.6

POUR POINT C (F): < -24 (-11)

FREEZING POINT C (F): NE

VOLATILE ORGANIC COMPOUND: NE

DMSO EXTRACT, IP-346 (WT. %): <3, FOR MINERAL OIL ONLY

NA = NOT APPLICABLE
NE = NOT ESTABLISHED
D = DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): STABLE.

CONDITIONS TO AVOID: EXTREME HEAT AND HIGH ENERGY SOURCES OF IGNITION.

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS.

HAZARDOUS DECOMPOSITION PRODUCTS:
PRODUCT DOES NOT DECOMPOSE AT AMBIENT TEMPERATURES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

11. TOXICOLOGICAL DATA

ACUTE TOXICOLOGY:

ORAL TOXICITY (RATS):
PRACTICALLY NON-TOXIC (LD50: GREATER THAN 2000 MG/KG).
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

DERMAL TOXICITY (RABBITS):
PRACTICALLY NON-TOXIC (LD50: GREATER THAN 2000 MG/KG).
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

INHALATION TOXICITY (RATS):
PRACTICALLY NON-TOXIC (LC50: GREATER THAN 5 MG/L).
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

EYE IRRITATION (RABBITS):
PRACTICALLY NON-IRRITATING. (DRAIZE SCORE: GREATER THAN 6 BUT 15 OR LESS).
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

SKIN IRRITATION (RABBITS):
PRACTICALLY NON-IRRITATING. (PRIMARY IRRITATION INDEX: GREATER THAN 0.5 BUT LESS THAN 3).
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

OTHER ACUTE TOXICITY DATA:
ALTHOUGH AN ACUTE INHALATION STUDY WAS NOT PERFORMED WITH THIS PRODUCT, A VARIETY OF MINERAL OILS, SUCH AS THOSE IN THIS PRODUCT, HAVE BEEN TESTED. THESE SAMPLES HAD VIRTUALLY NO EFFECT OTHER THAN A NONSPECIFIC INFLAMMATORY RESPONSE IN THE LUNG TO THE AEROSOLIZED MINERAL OIL. THE PRESENCE OF ADDITIVES IN OTHER TESTED FORMULATIONS (IN APPROXIMATELY THE SAME AMOUNTS AS IN THE PRESENT FORMULATION) DID NOT ALTER THE OBSERVED EFFECTS.

SUBCHRONIC TOXICOLOGY (SUMMARY):
SEVERELY SOLVENT REFINED AND SEVERELY HYDROTREATED MINERAL BASE OILS HAVE BEEN TESTED AT EXXONMOBIL BY DERMAL APPLICATION TO RATS 5/DAYS/WEEK FOR 90 DAYS AT DOSES SIGNIFICANTLY HIGHER THAN THOSE EXPECTED DURING NORMAL INDUSTRIAL EXPOSURE. EXTENSIVE EVALUATIONS INCLUDING MICROSCOPIC EXAMINATION OF INTERNAL ORGANS AND CLINICAL CHEMISTRY OF BODY FLUIDS, SHOWED NO ADVERSE EFFECTS.

CHRONIC TOXICOLOGY (SUMMARY):
REPEATED AND/OR PROLONGED EXPOSURE MAY CAUSE IRRITATION TO THE SKIN, EYES OR RESPIRATORY TRACT. OVEREXPOSURE TO OIL MIST MAY RESULT IN OIL DROPLET DEPOSITION AND/OR GRANULOMA FORMATION. THE BASE OILS IN THIS PRODUCT ARE SEVERELY SOLVENT REFINED AND/OR SEVERELY HYDROTREATED. CHRONIC MOUSE SKIN PAINTING STUDIES OF SEVERELY TREATED OILS SHOWED NO EVIDENCE OF CARCINOGENIC EFFECTS. THESE RESULTS ARE CONFIRMED ON A CONTINUING BASIS USING VARIOUS SCREENING METHODS SUCH AS THE MODIFIED AMES TEST, IP-346, AND/OR OTHER ANALYTICAL METHODS.

SENSITIZATION (SUMMARY):
NOT EXPECTED TO BE SENSITIZING BASED ON TESTS OF THIS PRODUCT, COMPONENTS, OR
SIMILAR PRODUCTS.

OTHER TOXICOLOGY DATA:
SMALL METAL PARTICLES FROM MACHINING MAY CAUSE ABRASION OF THE SKIN AND MAY PREDISPOSE TO DERMATITIS.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

ECOTOXICITY: NOT ESTABLISHED.

MOBILITY: NOT ESTABLISHED.

PERSISTENCE AND DEGRADABILITY: NOT ESTABLISHED.

BIOACCUMULATIVE POTENTIAL: NOT ESTABLISHED.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
PRODUCT IS SUITABLE FOR BURNING IN AN ENCLOSED, CONTROLLED BURNER FOR FUEL VALUE. SUCH BURNING MAY BE LIMITED PURSUANT TO THE RESOURCE CONSERVATION AND RECOVERY ACT. IN ADDITION, THE PRODUCT IS SUITABLE FOR PROCESSING BY AN APPROVED RECYCLING FACILITY OR CAN BE DISPOSED OF AT AN APPROPRIATE GOVERNMENT WASTE DISPOSAL FACILITY. USE OF THESE METHODS IS SUBJECT TO USER COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS AND CONSIDERATION OF PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

RCRA INFORMATION:
THE UNUSED PRODUCT, IN OUR OPINION, IS NOT SPECIFICALLY LISTED BY THE EPA AS A HAZARDOUS WASTE (40 CFR, PART 261D), NOR IS IT FORMULATED TO CONTAIN MATERIALS WHICH ARE LISTED HAZARDOUS WASTES. IT DOES NOT EXHIBIT THE HAZARDOUS CHARACTERISTICS OF IGNITABILITY, CORROSIVITY, OR REACTIVITY. TH UNUSED PRODUCT IS NOT FORMULATED WITH SUBSTANCES COVERED BY THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP). HOWEVER, USED PRODUCT MAY BE REGULATED.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 PICOSIEMENS OR LESS): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD:
THIS PRODUCT MAY BE USED IN CERTAIN APPLICATIONS WHERE MISTING CAN OCCUR. ACCORDING TO OSHA 29 CFR 1910.1200, CERTAIN MINERAL OIL MISTS MAY BE CONSIDERED HAZARDOUS IF THE WORKPLACE AIRBORNE CONCENTRATION EXCEEDS 5 MG/M3 (ACGIH TLV).

EU LABELING:
PRODUCT IS NOT DANGEROUS AS DEFINED BY THE EUROPEAN UNION DANGEROUS SUBSTANCES/PREPARATIONS DIRECTIVES. EU LABELING NOT REQUIRED.

GOVERNMENTAL INVENTORY STATUS:
ALL COMPONENTS COMPLY WITH TSCA, EINECS/ELINCS, AICS, METI, AND DSL.

U.S. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III:
THIS PRODUCT CONTAINS NO "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: NONE.
THIS PRODUCT CONTAINS NO CHEMICALS SUBJECT TO THE SUPPLIER NOTIFICATION REQUIREMENTS OF SARA (313) TOXIC RELEASE PROGRAM.

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
ZINC (ELEMENTAL ANALYSIS) (<0.10%)	7440-66-6	22
CHLORINE (ELEMENTAL ANALYSIS) (<0.90%)	7782-50-5	22
CHLORO ALKANES (1.93%)	61788-76-9	21, 22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (0.73%)	68649-42-3	22

REGULATORY LISTS SEARCHED:
1=ACGIH ALL
2=ACGIH A1
3=ACGIH A2
4=NTP CARC
5=NTP SUS
6=IARC 1
7=IARC 2A
8=IARC 2B
9=OSHA CARC
10=OSHA Z
11=TSCA 4
12=TSCA 5A2
13=TSCA 5E
14=TSCA 6
15=TSCA 12B
16=CA P65 CARC
17=CA P65 REPRO
18=CA RTK
19=FL RTK
20=IL RTK
21=LA RTK
22=MI 293
23=MN RTK
24=NJ RTK
25=PA RTK
26=RI RTK

CODE KEY:
CARC=CARCINOGEN
SUS=SUSPECTED CARCINOGEN
REPRO=REPRODUCTIVE

16. OTHER INFORMATION

USE: AIR TOOL LUBRICANT

NOTE:
PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS. HEALTH STUDIES HAVE SHOWN THAT MANY HYDROCARBONS POSE POTENTIAL HUMAN HEALTH RISKS WHICH MAY VARY FROM PERSON TO PERSON. INFORMATION PROVIDED ON THIS MSDS REFLECTS INTENDED USE. THIS PRODUCT SHOULD NOT BE USED FOR OTHER APPLICATIONS. IN ANY CASE, THE FOLLOWING ADVICE SHOULD BE CONSIDERED:

INJECTION INJURY WARNING:
IF PRODUCT IS INJECTED INTO OR UNDER THE SKIN, OR INTO ANY PART OF THE BODY, REGARDLESS OF THE APPEARANCE OF THE WOUND OR ITS SIZE, THE INDIVIDUAL SHOULD BE EVALUATED IMMEDIATELY BY A PHYSICIAN AS A SURGICAL EMERGENCY. EVEN THOUGH INITIAL SYMPTOMS FROM HIGH PRESSURE INJECTION MAY BE MINIMAL OR ABSENT, EARLY SURGICAL TREATMENT WITHIN THE FIRST FEW HOURS MAY SIGNIFICANTLY REDUCE THE ULTIMATE EXTENT OF INJURY.

PRECAUTIONARY LABEL TEXT:

CAUTION!
EXPOSURE TO OIL MIST MAY RESULT IN EYE AND SKIN IRRITATION. EXCESSIVE EXPOSURE TO MISTS MAY CAUSE RESPIRATORY IRRITATION AND DAMAGE.
KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION.

FIRST AID:

IF INHALED AND SYMPTOMS DEVELOP, REMOVE TO FRESH AIR AND GET MEDICAL ATTENTION.

FOR INDUSTRIAL USE ONLY. NOT INTENDED OR SUITABLE FOR USE IN OR AROUND A HOUSEHOLD OR DWELLING.

REFER TO PRODUCT MATERIAL SAFETY DATA SHEET FOR FURTHER SAFETY AND HEALTH INFORMATION.

FOR INTERNAL USE ONLY:
MHC: 1* 1* 1* 1* 1*
MPPEC: A
TRN: 603183-00
ELIS: 400325
CMCS97: 970924
REQ: US - MARKETING
SAFE USE: L

EHS APPROVAL DATE: 21 OCT 2002

LEGALLY REQUIRED INFORMATION IS GIVEN IN ACCORDANCE WITH APPLICABLE INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING ANY LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS. USE OR RETRANSMISSION OF THE INFORMATION CONTAINED HEREIN IN ANY OTHER FORMAT THAN THE FORMAT AS PRESENTED IS STRICTLY PROHIBITED. MOBIL NEITHER REPRESENTS NOR WARRANTS THAT THE FORMAT, CONTENT OR PRODUCT FORMULAS CONTAINED IN THIS DOCUMENT COMPLY WITH THE LAWS OF ANY OTHER COUNTRY EXCEPT THE UNITED STATES OF AMERICA.

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MSDS KROIL

KANO LABORATORIES, INC.
SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer: Kano Laboratories, Inc.
1000 E. Thompson Lane
Nashville, TN 37211
Information Phone Number: (615) 833-4101
Fax: (615) 833-5790 **Emergency:** 800-424-9300 (Chemtrec)
Website: www.kanolaboratories.com

HMIS Hazard Rating

HEALTH	1
FLAMMABILITY	4
REACTIVITY	0
PERSONAL PROTECTION	X

Product Name: AEROKROIL
MSDS Date of Preparation: 6/7/05
Product Use: Penetrant/Lubricant for Industrial Use

SECTION 2: HAZARDS IDENTIFICATION

Slightly reddish liquid with a refreshing odor packaged as an aerosol.

EMERGENCY OVERVIEW

WARNING! Contents under pressure. Heated can may rupture. Combustible Liquid and Vapor. May cause eye and skin irritation. May be harmful if absorbed through the skin. Inhalation of vapors or mist may cause respiratory irritation and central nervous system effects such as headache, dizziness, nausea and vomiting. Harmful or fatal if swallowed. Aspiration into the lungs during ingestion or vomiting may cause lung damage. May cause chronic effects.

Potential Health Effects:

Eye: May cause eye irritation with redness, tearing and stinging. Corneal injury is possible if not promptly removed.

Skin: May cause mild irritation with redness, rash, swelling. Prolonged or repeated contact may result in defatting and dermatitis. May be absorbed through the skin with effects similar to inhalation and ingestion.

Inhalation: Inhalation of vapors or mists may cause mucous membrane and upper respiratory tract irritation and central nervous system depression. Symptoms may include burning sensation, coughing, wheezing, sore throat, shortness of breath, headache, dizziness, drowsiness, nausea, vomiting, depressed respiration and heart rate, heart rhythm irregularities and unconsciousness.

Ingestion: Ingestion is an unlikely route of exposure for aerosol products. Swallowing may cause gastrointestinal irritation with abdominal pain, nausea, vomiting and diarrhea and central nervous system depression with symptoms including headache, dizziness, intoxication, weakness, respiratory failure, convulsions, cardiovascular collapse and pulmonary edema. Aspiration into the lungs during ingestion or vomiting may cause lung damage.

Chronic Hazards: Prolonged or repeated exposure may cause damage to the central nervous system, blood, kidney and liver. This product contains chemicals that in animal studies caused harm to the developing fetus, but only at exposure levels that harm the pregnant animal. There is no evidence of adverse fetal or reproductive effects in humans.

Carcinogen Status: None of the components of this product at greater than 0.1% are listed as carcinogens by OSHA, IARC or NTP.

Medical Conditions Aggravated by Exposure: Pre-existing eye, skin, respiratory, heart, central nervous system, liver and kidney disorders.

KMB00003404

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS#	%
Severely Hydrotreated Petroleum Distillates	64742-52-5	30-50
Light Petroleum Distillates	64742-95-6/64742-88-7/ 64742-47-8	30-50
Aliphatic Alcohols	78-92-2/123-42-2	1-5
Glycol Ether	111-76-2	1-5
Proprietary Ingredients	Proprietary	5-15
Dimethyl Ether Propellant	115-10-6	1-15

SECTION 4: FIRST AID MEASURES

Eye: Rinse thoroughly with water for at least 15 minutes, holding the eye lids open to be sure the material is washed out. Get immediate medical attention.

Skin: Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation or symptoms of exposure develop. Launder clothing before re-use.

Inhalation: Remove victim to fresh air. Give artificial respiration if needed. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Ingestion: Ingestion is an unlikely route of exposure for aerosol products. DO NOT induce vomiting. Keep the victim calm and warm. Never give anything by mouth to an unconscious or drowsy person. Get immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Flash Point: 124°F (51°C) COC (concentrate)
-42°F (-41°C) (propellant)

Flammable Limits: LEL: 0.9%
UEL: 26.7%

Autoignition Temperature: Not Determined
Aerosol Flame Extension: None
Aerosol Flashback: None
Aerosol Protection Level (NPPA 30B): Level 3
Extinguishing Media: Use carbon dioxide, dry chemical or foam. Water may be ineffective but can be used to cool containers and structures.

Special Fire Fighting Procedures: Wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing. Cool fire exposed containers with water. Protect against bursting cans.

Unusual Fire Hazards: Contents under pressure. Keep away from heat and open flames. Container may rupture or explode in the heat of a fire. Prolonged exposure to temperatures above 120°F may cause cans to burst. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Never use welding or cutting torch on or near containers (even empty) because product can ignite explosively. Combustion products may be hazardous.

Hazardous Decomposition Products: Oxides of carbon, organic compounds, smoke and fumes.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill: Remove all ignition sources such as open flames, spark producing equipment, pilot lights, etc. Wear appropriate protective clothing to prevent eye and skin contact including impervious gloves, safety goggles and respirator if needed (refer to Section 8 for specific recommendations). Ventilate area. Cover with an inert absorbent

material and collect into an appropriate container for disposal. Report spills and releases as required to appropriate authorities.

SECTION 7: HANDLING AND STORAGE

Handling: Avoid breathing vapors, aerosols and mists. Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Wash exposed skin thoroughly with soap and water after use. Keep product away from heat, sparks, flames and all other sources of ignition. No smoking in storage or use areas. Do not cut, braze, solder, grind or weld on or near containers. *Contents under pressure. Do not puncture or incinerate container.*

Storage Store in a cool, well ventilated area at temperatures below 120°F. Do not store in direct sunlight. Store as a Level 3 aerosol.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	Exposure Limits
Severely Hydrotreated Petroleum Distillates	5 mg/m3 OSHA PEL-TWA 5 mg/m3 ACGIH TLV-TWA 10 mg/m3 ACGIH TLV-STEL
Light Petroleum Distillates	100 ppm OSHA PEL-TWA 100 ppm ACGIH TLV-TWA
Aliphatic Alcohol	150 ppm OSHA PEL-TWA 100 ppm ACGIH TLV-TWA
Aliphatic Alcohol	50 ppm OSHA PEL-TWA 50 ppm ACGIH TLV-TWA
Glycol Ether	50 ppm OSHA PEL-TWA 20 ppm ACGIH TLV-TWA
Proprietary Ingredients	None Established
Dimethyl Ether Propellant	1000 ppm AIHA WEEL

Ventilation: Use with adequate general or local exhaust ventilation to maintain concentrations below the occupational exposure limits. Use explosion proof electrical equipment and wiring where required.

Respiratory Protection: If needed, a NIOSH approved respirator with organic vapor cartridges may be used. For higher exposures, a supplied air respirator may be required. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.

Skin Protection Impervious gloves are recommended when needed to avoid skin contact. Based on available test data, 4H or Silver Shield gloves are suggested.

Eye Protection: Chemical safety goggles recommended.

Other Protective Equipment: Impervious clothing as required to prevent skin contact and contamination of personal clothing. Suitable eye wash and washing facilities should be available in the work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Slightly reddish liquid with a refreshing odor packages as an aerosol.
pH: 6-7
Boiling Point: 258°F
Vapor Pressure: 12 mm Hg @ 20°C (aliphatic alcohol)
Vapor Density (air =1): Greater than 1
Specific Gravity: 0.87
Melting Point: Not applicable
Water Solubility: Negligible
Evaporation Rate (ether=1): Less than 1

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage or use.

Incompatibility/Conditions to Avoid: Avoid strong oxidizing agents, reducing agents, acids, bases, amines, alkanolamines, ammonia, chlorinated compounds. Avoid heat, sparks, flames and all other sources of ignition.

Hazardous Decomposition Products: Combustion will produce oxides of carbon, organic compounds, smoke and fumes.

Hazardous Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological testing has not been performed on this product as a mixture.

The calculated acute toxicity values, as determined by the DOT and other agency standard formula are: Oral LD50 = 2270; Dermal LD50 = 1500 mg/kg. Aerokroil is not classified as toxic under workplace or transportation criteria.

SECTION 12: ECOLOGICAL INFORMATION

No data available.

SECTION 13: DISPOSAL INFORMATION

Dispose in accordance with all local, state and federal regulations. Do not puncture or incinerate containers. When contents are depleted, continue to depress button until all gas is expelled.

SECTION 14: TRANSPORT INFORMATION

DOT Proper Shipping Name: Consumer Commodity
DOT Technical Name: None
DOT Hazard Class: ORM-D
UN Number: None
DOT Labels Required (49CFR172.101): None
Hazardous Substance (49CFR172.101): None
Reportable Quantity: None

DOT Marine Pollutants: This product does not contain marine pollutants as defined in 49CFR 171.8.

IMDG Shipping Description: Aerosols, 2, UN1950, FP 51 C, Limited Quantity
ID Number: UN1950
Hazard Class: 2
Packing Group: None
Labels Required: None
Marking Required: Aerosol Marking On Carton
Placards Required: Limited Quantities On Transport Containers

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA TITLE III:

Hazard Category for Section 311/312: Acute Health, Chronic Health, Fire Hazard, Sudden Release of Pressure

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements:

Aliphatic Alcohol	78-92-2	1-5%
Glycol Ether	111-76-2	1-5%
1,2,4-Trimethylbenzene	95-63-6	.5 - < 5%

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

SECTION 16: OTHER INFORMATION

HMIS Ratings:	Health - 1	Flammability - 4	Reactivity - 0
NFPA Ratings:	Health - 1	Flammability - 4	Reactivity - 0

The information contained herein has been developed based upon current available scientific data. New information may be developed from time to time which may render the conclusions of this report obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or the consequences of its use or misuse.

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KMB00003409

NORTON

Health Rating: 1 | Reactivity Rating: 0 | 0

HAZARD RATING
Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME **NORTON COMPANY**	CONTACT **THOMAS Z. RICHARDS**
ADDRESS (STREET, CITY, STATE AND ZIP CODE) **1 NEW BOND STREET, WORCESTER, MA 01615-0008**	EMERGENCY TELEPHONE NO. **508-795-2690**
TRADE NAME, COMMON NAME OR SPECIFICATION **DIAMOND OR CUBIC BORON NITRIDE GRINDING WHEELS**	APPROVED BY Kathleen Forrester DATE April 17, 1990
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Silver ****	85	Silver	Y	7440-22-4	.01mg/m³	.1mg/m³	N
Cobalt ****	60	Cobalt	Y	7440-48-4	.1mg/m³	.1mg/m³	N
Copper ****	85	Copper	Y	7440-50-8	1mg/m³	1mg/m³	N
Tin	25	Tin	Y	7440-31-5	2mg/m³	2mg/m³	N
Graphite	5	Graphite	Y	7782-42-5	15MPPCF	5mg/m³ (Respirable Dust)	N
Silicon Carbide **	73	Crystolon	Y	409-21-2	10mg/m³	10mg/m³	N
Alpha-Alumina	81	Alundum	Y	1344-28-1	(Total Dust)	(Total Dust)	
Nickel ****	82	Nickel	Y	7440-02-0	1mg/m³	1mg/m³	Y*
Phosphorus ****	1	Phosphorus	Y	7723-14-0	0.1mg/m³	0.1mg/m³	N
Manganese	3	Manganese	Y	7439-96-5	5mg/m³	5mg/m³	N
Molybdenum	1	Molybdenum	Y	7439-98-7	15mg/m³	10mg/m³	N
Silicon Powder	5	Silicon Powder	Y	7440-21-3	**NAIF	10mg/m³	N
Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	0.1mg/m³	0.1mg/m³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations. *Listed by NTP as a Carcinogen. Other studies are not in agreement with IRAC that nickel is a probable human carcinogen.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT >220°C	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
OTHER PRECAUTIONS:
**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR

INCOMPATABILITY (MATERIALS TO AVOID)
**NAIF

DECOMPOSITION PRODUCTS
In use, dust and decomposing odors are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.

CONDITIONS TO BE AVOIDED
**NAIF

NAIF = NO APPLICABLE INFORAMTION FOUND * N/A = NOT APPLICABLE

NORTON

Health Rating 1 | 0 Reactivi Rating

HAZARD RATING
Please rate consistent with NFPA Cod

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME	CONTACT
NORTON COMPANY	THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE)	EMERGENCY TELEPHONE NO.
1 NEW BOND STREET, WORCESTER, MA 01615-0008	508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION	APPROVED BY Kemarayanan
RESINOID BONDED GRINDING WHEELS	DATE April 17, 1990

CHEMICAL FAMILY OR PRODUCT TYPE BONDS: FFX, GFX, HFX, IFX, JTX, KTX, MTX, NTX, PTX, XFL, FL, M, R, IGX, LGX, NTX SOFT, MEDIUM, HARD, X-HARD

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARC OGEN (Y/N)
Alpha-Alumina	80	Alundum, Seeded Gel	Y	1344-28-1	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
Silicon Carbide	80	Crystolon	Y	409-21-2	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.							
Resin Coated Glass	20%	Fiberglass	Y	12604-58-9	**NAIF	10mg/m³	N
Acrylonitrile Copolymer	20%	Nitrile Latex	Y	107-13-1	**NAIF	***N/A	N
Cotton (Raw)	20%	Cotton	Y	7440-50-8	1mg/m³ Dust	**NAIF	N

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard,and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
OTHER PRECAUTIONS:
**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR

INCOMPATABILITY (MATERIALS TO AVOID)
**NAIF

DECOMPOSITION PRODUCTS
In use, dust and decomposing odors are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.

CONDITIONS TO BE AVOIDED
**NAIF

**NAIF = NO APPLICABLE INFORMATION FOUND ***N/A = NOT APPLICABLE

NORTON

MATERIAL SAFETY DATA SHEET

Health Rating: 1 | Reactivity Rating: 0 | 0

HAZARD RATING
Please rate consistent with NFPA Code

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION RESINOID BONDED GRINDING WHEELS	APPROVED BY Ramarayanan DATE 4/30/90
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Alpha-Alumina	90	Alundum, Seeded Gel	Y	1344-28-1	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
Silicon Carbide	90	Crystolon	Y	409-21-2	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
Zirconia Alumina	90	NZ, ZF, ZS	Y	**NAIF	5mg/m³ (as Zirconium)	5mg/m³ (as Zirconium)	N
The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.							
Fluorides (as F)	3	***N/A	Y	***N/A	2.5mg/m³	2.5mg/m³	N
Calcium Oxide	3	Lime	Y	1305-78-8	5mg/m³	2mg/m³	N
Glass, Fibrous or Dust	10	Fiberglass	Y	**NAIF	**NAIF	10mg/m³	N
[1]Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	0.1mg/m³	0.1mg/m³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

[1] Actual grinding tests with wheels known to contain Crystaline Silica did not produce any detectable amount of respirable free Silica.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
OTHER PRECAUTIONS:
**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR

INCOMPATABILITY (MATERIALS TO AVOID)

DECOMPOSITION PRODUCTS
In use, dust and decomposing odors are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.

CONDITIONS TO BE AVOIDED
**NAIF

**NAIF = NO APPLICABLE INFORMATION FOUND ***N/A = NOT APPLICABLE

NORTON

Health Rating 0 | Reactivity Rating 0 | 1

HAZARD RATING
Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION RUBBER & SHELLAC BONDED GRINDING WHEELS	APPROVED BY Kmarayanan DATE April 17, 1990
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Amorphous Silica	2	Silica Gel	Y	63231-67-4	20 mppcf	10mg/m³	N
Sulfur	8	Sulfur	Y	7704-34-9	**NAIF	**NAIF	N
Fluorides (as F)	2	***N/A	Y	***N/A	2.5mg/m³	2.5mg/m³	N
Carbon Black	11	***N/A	Y	1333-86-4	3.5mg/m³	3.5mg/m³	N
Dibutyl Phthalate****	1	***N/A	Y	84-74-2	5mg/m³	5mg/m³	N
Thiram	1	Methyl Tuads	Y	137-26-8	5mg/m³	5mg/m³	N
The chemicals listed above may be a part of the bond system. The grinding wheel may be comprised of one or more of the following abrasives.							
Alpha Alumina	90	Alundum	Y	1344-28-1	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
Silicon Carbide	90	Crystolon	Y	409-21-2	10mg/m³ (Total Dust)	10mg/m³ (Total Dust)	N
Zirconia Alumina	90	NZ, ZS, ZF	Y	**NAIF	5mg/m³ (as Zirconium)	5mg/m³ (as Zirconium)	N
Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	0.1mg/m³	0.1mg/m³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE – NONE.
OTHER PRECAUTIONS:
**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR

INCOMPATABILITY (MATERIALS TO AVOID)
**NAIF

DECOMPOSITION PRODUCTS
In use, dust and decomposing odors are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.

CONDITIONS TO BE AVOIDED
**NAIF

**NAIF = NO APPLICABLE INFORMATION FOUND ***N/A = NOT APPLICABLE

RHÔNE-POULENC

SULFURIC ACID

Material Safety Data Sheet **Date Prepared:** 12/18/95 **Supersedes Date:** 11/14/95

1. CHEMICAL PRODUCT AND COMPANY DESCRIPTION

NORTH AMERICAN CHEMICALS ZONE
ENVIRONMENTAL SERVICES
One Corporate Drive
Shelton CT 06484

Emergency Phone Numbers:
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC (800-424-9300) OR RHONE-POULENC (800-334-7577).

For Product Information:
(800) 642-4200

Chemical Name or Synonym:
SULFURIC ACID

Molecular Formula:
H_2SO_4

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	OSHA Hazard	Percentage
SULFURIC ACID	7664-93-9	Y	65 - 100
WATER	7732-18-5	N	BALANCE

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW:

Physical Appearance and Odor:
colorless oily liquid, odorless.

Warning Statements:
DANGER! CAUSES SEVERE BURNS. REACTS VIOLENTLY WITH WATER. CONTENTS MAY BE UNDER PRESSURE OF EXPLOSIVE, FLAMMABLE HYDROGEN GAS. HIGHLY REACTIVE AND CAPABLE OF IGNITING COMBUSTIBLE MATERIAL ON CONTACT.

 Continued on Next Page

3. HAZARDS IDENTIFICATION (Continued)

B. POTENTIAL HEALTH EFFECTS:

Acute Eye:
Corrosive. Causes burns, tissue destruction, Can cause blindness.

Acute Skin:
Corrosive. Causes redness, inflammation, burns.

Acute Inhalation:
Harmful if inhaled. Causes upper respiratory tract irritation, lung irritation, chest pain, wheezing, shortness of breath, a burning sensation, tickling of the nose and throat, sneezing.

Acute Ingestion:
Harmful if ingested. Can cause irritation, abdominal pain, corrosion, burns to mouth and esophagus, death.

Chronic Effects:
This product contains ingredients that are considered by OSHA, NTP, IARC or ACGIH to be probable or suspected human carcinogens (see Section 11 - Chronic).

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:
Eye Exposure:
Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention.

Skin Exposure:
Immediately wipe excess material off skin with a dry cloth; then wash skin with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned.

Inhalation:
Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek medical attention.

4. FIRST AID MEASURES (Continued)

Ingestion:
If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Vomiting may occur spontaneously. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.

INHALATION: If cough or shortness of breath occurs, evaluate the possibility of bronchitis or pneumonitis. Chest x-ray and arterial blood gases can be used to determine the presence of pulmonary edema. In severe cases, use of humidified oxygen and assisted ventilation including positive end expiratory pressure (PEEP) may be needed. Parenteral steroids may be useful in limiting the extent of pulmonary damage.

SKIN: Wash exposed area thoroughly with soap and water. Chemical burns from strong acids are generally treated the same as thermal burns.

EYES: Irrigate eyes for 15 minutes with sterile saline. If irritation, pain, swelling, photophobia or lacrimation persist, examination by an ophthalmologist is recommended.

INGESTION: If not already performed by first aid personnel, irrigate mouth with large amounts of water and dilute the acid by having victim drink 4 to 8 ounces of water or milk. DO NOT induce vomiting. Use of gastric lavage is controversial. The advantage of removal of acid must be weighted against the risk of perforation or bleeding. If a large amount of acid (> 1 ml/kg body weight) has been recently ingested, cautious gastric lavage is generally advised if the patient is alert

 Continued on Next Page

4. FIRST AID MEASURES (Continued)

and there is little risk of convulsions. Consultation with a gastroenterologist and/or surgeon is advised. Serious complications such as perforation or stricture of the esophagus may occur requiring care by specialists. Laryngeal edema may develop requiring intubation or tracheostomy.

5. FIRE FIGHTING MEASURES

FIRE HAZARD DATA:

Flash Point:
Not Applicable

Extinguishing Media:
Not combustible. Use extinguishing method suitable for surrounding fire. Recommended (small fires): dry chemical, Recommended (large fire): water spray (massive amount).

Special Fire Fighting Procedures:
Firefighters should wear NIOSH/MSHA approved positive pressure breathing apparatus with full face-piece and full acid-resistant protective clothing. Fight fire from maximum distance.

Unusual Fire and Explosion Hazards:
Not combustible. Strong oxidizers can react with reducing agents or combustibles producing heat and causing ignition. Reacts violently with water releasing heat and corrosive material.

Hazardous Decomposition Materials (Under Fire Conditions):
oxides of sulfur

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:
Personnel handling this material should be thoroughly trained to handle spills and releases. Do not direct hose streams into an unignited transportation spill (tank truck or tank car).

6. ACCIDENTAL RELEASE MEASURES (Continued)

Containment of Spill:
Stop leak if it can be done without risk. Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike or retain dilution water or water from firefighting for later disposal.

Cleanup and Disposal of Spill:
Pump any free liquid into an appropriate closed container (see Section 7: Handling and Storage). Exercise caution during neutralization as considerable heat may be generated. Carefully neutralize spill with soda ash. Absorb neutralized spill with an inert absorbent. Scrape up and place in appropriate closed container (see Section 7: Handling and Storage).

Environmental and Regulatory Reporting:
Do not flush to drain. Runoff from fire control or dilution water may cause pollution. Dispose of as a hazardous waste. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact the Technical Service Department using the Product Information phone number in Section 1.

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures:
> -36 C (-33 F)

Handling:
Do not breathe vapors and mists. Do not get on skin or in eyes. This product reacts violently with bases liberating heat and causing spattering.

When diluting an acid, ALWAYS add the acid slowly to water and stir well to avoid spattering. NEVER ADD WATER TO ACID.

Storage:
Store in tightly closed containers. Store in an area that is dry, well-ventilated, diked with impermeable material.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:
These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:
Exposure limits represent regulated or recommended worker breathing zone concentrations measured by validated sampling and analytical methods, meeting OSHA requirements. The following limits (ACGIH, OSHA and other) apply to this material, where, if indicated, S=skin and C=ceiling limit:

SULFURIC ACID

	Notes	TWA	STEL
ACGIH		1 mg/cu m	3 mg/cu m
OSHA		1 mg/cu m	

Engineering Controls:
Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Respiratory Protection:
When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the latest OSHA standard (29 CFR 1910.134) and/or ANSI Z88.2 recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by OSHA/ANSI: Air-purifying (half-mask/full-face) respirator with cartridges/canister approved for use against acid gases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (Continued)

Eye/Face Protection:
Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area.

Skin Protection:
Skin contact must be prevented through the use of permeation resistant clothing, gloves and footwear, selected with regard for use conditions and exposure potential. An emergency shower must be readily accessible to the work area. Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:
Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

(1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
(2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
(3) Wash exposed skin promptly to remove accidental splashes of contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance:
colorless oily liquid.

Odor:
odorless.

KMB00003420

9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)

pH:
1 at 1 wt/wt%.

Specific Gravity:
No Data Available

Density:
1.6 to 1.8 g/ml at 25 C (77 F).

Water Solubility:
miscible

Melting Point Range:
No Data Available

Freezing Point Range:
-36 to -28 C (-33 to -18 F)

Boiling Point Range:
151 to 276 C (304 to 529 F) at 760 mmHg

Vapor Pressure:
1 to 0 mmHg at 40 C (104 F)

Vapor Density:
3.4

Molecular Weight:
98.08

10. STABILITY AND REACTIVITY

Chemical Stability:
This material is stable under normal handling and storage conditions described in Section 7.

Conditions To Be Avoided:
none known

Materials/Chemicals To Be Avoided:
water

10. STABILITY AND REACTIVITY (Continued)

strong reducing agents
halogens
bases
metals
nitrogen compounds

Decomposition Temperature Range:
340 C (644 F)

The Following Hazardous Decomposition Products Might Be Expected:
Decomposition Type: thermal
oxides of sulfur

Hazardous Polymerization Will Not Occur.
Avoid The Following To Inhibit Hazardous Polymerization:
not applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:
Toxicological Information and Interpretation
eye - eye irritation, 250 ug, rabbit.
Severe Irritant.

Acute Skin Irritation:
Acute Dermal Toxicity:
No test data found for product.

Acute Respiratory Irritation:
No test data found for product.

Acute Inhalation Toxicity:
Toxicological Information and Interpretation
LC50 - lethal conctn. 50% of test species, 150 mg/cu m/4 hr, rat.

Acute Oral Toxicity:
Toxicological Information and Interpretation
LD50 - lethal dose 50% of test species, 2140 mg/kg, rat.

Chronic Toxicity:
This product contains the following substances that are considered by

11. TOXICOLOGICAL INFORMATION (Continued)

OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

	Regulatory Agency Listing Carcinogen			
Ingredient Name	OSHA	IARC	NTP	ACGIH
OCCUPATIONAL EXPOSURES TO STRONG-INORGANIC-ACID MI ISTS CONTAINING SULF	No	1	No	No

The International Agency for Research on cancer (IARC) has classified strong inorganic acid mists containing sulfuric acid as a known human carcinogen (IARC Category 1). This classification applies only to sulfuric acid when it is generated as a mist. There is still debate in the scientific community whether the studies reviewed by IARC adequately controlled for confounding occupational exposures and personal habits such as cigarette smoking and alcohol consumption. A few epidemiology studies have suggested a possible association between sulfuric acid exposure and laryngeal or lung cancer; however, in all these studies, workers were exposed to many other chemicals, some of which are recognized carcinogens, such as diethylsulfate and nickel. Considering the multiple chemical exposures and other limitations of the studies, we disagree with IARC's conclusion that a cause and effect relationship between cancer and exposure to strong inorganic acid mist containing sulfuric acid has been demonstrated.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:
No data found for product.

Chemical Fate Information:
No data found for product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Chemical additions, processing or otherwise altering this material may

13. DISPOSAL CONSIDERATIONS (Continued)

make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

EPA Hazardous Waste - YES

14. TRANSPORTATION INFORMATION

Transportation Status:
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

US Department of Transportation
DOT Hazard Class..... 8

DOT Shipping Name:
SULFURIC ACID
DOT ID Number..... UN1830
DOT Packing Group.... II
DOT Labels..... CORROSIVE
Emergency Guide #.... 39

15. REGULATORY INFORMATION

FEDERAL REGULATIONS

TSCA Inventory Status:
All ingredients of this product are listed on the TSCA Inventory.

SARA Title III Hazard Classes:
Fire Hazard - NO
Reactive Hazard - YES
Release of Pressure - NO

15. REGULATORY INFORMATION (Continued)

Acute Health Hazard - YES
Chronic Health Hazard - NO

SARA 313 Chemicals
SULFURIC ACID (65 - 100%)

SARA Extremely Hazardous Substances (EHS)/CERCLA Hazardous Substances

Ingredient	CERCLA/SARA RQ	SARA EHS TPQ
SULFURIC ACID	1000 lbs	1000 lbs
UNLISTED HAZARDOUS WASTES - CHARACTERISTIC OF CORROSIVITY	100 lbs	
UNLISTED HAZARDOUS WASTES - CHARACTERISTIC OF REACTIVITY	100 lbs	

STATE REGULATIONS:
This product does not contain any components that are regulated under California Proposition 65.

16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings--NFPA(R):
3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
2 Reactivity Rating--Moderate
0 * NO WATER

National Paint & Coating Hazardous Materials Identification System--HMIS(R):
3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
2 Reactivity Rating--Moderate

Reason for Revisions:
Conversion to ANSI MSDS format.

Key Legend Information:
NAV - Not Available
NAP - Not Applicable
ND - Not Determined
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value

16. OTHER INFORMATION (Continued)

PEL - Permissable Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer

Disclaimer:
The information herein is given in good faith but no warranty, expressed or implied, is made.

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Safety Yellow Gloss Quick Dry Alkyd 450 **HMIS CODES:** H F R P
PRODUCT CODE: 2090-16 2 3 0 G

SECTION 1 - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Imperial Paint Company, Inc.
ADDRESS : 2526 NW Yeon Avenue
Portland OR 97210-1895

EMERGENCY PHONE : 1-800-424-9300 **DATE PRINTED** : 06/06/00
INFORMATION PHONE : 1-503-223-5124 **NAME OF PREPARER** : Steve Rearden

SECTION 2 - HAZARDOUS INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
VM&P naphtha	64742-89-8	26	100°F	24
OSHA Permissible Exposure Limit (PEL):300 ppm (TWA), 400 ppm (STEL)				
ACGIH Threshold Limit Value (TLV):300 ppm (TWA), 400 ppm(STEL)				
iso-PROPYL ALCOHOL	67-63-0	33	68°F	8
OSHA Permissible Exposure Limit (PEL):400 ppm (TWA), 500 ppm (STEL)				
ACGIH Threshold Limit Value (TLV):400 ppm (TWA), 500 ppm (STEL)				
AROMATIC HYDROCARBON	64742-94-5	5	100°F	6
OSHA Permissible Exposure Limit (PEL):100 ppm (TWA), 100 ppm (STEL)				
ACGIH Threshold Limit Value (TLV):100 ppm (TWA), 100 ppm (STEL)				
Note:The above information is based on a recommendation from Exxon Chemical				
* XYLENE (mixed isomers)	1330-20-7	5.1	68°F	2
OSHA Permissible Exposure Limit (PEL):100 ppm (TWA), 150 ppm (STEL)				
ACGIH Threshold Limit Value (TLV):100 ppm (TWA), 150 ppm (STEL)				
* TOLUENE	108-88-3	22	68|F	2
OSHA Permissible Exposure Limit (PEL):100 ppm (TWA), 150 ppm (STEL)				
ACGIH Threshold Limit Value (TLV):50 ppm (TWA) skin				

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 180°F - 380°F **SPECIFIC GRAVITY (H2O=1):** 1.02
VAPOR DENSITY: Heavier than air **EVAPORATION RATE:** Slower than ether
COATING V.O.C.(excluding water): 3.68 lb/gl
COATING V.O.C.(excluding water): 441 g/l
SOLUBILITY IN WATER: No
APPEARANCE AND ODOR: Liquid, typical odor of solvent(s) listed above.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 40|F **METHOD USED:** CLOSED CUP
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1 **UPPER:** 12.3

EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical, water fog.

KMB00003427

SPECIAL FIREFIGHTING PROCEDURES
Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible rupture of containers. Water fog is preferred. Fire fighters should wear self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flames. Closed containers may explode when exposed to extreme heat. Do not apply on hot surfaces, toxic gases may form when product is contacted by flame or hot surfaces.

========== SECTION 5 - REACTIVITY DATA ==========

STABILITY: Stable
CONDITIONS TO AVOID
None

INCOMPATIBILITY (MATERIALS TO AVOID)
Avoid contact with strong alkalies, strong mineral acids or strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Dry material exposed to high heat such as welding or flame-cutting operations may release carbon monoxide.

HAZARDOUS POLYMERIZATION: Will not occur

========== SECTION 6 - HEALTH HAZARD DATA ==========

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Effects from vapors or spray mists in poorly ventilated areas may include irritation of the mucus membranes. Inhalation of vapors or spray mists may also result in nausea, dizziness, breathing difficulty, headaches, and loss of coordination.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Skin contact: May cause skin irritation or sensitivity. Symptoms include redness, cracks, swelling, and dermatitis. Eye contact: Causes severe eye irritation. Symptoms include redness, tearing, burning, and visual disturbances.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
May be harmful if absorbed through the skin. Symptoms include, nausea, headache and irritation, swelling, and redness of the affected area.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Harmful or fatal if swallowed. Symptoms include gastrointestinal irritation, nausea, vomiting, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)
Inhalation-(ACUTE) May cause dizziness, breathing difficulty, headaches & loss of coordination. (CHRONIC) Repeated exposure to high vapor concentrations may

cause irritation of the respiratory system and permanent brain and nervous system damage. Eye Contact-Severe irritation, tearing, redness, and blurred vision. Skin contact-Can dry and de-fat skin causing cracks, irritation, and dermatitis. Ingestion-Can cause gastrointestinal irritation, vomiting, & diarrhea.

CARCINOGENICITY: NTP CARCINOGEN: No **IARC MONOGRAPHS:** No **OSHA REGULATED:** Yes
N/A

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
Unknown

EMERGENCY AND FIRST AID PROCEDURES
Ingestion: Do not induce vomiting. Can cause chemical pneumonitis and pulmonary edema if material is aspirated into lungs. Call physician or emergency response agency immediately. Eye contact: Flush eyes with large amounts of water for at least 15 minutes. Seek medical attention. Skin contact: Flush with water followed by washing with soap and water. Inhalation: Remove victim to fresh air. Apply artificial respiration and other supportive measures as required. Seek medical attention.

========== SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE ==========

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Dike and contain spill with inert material (sand, earth. etc.). Transfer liquid to containers for recovery or disposal. Do not allow spilled material to enter drains or sewer systems. Remove all sources of ignition. Provide maximum ventilation. Do not allow personnel to enter spill area if they are not using proper protective gear as outlined in Section 8.

WASTE DISPOSAL METHOD
Dispose of waste in strict accordance with all local, state, and federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep containers closed when not in use. Do not store above 120°F. Store large quantities only in buildings designed and protected to comply with OSHA 1910.106. Spills on floors may be slippery, care should be taken to avoid falls. Keep out of reach of children.

OTHER PRECAUTIONS
Since containers of this material may contain residues (vapor, liquid or solid) when "empty", all hazard precautions given in this data sheet must be observed. Read and understand safety precautions before using this product. Keep closure tight and container upright to prevent leakage. Avoid breathing sanding dust. Intentional misuse by deliberately concentrating and inhaling this product can be harmful or fatal.

========== SECTION 8 - CONTROL MEASURES ==========

RESPIRATORY PROTECTION
Overexposure to vapors may be prevented by using ventilation controls, vapor exhaust or fresh air entry. NIOSH/MSHA approved (TC-23C) paint spray or air

supplied (TC-19C) respirators may also reduce exposure. Read respirator manufactures's instructions carefully to determine the type of airborne contaminants which the respirator is effective.

VENTILATION
Provide sufficient mechanical ventilation to keep the concentration of ingredients listed in section 2 below the lowest suggested exposure limits.

PROTECTIVE GLOVES
Gloves should be constructed of nitrile, neoprene, or latex, or impervious to the ingredients listed in section 2.

EYE PROTECTION
Use chemical safety glasses, goggles or face shields for protection.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
To prevent repeated or prolonged skin contact, wear gloves, clothing, and footwear which are designed for protection when using this material.

WORK/HYGIENIC PRACTICES
Wash thoroughly after handling. If clothing or footwear is contaminated, discard or launder.

========== SECTION 9 - OTHER REGULATORY INFORMATION ==========

WARNING: Detectable amounts of a chemical known to the state of California to cause cancer, birth defects or other reproductive harm may be present in this product.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Imperial Paint Company makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Imperial Paint Companys control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes. Users assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

REVISION DATE: 06/06/00 **SUPERSEDES: ALL PREVIOUS VERSIONS**

KMB00003430

This MSDS should be attached or kept with the respective product with which it is associated.

5H890

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : FLAT WHITE 9604970
IDENTIFICATION NUMBER: 2764 402
DATE PRINTED : 11-03-97

PRODUCT USE/CLASS : INDUSTRIAL ENAMEL/ALKYD

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847) 367-7700 RUST-OLEUM CORP.
MON.-FRI, 8:00 AM-4:30 PM

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847) 367-7700 RUST-OLEUM CORP.
MON.-FRI, 8:00 AM-4:30 PM

PREPARER: LJW, PHONE: , PREPARE DATE: 06-11-97

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	STODDARD SOLVENT	8052-41-3	25.0 %
02	TITANIUM DIOXIDE	13463-67-7	20.0 %
03	CALCIUM CARBONATE	1317-65-3	15.0 %
04	AMORPHOUS SILICON DIOXIDE	7631-86-9	15.0 %
05	1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
06	1,3,5-TRIMETHYLBENZENE	108-67-8	5.0 %
07	COBALT DRIER	136-52-7	0.1 %

EXPOSURE LIMITS

	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	100PPM	N.E.	100PPM	N.E.	N.E.	NO
02	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
03	10MG/M3	N.E.	15MG/M3	N.E.	N.E.	NO
04	10MG/M3	N.E.	80/%SIO2MG/M	N.E.	N.E.	NO
05	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
06	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
07	N.E.	N.E.	N.E.	N.E.	N.E.	NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: CONTAIN SPIL LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING: WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUS IT MAY RETAIN PRODUCT RESIDUES. AVOID BREATHING VAPOR OR MIST. AVOID CONTACT WITH EYES.

STORAGE: KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAME AN SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMEND EXPOSURE LIMITS. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION: A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSH 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. A NIOSH/MSHA APPROVED AIR PURIFY RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBL UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED T EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATOR IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVI ADEQUATE PROTECTION.

SKIN PROTECTION: USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVE MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION: USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH O LIQUIDS.

OTHER PROTECTIVE EQUIPMENT: REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMEN AND ITS APPLICATION.

HYGIENIC PRACTICES: WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: HARMFUL IF SWALLOWED. CAUSES (TARGET ORGAN OR SYSTEM) DAMAGE. CAUSES EYE IRRITATION. VAPORS IRRITATING TO EYES AND RESPIRATORY TRACT. COMBUSTIBLE LIQUID AND VAPOR.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: MAY CAUSE SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION: HARMFUL IF INHALED. MAY CAUSE HEADACHES AND DIZZINESS.

EFFECTS OF OVEREXPOSURE - INGESTION: SUBSTANCE MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.

PRIMARY ROUTE(S) OF ENTRY: INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT: WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET IMMEDIATE MEDICAL ATTENTION.

FIRST AID - INGESTION: ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 102 F

LOWER EXPLOSIVE LIMIT: 0.9 %

UPPER EXPLOSIVE LIMIT: 6.4 %

AUTOIGNITION TEMPERATURE: NE

EXTINGUISHING MEDIA: DRY CHEMICAL FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: KEEP CONTAINERS TIGHTLY CLOSED.

SPECIAL FIREFIGHTING PROCEDURES: WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE AUTOIGNITION OR EXPLOSION. EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 318 - 383 F	VAPOR DENSITY	: IS HEAVIER THAN A
ODOR	: SOLVENT	ODOR THRESHOLD	: NE
APPEARANCE	: LIQUID	EVAPORATION RATE	: IS SLOWER THAN ET
SOLUBILITY IN H2O	: SLIGHT		
FREEZE POINT	: NE	SPECIFIC GRAVITY	: 1.3659
VAPOR PRESSURE	: NE	PH AT 0.0 %	: NE
PHYSICAL STATE	: LIQUID	VISCOSITY	: NE

COEFFICIENT OF WATER/OIL DISTRIBUTION: NE

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACID AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS: BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
STODDARD SOLVENT	4900MG/KG(RAT)	N.E.
TITANIUM DIOXIDE	N.A.	N.A.
CALCIUM CARBONATE	NONE	NONE
AMORPHOUS SILICON DIOXIDE	NONE	NONE
1,2,4-TRIMETHYLBENZENE	N.E.	RAT 18G/M3 4HR
1,3,5-TRIMETHYLBENZENE	RAT 1303MG/KG	RAT 24MG/M3 4HR
COBALT DRIER	NA	NA

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: PRODUCT IS A MIXTURE OF LISTED COMPONENTS.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

NO TRANSPORTATION INFORMATION IS AVAILABLE.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD FIRE HAZARD

SARA SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
XYLENE	1330-20-7	1.0 %
ETHYLBENZENE	100-41-4	1.0 %

TOXIC SUBSTANCES CONTROL ACT:

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES:

CHEMICAL NAME	CAS NUMBER

NO INFORMATION IS AVAILABLE.

U.S. STATE REGULATIONS: AS FOLLOWS -

NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN	66070-60-8

PENNSYLVANIA RIGHT-TO-KNOW:

THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN	66070-60-8
ALUMINUM SILICATE	1332-58-7

CALIFORNIA PROPOSITION 65:

WARNING: THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER

NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: NO INFORMATION AVAILABLE.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: FLAMMABILITY: REACTIVITY:

PREVIOUS MSDS REVISION DATE: 04-10-97

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED,
N.D. - NOT DETERMINED

: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

0055137747 HAZARDOUS MATERIAL WARNING (HAZMAT) 5H931

When shipment is complete, retain for daily Hazmat audit.

##

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GRAINGER SHIPPING INFORMATION

STOCK # : 5H931

MSDS # : 7S179

FREIGHT CODE : 0204

DOT PROPER SHIP NAME : PER 49 CFR 173.150(F)(2)
NOT REGULATED BY THE DOT AS A HAZARDOUS MATERIAL
COMBUSTIBLE LIQUID, N.O.S., (PAINT),

UPS RESTRICTIONS :

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL :

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 : ONLY ARROW UP LABEL(2S594) REQUIRED.

SHIPPING PAPERS : NONE REQUIRED.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

This MSDS should be attached or kept with the respective product with which it is associated.

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MATERIAL SAFETY DATA SHEET - A0344

Associated Grainger Items

3W959, 3W962, 3W963

M A T E R I A L S A F E T Y D A T A S H E E T

SPEED ROCK, CONC WIDE CODE: 3W963/3W962/3W959

HMIS CODES: H F R
2 0 0

========== SECTION I - CHEMICAL PRODUCT & COMPANY ==========

PRODUCT NAME: SPEED ROCK, CONC WIDE

PRODUCT CODE: 3W963/3W962/3W959

MANUFACTURER'S NAME: BIL-DRY

ADDRESS : 5525 GRAYS AVENUE
PHILADELPHIA PA 19143

EMERGENCY PHONE :(CHEMTREC)800-424-3830 DATE PRINTED : 02/03/00

INFORMATION PHONE : 215-724-1000

========== SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS ==========

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE MM HG @ TEMP		WEIGHT PERCENT
SILICON DIOXIDE	14808-60-7	N/A	N/A	65% TO 75%
OSHA - PEL 10MG/M3 ACGIH - TLV-TWA .01MG/M3 CRYSTALINE QUARTZ				
MAGNESIUM OXIDE	1309-48-4	N/A	N/A	15% TO 25%
OSHA - PEL 10MG/M3 ACGIH TLV-TWA 10MG/M3				
FLY ASH	68131-74-8	N/A	N/A	5% TO 15%
OSHA - PEL 5MG/M3 ACGIH TLV-TWA 5MG/M3				

ABBREVIATIONS: NE - NOT ESTABLISHED, N/A - NOT APPLICABLE, [CL] - CEILING LIMIT, D - NUISANCE PARTICLE TVL 10 MG/M3 TOTAL DUST, [C] - CARCINOGEN, [PC] - POTENTIAL CARCINOGEN, DD - INERT OR NUISANCE DUST PEL 15 MG/M3 TOTAL DUST, [1] NOT ESTABLISHED OR USE STODDARD SOLVENT AS A GUIDE.

*** NO TOXIC CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III AND OF 40 CFR 372 ARE PRESENT. ***

========== SECTION III - HAZARDS IDENTIFICATION ==========

* EMERGENCY OVERVIEW *

NO SPECIAL CONDITONS APPLY.

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: INHALATION, SKIN CONTACT/ABSOBTION, AND EYE CONTACT.

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

INFORMATION IS BASED ON MATERIALS USED IN THIS PRODUCT. THE FOLLOWING SECTION INCLUDES SIGNS AND SYMTOMS OF OVEREXPOSURE.

ACUTE INHALATION.....: NONE KNOWN, BUT THE INHALATION OF ANY FOREIGN MATERIAL SHOULD BE AVOIDED.

CHRONIC INHALATION.....: PRODUCT CONTAINS SILICA. RESPIRABLE SILICA (QUARTZ) CAN CAUSE SILICOSIS, A FIBROSIS (SCARRING) OF THE LUNGS. SILICOSIS MAY BE PROGRESSIVE; IT MAY LEAD TO DISABILITY AND DEATH. CRYSTALLINE SILICA (QUARTZ) INHALED FROM OCCUPATIONAL SOURCES IS CLASSIFIED AS CARCINOGENIC TO HUMANS.

ACUTE SKIN CONTACT.....: CAN DRY AND DEFAT SKIN CAUSING CRACKS, IRRITATION AND DERMATITUS.

M A T E R I A L S A F E T Y D A T A S H E E T

SPEED ROCK, CONC WIDE CODE: 3W963/3W962/3W959

MATERIAL IN A WET STATE GENERATES HEAT IN SUFFICENT AMOUNTS TO CAUSE BURNS.

CHRONIC SKIN CONTACT.....: REPEATED OR PROLONGED CONTACT CAN CAUSE PERSISTANT IRRITATION OR DERMATITUS.

ACUTE EYE CONTACT.....: MAY CAUSE IRRITATION.

CHRONIC EYE CONTACT.....: POSSIBLE CHEMICAL BURNS AND PERMENANT DAMAGE.

ACUTE INGESTION.....: CAN CAUSE GASTROINTSTESTINAL IRRITATION, VOMITING, NAUSEA AND DIARRHEA.

CHRONIC INGESTION.....: NONE KNOWN. NOT A LIKELY FORM OF EXPOSURE. IF SUBSTANSIAL QUANTITIES ARE INGESTED, SEEK MEDICAL ATTENTION.

CARCINOGENICITY

NTP.....: NO

IARC....: NO

OSHA....: NO

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: CHRONIC REPSIRATORY CONDITIONS.

SKIN

ALLERGIES, ECZEMA.

==========SECTION IV FIRST AID MEASURES ==========

FIRST AID FOR EYES.....: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

FIRST AID FOR SKIN.....: WASH AFFECTED AREA WITH SOAP AND WATER. WASH CONTAMINATED CLOTHING BFORE USE.

FIRST AID FOR INHALATION.....: NOT LIKLY. BUT IF TROUBLE BREATHING, REMOVE TO FRESH AIR, CALL A PHYSICIAN.

FIRST AID FOR INGESTION.....: DO NOT INDUCE VOLMITING. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. CALL A PHYSICIAN.

========== SECTION V FIRE FIGHTING MEASURES ==========

FLASH POINT....: N/A

UPPER EXPLOSIVE LIMIT.....: NE

LOWER EXPLOSIVE LIMIT.....: NE

EXTINGUISHING MEDIA.....: FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIREFIGHTING PROCEDURES.....: MAGNESIUM OXIDES PRODUCE POISON GAS DURING

FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS.....: MAGNESIUM OXIDES PRODUCE POISON GAS DURING FIRE.

========== SECTION VI ACCIDENTAL RELEASE MEASURES ==========

SPILL OR LEAK PROCEDURES.....: USE A VACUUM TO REMOVE SPILLED MATERIAL. DO NOT SWEEP AND CREATE DUST.

========== SECTION VII HANDLING AND STORAGE ==========

STORAGE TEMPERATURE (MIN./MAX.).....: 41 F (5 C) TO 74 F (20 C)

SHELF LIFE.....: 6 MONTHS IN ORIGINAL SEALED CONTAINER.

SPECIAL SENSITIVITY.....: NONE KNOWN.

M A T E R I A L S A F E T Y D A T A S H E E T

SPEED ROCK, CONC WIDE CODE: 3W963/3W962/3W959

HANDLING AND STORAGE PRECAUTIONS....: NO SPECIAL PRECAUTIONS.

========== EXPOSURE CONTROLS/PERSONAL PROTECTION ==========

EYE PROTECTION REQUIREMENTS.....: SOLVENT RESISTANT SAFETY EYEWEAR WITH SPLASH GUARDS OR SIDE SHIELDS IS RECOMMENDED. CONTACT LENSES SHOULD NOT BE WORN.

SKIN PROTECTION REQUIREMENTS.....: CHEMICAL RESISTANT GLOVES SHOULD BE WORN.

RESPIRATORY/VENILATION REQUIREMENTS.....: USE NIOSH APPROVED RESPIRATOR UNDER APPROPRIATE OSHA STANDARDS AND REGULATIONS. A COMBINATION OF BOTH PROPER VENTILATION AND RESPIRATORY PROTECTION WOULD TEND TO ELIMINATE MOST RISKS.

EXPOSURE LIMITS.....: NOT ESTABLISHED FOR PRODUCT AS A WHOLE, REFER TO SECTION II.

========== SECTION IX PHYSICAL AND CHEMICAL PROPERTIES ==========

PHYSICAL FORM.....: POWDER

COLOR.....: GRAY

ODOR.....: SLIGHT

BOILING POINT.....: N/A

MELT POINT/FREEZE POINT: NOT APPLICABLE.

PH.....: NA

SOLUBILITY IN WATER....: PARTIAL

SPECIFIC GRAVITY.....: 2.05

BULK DENSITY.....: 17.07 LB/GL

% VOLATILE BY WEIGHT....: 0.00 LB/GL

VAPOR PRESSURE.....: N/A

VAPOR DENSITY.....: UNKNOWN

========== SECTION X - REACTIVITY ==========

STABILITY.....: STABLE

HAZARDOUS POLYMERIZATION.....: WILL NOT OCCUR

INCOMPATIBILITIES.....: STRONG MINERAL ACIDS AND/OR OXIDIZING AGENTS

DECOMPOSITION PRODUCTS.....: MAY YIELD CARBON OXIDES AND TOXIC MONOMER FUMES.

========== SECTION XI - TOXICOLOGICAL INFORMATION ==========

NO INFORMATION FOR PRODUCT AS A WHOLE.

========== SECTION XII - ECOLOGICAL INFORMATION ==========

NO INFORMATION IS AVAILABLE FOR PRODUCT AS A WHOLE.

========== SECTION XIII - DISPOSAL CONSIDERATIONS ==========

WASTE DISPOSAL METHOD.....: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. IT CAN BE DISPOSED OF AS COMMON WASTE.

========== SECTION XIV - TRANSPORTATION INFORMATION ==========

D.O.T. SHIPPING NAME.....: CEMENT COMPOUND, NOI, BUILDING OR FLOOR, DRY

TECHNICAL SHIPPING NAME.....: N/A

D.O.T. HAZARD CLASS.....: N/A

U.N./N.A. NUMBER.....: N/A

PRODUCT RQ.....: NONE.

M A T E R I A L S A F E T Y D A T A S H E E T

SPEED ROCK, CONC WIDE CODE: 3W963/3W962/3W959

D.O.T. LABEL.....: NONE REQUIRED

D.O.T. PLACARD.....: NONE REQUIRED.

FREIGHT CLASS BULK.....: CLASS 55

FREIGHT CLASS PACKAGE.....: NOT APPLICABLE

PRODUCT LABEL.....: SPEED ROCK, CONC WIDE

========== SECTION XV - REGULATORY INFORMATION ==========

OSHA STATUS.....: THIS PRODUCT IS HAZARDOUS UNDER THE CRITERIA OF THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

TSCA STATUS.....: TOXIC SUBSTANCES CONTROL ACT (TSCA): THIS PRODUCT AND/OR ALL THE INGREDIENTS CONTAINED IN THIS PRODUCT HAVE BEEN REGISTERED UNDER THE TOXIC SUBSTANCES CONTROL ACT.

CERCLA REPORTABLE QUANTITY.....: NONE

SARA TITLE III:

SECTION 302 EXTEMELY HAZARDOUS SUBSTANCE.....: NONE

SECTION 311/312 HAZARD CATEGORIES....: THIS PRODUCT HAS BEEN REVIEWED IN ACCORDANCE WITH SECTIONS 311 (MSDS INVENTORY) AND SECTION 312 (TIER I/II INVENTORY) OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (40 CFR 370.2) FOR "HAZARD CATEGORY" STATUS. UNDER APPLICABLE DEFINITIONS, THIS PRODUCT

MEETS THE FOLLOWING CATAGORIES: IMMEDIATE (ACUTE) HEALTH HAZARD, AND DELAYED (CHRONIC) HEALTH HAZARD.

SECTION 313 TOXIC CHEMICALS....: REFER TO SECTION II

RCRA STATUS.....: R.C.R.A.: THIS PRODUCT DOES NOT MEET THE DEFINITIONS OR CONTAIN ANY SUBSTANCE APPEARING IN THE LISTINGS CONTAINED IN 40 CFR 261, "IDENTIFICATION AND LISTING OF HAZARDOUS WASTE".

STATE REGULATORY INFORMATION...: THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED

BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMNETS. FOR DETAIL ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

COMPONENT	CAS #	VOLUME %	STATE CODE	MJ
SILICON DIOXIDE	14808-60-7	65% TO 75%		
MAGNESIUM OXIDE	1309-48-4	15% TO 25%		
FLY ASH	68131-74-8	5% TO 15%		

OTHER REGULATORY COMMENTS

THE INFORMATION CONTAINED IN THIS MATERIAL SAFETY DATA SHEET IS BASED ON THE NEAT OR CONCENTRATED PRODUCT AS SHIPPED.

*** PERSONAL PROTECTION RECOMMENDATIONS SHOULD BE REVIEWED BY THE PURCHASER. WORKPLACE CONDITIONS ARE IMPORTANT FACTORS IN SPECIFYING ADEQUATE PROTECTION. ***

========== SECTION XVI - OTHER INFORMATION ==========

REASON FOR ISSUE.....: REVISED FORMAT

PREPARED BY.....: JOHN J. DORAN

APPROVED BY.....: JOHN J. DORAN

TITLE.....: OPERATIONS MANAGER

APPROVAL DATE.....: APRIL 01, 1999

SUPERSEDES DATE.....: ALL PREVIOUS ISSUES

DISCLAIMER....: THIS PRODUCTS SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESING COMPLIANCE WITH HEALTH/SAFETY/ENVIROMENTAL REGULATIONS.

M A T E R I A L S A F E T Y D A T A S H E E T

SPEED ROCK, CONC WIDE CODE: 3W963/3W962/3W959

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY USE, OR ANY OTHER WARRANTY IS EXPRESSED OR TO BE IMPLIED, REGARDING THE ACCURACY OF THIS DATA, THE RESULTS TO BE OBTAINED FROM THE USE THEREOF, OR THE HAZARDS CONNECTED WITH THE USE OF THE PRODUCT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USERS OBLIGATION TO DETERMINE THE SAFE USE OF THIS PRODUCT. SUCH CONDITIONS SHOULD COMPLY WITH ALL THE FEDERAL REGULATIONS CONCERNING THE PRODUCT. THE "SELLER" ASSUMES NO LIABILITY FOR ANY INJURY OR DAMAGE, DIRECT OR CONSEQUENTIAL, RESULTING FROM THE USE OF THIS PRODUCT UNLESS SUCH INJURY OR DAMAGE IS ATTRIBUTABLE TO NEGLIGENCE ON THE PART OF THE "SELLER".

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MATERIAL SAFETY DATA SHEET: ALUMI-ARC ELECTRODE

(000000-000000- -1414GREN)

DATE OF ISSUE 7/06/2000

SUPERSEDES 6/22/2000

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms
ALL PURPOSE ALUMINUM ALLOY

Trade Name & Synonyms
ALUMI-ARC ELECTRODE

Chemical Family:
WELDING ELECTRODE

Formula Mixture --> X

Manufacturer's Name:
X-ERGON, A PARTSMASTER CO., DIV OF NCH

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:
a santiago/Chemist

Product Code Number
1414GREN

Emergency Phone Number
972-438-1381

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
SILICON	NUIS.DUST	10 MG/M3	10 MG/M3	N/A	7440-21-3
ALUMINUM	RETV. METL	5 MG/M3	5 MG/M3	N/A	7429-90-5
ALUMINUM FLUORIDE	IRRITANT	2.5 MG/M3	2.5 MG/M3	N/A	7784-18-1
LITHIUM FLUORIDE	POISON	2.5 MG/M3	2.5 MG/M3	N/A	7789-24-4
MAGNESIUM FLUORIDE	MOD TOXIC	2.5 MG/M3	2.5MG/M3	N/A	7783-40-6
POTASSIUM CHLORIDE	EYE IRRIT	NOT REGSTR	NOT REGSTR	N/A	7447-40-7
POTASSIUM FLUORIDE	CORROSIVE	2.5 MG/M3	2.5 MG/M3	N/A	7789-23-3
SODIUM CHLORIDE	IRRITANT	NOT REGSTR	NOT REGSTR	N/A	7647-14-5

SECTION III - PHYSICAL DATA

Boiling Point (F):	N/A	**Specific Gravity (H20=1):**	N/A
Vapor Pressure (MM HG):	N/A	**Color:**	AQUA
Vapor Density (Air=1):	N/A	**Odor:**	NONE
PH @ 100% :	N/A	**Clarity:**	OPAQUE
% Volatile by Volume:	0%	**Evaporation Rate (BU A/C=1):**	N/A
H20 Solubility:	INSOLUBLE	**Viscosity:**	SOLID METAL

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point
N/A / N/A

Flammable Limits

LEL N/A

UEL N/A

Extinguishing Media
<--Foam <--Alcohol Foam <--CO2 <--Dry Chemical <--Water Spray <--Other

Special Fire Fighting Procedures:
SEE AMERICAN NATIONAL STANDARD Z49.1,SAFETY IN WELDING AND CUTTING, PUBLISH ED BY THE AMERICAN WELDING SOCIETY AND OSHA PUBLICATION 2206(C.F.R.192-1910)

Unusual Fire and Explosion Hazards:
NON-FLAMMABLE: WELDING ARC AND SPARK CAN IGNITE COMBUSTIBLES. REFERE TO AMERICAN NATIONAL STANDARD Z49.1 FOR FIRE PREVENTION DURING WELDING. THIS PRODUCT AS SHIPPED IS NONHAZARDOUS, NONFLAMMABLE, NONEXPLOSIVE, AND NONREACTIVE.

NFPA 704 Hazard Rating **(0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)**
2 <--Health 0 <--Flammability 0 <--Instability <--Special

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
THE ACGIH RECOMMENDED GENERAL LIMIT FOR WELDING FUMES (NOT OTHERWISE CLASSIFIED) IS 5MG/M3.

Effects of Overexposure:

-Acute (Short Term Exposure)
FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH. PRIMARY ROUTE OF EXPOSURE IS INHALATION OF FUMES. PREEXISTING RESPIRATORY OR ALLERGIC CONDITIONS MAY BE AGGRAVATED IN SOME INDIVIDUALS.
SHORT-TERM EXPOSURE TO WELDING FUMES MAY RESULT IN DISCOMFORT SUCH AS DIZZINESS, NAUSEA, OR DRYNESS OR IRRITATION OF NOSE,THROAT, OR EYES.

-Chronic (Long Term Exposure)
LONG TERM OVEREXPOSURE MAY LEAD TO SIDEROSIS AND IS BELIVED BY SOME INVESTIGATORS TO AFFECT PULMONARY FUNCTION. ARC RAYS CAN INJURE EYES AND BURN SKIN. ELECTRIC SHOCK CAN KILL.

Primary Routes of Entry: X <--Inhalation --Ingestion <--Absorption

Emergency and First Aid Procedures:

-Inhalation:
REMOVE FROM EXPOSURE AREA AND CALL FOR MEDICAL AID. ADMINISTER RESPIRATION. IF NO DETECTABLE PULSE, BEGIN EXTERNAL HEART MASSAGE. EMPLOY FIRST AID TECH NIQUES RECOMMENDED BY THE AMERICAN RED CROSS. IN CASE OF ELECTRICAL SHOCK, TURN OFF POWER PRIOR TO REMOVAL FROM EXPOSURE AREA AND ADMINISTER

SECTION V - HEALTH HAZARD DATA (Continued)

AID.

-Eye Contact:
FLUSH WITH WATER FOR AT LEAST 15 MINUTES.

-Skin Contact:
REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP AND WATER.

-Ingestion:
DO NOT INDUCE VOMITING. OBTAIN MEDICAL ATTENTION.

-Notes to Physician:
N/A

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:
IARC--> No NTP--> No OSHA--> No ACGIH--> No OTHER--> No

WELDING AND BRAZING FUMES CANNOT BE CLASSIFIED SIMPLY. THE COMPOSITION ANDQUANTITY ARE DEPENDENT UPON THE METAL BEING JOINED, THE PROCESS, THE PROCEDURES, AND THE FILLER METAL BEING USED. OTHER CONDITIONS WHICH ALSO INFLUENCE THE COMPOSITION AND QUANTITY OF THE FUMES AND GASSES TO WHICH THEWORKER MAY BE EXPOSED INCLUDE COATINGS ON THE METAL BEING JOINED, THE NUMBER OF WELDERS AND THE VOLUME OF THE WORK SPACE, THE QUALITY AND AMOUNT OFVENTILATION, THE POSITION OF THE OPERATOR'S HEAD IN RELATION TO THE FUME PLUME AS WELL AS THE PRESENCE OF CONTAMINANTS IN THE ATMOSPHERE WHEN THE FILLER METAL IS CONSUMED. THE FUME AND GAS DECOMPOSITION PRODUCTS GENERATED ARE DIFFERENT IN PERCENT AND FORM FROM THE INGREDIENTS LISTED IN SECTION II. FUME AND GAS DECOMPOSITION PRODUCTS FROM NORMAL OPERATION INCLUDE THOSE ORIGINATING FROM THE VOLATILIZATION, REACTION AND OXIDATION OF THE ELECTRODE, PLUS THOSE FROM THE BASE METAL, COATING, ETC. AS NOTED ABOVE.

SECTION VII - REACTIVITY DATA

Stability: X <--Stable <--Unstable
Conditions to Avoid:
N/A

Incompatibility (Materials to Avoid):
NONE

Hazardous Decomposition Products:
N/A

Hazardous Polymerization: X <--May Occur X <--Will Not Occur
Conditions to Avoid:
N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled:
PICK UP PRODUCT. SWEEP AREA.

Waste Disposal Method(s):
PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSABLE CONTAINER, OR LINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER, IN FULL COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

Neutralizing Agent:
N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:
USE ENOUGH VENTILATION, LOCAL EXHAUST AT THE ARC OR BOTH TO KEEP THE FUMES AND GASES BELOW THE TLV'S IN THE WORKERS BREATHING ZONE AND THE GENERAL AREA. TRAIN THE WELDOR TO KEEP HIS HEAD OUT OF THE FUMES.

Respiratory Protection:
USE NIOSH APPROVED OR EQUIVALENT FUME RESPIRATOR OR AIR SUPPLIED RESPIRATOR WHEN WELDING IN A CONFINED SPACE OR WHERE LOCAL EXHAUST OR VENTILATION DOES NOT KEEP EXPOSURE BELOW TLV.

Glove Protection:
WELDER'S PROTECTIVE GLOVES

Eye Protection:
PROTECTIVE WELDING LENS, #10 OR DARKER

Other Protection:
PROTECTIVE CLOTHING SUCH AS LEATHER APRONS, ETC.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors--> Outdoors--> Heated--> Refrigerated-->
Minimum Temperature: N/A Maximum Temperature: N/A

Precautions to be Taken in Handling and Storing:
KEEP MATERIAL DRY AND SEALED BEFORE USE.

Other Precautions:
DURING USE, WELDING ARC AND SPARK CAN IGNITE COMBUSTIBLE MATERIALS. THESE PRODUCT SHOULD BE REMOVED FROM THE WORK AREA.

SECTION XI - REGULATORY INFORMATION

SECTION XI - REGULATORY INFORMATION (Continued)

Chemical Name	CAS Number	Upper % Limit
None		

Those ingredients listed above are subject to the reporting requirements of 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Please call 1-800-527-9919 for additional information if you are a California customer.
This MSDS is not intended for users in the state of California.

SECTION XII - REFERENCES

1. SAX'S DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, TENTH EDITION, RICHARD J. LEWIS, SR.
2. TOXIC SUBSTANCE CONTROL ACT, TSCA, OCTOBER, 1999.
3. TITTLE III SECTION 313 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT, SARA, OCTOBER, 1999.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

X-ERGON, A PARTSMASTER CO., DIV OF NCH assumes no responsibility for personal injury or property damage caused by the use, storage, or disposal of the product in a manner not recommended on the product label. Users assume all risks associated with such unrecommended use, storage, or disposal of the product.

This MSDS should be attached or kept with the respective product with which it is associated.

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MATERIAL SAFETY DATA SHEET - A0635

Associated Grainger Items

5A266

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : NAVY GRAY 9604965

IDENTIFICATION NUMBER: 0975 402

DATE PRINTED : 11/03/97

PRODUCT USE/CLASS : ENAMEL/ALKYD

SUPPLIER:	MANUFACTURER:
RUST-OLEUM CORPORATION	RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY	11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS	VERNON HILLS, ILLINOIS
60061 USA	60061 USA
(847) 367-7700 RUST-OLEUM CORP.	(847) 367-7700 RUST-OLEUM CORP.
MON.-FRI, 8:00 AM-4:30 PM	MON.-FRI, 8:00 AM-4:30 PM

PREPARER: LJW, PHONE: , PREPARE DATE: 06/11/97

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	STODDARD SOLVENT	8052-41-3	45.0 %
02	TITANIUM DIOXIDE	13463-67-7	5.0 %
03	1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
04	1,3,5-TRIMETHYLBENZENE	108-67-8	5.0 %
05	XYLENE	1330-20-7	5.0 %
06	COBALT DRIER	136-52-7	1.0 %

EXPOSURE LIMITS

	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	100PPM	N.E.	100PPM	N.E.	N.E.	NO
02	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
03	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
04	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
05	100PPM	150PPM	100PPM	N.E.	N.E.	NO
06	N.E.	N.E.	N.E.	N.E.	N.E.	NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

*** EMERGENCY OVERVIEW ***: HARMFUL IF SWALLOWED. CAUSES (TARGET ORGAN OR SYSTEM) DAMAGE. CAUSES EYE IRRITATION. VAPORS IRRITATING TO EYES AND RESPIRATORY TRACT. COMBUSTIBLE LIQUID AND VAPOR.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: MAY CAUSE SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION: HARMFUL IF INHALED. MAY CAUSE HEADACHES AND DIZZINESS.

EFFECTS OF OVEREXPOSURE - INGESTION: SUBSTANCE MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN AND EYE DAMAGE AS WELL AS ANEMIA. EFFECTS IN HUMANS HAVE INCLUDED LIVER AND CARDIAC ABNORMALITIES. CONTAINS CARBON BLACK. CHRONIC INFLAMMATION, LUNG FIBROSIS, AND LUNG TUMORS HAVE BEEN OBSERVED IN SOME RATS EXPERIMENTALLY EXPOSED

FOR LONG PERIODS OF TIME TO EXCESSIVE CONCENTRATIONS OF CARBON BLACK AND SEVERAL INSOLUBLE FINE DUST PARTICLES. TUMORS HAVE NOT BEEN OBSERVED IN OTHER ANIMAL SPECIES (I.E., MOUSE AND HAMPSTER) UNDER SIMILAR CIRCUMSTANCES AND STUDY CONDITIONS. EPIDEMIOLOGICAL STUDIES OF NORTH AMERICAN WORKERS SHOW NO EVIDENCE OF CLINICALLY SIGNIFICANT ADVERSE HEALTH EFFECTS DUE TO OCCUPATIONAL EXPOSURE TO CARBON BLACK. CARBON BLACK IS LISTED AS A GROUP 2B-"POSSIBLY CARCINOGENIC TO HUMANS" BY IARC AND IS PROPOSED TO BE LISTED AS A4-
"NOT CLASSIFIED AS A HUMAN CARCINOGEN" BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS. SIGNIFICANT EXPOSURE IS NOT ANTICIPATED DURING BRUSH APPLICATION OR DRYING. RISK OF OVEREXPOSURE DEPENDS ON DURATION AND LEVEL OF EXPOSURE TO DUST FROM REPEATED SANDING OF SURFACES OR SPRAY MIST AND THE ACTUAL CONCENTRATION OFCARBON BLACK IN THE FORMULA.
PRIMARY ROUTE(S) OF ENTRY: INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEASE 15 MINUTES. GET MEDICAL ATTENTION.
FIRST AID - SKIN CONTACT: WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.
FIRST AID - INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET

SECTION 4 - FIRST AID MEASURES

IMMEDIATE MEDICAL ATTENTION.
FIRST AID - INGESTION: ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 102 F LOWER EXPLOSIVE LIMIT: 0.9 %
UPPER EXPLOSIVE LIMIT: 6.6 %

AUTOIGNITION TEMPERATURE: NE
EXTINGUISHING MEDIA: DRY CHEMICAL FOAM WATER FOG
UNUSUAL FIRE AND EXPLOSION HAZARDS: KEEP CONTAINERS TIGHTLY CLOSED.
SPECIAL FIREFIGHTING PROCEDURES: WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE AUTOIGNITION OR EXPLOSION. EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING: WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES. AVOID BREATHING VAPOR OR MIST. AVOID CONTACT WITH EYES.
STORAGE: KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAME AND SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

WINDOWS TO ACHIEVE CROSS-VENTILATION.
RESPIRATORY PROTECTION: A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR`S USE. A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO

EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

SKIN PROTECTION: USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION: USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT: REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES: WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 276 - 383 F	VAPOR DENSITY	: IS HEAVIER THAN AIR
ODOR	: SOLVENT	ODOR THRESHOLD	: NE
APPEARANCE	: LIQUID	EVAPORATION RATE	: IS SLOWER THAN ETHER
SOLUBILITY IN H2O	: SLIGHT		
FREEZE POINT	:	SPECIFIC GRAVITY	: 0.9438
VAPOR PRESSURE	: ND	PH @ 0.0 %	: ND
PHYSICAL STATE	: LIQUID	VISCOSITY	: >100 SUS

COEFFICIENT OF WATER/OIL DISTRIBUTION: NE

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS: BY OPEN FLAME, CARBON MONOXIDE AND

SECTION 10 - STABILITY AND REACTIVITY

CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
STODDARD SOLVENT	4900MG/KG(RAT)	N.E.
TITANIUM DIOXIDE	24000MG/KG RATS	6820MG/M3 RATS
1,2,4-TRIMETHYLBENZENE	N.E.	RAT 18G/M^3 4HR
1,3,5-TRIMETHYLBENZENE	RAT 1303MG/KG	RAT 24MG/M^3 4HR
XYLENE	RAT 4300MG/KG	RAT 5000PPM 4HR
COBALT DRIER	NA	NA

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: PRODUCT IS A MIXTURE OF LISTED COMPONENTS.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

NO TRANSPORTATION INFORMATION IS AVAILABLE.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

SECTION 15 - REGULATORY INFORMATION

CERCLA - SARA HAZARD CATEGORY:

THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA `HAZARD CATEGORIES` PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER

APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD FIRE HAZARD

SARA SECTION 313:

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

---------- CHEMICAL NAME ----------	CAS NUMBER	WT/WT % IS LESS THAN
1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
XYLENE	1330-20-7	5.0 %
ETHYLBENZENE	100-41-4	1.0 %

TOXIC SUBSTANCES CONTROL ACT:

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES:

---------- CHEMICAL NAME ----------	CAS NUMBER

NO INFORMATION IS AVAILABLE.

U.S. STATE REGULATIONS: AS FOLLOWS -

NEW JERSEY RIGHT-TO-KNOW:

THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

---------- CHEMICAL NAME ----------	CAS NUMBER
ALKYD RESIN	66070-60-8

PENNSYLVANIA RIGHT-TO-KNOW:

THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

---------- CHEMICAL NAME ----------	CAS NUMBER
ALKYD RESIN	66070-60-8

CALIFORNIA PROPOSITION 65:

WARNING: THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

---------- CHEMICAL NAME ----------	CAS NUMBER

NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

SECTION 15 - REGULATORY INFORMATION

CANADIAN WHMIS: THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: NO INFORMATION AVAILABLE.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: FLAMMABILITY: REACTIVITY:

PREVIOUS MSDS REVISION DATE: 04/10/97

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED,
N.D. - NOT DETERMINED

: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

0082534191 HAZARDOUS MATERIAL WARNING (HAZMAT) 5A266

When shipment is complete, retain for daily Hazmat audit.

****

GRAINGER SHIPPING INFORMATION

STOCK # : 5A266

MSDS # : A0635

FREIGHT CODE : 0204

DOT PROPER SHIP NAME : PER 49 CFR 173.150(F)(2)
NOT REGULATED BY THE DOT AS A HAZARDOUS MATERIAL
COMBUSTIBLE LIQUID, N.O.S., (PAINT),

UPS RESTRICTIONS :

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL :

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : CAN REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 : ONLY ARROW UP LABEL(2S594) REQUIRED.

SHIPPING PAPERS : NONE REQUIRED.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A0827

Associated Grainger Items

6A387

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : MARLIN BLUE 9702228

IDENTIFICATION NUMBER: 0866 402

DATE PRINTED : 11/03/97

PRODUCT USE/CLASS : ENAMEL/ALKYD

SUPPLIER:	MANUFACTURER:
RUST-OLEUM CORPORATION	RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY	11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS	VERNON HILLS, ILLINOIS
60061 USA	60061 USA
(847) 367-7700 RUST-OLEUM CORP.	(847) 367-7700 RUST-OLEUM CORP.
MON.-FRI, 8:00 AM-4:30 PM	MON.-FRI, 8:00 AM-4:30 PM

PREPARER: DC, PHONE: , PREPARE DATE: 06/11/97

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	STODDARD SOLVENT	8052-41-3	40.0 %
02	TITANIUM DIOXIDE	13463-67-7	20.0 %
03	1,3,5-TRIMETHYLBENZENE	108-67-8	5.0 %
04	1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
05	XYLENE	1330-20-7	5.0 %
06	COBALT DRIER	136-52-7	1.0 %

EXPOSURE LIMITS

	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	100PPM	N.E.	100PPM	N.E.	N.E.	NO
02	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
03	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
04	25 PPM	N.E.	N.E.	N.E.	N.E.	NO
05	100PPM	150PPM	100PPM	N.E.	N.E.	NO
06	N.E.	N.E.	N.E.	N.E.	N.E.	NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

*** EMERGENCY OVERVIEW ***: HARMFUL IF SWALLOWED. CAUSES (TARGET ORGAN OR SYSTEM) DAMAGE. CAUSES EYE IRRITATION. VAPORS IRRITATING TO EYES AND RESPIRATORY TRACT. COMBUSTIBLE LIQUID AND VAPOR.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: MAY CAUSE SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION: HARMFUL IF INHALED. MAY CAUSE HEADACHES AND DIZZINESS.

EFFECTS OF OVEREXPOSURE - INGESTION: SUBSTANCE MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN AND EYE DAMAGE AS WELL AS ANEMIA. EFFECTS IN HUMANS HAVE INCLUDED LIVER AND CARDIAC ABNORMALITIES.

PRIMARY ROUTE(S) OF ENTRY: INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEASE 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT: WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET IMMEDIATE MEDICAL ATTENTION.

FIRST AID - INGESTION: ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 104 F LOWER EXPLOSIVE LIMIT: 0.9 %

UPPER EXPLOSIVE LIMIT: 6.6 %

AUTOIGNITION TEMPERATURE: NE

SECTION 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: DRY CHEMICAL FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: KEEP CONTAINERS TIGHTLY CLOSED.

SPECIAL FIREFIGHTING PROCEDURES: WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE AUTOIGNITION OR EXPLOSION. EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING: WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES. AVOID BREATHING VAPOR OR MIST. AVOID CONTACT WITH EYES.

STORAGE: KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAME AND SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION: A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR`S USE. A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

SKIN PROTECTION: USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION: USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT: REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES: WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE : 276 - 383 F | VAPOR DENSITY : IS HEAVIER THAN AIR

ODOR : SOLVENT | ODOR THRESHOLD : NE

APPEARANCE : LIQUID | EVAPORATION RATE: IS SLOWER THAN ETHER

SOLUBILITY IN H2O : SLIGHT

FREEZE POINT : ND | SPECIFIC GRAVITY: 1.0181

VAPOR PRESSURE : ND | PH @ 0.0 % : ND

PHYSICAL STATE : LIQUID | VISCOSITY : >100 SUS

COEFFICIENT OF WATER/OIL DISTRIBUTION: NE

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS: BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
STODDARD SOLVENT	4900MG/KG(RAT)	N.E.
TITANIUM DIOXIDE	24000MG/KG RATS	6820MG/M3 RATS

SECTION 11 - TOXICOLOGICAL PROPERTIES

CHEMICAL NAME	LD50	LC50
1,3,5-TRIMETHYLBENZENE	RAT 1303MG/KG	RAT 24MG/M^3 4HR
1,2,4-TRIMETHYLBENZENE	N.E.	RAT 18G/M^3 4HR
XYLENE	RAT 4300MG/KG	RAT 5000PPM 4HR
COBALT DRIER	NA	NA

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: PRODUCT IS A MIXTURE OF LISTED COMPONENTS.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

NO TRANSPORTATION INFORMATION IS AVAILABLE.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:

THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA `HAZARD CATEGORIES` PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD FIRE HAZARD

SARA SECTION 313:

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
1,2,4-TRIMETHYLBENZENE	95-63-6	5.0 %
XYLENE	1330-20-7	5.0 %

SECTION 15 - REGULATORY INFORMATION

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
ETHYLBENZENE	100-41-4	1.0 %

TOXIC SUBSTANCES CONTROL ACT:

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES:

---------- CHEMICAL NAME ---------- CAS NUMBER

NO INFORMATION IS AVAILABLE.

U.S. STATE REGULATIONS: AS FOLLOWS -

NEW JERSEY RIGHT-TO-KNOW:

THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

---------- CHEMICAL NAME ---------- CAS NUMBER

ALKYD RESIN 66070-60-8

PENNSYLVANIA RIGHT-TO-KNOW:

THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

---------- CHEMICAL NAME ---------- CAS NUMBER

ALKYD RESIN 66070-60-8

CALIFORNIA PROPOSITION 65:

WARNING: THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

---------- CHEMICAL NAME ---------- CAS NUMBER

NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: NO INFORMATION AVAILABLE.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: FLAMMABILITY: REACTIVITY:

PREVIOUS MSDS REVISION DATE: 04/10/97

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED,
N.D. - NOT DETERMINED

SECTION 16 - OTHER INFORMATION

: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

0082534191 HAZARDOUS MATERIAL WARNING (HAZMAT) 6A387

When shipment is complete, retain for daily Hazmat audit.

****

GRAINGER SHIPPING INFORMATION

STOCK # : 6A387

MSDS # : A0827

FREIGHT CODE : 0204

DOT PROPER SHIP NAME : PER 49 CFR 173.150(F)(2)
NOT REGULATED BY THE DOT AS A HAZARDOUS MATERIAL
COMBUSTIBLE LIQUID, N.O.S., (PAINT),

UPS RESTRICTIONS :

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL :

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : CAN REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 : ONLY ARROW UP LABEL(28594) REQUIRED.

SHIPPING PAPERS : NONE REQUIRED.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

This MSDS should be attached or kept with the respective product with which it is associated.

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MATERIAL SAFETY DATA SHEET - 7SQ11

Associated Grainger Items

3JT31, 3JT33, 3JT39, 3JW39, 3JW40, 3JW41, 3JW42, 3JW43, 3JW44

3JW39,3JW40,3JW41,3JW42,3JW43,3JW44,3JT31,3JT33

3005

SECTION I - NAME AND PRODUCT

MANUFACTURER'S NAME: WOOSTER PRODUCTS INC.

ADDRESS (STREET, CITY, STATE, AND ZIP CODE):

1000 SPRUCE ST, PO BOX 6005, WOOSTER, OH 44691

CONTACT:

EMERGENCY TELEPHONE NO.: 330-264-2844

DATE: JANUARY 1, 1999

TRADE NAME: FLEX TRED

C.A.S. NUMBER:

SUB RISK:

D.O.T. HAZARD CLASS: 3

HMIS: 0 0 0 A

I.D.:

MFAG:

PROPER SHIPPING NAME:

SECTION II - HAZARDOUS INGREDIENTS

			EXPOSURE LIMITS - VP		
INGREDIENTS	CAS#	WEIGHT %	ACGIH/TLV	OSHA/PEL	MM HG

N/A

SECTION III - PHYSICAL DATA

BOILING RANGE: N/A

EVAP. RATE: N/A

SP GRAVITY: N/A

VISCOSITY: N/A

VAPOR DENSITY: N/A

PERCENT VOLATILE BY VOLUME: N/A

VOLATILE ORGANICS: N/A

VAPOR PRESSURE: N/A

PH: N/A

SOLUBILITY IN WATER: N/A

APPEARANCE & ODOR: VARIED COLOR

SECTION IV - FIRE AND EXPLOSION DATA

FLAMMABILITY CLASS: N/A

FLASH POINT: N/A

LEL: N/A

UEL: N/A

EXTINGUISHING MEDIA: WATER, CARBON DIOXIDE, FOAM AND DRY CHEMICAL.

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE & EXPLOSION HAZARDS: TRACE OF HYDROGEN CYANIDE WHEN BURNED.

NFPA-HAZARD-CODES: HEALTH N/A FIRE N/A REACTIVITY N/A

UNUSUAL REACTION HAZARD: NONE

SECTION V - HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE OF ENTRY: INHALATION

EFFECTS OF OVEREXPOSURE: N/A

FIRST AID AND MEDICAL INFORMATION:

PRIMARY ROUTE OF ENTRY: EYE CONTACT

EFFECTS OF OVEREXPOSURE: N/A

FIRST AID AND MEDICAL INFORMATION:

PRIMARY ROUTE OF ENTRY: SKIN CONTACT

EFFECTS OF OVEREXPOSURE: N/A

FIRST AID AND MEDICAL INFORMATION:

PRIMARY ROUTE OF ENTRY: INGESTION

EFFECTS OF OVEREXPOSURE: N/A

FIRST AID AND MEDICAL INFORMATION:

OTHER HEALTH HAZARD INFORMATION:

SECTION VI - CORROSIVITY AND REACTIVITY DATA

STABILITY: UNSTABLE __ STABLE X

INCOMPATIBILITY (MATERIALS TO AVOID): N/A

DECOMPOSITION PRODUCTS: CO, OXIDES OF NITROGEN, TRACE OF HYDROGEN CYANIDE, HYDROCARBONS

CONDITIONS TO BE AVOIDED:

POLYMERIZATION MAY OCCUR __ WILL NOT OCCUR X

SECTION VII - STORAGE, HANDLING AND USE PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILLS: N/A

WASTE DISPOSAL METHOD: LANDFILL.

ENVIRONMENTAL DATA: N/A

SECTION VIII - PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: N/A

VENTILATION: NONE REQUIRED.

SKIN CONTACT: N/A

EYE PROTECTION: SAFETY GLASSES.

OTHER: NONE.

SECTION IX - SPECIAL PRECAUTIONS/REGULATORY INFORMATION

ALTHOUGH THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN (HEREINAFTER "INFORMATION") ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE CORRECT AS OF

DATE HEREOF. WOOSTER PRODUCTS INC. MAKES NO REPRESENTATIONS AS TO THE COMPLETENESS OR ACCURACY THEREOF. INFORMATION IS SUPPLIED UPON THE CONDITIO THAT THE PERSONS RECEIVING SAME WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSES PRIOR TO USE. IN NO EVENT WILL WOOSTER PRODU INC. BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE OF, OR RELIANCE UPON INFORMATION. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PROD TO WHICH INFORMATION REFERS.

MATERIAL SAFETY DATA SHEET

1.0 PRODUCT AND COMPANY IDENTIFICATION

Product Name: WATER PRESERVATIVE

Product Use: Water Preservative

Manufacturer/Supplier: Fendall Company

Address: 5 East College Drive
Arlington Heights, IL 60004
USA

Phone Number: (847) 577-7400

2.0 INFORMATION ON INGREDIENTS

Ingredients	CAS#	Wt%	OSHA-PEL	ACGIH-TLV	LD_{50}	LC_{50}
Ethylenediaminetetraacetic acid	60-00-4	10-30	Not available	Not available	>2000 mg/kg oral, rat	Not available
Benzalkonium chloride	8001-54-5	3-7	Not available	Not available	745 mg/kg oral, rat	Not available

3.0 HEALTH HAZARDS IDENTIFICATION

Route of Entry: Eye, Skin Contact, Ingestion

EFFECTS OF ACUTE EXPOSURE:
Eye: Contact may cause irritation.
Skin: May cause irritation.
Ingestion: May cause stomach distress and other medical problems.

EFFECTS OF CHRONIC EXPOSURE:
Skin: Prolonged or repeated exposure can cause drying, defatting, and dermatitis.
Irritancy: May cause irritation.
Respiratory Tract Sensitization: No data available.
Carcinogenicity: No ingredients listed by IARC, ACGIH, NTP or OSHA greater than 0.1%.
Teratogenicity, Reproductive Effects: No data available.
Mutagenicity: No data available. **Synergistic Materials:** None

4.0 FIRST AID MEASURES

Eye: Flush eyes with cool water. Remove contact lenses, if applicable, and continue flushing for 15 minutes. If irritation persists, obtain medical attention.
Skin: Flush with cool water. Wash thoroughly with soap and water. Obtain medical attention if irritation persists.
Inhalation: Not a normal route of exposure. If symptoms develop, move victim to fresh air. If symptoms persist, obtain medical attention.
Ingestion: Do not induce vomiting. Rinse mouth with water, then drink one glass of water. Obtain medical attention or call poison control centre immediately. Never give anything by mouth if victim is unconscious, is rapidly losing consciousness or is convulsing.

5.0 FIRE FIGHTING MEASURES

Flammability: Not flammable
Flash Point (deg F/C, TCC): None **LEL:** Not applicable **UEL:** Not applicable
Hazardous Combustion Products: May include but are not limited to oxides of carbon, oxides of nitrogen, ammonia, hydrogen chloride.
Means of Extinction: Treat for surrounding material.
Special Fire Hazards: Fire fighters should wear self-contained breathing apparatus.

6.0 ACCIDENTAL RELEASE MEASURES

Leak and Spill Procedure: Before attempting cleanup, refer to hazard data given above. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered, labelled containers. Prevent large spills from entering sewers or waterways. Contact emergency services and supplier for advice. For large quantities review federal, state/provincial and local government requirements prior to disposal.

7.0 HANDLING AND STORAGE

Storage and Handling Requirements: Keep out of reach of children. Store in closed container away from incompatible materials.

8.0 EXPOSURE CONTROLS/PERSONAL PROTECTION

Gloves: Impervious. Confirm with a reputable supplier.
Eye Protection: Safety goggles.
Respiratory Protection: General ventilation normally adequate.
Other Protective Equipment: As required by employer code.
Engineering Controls: Ensure good ventilation.

9.0 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (deg F/C): Not available
Oven Solids (Wt %): Not available
Solubility in Water: Complete
Physical State: Liquid
Appearance and odour: Transparent; no distinct odour

Specific Gravity (H_2O = 1): Not available
Evaporation Rate (H_2O = 1): Not available
pH (100%): Not available
Viscosity: Water thin
Odour Threshold (ppm): Not available

10.0 STABILITY AND REACTIVITY

Conditions for Chemical Instability: Stable.
Incompatible Materials: Strong oxidizing agents, strong reducing agents.
Conditions for Reactivity: Not available.
Hazardous Decomposition Products: May include but are not limited to oxides of carbon, oxides of nitrogen, ammonia, hydrogen chloride when heated to decomposition.

11.0 DISPOSAL CONSIDERATIONS

Review federal, state/provincial and local government requirements prior to disposal.

12.0 TRANSPORTATION

T.D.G. Classification: Not regulated.
D.O.T. Classification: Not regulated.

13.0 REGULATORY INFORMATION

Occupational Health and Safety Regulations:
WHMIS Class: Class D; Division 2B
OSHA & WHMIS: MSDS prepared pursuant to the Hazard Communication Standard (CFR29 1910.1200) and Canadian WHMIS regulations (Controlled Products Regulations under the Hazardous Products Act).
SARA Title III; Section 313: No hazardous ingredients listed.

14.0 PREPARATION INFORMATION

Date: July 1, 1999
Telephone: (519) 858-5021

MSDS Prepared by: Dell Tech Laboratories Ltd.

Disclaimer

Information for this material safety data sheet was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this form. If user requires independent information on ingredients in this or any other material, we recommend contact with the Canadian Centre for Occupational Health and Safety (CCOHS) in Hamilton, Ontario (1-800-263-8466) or CSST in Montreal, Quebec (514-873-3990).

PART #5352

0116263709 MATERIAL SAFETY DATA SHEET (MSDS) 3W769

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - 7S151

Associated Grainger Items
3W767, 3W768, 3W769, 3W770

FORMAX MANUFACTURING CORP. 7S151
MATERIAL SAFETY DATA SHEET for 3W767
3W768
MSDS NO. 29-A 3W769
DATE: 8/19/88 3W770

SECTION I:
PRODUCT NAME OR NUMBER (AS IT APPEARS ON LABEL):
FOUR BAR BUFFING COMPOUND SET
THE KIT/SET CONTAINS FOUR DIFFERENT GRADES OF BUFFING COMPOUNDS. ALL GRADES ARE FORMULATED WITH AN ABRASIVE THAT SERVES TO BUFF/SHINE THE WORK SURFACE AND THE GREASE BINDERS SERVE TO ADHERE THE ABRASIVE TO THE BUFFING WHEEL FACE. THE TYPE OF ABRASIVE AND GREASE BINDER PERCENTAGES CAN BE, AND ARE VARIED TO SUIT THE INDIVIDUAL REQUIREMENTS TO BUFF AND SHINE DIFFERENT CLASSES OF METALS AND PLASTICS.

MANUFACTURER'S NAME: FORMAX MANUFACTURING CORPORATION
ADDRESS: 3178 BELLVUE, DETROIT, MICHIGAN 48207
EMERGENCY TELEPHONE NO.: 313-921-7030
APPROVED BY: H.J. MCALEER
MANUFACTURER'S D.U.N.S. NO.: 00-535-4238
PROPER SHIPPING NAME: NMFC-48580 SCOURING COMPOUND (CAKE, PASTE, OR LIQUID FORM N.O.I.)
ADDITIONAL HAZARD CLASSES (AS APPLICABLE): NOT REGULATED BY D.O.T.
CHEMICAL FAMILY: ORGANIC/INORGANIC MIXTURE
FORMULA: ABRASIVES IN GREASE MATRIX

SECTION II COMPOSITION:
BINDERS

CHEMICAL NAME:	ANIMAL FATS & GLYCERIDES	PARAFFIN
% RANGE:	32 - 17	3 - 3
COMMON NAME:	TRIGLYCERIDES	WAX
TALLOW DERIVATIVE		
REG.*(Y/N):	Y	
CAS #:	61789-97-7	8002-74-2
67701-27-2		
OSHA PEL:	15mg/M3 (Total dust)	
ACGIH TLV:	10mg/M3	
CARCINOGEN*(Y/N):	N	N

ABRASIVES

CHEMICAL NAME:	TRIPOLI	SILICON CARBIDE	ALUMINA OXIDE	FERRIC
% RANGE:	65 - 80	65 - 80	65 - 80	65 - 80
COMMON NAME:	BROWN ROUGE	BLACK EMERY	WHITE ROUGE	RED ROUGE
CAS #:	7631-86-9	409-21-2	1344-28-1	1309-37-1
CARCINOGEN*:	N	N	N	N

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Michigan Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA:
Boiling Point: Over 250 Deg F
Melting Point: 125 Deg/135 Deg
Specific Gravity: 1.5
Vapor Pressure: N/A
Percent Volatile by Vol: -0-
Vapor Density: N/A
Evaporation Rate: None
Solubility in Water: Negligible
Solubility in Alcohol: Partially
Solubility in Other Solvent: Alkaline soap cleaners or chlorinated solutions.
Appearance and Odor: Cake form - Tallow odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA:
Flash Point: over 300 Deg F Method Used: C.O.C.
Flammable Limits: NAIF
Extinguishing Media: C.O.2; Dry chemical or foam
Special Fire Fighting Procedures: Treat buffing dust, dirt and debris as an oil fire.
Explosion Potential: None

SECTION VI REACTIVITY DATA:
STABILITY: Stable CONDITIONS TO AVOID: NAIF
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers or reducing agents
HAZARDOUS DECOMPOSITION PRODUCTS: On combustion hydrocarbons may form to product smoke, carbon monoxide, carbon dioxide.
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Using under condition of insufficient dust collecting system.

SECTION V HEALTH, FIRST AID AND MEDICAL DATA:
PRIMARY ROUTE(S) OF ENTRY: ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE
Inhalation (During use): Acute - May cause coughing, shortness
of breath (dust). Chronic - May affect breathing capacity
(dust).
Ingestion: No known adverse effects, but ingestion not recommended.
Skin (Contact & Absorption): Irritation of the skin may occur due to mechanical/chemical action.
Eye: Dust may irritate eyes.
Other Potential Health Risks: (Prolonged inhalation of dust particles may result in disabling pulmonary fibrosis.) Symptoms might include deposits of materials in eyes, ears, nasal passages, irritation of mucus membranes.
WARNING: Do not breath dust of compounds containing abrasive materials without following OSHA Safety and Health Standards for Dust Accumulation Collection.

KMB00003458

FIRST AID AND MEDICAL INFORMATION

Inhalation: Remove to fresh air, apply artificial respiration as needed. Obtain first aid or medical assistance.

Ingestion: Obtain first aid or medical assistance, if needed.

Skin: Obtain first aid or medical assistance, if needed.

Eye: Wash with large amounts of water; obtain first aid or medical assistance, if needed.

SECTION VII SPILL OR LEAK PROCEDURES:

Steps To Be Taken In Case Material Is Released Or Spilled: Sweep into containers. Storage of buffing wheel and compound debris may contain combustible lint.

Waste Disposal Method: Incinerate or dispose in accordance with Federal, State and Local Regulations.

CERCLA (SUPERFUND) Reportable Quantity (in lbs): N/A

RCRA Hazardous Waste No. (40CFR261.33): N/A

Volatile Organic Compound (VOC) (As packaged, minus water): N/A ANALYTICAL: 14 lb/gal

SECTION VIII SPECIAL PROTECTION INFORMATION:

Respiratory Protection (specify type): 24 CFR/134 NIOSH/MSHA approved respirators for particulates from buffing debris.

Ventilation: Local Exhaust: General Room Ventilation

♦

Mechanical (general): Recommend venting to dust collectors

Protective Gloves: As desired by user.

Eye Protection: OSHA 29 CFR 1910.122 SAFETY GLASSES

Other Protective Equipment: Protective work clothing, body apron or belly pads, safety shoes, as needed.

Hearing Protection: OSHA 29 CFR 1910.215 (Hearing Protection)

SECTION IX SPECIAL PRECAUTIONS:

Precautions To Be Taken In Handling And Storing: Handle with adequate ventilation for nuisance dust when using. See OSHA 29 CFR 1910.24 (VENTILATION) and 29 CFR 1910.1000 (AIR CONTAMINANTS).

Other Precautions: Keep liquids from freezing. Store away from excessive heat.

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however, Formax Mfg. makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

NOTE: NAIF = NO APPLICABLE INFORMATION FOUND

0116263709 MATERIAL SAFETY DATA SHEET (MSDS) 3W770

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - 7S151

Associated Grainger Items
3W767, 3W768, 3W769, 3W770

FORMAX MANUFACTURING CORP. 7S151
MATERIAL SAFETY DATA SHEET for 3W767
3W768
MSDS NO. 29-A 3W769
DATE: 8/19/88 3W770

SECTION I:
PRODUCT NAME OR NUMBER (AS IT APPEARS ON LABEL):
FOUR BAR BUFFING COMPOUND SET
THE KIT/SET CONTAINS FOUR DIFFERENT GRADES OF BUFFING COMPOUNDS. ALL GRADES ARE FORMULATED WITH AN ABRASIVE THAT SERVES TO BUFF/SHINE THE WORK SURFACE AND THE GREASE BINDERS SERVE TO ADHERE THE ABRASIVE TO THE BUFFING WHEEL FACE. THE TYPE OF ABRASIVE AND GREASE BINDER PERCENTAGES CAN BE, AND ARE VARIED TO SUIT THE INDIVIDUAL REQUIREMENTS TO BUFF AND SHINE DIFFERENT CLASSES OF METALS AND PLASTICS.

MANUFACTURER'S NAME: FORMAX MANUFACTURING CORPORATION
ADDRESS: 3178 BELLVUE, DETROIT, MICHIGAN 48207
EMERGENCY TELEPHONE NO.: 313-921-7030
APPROVED BY: H.J. MCALEER
MANUFACTURER'S D.U.N.S. NO.: 00-535-4238
PROPER SHIPPING NAME: NMFC-48580 SCOURING COMPOUND (CAKE, PASTE, OR LIQUID FORM N.O.I.)
ADDITIONAL HAZARD CLASSES (AS APPLICABLE): NOT REGULATED BY D.O.T.
CHEMICAL FAMILY: ORGANIC/INORGANIC MIXTURE
FORMULA: ABRASIVES IN GREASE MATRIX

SECTION II COMPOSITION:
BINDERS

CHEMICAL NAME:	ANIMAL FATS & GLYCERIDES	PARAFFIN
% RANGE:	32 - 17	3 - 3
COMMON NAME:	TRIGLYCERIDES	WAX
TALLOW DERIVATIVE		
REG.*(Y/N):	Y	
CAS #:	61789-97-7	8002-74-2
67701-27-2		
OSHA PEL:	15mg/M3 (Total dust)	
ACGIH TLV:	10mg/M3	
CARCINOGEN*(Y/N):	N	N

ABRASIVES

CHEMICAL NAME:	TRIPOLI	SILICON CARBIDE	ALUMINA OXIDE	FERRIC
% RANGE:	65 - 80	65 - 80	65 - 80	65 - 80
COMMON NAME:	BROWN ROUGE	BLACK EMERY	WHITE ROUGE	RED ROUGE
CAS #:	7631-86-9	409-21-2	1344-28-1	1309-37-1
CARCINOGEN*:	N	N	N	N

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Michigan Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA:
Boiling Point: Over 250 Deg F
Melting Point: 125 Deg/135 Deg
Specific Gravity: 1.5
Vapor Pressure: N/A
Percent Volatile by Vol: -0-
Vapor Density: N/A
Evaporation Rate: None
Solubility in Water: Negligible
Solubility in Alcohol: Partially
Solubility in Other Solvent: Alkaline soap cleaners or chlorinated solutions.
Appearance and Odor: Cake form - Tallow odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA:
Flash Point: over 300 Deg F Method Used: C.O.C.
Flammable Limits: NAIF
Extinguishing Media: C.O.2; Dry chemical or foam
Special Fire Fighting Procedures: Treat buffing dust, dirt and debris as an oil fire.
Explosion Potential: None

SECTION VI REACTIVITY DATA:
STABILITY: Stable CONDITIONS TO AVOID: NAIF
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers or reducing agents
HAZARDOUS DECOMPOSITION PRODUCTS: On combustion hydrocarbons may form to product smoke, carbon monoxide, carbon dioxide.
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Using under condition of insufficient dust collecting system.

SECTION V HEALTH, FIRST AID AND MEDICAL DATA:
PRIMARY ROUTE(S) OF ENTRY: ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE
Inhalation (During use): Acute - May cause coughing, shortness
of breath (dust). Chronic - May affect breathing capacity
(dust).
Ingestion: No known adverse effects, but ingestion not recommended.
Skin (Contact & Absorption): Irritation of the skin may occur due to mechanical/chemical action.
Eye: Dust may irritate eyes.
Other Potential Health Risks: (Prolonged inhalation of dust particles may result in disabling pulmonary fibrosis.) Symptoms might include deposits of materials in eyes, ears, nasal passages, irritation of mucus membranes.
WARNING: Do not breath dust of compounds containing abrasive materials without following OSHA Safety and Health Standards for Dust Accumulation Collection.

FIRST AID AND MEDICAL INFORMATION

Inhalation: Remove to fresh air, apply artificial respiration as needed. Obtain first aid or medical assistance.

Ingestion: Obtain first aid or medical assistance, if needed.

Skin: Obtain first aid or medical assistance, if needed.

Eye: Wash with large amounts of water; obtain first aid or medical assistance, if needed.

SECTION VII SPILL OR LEAK PROCEDURES:

Steps To Be Taken In Case Material Is Released Or Spilled: Sweep into containers. Storage of buffing wheel and compound debris may contain combustible lint.

Waste Disposal Method: Incinerate or dispose in accordance with Federal, State and Local Regulations.

CERCLA (SUPERFUND) Reportable Quantity (in lbs): N/A

RCRA Hazardous Waste No. (40CFR261.33): N/A

Volatile Organic Compound (VOC) (As packaged, minus water): N/A ANALYTICAL: 14 lb/gal

SECTION VIII SPECIAL PROTECTION INFORMATION:

Respiratory Protection (specify type): 24 CFR/134 NIOSH/MSHA approved respirators for particulates from buffing debris.

Ventilation: Local Exhaust: General Room Ventilation

Mechanical (general): Recommend venting to dust collectors

Protective Gloves: As desired by user.

Eye Protection: OSHA 29 CFR 1910.122 SAFETY GLASSES

Other Protective Equipment: Protective work clothing, body apron or belly pads, safety shoes, as needed.

Hearing Protection: OSHA 29 CFR 1910.215 (Hearing Protection)

SECTION IX SPECIAL PRECAUTIONS:

Precautions To Be Taken In Handling And Storing: Handle with adequate ventilation for nuisance dust when using. See OSHA 29 CFR 1910.24 (VENTILATION) and 29 CFR 1910.1000 (AIR CONTAMINANTS).

Other Precautions: Keep liquids from freezing. Store away from excessive heat.

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however, Pormax Mfg. makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

NOTE: NAIF = NO APPLICABLE INFORMATION FOUND

0127521782 MATERIAL SAFETY DATA SHEET (MSDS) 6Z174

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - A1789

Associated Grainger Items

6ZC05, 6Z173, 6Z174, 6Z175

MATERIAL SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. STANDARD MUST BE CONSULTED FOR SPECIFIC REQUIREMENTS.

U.S. DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
(NON-MANDATORY FORM)
FORM APPROVED
OMB NO. 1218-0072

IDENTITY (AS USED ON LABEL AND LIST): ROCKITE CEMENT

NOTE:
BLANK SPACES ARE NOT PERMITTED. IF ANY ITEM IS NOT APPLICABLE, OR NO INFORMATION IS AVAILABLE, THE SPACE MUST BE MARKED TO INDICATE THAT.

------SECTION I ------

MANUFACTURER'S NAME: HARTLINE PRODUCTS CO., INC.

ADDRESS (NUMBER, STREET, CITY, STATE, AND ZIP CODE):
2120 S. GREEN RD.
SUITE 202
CLEVELAND, OHIO 44121

EMERGENCY TELEPHONE NUMBER: (216) 291-2303

TELEPHONE NUMBER FOR INFORMATION: (216) 291-2303

DATE PREPARED: 3-1-2001

SIGNATURE OF PREPARER (OPTIONAL):

------SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION ------

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY; COMMON NAME(S))		OSHA PEL
GYPSUM (CALCIUM SULFATE)	% WT: 98	15 MG/M3 TOTAL DUST 5 MG/M3 RESPIRABLE DUST
PORTLAND CEMENT	%WT: 2	10 MG/M3 TOTAL DUST 5 MG/M3 RESPIRABLE DUST

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY; COMMON NAME(S))	ACGIH TLV	CAS NO.
GYPSUM (CALCIUM SULFATE)	10 MG/M3 TOTAL DUST	7778-18-9
PORTLAND CEMENT	10 MG/M3 TOTAL DUST	65997-15-1

------SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS ------

BOILING POINT: NA

SPECIFIC GRAVITY (H2O = 1): 2.7

VAPOR PRESSURE (MMHg.): NA

MELTING POINT (DECOMPOSES): 1450 DEG. C

VAPOR DENSITY (AIR = 1): NA

EVAPORATION RATE (BUTYL ACETATE = 1): NA

SOLUBILITY IN WATER: 0.2%

HARDENING TIME: 12-15 MINUTES

APPEARANCE AND ODOR: WHITE, OFF-WHITE, GRAY OR PIGMENTED POWDER. - LOW ODOR.

------SECTION IV - FIRE AND EXPLOSION HAZARD DATA ------

FLASH POINT (METHOD USED): NONE

FLAMMABLE LIMITS:
LEL: NA
UEL: NA

EXTINGUISHING MEDIA: NOT COMBUSTIBLE

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

------SECTION V - REACTIVITY DATA ------

STABILITY:
UNSTABLE ( )
STABLE (X)

CONDITIONS TO AVOID:

INCOMPATIBILITY (MATERIALS TO AVOID):

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: ABOVE 1450 DEG. C - SO2 AND CaO

HAZARDOUS POLYMERIZATION:
MAY OCCUR ( )
WILL NOT OCCUR (X)

CONDITIONS TO AVOID:

------SECTION VI - HEALTH HAZARD DATA ------

ROUTE(S) OF ENTRY:
INHALATION?: YES
SKIN?:
INGESTION?:

HEALTH HAZARDS (ACUTE AND CHRONIC):

ACUTE:

EYES: MAY CAUSE IRRITATION.

SKIN:
MAY DEVELOP SUFFICIENT HEAT TO CAUSE BURNS IF A LARGE MASS, SUCH AS A CAST OF AN ARM OR LEG, IS KEPT IN CONTACT WITH SKIN WHILE HARDENING.

INHALATION: DUST IS CONSIDERED A NUISANCE DUST.

CHRONIC: NONE

CARCINOGENICITY: NOT CARCINOGENIC.
NTP?:
IARC MONOGRAPHS?:
OSHA REGULATED?:

SIGNS AND SYMPTOMS OF EXPOSURE:

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

EYES: FLOOD EYES FOR 15 MINUTES WITH WATER.

SKIN:
REMOVE FROM SKIN BY WASHING. IF IRRITATION CONTINUES, SEE PHYSICIAN.
GYPSUM CEMENT HARDENS WHEN WETTED AND IF INGESTED, MAY RESULT IN OBSTRUCTION.
SEE PHYSICIAN.

EMERGENCY AND FIRST AID PROCEDURES:

♦

------SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE ------

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
SWEEP UP. AVOID CREATING EXCESSIVE DUST. SLURRY MAY PLUG DRAINS.

WASTE DISPOSAL METHOD:
IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
DEW POINT CONDITIONS OR OTHER CONDITIONS CAUSING PRESENCE OF LIQUID WATER DURING STORAGE WILL HARDEN GYPSUM CEMENT.

OTHER PRECAUTIONS:

------SECTION VIII - CONTROL MEASURES ------

RESPIRATORY PROTECTION (SPECIFY TYPE):
NIOSH APPROVED NUISANCE DUST RESPIRATOR IF ABOVE TLV.

VENTILATION:
LOCAL EXHAUST: IF ABOVE, TLV
MECHANICAL (GENERAL):
SPECIAL:
OTHER:

PROTECTIVE GLOVES: IF DUST OR SLURRY IS IRRITATING.

EYE PROTECTION: DUST GOGGLES OR SAFETY GLASSES IF DUST IS ANNOYING.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: NONE

WORK/HYGIENIC PRACTICES:

(REPRODUCE LOCALLY)

OSHA 174, SEPT. 1985

* U.S.G.P.O.: 1986-491-529/45775

PICK REQ: 0155235434 ITEM: 5W181 MSDS: A4608

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A4608

Associated Grainger Items

5W181

MATERIAL SAFETY DATA SHEET

------SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ------

PRODUCT NAME: RUST REFORMER 0001558

IDENTIFICATION NUMBER: 3575 402

DATE PRINTED: 05/30/00

PRODUCT USE/CLASS: RUST CONVERTER/SPECIAL PURPOSE

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS 60061
USA

RUST-OLEUM CORP.: (847)367-7700
8:00 AM-4:30 PM/24-HR EMER.ASSIST

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS 60061
USA

RUST-OLEUM CORP.: (847)367-7700
8:00 AM-4:30 PM/24-HR EMER.ASSIST

PREPARER: L.J.W.

PHONE: 847-816-2445

PREPARE DATE: 05/11/00

------SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS ------

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	TANNIC ACID	1401-55-4	5.0%
02	FUMED SILICA	112945-52-5	1.0%

------SECTION 5 - FIRE FIGHTING MEASURES ------

FLASH POINT: N.A.

EXPOSURE LIMITS

	ACGIH		OSHA		MEXICAN	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	N.E.	N.E.	N.E.	N.E.	N.E.	NO
02	10 MG/M3	N.E.	N.E.	N.E.	N.E.	NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

------SECTION 3 - HAZARDS IDENTIFICATION ------

EMERGENCY OVERVIEW:
CAUSES EYE IRRITATION. USE VENTILATION NECESSARY TO KEEP EXPOSURES BELOW RECOMMENDED EXPOSURE LIMITS, IF ANY.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: MAY CAUSE SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION:
HIGH GAS, VAPOR, MIST OR DUST CONCENTRATIONS MAY BE HARMFUL IF INHALED. LOW HAZARD FOR USUAL INDUSTRIAL HANDLING OR COMMERCIAL HANDLING BY TRAINED PERSONNEL.

EFFECTS OF OVEREXPOSURE - INGESTION: SUBSTANCE MAY BE HARMFUL IF SWALLOWED.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: NO INFORMATION.

PRIMARY ROUTE(S) OF ENTRY: EYE CONTACT

------SECTION 4 - FIRST AID MEASURES ------

FIRST AID - EYE CONTACT:
HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET IMMEDIATE MEDICAL ATTENTION.

FIRST AID - INGESTION:
SWALLOWING LESS THAN AN OUNCE WILL NOT CAUSE SIGNIFICANT HARM. FOR LARGER AMOUNTS, DO NOT INDUCE VOMITING, BUT GIVE ONE OR TWO GLASSES OF WATER TO DRINK AND GET MEDICAL ATTENTION.

REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES:

Please put in MSDS Book

LOWER EXPLOSIVE LIMIT: 1.0%

UPPER EXPLOSIVE LIMIT: 15.0%

AUTOIGNITION TEMPERATURE: N.D.

EXTINGUISHING MEDIA: DRY CHEMICAL, FOAM, WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLASH POINT IS TESTED TO BE GREATER THAN 212 DEGREES F (>100 DEGREES C).

SPECIAL FIREFIGHTING PROCEDURES:
WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT BUILDUP OF STEAM.

------SECTION 6 - ACCIDENTAL RELEASE MEASURES ------

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS.
DO NOT INCINERATE CLOSED CONTAINERS.

------SECTION 7 - HANDLING AND STORAGE ------

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. AVOID CONTACT WITH EYES.

STORAGE: KEEP FROM FREEZING. KEEP CONTAINER CLOSED WHEN NOT IN USE.

------SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION ------

ENGINEERING CONTROLS:
USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

SKIN PROTECTION:
USE GLOVES TO PREVENT PROLONGED SKIN CONTACT. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT:

------SECTION 11 - TOXICOLOGICAL PROPERTIES ------

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
TANNIC ACID	5 G/KG RAT	NO INFORMATION

WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

------SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ------

BOILING RANGE: 212-212 F

ODOR: AMMONICAL

APPEARANCE: LIQUID

SOLUBILITY IN H2O: SOLUBLE

FREEZE POINT: N.D.

VAPOR PRESSURE: N.D.

PHYSICAL STATE: LIQUID

VAPOR DENSITY: IS HEAVIER THAN AIR

ODOR THRESHOLD: N.D.

EVAPORATION RATE: IS SLOWER THAN ETHER

SPECIFIC GRAVITY: 1.3000

pH @ 0.0%: N.D.

VISCOSITY: N.D.

COEFFICIENT OF WATER/OIL DISTRIBUTION: N.D.

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

------SECTION 10 - STABILITY AND REACTIVITY ------

CONDITIONS TO AVOID: AVOID CONTACT WITH STRONG ACID AND STRONG BASES.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS:
BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE. WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SARA SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN

NO SARA SECTION 313 COMPONENTS EXIST IN THIS PRODUCT ABOVE DE MINIMIS

FUMED SILICA 3160 MG/KG RAT N.E.

------SECTION 12 - ECOLOGICAL INFORMATION ------

ECOLOGICAL INFORMATION:
PRODUCT IS A MIXTURE OF LISTED COMPONENTS. ACCORDING TO OUR RAW MATERIAL SUPPLIERS, ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY AS REQUIRED OR MEET THE POLYMER EXEMPTION AS DEFINED IN SECTION 5.5.2 OF THE TOXIC SUBSTANCES CONTROL ACT.

------SECTION 13 - DISPOSAL CONSIDERATIONS ------

DISPOSAL METHOD:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

------SECTION 14 - TRANSPORTATION INFORMATION ------

DOT PROPER SHIPPING NAME: PAINT

DOT TECHNICAL NAME:

DOT HAZARD CLASS:

HAZARD SUBCLASS:

DOT UN/NA NUMBER:

PACKING GROUP:

RESP. GUIDE PAGE:

------SECTION 15 - REGULATORY INFORMATION ------

U.S. FEDERAL REGULATIONS: AS FOLLOWS
OSHA:
HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA-SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES: NONE

FLAMMABILITY: 1
REACTIVITY : 0

PREVIOUS MSDS REVISION DATE: 04/27/00

REASON FOR REVISION: WHMIS CLASS ADDITION

LEGEND:
N.A.: NOT APPLICABLE
N.E.: NOT ESTABLISHED

LEVELS.

U.S. STATE REGULATIONS: AS FOLLOWS
NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
WATER DEIONIZED	7732-18-5
VINYLCOPOLYMER RESIN	NOT AVAILABLE
BARIUM SULFATE	7727-43-7

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
WATER DEIONIZED	7732-18-5
VINYLCOPOLYMER RESIN	NOT AVAILABLE
BARIUM SULFATE	7727-43-7

CALIFORNIA PROPOSITION 65:
WARNING:
THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER

ACCORDING TO OUR RAW MATERIAL SUPPLIERS NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT ABOVE OSHA DE MINIMUS LEVELS. ALL PRODUCTS COMPLY WITH LABEL PROVISIONS OF PROPOSITION 65.

INTERNATIONAL REGULATIONS: AS FOLLOWS
CANADIAN WHMIS:
THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: D2B

------SECTION 16 - OTHER INFORMATION ------

HMIS RATINGS:

HEALTH : 1
N.D.: NOT DETERMINED
: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

PRODUCT: 3575 402

PREPARATION DATE: 05/11/00

ITEM: 5H905 - PAINT SPRAY

PICK_REQ: 0172609422 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A4102**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A4102

Associated Grainger Item: 5H905 - PAINT SPRAY

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: DARK MACHINE GRAY 9905585

IDENTIFICATION NUMBER: V2187 838

DATE PRINTED: 04/19/01

PRODUCT USE/CLASS: HARD HAT/AEROSOL PAINT

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM-4:30 PM/24-HR EMER.ASSIST

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM-4:30 PM/24-HR EMER.ASSIST

PREPARER: MTM
PHONE: 847-816-2445
PREPARE DATE: 04/19/01

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	LIQUIFIED PETROLEUM GAS	68476-85-7	25.0 %
02	XYLENE	1330-20-7	20.0 %
03	ACETONE	67-64-1	20.0 %
04	ETHYLBENZENE	100-41-4	10.0 %
05	METHYL ETHYL KETONE	78-93-3	5.0 %
06	TITANIUM DIOXIDE	13463-67-7	5.0 %
07	ETHYLENE GLYCOL MONOBUTYL EITHER	111-76-2	5.0 %

	EXPOSURE LIMITS					
	ACGIH		OSHA		MEXICAN	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	1000 PPM	N.E.	1000 PPM	N.E.	N.E.	NO
02	100 PPM	150 PPM	100 PPM	N.E.	100 PPM	YES
03	750 PPM	1000 PPM	750 PPM	N.E.	N.E.	NO
04	100 PPM	125 PPM	100 PPM	N.E.	N.E.	YES
05	200 PPM	300 PPM	200 PPM	N.E.	200 PPM	NO
06	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
07	25 PPM	N.E.	50 PPM	N.E.	N.E.	YES

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
HARMFUL IF INHALED. HARMFUL IF SWALLOWED. EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPORS MAY CAUSE FLASH FIRE OR EXPLOSION. HARMFUL IF INHALED. MAY EFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. CONTENTS UNDER PRESSURE.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT:
SUBSTANCE MAY CAUSE SLIGHT SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

EFFECTS OF OVEREXPOSURE - INHALATION:
HARMFUL IF INHALED. HIGH GAS, VAPOR, MIST OR DUST CONCENTRATIONS MAY BE HARMFUL IF INHALED. AVOID BREATHING VAPORS OR MISTS. HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS.

EFFECTS OF OVEREXPOSURE - INGESTION:
SUBSTANCE MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:
MAY CAUSE CENTRAL NERVOUS SYSTEM DISORDER (E,G., NARCOSIS INVOLVING A LOSS OF COORDINATION, WEAKNESS, FATIGUE, MENTAL CONFUSION, AND BLURRED VISION) AND/OR DAMAGE. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN, EYE AND BLOOD DAMAGE AS WELL AS REPRODUCTIVE DISORDERS. EFFECTS IN HUMANS, DUE TO CHRONIC OVEREXPOSURE, HAVE INCLUDED LIVER, CARDIAC ABNORMALITIES AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO METHYL ETHYL KETONE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY AND LUNG DAMAGE. FETOTOXIC/EMBRYOTOXIC EFFECTS FROM INHALATION HAVE BEEN SEEN IN RATS EXPOSED TO >1000 PPM DURING GESTATION.

PRIMARY ROUTE(S) OF ENTRY: SKIN ABSORPTION, INHALATION, EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT:
HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION:
IF YOU EXPERIENCE DIFFICULTY IN BREATHING, LEAVE THE AREA TO OBTAIN FRESH AIR. IF CONTINUED DIFFICULTY IS EXPERIENCED, GET MEDICAL ASSISTANCE IMMEDIATELY.

FIRST AID - INGESTION:
ASPIRATION HAZARD:
DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: -99 F

LOWER EXPLOSIVE LIMIT: 1.0 %
UPPER EXPLOSIVE LIMIT: 12.8 %

AUTOIGNITION TEMPERATURE: ND

EXTINGUISHING MEDIA: DRY CHEMICAL, FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLASH POINT IS LESS THAN 20 DEG. F. EXTREMELY FLAMMABLE LIQUID AND VAPOR! WATER SPRAY MAY BE INEFFECTIVE. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT DUE TO BUILDUP OF STEAM. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. PERFORATION OF THE PRESSURIZED CONTAINER MAY CAUSE BURSTING OF THE CAN. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT.

SPECIAL FIREFIGHTING PROCEDURES:
EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
EVACUATE THE AREA, REMOVE ALL SOURCES OF IGNITION AND VENTILATE WELL. CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. REMOVE ALL SOURCES OF IGNITION, VENTILATE AREA AND REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. USE ONLY IN A WELL-VENTILATED AREA. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES. AVOID BREATHING VAPOR OR MIST.

STORAGE:
KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. DO NOT STORE ABOVE 120 DEGREES F. STORE LARGE QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. CONTENTS UNDER PRESSURE. DO NOT EXPOSE TO HEAT OR STORE ABOVE 120 DEGREES F.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. USE EXPLOSION-PROOF VENTILATION EQUIPMENT. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

SKIN PROTECTION:
USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION:
USE SAFETY EYE WEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT:
REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES:
WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE: -34-336 F

PICK_REQ: 0172609422 ITEM: 5H905 HAZMAT: 5H905

HAZARD MATERIAL WARNING SHEET (HAZMAT)

When shipment is complete, retain for daily Hazmat audit

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GRAINGER SHIPPING INFORMATION

STOCK #	: 5H905
MSDS #	: A4102
FREIGHT CODE	: 0800
DOT PROPER SHIP NAME	: CONSUMER COMMODITY, ORM-D
UPS RESTRICTIONS	: 20 LB. & UNDER REQUIRES 200 LB. BSC/32 ECT, 21 LB. & OVER REQUIRES 275 LB. BSC/44 ECT.
HAZARDOUS CLASS NUMBER	:
UN ID #	:
PACKING GROUP	:
SHIPPING LABEL	: ORM-D
	:
LIMITED QUANTITY	: Y
CARTON INSTRUCTIONS	: CAN REPACK IN GRAINGER S CARTON
EXCEPTION	:
DOT/UPS EXEMPTION NO.	:
COMMENTS 1	: HAZARDOUS MATERIAL. DO NOT SHIP AIR!!
COMMENTS 2	:
SHIPPING-PAPERS	: AUTOMATED BILL OF LADING REQUIRED FOR TRUCK SHIPMENTS.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

ODOR: SOLVENT

APPEARANCE: LIQUID

SOLUBILITY IN H2O: SLIGHT

FREEZE POINT: ND

VAPOR PRESSURE: ND

PHYSICAL STATE: LIQUID

VAPOR DENSITY: IS HEAVIER THAN AIR

ODOR THRESHOLD: ND

EVAPORATION RATE: IS FASTER THAN ETHER

SPECIFIC GRAVITY: 0.9850

pH @ 0.0 %: ND

VISCOSITY: ND

COEFFICIENT OF WATER/OIL DISTRIBUTION: ND

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
AVOID TEMPERATURES ABOVE 120 DEGREES F. AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS:
BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE. WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
LIQUIFIED PETROLEUM GAS	N.E.	N.E.
XYLENE	RAT 4300 MG/KG	RAT 5000 PPM 4 HR
ACETONE	RAT 5800 MG/KG	RAT 50100 MG/M3 8 H
ETHYLBENZENE	RAT 3500 MG/KG	N.A.
METHYL ETHYL KETONE	RAT 2737 MG/KG	RAT 23500 MG/M3 8 HR
TITANIUM DIOXIDE	24000 MG/KG RATS	6820 MG/M3 RATS
ETHYLENE GLYCOL MONOBUTYL ETHER	MOUSE 1519 MG/KG	MOUSE 700 PPM 7 HR

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
PRODUCT IS A MIXTURE OF LISTED COMPONENTS. ACCORDING TO OUR RAW MATERIAL SUPPLIERS, ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY AS REQUIRED OR MEET THE POLYMER EXEMPTION AS DEFINED IN SECTION 5.5.2 OF THE TOXIC SUBSTANCES CONTROL ACT.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: AEROSOL

DOT TECHNICAL NAME:

DOT HAZARD CLASS: 2

HAZARD SUBCLASS: 1

DOT UN/NA NUMBER: UN1950

PACKING GROUP:

RESP. GUIDE PAGE: 126

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS
OSHA:
HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

IMMEDIATE HEALTH HAZARD, CHRONIC HEALTH HAZARD, FIRE HAZARD

SARA SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
XYLENE	1330-20-7	20.0 %
ETHYLBENZENE	100-41-4	10.0 %
METHYL ETHYL KETONE	78-93-3	5.0 %
ETHYLENE GLYCOL MONOBUTYL ETHER	111-76-2	5.0 %

U.S. STATE REGULATIONS: AS FOLLOWS
NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	68552-41-0

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	68552-41-0
BARIUM SULFATE	7727-43-7

CALIFORNIA PROPOSITION 65:
WARNING:
THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER

ACCORDING TO OUR RAW MATERIAL SUPPLIERS NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT ABOVE OSHA DE MINIMUS LEVELS. ALL PRODUCTS COMPLY WITH LABEL PROVISIONS OF PROPOSITION 65.

INTERNATIONAL REGULATIONS: AS FOLLOWS
CANADIAN WHMIS:
THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: A, B5, D2A, D2B

SECTION 16 - OTHER INFORMATION

HMIS RATINGS:

HEALTH :
FLAMMABILITY:
REACTIVITY :

PREVIOUS MSDS REVISION DATE: 06/28/00

REASON FOR REVISION: TRANSPORTATION INFORMATION

LEGEND:

N.A.: NOT APPLICABLE
N.E.: NOT ESTABLISHED
N.D.: NOT DETERMINED

: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

ASHBURN
Cut - Clean - Protect

MATERIAL SAFETY DATA SHEET

MIKE-O-CUT No. 87, Tapping and Drilling Fluid

I. PRODUCT AND MANUFACTURER INFORMATION	
Product name	MIKE-O-CUT No. 87, Tapping and Drilling Fluid
Chemical name	NA
Synonyms	NA
CAS number	NE
Manufacturer	Ashburn Chemical Technologies 2911 Rusk Houston, TX 77003
Emergency phone number	713-425-3000
Date of last revision	5-16-05

II. HAZARDOUS INGREDIENTS					
HAZARDOUS COMPONENT	%	CAS NUMBER	ACGIH TLV	OSHA PEL	CHEMICAL AND/OR COMMON NAME(S)
Chlorinated paraffins	NR	63449-39-8	5 mg/m^3	5 mg/m^3	chloroalkanes

III. PHYSICAL AND CHEMICAL CHARACTERISTICS	
Boiling point @ 760 mm Hg	>212 °F
Vapor pressure at 20 °C	NA
Vapor density (air = 1)	<1
Solubility in water	Not Soluble
Appearance and odor	Amber fluid, wintergreen odor
Specific gravity (H_2O = 1.0)	1.204
Melting point	NA
Evaporation rate (butyl acetate = 1)	<1

IV. FIRE AND EXPLOSION HAZARD DATA			
Combustible/Not combustible	Not combustible		
Flammable/Not flammable	Not flammable		
Pyrophoric/Not pyrophoric	Not pyrophoric		
Explosive/Not explosive	Not explosive		
Flash point (test method)	415 °F (PMCC)		
Flammable limits (in Air % by volume)	NA	LEL: NA	UEL: NA
Extinguishing media	Foam or dry chemical		
Special fire-fighting procedures or equipment	Same as for petroleum products		
Unusual fire and explosion hazards	None		

V. REACTIVITY DATA	
Material is stable/unstable	Stable.
Conditions to avoid	
Incompatibility (materials to avoid)	Avoid contact of concentrate with strong acids or bases
Hazardous decomposition or by-products	None known
Hazardous polymerization will/will not occur	Will not occur.
Oxidizer/Not an oxidizer	Not an oxidizer.

KMB00003470

ASHBURN
Cut - Clean - Protect

VI. HEALTH HAZARD DATA Note: data applies to the concentrate. Health hazard potential is reduced at use concentrations, if applicable.	
Threshold limit value	TLV for this product not established. Refer to the hazardous materials list for TLV of individual ingredients.
Primary route(s) of entry	Skin contact
Known Hazards Under 29 CFR 1910.1200	
Mutagenic (genetic defects)	NONE
Reproductive	NONE
Systemic	NONE
Teratogenic (birth defects)	NONE
Carcinogen listed in:	
NTP (National Toxicology Program)	NO
IARC Monographs	NO
OSHA	NO
Signs and symptoms of exposure	
Inhalation	Inhalation of oil mist is harmful and may cause lung damage if TLV is exceeded.
Skin contact	Skin irritation should not occur if used as recommended.
Skin absorption	Not likely to occur
Eye contact	May cause eye irritation
Ingestion	May cause nausea
Emergency first aid procedures	
Inhalation	Remove to fresh air. Consult a physician if symptoms persist.
Skin contact	Wash off thoroughly with soap and water. Remove contaminated clothing and launder before re-use. Discard contaminated leather gloves and shoes.
Skin absorption	Not likely to occur
Eye contact	Flush with water for 15 minutes, seek medical attention.
Ingestion	If swallowed, induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person.
Medical conditions generally aggravated by exposure	Persons with pre-existing skin disorders should avoid contact with this product.
Notes to physician	Treatment of overexposure should be directed toward the control of symptoms and the clinical condition.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE		
Steps to take if released or spilled	Flush with water and/or use absorbent material. Mop up.	
Waste disposal method	RCRA criteria must be determined for used material. Use approved treatment, transporters and disposal sites in accordance with local, state and federal laws. Do not flush to storm or sanitary sewer.	
Precautions for handling and storing	Launder contaminated clothing before reuse. Use as directed. Normal precautions common to good manufacturing should be followed in storage and handling.	
Personal protection (code and type)		
Other precautions	For industrial use only. Affix warning labels on containers in accordance with 29 CFR 1910.1200	
Hazard ratings	NFPA	HIMS
Health	1	NR
Flammability	1	NR
Reactivity	1	NR

VIII. CONTROL MEASURES	
Protective gloves (type and material)	Not normally required under normal working conditions. Use chemical-resistant gloves in situations of overexposure.

KMB00003471

ASHBURN
Cut - Clean - Protect

Eye protection	Wear safety glass or goggles if potential for eye contact exists.
Other protective clothing or equipment	Not normally required.
Respiratory protection (specify type)	Not needed under recommended conditions.
Ventilation and conditions	
Local	Yes
Mechanical	Recommended
Other	None
Special	None
Work/hygienic practices	Do not wear contaminated clothing. Wash prior to eating, drinking, smoking or use of restroom and when leaving work.

IX. ADDITIONAL REGULATORY INFORMATION	
SARA hazard category (Section 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III)	None
Toxic chemical(s) subject to the supplier notification requirements of section 313 of the Superfund Amendment and Reauthorization Act of 1986 (SARA) and the requirements of 40 CFR part 372	polychlorinated alkanes C10-C13
Ingredient(s) regulated under the Clean Air Act Section 112 hazardous air pollutants and subject to all reporting requirements of CERCLA (Superfund)	None

NA – not applicable NR – not reported ND – not determined NE – not established UN – unknown

The information presented in this MSDS has been compiled from sources deemed reliable. This MSDS is presented in good faith and believed to be accurate as of the effective date shown above. No warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another. It is the responsibility of the buyer to insure compliance with federal, state, provincial and local laws and regulations.

KMB00003472

ITEM: 5U704 - PRIMER RED

PICK_REQ: 1107590702 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A4282**

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A4282

Associated Grainger Item: 5U704 - PRIMER RED

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: RED PRIMER 9802736

IDENTIFICATION NUMBER: V2169 838

DATE PRINTED: 04/19/01

PRODUCT USE/CLASS: HARD HAT/AEROSOL

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS 60061
USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM-4:30 PM/24-HR EMER. ASSIST

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS 60061
USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM-4:30 PM/24-HR EMER. ASSIST

PREPARER: MTM
PHONE: 847-816-2445
PREPARE DATE: 04/19/01

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	LIQUIFIED PETROLEUM GAS	68476-85-7	25.0 %
02	XYLENE	1330-20-7	20.0 %
03	ACETONE	67-64-1	15.0 %
04	MAGNESIUM SILICATE HYDRATE-TALC	14807-96-6	10.0 %
05	CALCIUM CARBONATE (LIMESTONE)	1317-65-3	10.0 %
06	ETHYLBENZENE	100-41-4	5.0 %
07	AROMATIC HYDROCARBON	64742-95-6	5.0 %

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	MEXICAN TLV-TWA	SKIN
01	1000 PPM	N.E.	1000 PPM	N.E.	N.E.	NO
02	100 PPM	150 PPM	100 PPM	N.E.	100 PPM	YES
03	750 PPM	1000 PPM	750 PPM	N.E.	N.E.	NO
04	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
05	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
06	100 PPM	125 PPM	100 PPM	N.E.	N.E.	YES
07	N.E.	N.E.	N.E.	N.E.	N.E.	YES

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
HARMFUL IF INHALED. HARMFUL IF SWALLOWED. EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPORS MAY CAUSE FLASH FIRE OR EXPLOSION. HARMFUL IF INHALED. MAY EFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. CONTENTS UNDER PRESSURE.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT:
SUBSTANCE MAY CAUSE SLIGHT SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION:
HARMFUL IF INHALED. HIGH GAS, VAPOR, MIST OR DUST CONCENTRATIONS MAY BE HARMFUL IF INHALED. AVOID BREATHING VAPORS OR MISTS. HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS.

EFFECTS OF OVEREXPOSURE - INGESTION:
SUBSTANCES MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:
MAY CAUSE CENTRAL NERVOUS SYSTEM DISORDER (E.G., NARCOSIS INVOLVING A LOSS OF COORDINATION, WEAKNESS, FATIGUE, MENTAL CONFUSION, AND BLURRED VISION) AND/OR DAMAGE. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN, EYE AND BLOOD DAMAGE AS WELL AS REPRODUCTIVE DISORDERS. EFFECTS IN HUMANS, DUE TO CHRONIC OVEREXPOSURE, HAVE INCLUDED LIVER, CARDIAC ABNORMALITIES AND NERVOUS SYSTEM DAMAGE.

PRIMARY ROUTE(S) OF ENTRY: SKIN ABSORPTION, INHALATION, EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT:
HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION:
IF YOU EXPERIENCE DIFFICULTY IN BREATHING, LEAVE THE AREA TO OBTAIN FRESH AIR. IF CONTINUED DIFFICULTY IS EXPERIENCED, GET MEDICAL ASSISTANCE IMMEDIATELY.

FIRST AID - INGESTION:
ASPIRATION HAZARD:
DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: -99 F

LOWER EXPLOSIVE LIMIT: 1.0 %
UPPER EXPLOSIVE LIMIT: 12.8 %

AUTOIGNITION TEMPERATURE: ND

EXTINGUISHING MEDIA:
DRY CHEMICAL, FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLASH POINT IS LESS THAN 20 DEG. F. - EXTREMELY FLAMMABLE LIQUID AND VAPOR! WATER SPRAY MAY BE INEFFECTIVE. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT DUE TO BUILDUP OF STEAM. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. PERFORATION OF THE PRESSURIZED CONTAINER MAY CAUSE BURSTING OF THE CAN. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT.

SPECIAL FIREFIGHTING PROCEDURES:
EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
EVACUATE THE AREA, REMOVE ALL SOURCES OF IGNITION AND VENTILATE WELL. CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. REMOVE ALL SOURCES OF IGNITION, VENTILATE AREA AND REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. USE ONLY IN A WELL-VENTILATED AREA. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES. AVOID BREATHING VAPOR OR MIST.

STORAGE:
KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. DO NOT STORE ABOVE 120 DEGREES F. STORE LARGE QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. CONTENTS UNDER PRESSURE. DO NOT EXPOSE TO HEAT OR STORE ABOVE 120 DEGREES F.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. USE EXPLOSION-PROOF VENTILATION EQUIPMENT. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTIONS:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

SKIN PROTECTION:
USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT:
REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES:
WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE: -34 - 338 F

ODOR: SOLVENT

APPEARANCE: LIQUID

SOLUBILITY IN H2O: SLIGHT

FREEZE POINT: ND

VAPOR PRESSURE: ND

PHYSICAL STATE: LIQUID

VAPOR DENSITY: IS HEAVIER THAN AIR

ODOR THRESHOLD: ND

EVAPORATION RATE: IS FASTER THAN ETHER

SPECIFIC GRAVITY: 1.2092

pH @ 0.0 %: ND

VISCOSITY: ND

COEFFICIENT OF WATER/OIL DISTRIBUTION: ND

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
AVOID TEMPERATURES ABOVE 120 DEGREES F. AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS:
BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE. WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
LIQUIFIED PETROLEUM GAS	N.E.	N.E.
XYLENE	RAT 4300 MG/KG	RAT 5000 PPM 4HR
ACETONE	RAT 5800 MG/KG	RAT 50100 MG/M3 8H
MAGNESIUM SILICATE HYDRATE-TALC	NONE	NONE
CALCIUM CARBONATE (LIMESTONE)	NO INFORMATION	NO INFORMATION
ETHYLBENZENE	RAT 3500 MG/KG	N.A.
AROMATIC HYDROCARBON	4900 MG/KG (RAT)	N.E.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
PRODUCT IS A MIXTURE OF LISTED COMPONENTS. ACCORDING TO OUR RAW MATERIAL SUPPLIERS, ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY AS REQUIRED OR MEET THE POLYMER EXEMPTION AS DEFINED IN SECTION 5.5.2 OF THE TOXIC SUBSTANCES CONTROL ACT.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: AEROSOL

DOT TECHNICAL NAME:

DOT HAZARD CLASS: 2

HAZARD SUBCLASS: 1

DOT UN/NA NUMBER: UN1950

PACKING GROUP:

RESP. GUIDE SECTION: 126

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS AS FOLLOWS:
OSHA:
HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:
IMMEDIATE HEALTH HAZARD, CHRONIC HEALTH HAZARD, FIRE HAZARD

SARA SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
XYLENE	1330-20-7	20.0 %
ETHYLBENZENE	100-41-4	5.0 %

U.S. STATE REGULATIONS AS FOLLOWS:
NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	66070-60-8

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	66070-60-8
NATURAL IRON OXIDE ROUGE/METELLIC BROWNS	1332-37-2
ACRYLIC POLYMER	NOT AVAILABLE

CALIFORNIA PROPOSITION 65:
WARNING!
THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER

ACCORDING TO OUR RAW MATERIAL SUPPLIERS NO PROPOSITION 65 CHEMICALS EXIST IN THIS PRODUCT ABOVE OSHA DE MINIMUS LEVELS. ALL PRODUCTS COMPLY WITH LABEL PROVISIONS OF PROPOSITION 65.

INTERNATIONAL REGULATIONS AS FOLLOWS:
CANADIAN WHMIS:
THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16HEADINGS.

CANADIAN WHMIS CLASS: A B5 D2A D2B

SECTION 16 - OTHER INFORMATION

HMIS RATINGS:
HEALTH :
FLAMMABILITY:
REACTIVITY :

PREVIOUS MSDS REVISION DATE: 06/28/00

REASON FOR REVISION: TRANSPORTATION INFORMATION

LEGEND:
N.A.: NOT APPLICABLE
N.E.: NOT ESTABLISHED
N.D.: NOT DETERMINED
: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

PRODUCT: V2169 838
PREPARATION DATE: 04/19/01

ITEM: 5H898 - PAINT SPRAY

PICK REQ: 1107194278 **MATERIAL SAFETY DATA SHEET (MSDS)**

MSDS: A4220

This MSDS should be attached or kept with the respective product with which it is associated.

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MATERIAL SAFETY DATA SHEET - A4220

Associated Grainger Item: 5H898 - PAINT SPRAY

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: SAFETY YELLOW 9904442

IDENTIFICATION NUMBER: V2143 838

DATE PRINTED: 04/19/01

PRODUCT USE/CLASS: HARD HAT/AEROSOL PAINT

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM-4:30 PM/24-HR EMER. ASSIST

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS
60061 USA

(847)367-7700 RUST-OLEUM CORP.
8:00 AM - 4:30 PM/24-HR EMER. ASSIST

PREPARER: MTM
PHONE: 847-816-2445
PREPARE DATE: 04/19/01

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	LIQUIFIED PETROLEUM GAS	68476-85-7	25.0%
02	ACETONE	67-64-1	25.0%
03	XYLENE	1330-20-7	20.0%
04	ETHYLBENZENE	100-41-4	10.0%
05	TITANIUM DIOXIDE PIGMENT	13463-67-7	5.0%
06	METHYL ETHYL KETONE	78-93-3	5.0%
07	...ETHYLENE GLYCOL MONOBUTYL ETHER	111-76-2	5.0%

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	MEXICAN TLV-TWA	SKIN
01	1000 PPM	N.E.	1000 PPM	N.E.	N.E.	NO
02	750 PPM	1000 PPM	750 PPM	N.E.	N.E.	NO
03	100 PPM	150 PPM	100 PPM	N.E.	100 PPM	YES
04	100 PPM	125 PPM	100 PPM	N.E.	N.E.	YES
05	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
06	200 PPM	300 PPM	200 PPM	N.E.	200 PPM	NO
07	25 PPM	N.E.	50 PPM	N.E.	N.E.	YES

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
HARMFUL IF INHALED. HARMFUL IF SWALLOWED. EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPORS MAY CAUSE FLASH FIRE OR EXPLOSION. HARMFUL IF INHALED. MAY EFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. CONTENTS UNDER PRESSURE.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT:
SUBSTANCE MAY CAUSE SLIGHT SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

EFFECTS OF OVEREXPOSURE - INHALATION:
HARMFUL IF INHALED. HIGH GAS, VAPOR, MIST OR DUST CONCENTRATIONS MAY BE HARMFUL IF INHALED. AVOID BREATHING VAPORS OR MISTS. HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS.

EFFECTS OF OVEREXPOSURE - INGESTION:
SUBSTANCE MAY BE HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:
MAY CAUSE CENTRAL NERVOUS SYSTEM DISORDER (E.G., NARCOSIS INVOLVING A LOSS OF COORDINATION, WEAKNESS, FATIGUE, MENTAL CONFUSION, AND BLURRED VISION) AND/OR DAMAGE. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN, EYE AND BLOOD DAMAGE AS WELL AS REPRODUCTIVE DISORDERS. EFFECTS IN HUMANS, DUE TO CHRONIC OVEREXPOSURE, HAVE INCLUDED LIVER, CARDIAC ABNORMALITIES AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO METHYL ETHYL KETONE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY AND LUNG DAMAGE. FETOTOXIC/EMBRYOTOXIC EFFECTS FROM INHALATION HAVE BEEN SEEN IN RATS EXPOSED TO >1000 PPM DURING GESTATION.

HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF I PERSISTS.

FIRST AID - INHALATION:
IF YOU EXPERIENCE DIFFICULTY IN BREATHING, LEAVE THE AR AIR. IF CONTINUED DIFFICULTY IS EXPERIENCED, GET MED IMMEDIATELY.

FIRST AID - INGESTION:
ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR G BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SE GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEAS

FLASH POINT: -99 F
LOWER EXPLOSIVE LIMIT: 1.0%
UPPER EXPLOSIVE LIMIT: 12.8%

AUTOIGNITION TEMPERATURE: ND

EXTINGUISHING MEDIA: DRY CHEMICAL, FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLASH POINT IS LESS THAN 20 DEG. F. - EXTREMELY FLAM VAPOR!
WATER SPRAY MAY BE INEFFECTIVE. CLOSED CONTAINERS MA EXPOSED TO EXTREME HEAT DUE TO BUILDUP OF STEAM. CLOSED EXPLODE WHEN EXPOSED TO EXTREME HEAT. VAPORS MAY FORM E WITH AIR. VAPORS CAN TRAVEL TO A SOURCE OF IGNIT CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTR AND OPEN FLAME. PERFORATION OF THE PRESSURIZED CO BURSTING OF THE CAN. CLOSED CONTAINERS MAY EXPLOD HEAT.

SPECIAL FIREFIGHTING PROCEDURES:
EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE

SECTION 6 - ACCIDENTAL RELEASE MEASUR

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR EVACUATE THE AREA, REMOVE ALL SOURCES OF IGNITION CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT SUCH AS SAWDUST. REMOVE ALL SOURCES OF IGNITION, VENTIL WITH INERT ABSORBENT AND NON-SPARKING TOOLS. DISPOSE OF STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT I CONTAINERS.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE WELL-VENTILATED AREA. FOLLOW ALL MSDS/LABEL PRECAUTIONS IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUE MIST.

STORAGE:
KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELEC SPARKS AND OPEN FLAME. DO NOT STORE ABOVE 120 QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR S FLAMMABLE LIQUIDS. CONTENTS UNDER PRESSURE. DO NOT EXPO ABOVE 120 DEGREES F.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL

ENGINEERING CONTROLS:
USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, O CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPLOSION-PROOF VENTILATION EQUIPMENT. PREVENT BUILD OPENING
ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 191 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE RESPIRATOR'S USE. A NIOSH/MSHA APPROVED AIR PURIFYING ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIB CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EX LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATOR A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF T AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT P PROTECTION.

SKIN PROTECTION:
USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND AB MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES M SKIN PROTECTION.

EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLAS

OTHER PROTECTIVE EQUIPMENT:
REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS AP

HYGIENIC PRACTICES:

PRIMARY ROUTE(S) OF ENTRY: SKIN ABSORPTION, INHALATION, EYE CONTACT

WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT:

SECTION 9 - PHYSICAL AND CHEMICA

BOILING RANGE: -34 - 336 F

ODOR: SOLVENT

APPEARANCE: LIQUID

SOLUBILITY IN H2O: SLIGHT

FREEZE POINT: ND

VAPOR PRESSURE: ND

PHYSICAL STATE: LIQUID

COEFFICIENT OF WATER/OIL DISTRIBUTION: ND

VAPOR DENSITY: IS HEAVIER THAN AIR

ODOR THRESHOLD: ND

EVAPORATION RATE: IS FASTER THAN ETHER

SPECIFIC GRAVITY: 1.0510

pH @ 0.0%: ND

VISCOSITY: ND

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
AVOID TEMPERATURES ABOVE 120 DEGREES F. AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS:
BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE. WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
LIQUIFIED PETROLEUM GAS	N.E.	N.E.
ACETONE	RAT 5800 MG/KG	RAT 50100 MG/M3 8 H
XYLENE	RAT 4300 MG/KG	RAT 5000 PPM 4 HR
ETHYLBENZENE	RAT 3500 MG/KG	N.A.
TITANIUM DIOXIDE PIGMENT	>24000 MG/KG RATS	6820 MG/M3 RATS
METHYL ETHYL KETONE	RAT 2737 MG/KG	RAT 23500 MG/M3 8 HR
ETHYLENE GLYCOL MONOBUTYL ETHER	MOUSE 1519 MG/KG	MOUSE 700 PPM 7 HR

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
PRODUCT IS A MIXTURE OF LISTED COMPONENTS. ACCORDING TO OUR RAW MATERIAL SUPPLIERS, ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY AS REQUIRED OR MEET THE POLYMER EXEMPTION AS DEFINED IN SECTION 5.5.2 OF THE TOXIC SUBSTANCES CONTROL ACT.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: AEROSOL

DOT TECHNICAL NAME:

DOT HAZARD CLASS: 2

HAZARD SUBCLASS: 1

DOT UN/NA NUMBER: UN1950

PACKING GROUP:

RESP. GUIDE PAGE: 126

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA:
HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA-SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

IMMEDIATE HEALTH HAZARD
CHRONIC HEALTH HAZARD
FIRE HAZARD

SARA SECTION 313:

CHEMICAL NAME	CAS NUMBER	
XYLENE	1330-20-7	20.0
ETHYLBENZENE	100-41-4	10.0%
METHYL ETHYL KETONE	78-93-3	5.0
ETHYLENE GLYCOL MONOBUTYL ETHER	111-76-2	5.

U.S. STATE REGULATIONS: AS FOLLOWS -

NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT A COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	68552-41-0

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PR GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
ALKYD RESIN SOLUTION	68552-41-0

CALIFORNIA PROPOSITION 65:
WARNING:
THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFEC REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER

ACCORDING TO OUR RAW MATERIAL SUPPLIERS NO PROPOSITI IN THIS PRODUCT ABOVE OSHA DE MINIMUS LEVELS. ALL PRODU LABEL PROVISIONS OF PROPOSITION 65.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS:
THISMSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTRO REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: A B5 D2A D2B

SECTION 16 - OTHER INFORMAT

HMIS RATINGS:

HEALTH :
FLAMMABILITY:
REACTIVITY :

PREVIOUS MSDS REVISION DATE: 06/28/00

REASON FOR REVISION: TRANSPORTATION INFORMATION

LEGEND:
N.A.: NOT APPLICABLE
N.E.: NOT ESTABLISHED
N.D.: NOT DETERMINED
: NO INFORMATION.

THE INFORMATION CONTAINED ONTHIS MSDS HAS BEEN CHECK ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF TH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATI

PRODUCT: V2143

PREPARATION DATE: 04/19/01

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	Not controlled		

Section 1: Chemical Product and Company Identification

Product Name	**SULLAIR SRF 1/4000** -	Code	490-028-1 File # W000
		DSL	On the DSL
Synonym	Super Compressor Fluid 32	TSCA	On TSCA inventory list
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	This product is used for the lubrication of air and inert gas compressors of the reciprocating, rotary screw, and rotary vane types. This compressor oil should NEVER be used in equipment compressing pure oxygen.		

Section 2: Composition and Information on Ingredients

Name	CAS #	% (V/V)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Severely hydrotreated paraffinic oil (C23-C35) and additives THIS IS AN ASHLESS FORMULATION	72623-87-1	100	5 mg/m³ (oil mist)	Not applicable	Not applicable

Manufacturer Recommendation	8-hour TLV-TWA of 5 mg/m³ recommended by manufacturer based on ACGIH TLV for oil mists. Consult local authorities for acceptable exposure limits.
Other Exposure Limits	Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3: Hazards Identification

Potential Health Effects	Non irritating to eyes, non irritating to slight transient irritating to skin, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours, mists or fumes, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.

Section 4: First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. Allow the victim to rest in a well ventilated area. Administer oxygen if available. If the victim is not breathing, perform mouth-to-mouth resuscitation. If resuscitation is required, physician assessment mandatory.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Has laxative effect - rapidly eliminated. Physician assessment advised.
Note to Physician	Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 gm activated charcoal in 400 ml water and mix thoroughly. Administer 5 ml/kg, or 350 ml for an average adult.

Section 5. Fire-fighting Measures

Flammability	Combustible liquid.	**Flammable Limits**	Not available.
Flash Points	Open Cup:>230°C (>446°F), ASTM D92, Cleveland.	**Auto-Ignition Temperature**	379°C (714.2°F)
Fire Hazards in Presence of Various Substances	Low fire hazard. Must be moderately heated before ignition will occur. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating fumes as products of incomplete combustion.		
Fire Fighting Media and Instructions	Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, or CO2. LARGE FIRE: use water spray, fog or foam. WATER OR FOAM MAY CAUSE FROTHING. Avoid flushing spilled material into sewers, streams or other bodies of water. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.		

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Available in French

Section 6. Accidental Release Measures

Material Release or Spill	ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if without risk. Contain spill. Absorb with inert absorbents such as dry clay, or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Section 7. Handling and Storage

Handling	Keep away from sources of ignition. DO NOT reuse empty containers without commercial cleaning or reconditioning. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from strong oxidizing agents.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	
Eyes	Chemical splash goggles in case of splashing.
Body	Wear long sleeved clothing to minimize skin contact.
Respiratory	No special respiratory protection is normally required. If mist generated by heating, spraying, etc., wear an organic vapour respirator with a mist filter. All respirators must be NIOSH approved.
Hands	For casual contact, PVC gloves are suitable. For direct contact for more than 2 hours, NEOPRENE or NITRILE gloves are recommended.
Feet	Safety boots or shoes.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	Viscosity	38 cSt @ 40°C (104°F).
Colour	Pale yellow.	Pour Point	-36°C (-33°F).
Odour	Mild petroleum oil like.	Softening Point	Not applicable.
Odour Threshold	Not available.	Dropping Point	Not applicable.
Boiling Point	349°C (560.2°F)	Penetration	Not applicable.
Specific Gravity	0.86 kg/L @ 15°C (59°F).	Oil / Water Dist. Coeff.	Not available.
Vapour Density	Not available.	Ionicity (in water)	Insoluble in water.
Vapour Pressure	0.0075 mmHg @ 20°C (68°F).	Dispersion Properties	Nonvolatile and immobile.
Volatility	Non-volatile.	Solubility	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Section 10. Stability and Reactivity

Corrosivity	Not applicable		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Highly reactive with oxidizing agents, acids.	Decomposition Products	Releases of COx, NOx, SOx, H2S, smoke and irritating fumes when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.
Acute Lethality	Acute oral toxicity (SD/LD50): >6000 mg/kg (rat).
Chronic or Other Toxic Effects	
Dermal Route:	Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route:	Due to low volatility, inhalation is not likely. However, prolonged or repeated inhalation of excessive amount of mists or fumes may cause irritation of the respiratory tract. Oil deposits in the lung may lead to fibrosis and reduced pulmonary function.
Oral Route:	Relatively non-toxic via ingestion.
Eye Irritation/Inflammation:	Base oil is not an eye irritant.
Immunotoxicity:	No studies were found.
Skin Sensitization:	Based on toxicity of severely hydrotreated base oil, it is not a skin sensitizer in guinea pig.
Respiratory Tract Sensitization:	No studies were found.

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Mutagenicity:	Severely hydrotreated base oils give negative results when tested for: (a) in vitro cytogenetic assay measuring sister chromated exchange frequencies in Chinese hamster ovary cells; (b) determination of the mutagenic activity in [illegible] typhimurium TA 98 using the Modified Ames Assay.
Reproductive Toxicity:	Based on the available animal data, white mineral oils or severely hydrotreated base oils do not pose a reproductive risk.
Teratogenicity/Embryotoxicity:	Based on the available animal data, white mineral oils or severely hydrotreated base oils do not pose a developmental or reproductive risk.
Carcinogenicity (ACGIH):	Based on the available human studies, exposure to oil mist alone has not been demonstrated to cause human health effects at levels below 5 mg/m³. It is anticipated that this level minimize the potential for skin and respiratory tract irritation.
Carcinogenicity (IARC):	IARC Group 3: cannot be classified as to carcinogenicity to humans.
Carcinogenicity (NTP):	No studies were found.
Carcinogenicity (IRIS):	No studies were found.
Carcinogenicity (OSHA):	OSHA PEL (8-hour TWA) = 5 mg/m³ for mineral oil mists.
Other Considerations	No additional remark.

Section 12. Ecological Information

Environmental Fate	The product has the potential for degradation by hydroxyl radicals in the troposphere under the influence of sunlight, and by bacteria in soil or water.	**Persistence/ Bioaccumulation Potential**	No studies were found.
BOD5 and COD	Not available.	**Products of Biodegradation**	Not available.
Additional Remarks	Based on biodegradability of severely hydrotreated base oils, >60% of severely hydrotreated neutral base oils are biodegradable in 21 days.		

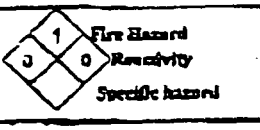
Section 13. Disposal Considerations

Waste Disposal	Ashless formulation is free of toxic heavy metals. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	Not regulated.	**Special Provisions for Transport**	No additional remark.

Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on CEPA-DSL, USEPA-TSCA and on EINECS. Not listed in CEPA-NPRI. This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in CERCLA (40 CFR 302.4). Not listed in EPCRA or SARA Title III, Section 302/304/311/312/313 (40 CFR 355/370/372). Not listed in RCRA (40CFR 261.33). Not listed as hazardous chemical in CHIP96-Approved Supply List (67/548/EEC). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
DSD/DPD (Europe)	Not classified under the Dangerous Substances or Dangerous Preparations Directives.
DSD/DPD (Europe) (Pictograms)	
DOT (U.S.A.) (Pictograms)	
HMIS (U.S.A.)	Health Hazard 0 Fire Hazard 1 Reactivity 0 Personal Protection B
NFPA (U.S.A.)	 Rating: 0 Insignificant, 1 Slight, 2 Moderate, 3 High, 4 Extreme

Section 16. Other Information

References Available upon request.

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ASTM - American Society for Testing and Materials
ADR - Agreement on Dangerous goods by Road (Europe)
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 - Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemical Hazard Information and Packaging Approved Supply
HCS - Hazardous Communication System
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NTP - National Toxicology Program

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KMB00003481

List
COD - Chemical Oxygen Demand
CPR - Controlled Products Regulation
DOT - Department of Transportation (U.S.A.)
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substance or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right-To-Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410	Prepared by May on 16/01/97. Data entry by May Chan.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

ITEM: 5W178 - PAINT SPRAY RED

PICK_REQ: 1113198625 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A5379**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A5379

Associated Grainger Item: 5W178 - PAINT SPRAY RED

MATERIAL SAFETY DATA SHEET

24 HOUR ASSISTANCE: 1-847-367-7700
RUST-OLEUM CORP.
WWW.RUSTOLEUM.COM

SECTION 1 - CHEMICAL PRODUCT/COMPANY INFORMATION

PRODUCT NAME:
RUST-OLEUM HIGH PERFORMANCE INDUSTRIAL ENAMEL AEROSOL FLUORESCENT (HARD HAT)

IDENTIFICATION NUMBER: 209568, 2233838, 2242838, 2255838, 2264838

PRODUCT USE/CLASS: FLUORESCENT/AEROSOL

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, IL 60061
USA

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, IL 60061
USA

PREPARER: DEPARTMENT, REGULATORY

REVISION DATE: 05/05/2003

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	WEIGHT % LESS THAN	ACGIH TLV-TWA	ACGIH TLV-STEL
LIQUIFIED PETROLEUM GAS	68476-86-8	30.0	1000 PPM	N.E.
ALIPHATIC HYDROCARBON	MIXTURE	30.0	300 PPM	N.E.
BARIUM SULFATE	7727-43-7	20.0	10 MG/M3	N.E.
XYLENE	1330-20-7	10.0	100 PPM	150 PPM
PIGMENT DISPERSION	MIXTURE	5.0		
ACETONE	67-64-1	5.0	500 PPM	750 PPM
NAPHTHA	64742-47-8	5.0	100 PPM	N.E.
NAPHTHA	8032-32-4	5.0	300 PPM	N.E.
ETHYLBENZENE	100-41-4	5.0	100 PPM	125 PPM

CHEMICAL NAME	OSHA PEL-TWA	OSHA PEL-CEILING
LIQUIFIED PETROLEUM GAS	1000 PPM	N.E.
ALIPHATIC HYDROCARBON	300 PPM	N.E.
BARIUM SULFATE	15 MG/M3	N.E.
XYLENE	100 PPM	N.E.
PIGMENT DISPERSION		
ACETONE	750 PPM	N.E.
NAPHTHA	N.E.	N.E.
NAPHTHA	N.E.	N.E.
ETHYLBENZENE	100 PPM	N.E.

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
CONTENTS UNDER PRESSURE. HARMFUL IF INHALED. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. VAPORS MAY CAUSE FLASH FIRE OR EXPLOSION. EXTREMELY FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: CAUSES EYE IRRITATION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT:
PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. SUBSTANCE MAY CAUSE SLIGHT SKIN IRRITATION.

EFFECTS OF OVEREXPOSURE - INHALATION:
HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS. AVOID BREATHING VAPORS OR MISTS. HIGH GAS, VAPOR, MIST OR DUST CONCENTRATIONS MAY BE HARMFUL IF INHALED. HARMFUL IF INHALED.

EFFECTS OF OVEREXPOSURE - INGESTION:
ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE. SUBSTANCE MAY BE HARMFUL IF SWALLOWED.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:
IARC LISTS ETHYLBENZENE AS A POSSIBLE HUMAN CARCINOGEN (GROUP 2B). MAY CAUSE CENTRAL NERVOUS SYSTEM DISORDER (E,G., NARCOSIS INVOLVING A LOSS OF COORDINATION, WEAKNESS, FATIGUE, MENTAL CONFUSION, AND BLURRED VISION) AND/OR DAMAGE. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN, EYE AND BLOOD DAMAGE AS WELL AS REPRODUCTIVE DISORDERS. EFFECTS IN HUMANS, DUE TO CHRONIC OVEREXPOSURE, HAVE INCLUDED LIVER, CARDIAC ABNORMALITIES AND NERVOUS SYSTEM DAMAGE.

PRIMARY ROUTE(S) OF ENTRY:
SKIN CONTACT, SKIN ABSORPTION, INHALATION, EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT:
HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION:
IF YOU EXPERIENCE DIFFICULTY IN BREATHING, LEAVE THE AREA TO OBTAIN FRESH AIR. IF CONTINUED DIFFICULTY IS EXPERIENCED, GET MEDICAL ASSISTANCE IMMEDIATELY.

FIRST AID - INGESTION:
ASPIRATION HAZARD:
DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: -156 F (SETAFLASH)

LOWER EXPLOSIVE LIMIT: 1.0%
UPPER EXPLOSIVE LIMIT: 13.1%

EXTINGUISHING MEDIA: DRY CHEMICAL, FOAM, WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS:
KEEP CONTAINERS TIGHTLY CLOSED. VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. FLASH POINT IS LESS THAN 20 DEG. F. - EXTREMELY FLAMMABLE LIQUID AND VAPOR! CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. WATER SPRAY MAY BE INEFFECTIVE. PERFORATION OF THE PRESSURIZED CONTAINER MAY CAUSE BURSTING OF THE CAN. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME.

SPECIAL FIREFIGHTING PROCEDURES:
EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IFMATERIAL IS RELEASED OR SPILLED:
DISPOSE OF ACCORDING TO LOCAL, STATE (PROVINCIAL) AND FEDERAL REGULATIONS. DO NOT INCINERATE CLOSED CONTAINERS. REMOVE ALL SOURCES OF IGNITION, VENTILATE AREA AND REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. USE ONLY IN A WELL-VENTILATED AREA. AVOID BREATHING VAPOR OR MIST. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES.

STORAGE:
KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. DO NOT STORE ABOVE 120 DEGREES F. STORE LARGE QUANTITIES IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. CONTENTS UNDER PRESSURE. DO NOT EXPOSE TO HEAT OR STORE ABOVE 120 DEGREES F.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION. USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. USE EXPLOSION-PROOF VENTILATION EQUIPMENT.

RESPIRATORY PROTECTION:
A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS.

PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

SKIN PROTECTION:
NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION. USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN.

EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT:
REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES:
WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE: 130 - 383 F

VAPOR DENSITY: HEAVIER THAN AIR

ODOR: SOLVENT LIKE

ODOR THRESHOLD: ND

APPEARANCE: LIQUID

EVAPORATION RATE: FASTER THAN ETHER

SOLUBILITY IN H2O: SLIGHT

FREEZE POINT: ND

SPECIFIC GRAVITY: 0.8680

VAPOR PRESSURE:

PH: NE

PHYSICAL STATE: LIQUID

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
AVOID ALL POSSIBLE SOURCES OF IGNITION. AVOID TEMPERATURES ABOVE 120 DEGREES F.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION:
WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES. BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL INFORMATION

PRODUCT LD50: ND

PRODUCT LC50: ND

CHEMICAL NAME	LD50	LC50
LIQUIFIED PETROLEUM GAS	N.E.	N.E.
ALIPHATIC HYDROCARBON	N.D.	N.D.
BARIUM SULFATE	N.D.	N.D.
XYLENE	N.D.	N.D.
PIGMENT DISPERSION		
ACETONE	N.D.	N.D.
NAPHTHA	>25 ML/KG (RAT)	>700PPM-4HR (RAT)
NAPHTHA	>5 G/KG RAT	
ETHYLBENZENE	3500 MG/KG (ORAL, RAT)	N.D.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: PRODUCT IS A MIXTURE OF LISTED COMPONENTS.

SECTION 13 - DISPOSAL INFORMATION

DISPOSAL INFORMATION:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: AEROSOL

DOT TECHNICAL NAME:

DOT HAZARD CLASS: 2

DOT UN/NA NUMBER: UN 1950

PACKING GROUP:

HAZARD SUBCLASS: 1

RESP. GUIDE PAGE:

SECTION 15 - REGULATORY INFORMATION

CERCLA - SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:
IMMEDIATE HEALTH HAZARD, CHRONIC HEALTH HAZARD, FIRE HAZARD

SARA SECTION 313:
LISTED BELOW ARE THE SUBSTANCES (IF ANY) CONTAINED IN THIS PRODUCT THAT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER
XYLENE	1330-20-7
ETHYLBENZENE	100-41-4

TOXIC SUBSTANCES CONTROL ACT:

LISTED BELOW ARE THE SUBSTANCES (IF ANY) CONTAINED IN THIS PRODUCT THAT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES: NONE KNOWN

U.S. STATE REGULATIONS: AS FOLLOWS -

NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT.

CHEMICAL NAME	CAS NUMBER
CALCIUM CARBONATE	1317-65-3

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%.

CHEMICAL NAME	CAS NUMBER
CALCIUM CARBONATE	1317-65-3
POLYMER ANCHORED GREEN DYE DISPERSION	MIXTURE
POLYMER ANCHORED ORANGE DYE DISPERSION	MIXTURE
POLYMER ANCHORED PINK DYE DISPERSION	MIXTURE
POLYMER ANCHORED RED DYE DISPERSION	MIXTURE
ACRYLIC MODIFIED VT ALKYD	PROPRIETARY

CALIFORNIA PROPOSITION 65:

WARNING:
THE FOLLOWING INGREDIENTS PRESENT IN THE PRODUCT ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER:

CHEMICAL NAME	CAS NUMBER
POLYMER ANCHORED ORANGE DYE DISPERSION	MIXTURE
MICROCRYSTALLINE SILICA	14808-60-7
LEAD COMPOUNDS	NOT SPECIFIED
FORMALDEHYDE	50-00-0
BENZENE	71-43-2
CADMIUM COMPOUNDS	NOT SPECIFIED
ACETALDEHYDE	75-07-0

WARNING:
THE FOLLOWING INGREDIENTS PRESENT IN THE PRODUCT ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS, OR OTHER REPRODUCTIVE HAZARDS.

CHEMICAL NAME	CAS NUMBER
TOLUENE	108-88-3
LEAD COMPOUNDS	NOT SPECIFIED
BENZENE	71-43-2
CADMIUM COMPOUNDS	NOT SPECIFIED

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS:
THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR THE USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: AB5 D2A D2B

SECTION 16 - OTHER INFORMATION

HMIS RATINGS:
HEALTH: 2*
FLAMMABILITY: 4
REACTIVITY: 0
PERSONAL PROTECTION: X

VOLATILE ORGANIC COMPOUNDS, G/L: 565 MAX

REASON FOR REVISION:

LEGEND:
N.A. - NOT APPLICABLE
N.E. - NOT ESTABLISHED
N.D. - NOT DETERMINED

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

ORDER: 1113198625 **ITEM: 5W178 - PAINT SPRAY RED** **HAZMAT: 5W178**

HAZARD MATERIAL WARNING SHEET (HAZMAT)

When shipment is complete, retain for daily Hazmat audit

****

GRAINGER SHIPPING INFORMATION

STOCK #	: 5W178
MSDS #	: A5379
FREIGHT CODE	: 0843
DOT PROPER SHIP NAME	: CONSUMER COMMODITY, ORM-D FLASHPOINT -104 DGS C, -156 DGS F
UPS RESTRICTIONS	: 20 LB. & UNDER REQUIRES 200 LB. BSC/32 ECT, 21 LB. & OVER REQUIRES 275 LB. BSC/44 ECT.
HAZARDOUS CLASS NUMBER	:
UN ID #	:
PACKING GROUP	:
SHIPPING LABEL	: ORM-D
	:
LIMITED QUANTITY	: Y
CARTON INSTRUCTIONS	: CAN REPACK IN GRAINGER S CARTON
EXCEPTION	:
DOT/UPS EXEMPTION NO.	:
COMMENTS 1	: HAZARDOUS MATERIAL. DO NOT SHIP AIR!!
COMMENTS 2	:
SHIPPING-PAPERS	: AUTOMATED BILL OF LADING REQUIRED FOR TRUCK SHIPMENTS.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

ITEM: 2C256 - FLUX BRAZING NO 5

MSDS: A1832 **ORDER: 0192382000** **DROP LOCATION: P1-143**

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A1832

Associated Grainger Items
2C256, 2C258

FORM NO.: MSDS # 21

DATE REVISED: 02/23/00

MATERIAL SAFETY DATA SHEET

(ESSENTIALLY SIMILAR TO U.S. DEPARTMENT OF LABOR SUGGESTED FORM FOR HAZARD COMMUNICATION COMPLIANCE)

HMIS RATINGS:
HEALTH: 1
FIRE: 0
REACTIVITY: 0
SPECIAL:

HAZARD RATINGS:
4=EXTREME
3=HIGH
2=MODERATE
1=SLIGHT
0=INSIGNIFICANT

I. PRODUCT IDENTIFICATION

PRODUCT TYPE - ALL-STATE GENERAL PURPOSE BRAZE/WELDING FLUXES (NO. 5 RED USED FOR TORCH BRAZING FOR CAST IRON)

MANUFACTURER - THE ESAB GROUP, INC.
ADDRESS - 801 WILSON AVENUE
HANOVER, PA 17331

TELEPHONE NO. - 1-717-637-8911
1-800-933-7070

EMERGENCY NO. - 1-717-637-8911
(CHEMTREC): 1-800-424-9300

NOMINAL CHEMICAL COMPOSITION

ALL-STATE PRODUCT TRADE NAME	BORAX	BORIC ACID	IRON OXIDE
ALL-STATE NO. 1 BLUE FLUX (1)	X	X	-
ALL-STATE NO. 5 RED FLUX (1)	X	X	X
ALL-STATE NO. 5 1/2 FLUX (1)	X	X	-
ALL-STATE BRAZO FLUX (1)	X	X	-
ALL-STATE LFB WHITE FLUX (1)	X	X	-

NOTE:
X INDICATES MATERIAL IS PRESENT

(1) SEE NOTE IN SECTION VI

II. HAZARDOUS INGREDIENTS

IMPORTANT:
THIS SECTION COVERS THE MATERIALS FROM WHICH THIS PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING NORMAL USE OF THESE PRODUCTS ARE COVERED IN SECTION V. THE TERM HAZARDOUS SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED BY LAWS, STATUTES OR REGULATIONS, AND DOES NOT NECESSSARILY IMPLY THE EXISTENCE OF ANY HAZARD WHEN THE PRODUCTS ARE USED AS DIRECTED BY THE ESAB GROUP.

MATERIAL	(CAS NO.)	SARA	ACGIH TLV (1999) TWA (MG/M3)	OSHA PEL (1993) TWA (MG/M3)	OSHA PEL (1993) STEL (MG/M3)
BORAX	(1330-43-4)		1	10	--
BORIC ACID	(10043-35-3)		10 (B2O3)	5 (B2O3 - RESPIRABLE)	--
IRON OXIDE	(1309-37-1)	5		10	

NOTE:
IN THE INGREDIENTS TABLE, AN ASTERISK (*) AFTER THE CAS NUMBER INDICATES A TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 (SARA) AND 40 CFR PART 372.

III. PHYSICAL DATA

PHYSICAL STATE: GAS ( )
LIQUID ( )
SOLID (X)

SOLUBILITY IN WATER: MODERATE

SPECIFIC GRAVITY (H2O=1): NO. 5 RED FLUX: 1.87 LFB WHITE FLUX: 1.625

BULK DENSITY (LBS/FT3): NO. 1 BLUE FLUX: 91 BRAZO FLUX: 91.2

ODOR AND APPEARANCE: NO. 1 BLUE FLUX: LIGHT BLUE POWDER, ODORLESS.
NO. 5 RED FLUX: RED POWDER, ODORLESS.
NO. 5 1/2 FLUX: PINK POWDER, ODORLESS.
BRAZO FLUX: WHITE POWDER, ODORLESS.
LFB WHITE FLUX: WHITE POWDER, ODORLESS.

IV. FIRE & EXPLOSION HAZARD

FLAMMABLE/EXPLOSIVE
NO (X)
YES ( )

UNDER WHAT CONDITIONS:
ONLY THE PACKAGING FOR THIS PRODUCT WILL BURN.

EXTINGUISHING MEDIA:
THIS PRODUCT WILL NOT BURN; HOWEVER, WELDING ARCS AND SPARKS CAN IGNITE COMBUSTIBLE AND FLAMMABLE MATERIALS. USE THE EXTINGUISHING MEDIA RECOMMENDED FOR THE BURNING MATERIALS AND FIRE SITUATION. SEE ANSI Z49.1 "SAFETY IN WELDING AND CUTTING" AND "SAFE PRACTICES" CODE: SP, PUBLISHED BY THE AMERICAN WELDING SOCIETY, P.O. BOX 351040, MIAMI, FL 33135, AND NFPA 51B "CUTTING AND WELDING PROCESSES," PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION, BATTERYMARCH PARK, QUINCY, MA 02269 FOR ADDITIONAL FIRE PREVENTION AND PROTECTION INFORMATION.

V. REACTIVITY DATA

STABILITY:
STABLE (X)
UNSTABLE ( )

HAZARDOUS POLYMERIZATION WILL NOT OCCUR:

INCOMPATIBILITY (MATERIALS TO AVOID):
ACETIC ANHYDRIDE, ELEMENTAL POTASSIUM AND OTHER REACTIVE METALS SUCH AS ZIRCONIUM METAL.

HAZARDOUS DECOMPOSITION PRODUCTS:
BORON OXIDE FUMES. WELDING FUMES AND GASES CANNOT BE CLASSIFIED SIMPLY. THE COMPOSITION AND QUANTITY OF THE FUMES AND GASES ARE DEPENDENT UPON THE BASE METAL, THE FLUX AND FILLER METAL BEING USED. COATINGS ON THE BASE METAL SUCH AS PAINT, GALVANIZING OR PLATING WILL PRODUCE FUMES AS WELL. OTHER CONDITIONS WHICH INFLUENCE THE COMPOSITION AND QUALITY OF THE FUMES AND GASES TO WHICH WORKERS MAY BE EXPOSED ARE THE NUMBER OF OPERATORS RELATIVE TO THE VOLUME OF THE WORK AREA, THE QUALITY AND AMOUNT OF VENTILATION, THE POSITION OF THE WELDER'S HEAD IN RESPECT TO THE FUME PLUME, AS WELL AS THE PRESENCE OF CONTAMINANTS IN THE ATMOSPHERE SUCH AS HALOGENATED HYDROCARBON VAPORS FROM CLEANING AND DEGREASING ACTIVITIES.

WHEN WELDING, THE COMPOSITION OF THE FUMES AND GASES ARE USUALLY DIFFERENT FROM THE COMPOSITION OF THE INGREDIENTS MENTIONED IN SECTION II. FUME INGREDIENTS OF NORMAL OPERATION INCLUDE THOSE ORIGINATING FROM VOLATILIZATION, REACTION, OR OXIDIZATION OF THE MATERIALS NOTED IN THE ABOVE PARAGRAPH. REASONABLY EXPECTED FUME CONSTITUENTS INCLUDE BORIC OXIDE (CAS NUMBER 1303-86-2) WITH OSHA TWA AND ACGIH TLV LISTINGS OF 10 MG/M3, AND OXIDES OF IRON AND CARBON.

REASONABLY EXPECTED DECOMPOSITION PRODUCTS FROM NORMAL USE OF THESE PRODUCTS INCLUDE A COMPLEX OF THE OXIDES OF THE MATERIALS LISTED IN SECTION II, AS WELL AS CARBON MONOXIDE, CARBON DIOXIDE, OZONE AND NITROGEN OXIDES (REFER TO "CHARACTERIZATION OF ARC WELDING FUME" AVAILABLE FROM THE AMERICAN WELDING SOCIETY). THE ONLY WAY TO DETERMINE THE TRUE IDENTITY OF THE DECOMPOSITION PRODUCTS IS BY SAMPLING AND ANALYSIS. THE COMPOSITION AND QUANTITY OF THE FUMES AND GASES TO WHICH A WORKER MAY BE OVEREXPOSED CAN BE DETERMINED FROM A SAMPLE OBTAINED FROM INSIDE THE WELDER'S HELMET, IF WORN, OR IN THE WORKERS BREATHING ZONE. SEE ANSI/AWS F1.1 "METHOD FOR SAMPLING AIRBORNE PARTICLES GENERATED BY WELDING AND ALLIED PROCESSES," AVAILABLE FROM THE AMERICAN WELDING SOCIETY.

VI. PHYSICAL AND HEALTH HAZARD DATA

A DETAILED DESCRIPTION OF THE HEALTH AND PHYSICAL HAZARDS AND THEIR CONSEQUENCES MAY BE FOUND IN ESAB'S FREE PUBLICATION F2035 "PRECAUTIONS AND SAFE PRACTICES FOR GAS WELDING, CUTTING AND HEATING." YOU MAY OBTAIN COPIES FROM YOUR LOCAL SUPPLIER OR BY WRITING TO THE ADDRESS IN SECTION I.

ROUTE OF OVEREXPOSURE:
THE PRIMARY ROUTE OF ENTRY OF THIS PRODUCT AND OF THE DECOMPOSITION PRODUCTS IS BY INHALATION. SKIN CONTACT, EYE CONTACT, AND INGESTION ARE POSSIBLE. WHEN THESE PRODUCTS ARE USED AS RECOMMENDED BY THE ESAB GROUP, AND VENTILATION MAINTAINS EXPOSURE TO THE DECOMPOSITION PRODUCTS BELOW THE LIMITS RECOMMENDED IN THIS SECTION, OVEREXPOSURE IS UNLIKELY.

EFFECTS OF ACUTE (SHORT-TERM) OVEREXPOSURE:

INHALATION:
IRRITANT TO RESPIRATORY SYSTEM. SNEEZING AND COUGHING. PRE-EXISTING LUNG DISORDERS MAY BE AGGRAVATED.

EYE CONTACT:
MILD IRRITATION TO EYE SURFACES. EXISTING DISORDERS MAY BE AGGRAVATED.

SKIN CONTACT:
MILD DERMATITIS OR IRRITATION. PRE-EXISTING SKIN DISORDERS MAY BE AGGRAVATED.

INGESTION:
NAUSEA, VOMITING AND DIARRHEA.

EFFECTS OF CHRONIC (LONG-TERM) OVEREXPOSURE:
COUGHING, ERYTHEMA, NAUSEA. LFB WHITE FLUX MAY ALSO CAUSE CNS (CENTRAL NERVOUS SYSTEM) EFFECTS.

PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
INDIVIDUALS WITH ALLERGIES OR IMPAIRED RESPIRATORY FUNCTION MAY HAVE SYMPTOMS WORSENED BY EXPOSURE TO WELDING FUMES; HOWEVER, SUCH REACTION CANNOT BE PREDICTED DUE TO THE VARIATION IN COMPOSITION AND QUANTITY OF THE DECOMPOSITION PRODUCTS.

EMERGENCY FIRST AID MEASURES:
ALWAYS CONTACT PHYSICIAN OR POISON CONTROL CENTER IN CASE OF MEDICAL EMERGENCY

EYE CONTACT:
FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES TO REMOVE ALL RESIDUE. PROMPTLY SEEK MEDICAL ATTENTION.

SKIN CONTACT:
WASH HANDS WITH SOAP AND WATER TO REMOVE ALL RESIDUE. IF RASH DEVELOPS, CONSULT A PHYSICIAN.

INHALATION:
REMOVE VICTIM TO FRESH AIR. IF FUMES, VAPORS OR DUSTS ARE INHALED, CALL A PHYSICIAN.

INGESTION:
CONTAINS BORIC ACID. CALL A PHYSICIAN OR YOUR POISON CONTROL CENTER. ADVISE OF SECTION II.

CARCINOGENIC ASSESSMENT (NTP ANNUAL REPORT, IARC MONOGRAPHS, OTHER):
NONE.

(1) WARNING:
THIS PRODUCT, WHEN USED FOR WELDING OR CUTTING, PRODUCES FUMES OR GASES WHICH CONTAIN CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND, IN SOME CASES, CANCER. (CALIFORNIA HEALTH & SAFETY CODE SUBSECTION 25249.5 ET SEQ.)

VII. PRECAUTIONS FOR SAFE HANDLING AND USE/ APPLICABLE CONTROL MEASURES

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTIONS AND THE PRECAUTIONARY LABEL ON THIS PRODUCT. SEE AMERICAN NATIONAL STANDARD Z-49.1, "SAFETY IN WELDING AND CUTTING", PUBLISHED BY THE AMERICAN WELDING SOCIETY, P.O. BOX 351040, MIAMI, FL 33135 AND OSHA PUBLICATION 2206 (29 C.F.R. 1910), U.S. GOVERNMENT PRINTING OFFICE, SUPERINTENDENT OF DOCUMENTS, P.O. BOX 371954, PITTSBURGH, PA 15250- 7954 FOR MORE DETAIL ON MANY OF THE FOLLOWING:

RESPIRATORY PROTECTION:
USE RESPIRABLE FUME RESPIRATOR OR AIR SUPPLIED RESPIRATOR WHEN WELDING IN CONFINED SPACES OR WHERE LOCAL EXHAUST OR VENTILATION DOES NOT KEEP EXPOSURE BELOW TLV.

EYE PROTECTION:
CHEMICAL TIGHT SAFETY GOGGLES. DO NOT WEAR CONTACT LENSES.

VENTILATION:
USE ENOUGH VENTILATION, LOCAL EXHAUST AT THE FLAME, OR BOTH, TO KEEP THE FUMES AND GASES BELOW THE TLV'S IN THE WORKER'S BREATHING ZONE AND THE GENERAL AREA. TRAIN THE WELDER TO KEEP HIS HEAD OUT OF THE FUMES. ADEQUATE VENTILATION SHOULD BE USED WHEN MATERIAL IS IN DUSTY OR MOLTEN STATE.

PROTECTIVE CLOTHING AND EQUIPMENT:
CHEMICAL AND ACID IMPERVIOUS GLOVES. WEAR HEAD, HAND, AND BODY PROTECTION WHICH HELP TO PREVENT INJURY FROM RADIATION, SPARKS AND ELECTRICAL SHOCK. SEE ANSI Z-49.1 FOR ADDITIONAL GUIDELINES. TRAIN THE WELDER NOT TO TOUCH LIVE ELECTRICAL PARTS AND TO INSULATE HIMSELF FROM WORK AND GROUND.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS:
CONTAIN SPILL, ABSORB, SWEEP UP. REMOVE TO CHEMICAL SEWER. FLUSH AREA TO CHEMICAL SEWER. AVOID BREATHING DUST.

WASTE DISPOSAL METHODS:
PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSABLE CONTAINER, OR LINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER, IN FULL COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
STORE FLUX AT AMBIENT CONDITIONS. KEEP UNDER EXTREMELY DRY AND CONTROLLED CONDITIONS. WASH THOROUGHLY AFTER HANDLING TO REMOVE ALL RESIDUE.

OTHER PRECAUTIONS AND/OR SPECIAL HAZARDS:
REMOVE AND PROFESSIONALLY CLEAN CONTAMINATED CLOTHING BEFORE REUSE.

THE OPINIONS EXPRESSED IN THIS MSDS ARE THOSE OF QUALIFIED EXPERTS WITHIN THE ESAB GROUP. WE BELIEVE THAT THE INFORMATION CONTAINED HEREIN IS CURRENT AS OF THE DATE OF THIS MSDS. SINCE THE USE OF THIS INFORMATION AND THESE OPINIONS AND THE CONDITIONS OF USE OF THESE PRODUCTS ARE NOT WITHIN THE CONTROL OF THE ESAB GROUP, IT IS THE USER'S OBLIGATION TO DETERMINE THE CONDITIONS OF SAFE USE OF THESE PRODUCTS.

THE ESAB GROUP REQUESTS THE USERS OF THESE PRODUCTS TO STUDY THIS MATERIAL SAFETY DATA SHEET (MSDS) AND BECOME AWARE OF THE PRODUCT HAZARDS AND SAFETY INFORMATION. TO PROMOTE THE SAFE USE OF THESE PRODUCTS A USER SHOULD (1) NOTIFY ITS EMPLOYEES, AGENTS AND CONTRACTORS OF THE INFORMATION ON THIS MSDS AND ANY PRODUCT HAZARDS AND SAFETY INFORMATION, (2) FURNISH THIS SAME INFORMATION TO EACH OF ITS CUSTOMERS FOR THESE PRODUCTS, AND (3) REQUEST SUCH CUSTOMERS TO NOTIFY THEIR EMPLOYEES AND CUSTOMERS, FOR THESE PRODUCTS, OF THE SAME PRODUCT HAZARDS AND SAFETY INFORMATION.

ITEM: 3WY36 - FLASHLIGHT COMBO

PICK_REQ: 1114905521 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A3656**

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A3656

Associated Grainger Item: 3WY36 - FLASHLIGHT COMBO

4JC14, 4VZ51, 5RV33, 5RV36

ENERGIZER

PRODUCT SAFETY DATA SHEET

ALKALINE BATTERIES

10/17/01

THE INFORMATION CONTAINED WITHIN IS PROVIDED FOR YOUR INFORMATION ONLY. THIS BATTERY IS AN ARTICLE PURSUANT TO 29 CFR 1910.1200 AND, AS SUCH, IS NOT SUBJECT TO THE OSHA HAZARD COMMUNICATION STANDARD REQUIREMENT FOR PREPARATION OF A MATERIAL SAFETY DATA SHEET. THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE MADE IN GOOD FAITH AND ARE BELIEVED TO BE ACCURATE AS OF THE DATE OF PREPARATION. HOWEVER, EVEREADY BATTERY COMPANY, INC., MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON IT.

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: EVEREADY BATTERY

TRADE NAMES: ENERGIZER, ENERGIZER E2, INDUSTRIAL ZMA; HERCULES

CHEMICAL SYSTEM: ALKALINE MANGANESE DIOXIDE-ZINC

TYPE NO.:

APPROXIMATE WEIGHT:

DESIGNED FOR RECHARGE: NO

VOLTS:

SECTION I - MANUFACTURER INFORMATION

EVEREADY BATTERY COMPANY, INC.
25225 DETROIT ROAD
WESTLAKE, OH 44145

TELEPHONE NUMBERS FOR INFORMATION:
(440) 835-7368
(800) 383-7323 (USA)

DATE PREPARED: OCTOBER 17, 2001

SECTION II - HAZARDOUS INGREDIENTS

IMPORTANT NOTE:
THE BATTERY SHOULD NOT BE OPENED OR BURNED. EXPOSURE TO THE INGREDIENTS CONTAINED WITHIN OR THEIR COMBUSTION PRODUCTS COULD BE HARMFUL.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/WT.
GRAPHITE (CAS# 7782-42-5)	15 MG/M3 TWA (TOTAL DUST) 5 MG/M3 TWA (RESPIRABLE FRACTION)	2 MG/M3 TWA (RESPIRABLE FRACTION)	2-6
MANGANESE DIOXIDE (CAS# 1313-13-9)	5 MG/M3 CEILING (AS Mn)	0.2 MG/M3 TWA (AS Mn)	30-45
POTASSIUM HYDROXIDE (CAS# 1310-58-3)	NONE ESTABLISHED	2 MG/M3 CEILING	4-8
ZINC (CAS# 7440-66-6)	15 MG/M3 TWA PNOR* (TOTAL DUST) 5 MG/M3 TWA PNOR* (RESPIRABLE FRACTION)	10 MG/M3 TWA PNOC** (INHALABLE PARTICULATE) 3 MG/M3 TWA PNOC** (RESPIRABLE PARTICULATE)	12-25

* PNOR: PARTICULATES NOT OTHERWISE REGULATED
**PNOC: PARTICULATES NOT OTHERWISE CLASSIFIED

SECTION III - FIRE AND EXPLOSION HAZARD DATA

IN CASE OF FIRE, IT IS PERMISSIBLE TO USE ANY CLASS OF EXTINGUISHING MEDIUM ON THESE BATTERIES OR THEIR PACKING MATERIAL. COOL EXTERIOR OF BATTERIES IF EXPOSED TO FIRE TO PREVENT RUPTURE.
FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS.

SECTION IV - HEALTH HAZARD DATA

UNDER NORMAL CONDITIONS OF USE, THE BATTERY IS HERMETICALLY SEALED.

INGESTION: SWALLOWING A BATTERY CAN BE HARMFUL.

CONTENTS OF AN OPEN BATTERY CAN CAUSE SERIOUS CHEMICAL BURNS OF MOUTH, ESOPHAGUS, AND GASTROINTESTINAL TRACT.

IF BATTERY OR OPEN BATTERY IS INGESTED, DO NOT INDUCE VOMITING OR GIVE FOOD OR DRINK. SEEK MEDICAL ATTENTION IMMEDIATELY. CALL NATIONAL BATTERY INGESTION HOTLINE FOR ADVICE AND FOLLOW-UP (202-625-3333 COLLECT) FOR ADVICE AND FOLLOW-UP, DAY OR NIGHT.

INHALATION:
CONTENTS OF AN OPEN BATTERY CAN CAUSE RESPIRATORY IRRITATION. PROVIDE FRESH AIR AND SEEK MEDICAL ATTENTION.

SKIN CONTACT:
CONTENTS OF AN OPEN BATTERY CAN CAUSE SKIN IRRITATION AND/OR CHEMICAL BURNS. REMOVE CONTAMINATED CLOTHING AND WASH SKIN WITH SOAP AND WATER. IF A CHEMICAL BURN OCCURS OR IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

EYE CONTACT:
CONTENTS OF AN OPEN BATTERY CAN CAUSE SEVERE IRRITATION AND CHEMICAL BURNS. IMMEDIATELY FLUSH EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF THE CHEMICAL REMAINS. SEEK MEDICAL ATTENTION.

SECTION V - PRECAUTIONS FOR SAFE HANDLING AND USE

STORAGE:
STORE IN A COOL, WELL VENTILATED AREA. ELEVATED TEMPERATURES CAN RESULT IN SHORTENED BATTERY LIFE.

MECHANICAL CONTAINMENT:
IF POTTING OR SEALING THE BATTERY IN AN AIRTIGHT OR WATERTIGHT CONTAINER IS REQUIRED, CONSULT YOUR EVEREADY BATTERY COMPANY REPRESENTATIVE FOR PRECAUTIONARY SUGGESTIONS. BATTERIES NORMALLY EVOLVE HYDROGEN WHICH, WHEN COMBINED WITH OXYGEN FROM THE AIR, CAN PRODUCE A COMBUSTIBLE OR EXPLOSIVE MIXTURE UNLESS VENTED. IF SUCH A MIXTURE IS PRESENT, SHORT CIRCUITS, HIGH TEMPERATURE, OR STATIC SPARKS CAN CAUSE AN IGNITION.

DO NOT OBSTRUCT SAFETY RELEASE VENTS ON BATTERIES. ENCAPSULATION (POTTING) OF BATTERIES WILL NOT ALLOW CELL VENTING AND CAN CAUSE HIGH PRESSURE RUPTURE.

HANDLING:
ACCIDENTAL SHORT CIRCUIT FOR A FEW SECONDS WILL NOT SERIOUSLY AFFECT THE BATTERY. PROLONGED SHORT CIRCUIT WILL CAUSE THE BATTERY TO LOSE ENERGY, AND CAN CAUSE THE SAFETY RELEASE VENT TO OPEN. SOURCES OF SHORT CIRCUITS INCLUDE JUMBLED BATTERIES IN BULK CONTAINERS, METAL JEWELRY, METAL COVERED TABLES OR METAL BELTS USED FOR ASSEMBLY OF BATTERIES INTO DEVICES.

IF SOLDERING OR WELDING TO THE BATTERY IS REQUIRED, CONSULT YOUR EVEREADY BATTERY COMPANY REPRESENTATIVE FOR PROPER PRECAUTIONS TO PREVENT SEAL DAMAGE OR SHORT CIRCUIT.

CHARGING:
THIS BATTERY IS MANUFACTURED IN A CHARGED STATE. IT IS NOT DESIGNED FOR RECHARGING. RECHARGING CAN CAUSE BATTERY LEAKAGE OR, IN SOME CASES, HIGH PRESSURE RUPTURE. INADVERTENT CHARGING CAN OCCUR IF A BATTERY IS INSTALLED BACKWARDS.

LABELING:
IF THE EVEREADY LABEL OR PACKAGE WARNINGS ARE NOT VISIBLE, IT IS IMPORTANT TO PROVIDE A PACKAGE AND/OR DEVICE LABEL STATING:

WARNING:
DO NOT INSTALL BACKWARDS, CHARGE, PUT IN FIRE, OR MIX WITH OTHER BATTERY TYPES. MAY EXPLODE OR LEAK CAUSING INJURY. REPLACE ALL BATTERIES AT THE SAME TIME.

WHERE ACCIDENTAL INGESTION OF SMALL BATTERIES IS POSSIBLE, THE LABEL SHOULD INCLUDE:

KEEP AWAY FROM SMALL CHILDREN. IF SWALLOWED, PROMPTLY SEE DOCTOR; HAVE DOCTOR PHONE (202) 625-3333 COLLECT.

DISPOSAL:
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS. APPROPRIATE DISPOSAL TECHNOLOGIES INCLUDE INCINERATION AND LANDFILLING.

SECTION VI - SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS: NOT NECESSARY UNDER NORMAL CONDITIONS.

RESPIRATORY PROTECTION: NOT NECESSARY UNDER NORMAL CONDITIONS.

EYE PROTECTION:
NOT NECESSARY UNDER NORMAL CONDITIONS. WEAR SAFETY GLASSES WITH SIDE SHIELDS IF HANDLING AN OPEN OR LEAKING BATTERY.

GLOVES:
NOT NECESSARY UNDER NORMAL CONDITIONS. USE NEOPRENE OR NATURAL RUBBER GLOVES IF HANDLING AN OPEN OR LEAKING BATTERY.

SECTION VII - REGULATORY INFORMATION

THE TRANSPORTATION OF DRY CELL BATTERIES MANUFACTURED OR SOLD BY EVEREADY BATTERY COMPANY IS NOT REGULATED BY THE U.S. DEPARTMENT OF TRANSPORTATION OR THE MAJOR INTERNATIONAL REGULATORY BODIES.

SARA/TITLE III - AS AN ARTICLE, THIS BATTERY AND ITS CONTENTS ARE NOT SUBJECT TO THE REQUIREMENTS OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT.

(C) 2001 EVEREADY BATTERY COMPANY, INC.

ITEM: 3WY36 - FLASHLIGHT COMBO

PICK_REQ: 1114905521 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A5551**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A5551

Associated Grainger Item: 3WY36 - FLASHLIGHT COMBO

SYNTHETIC RUBBER TECHNOLOGIES, INC.

MATERIAL SAFETY DATA SHEET

DATE: APRIL 15, 1994

1. PRODUCT IDENTIFICATION

IDENTITY: RIMFIL(R*) ABS RESIN

DESCRIPTION: ACRYLONITRILE-BUTADIENE-STYRENE RESIN

CHEMICAL FAMILY: THERMOPLASTIC RESIN

CAS REGISTRY NUMBER: 9003-56-9

2. COMPONENTS AND HAZARD CLASSIFICATION

STYRENE	>15%
POLYBUTADIENE	<16% *1000 PPM TLV
ACRYLONITRILE	<22%
ALPHA-METHYL STYRENE	<46% **2000 PPM TLV
OTHERS:	<1%

*THE VAPORS ARE IRRITATING TO THE EYES & MUCOUS MEMBRANES. INHALATION OF HIGH CONCENTRATIONS CAN CAUSE UNCONSCIOUSNESS AND DEATH.

**FURTHER EXPOSURE IN IRRITATION OF THE EYES PHOTOPHOBIA, IRRITATION OF THE NOSE, DEEPENED RESPIRATION.

3. PHYSICAL DATA

APPEARANCE & ODOR: PELLET

BOILING POINT: N/A

MELTING POINT: N/A

EVAPORATION RATE: N/A

PERCENT VOLATILE: N/A - ODORLESS

VAPOR DENSITY: N/A

SOLUBILITY IN WATER: INSOLUBLE

SPECIFIC GRAVITY: 1.04-1.06

4. FIRE & EXPLOSION DATA

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: N/A

SPECIAL FIGHTING PROCEDURES:
FIREFIGHTERS MUST BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE & EXPLOSION HAZARDS:
IF EXPOSED TO FIRE, HIGH HEAT WILL DEVELOP ALONG WITH HEAVY BLACK SMOKE. DURING COMBUSTION CARBON DIOXIDE WILL BE PRODUCED.

5. HEALTH HAZARD DATA

ACUTE TOXICITY EFFECTS: SEE SECTION 2.

EFFECT OF OVEREXPOSURE: N/A

FIRST AID PROCEDURES:
FLUSH EYES WITH FLOWING WATER AT LEAST 15 MINUTES. IF EYE OR SKIN IRRITATION PERSISTS, CONSULT A PHYSICIAN. WASH CONTAMINATED SKIN AREA WITH SOAP AND WATER. IF VAPORS ARE INHALED, MOVE TO FRESH AIR. AID IN BREATHING IF NECESSARY AN CONSULT A PHYSICIAN.

6. REACTIVITY DATA

MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR. AVOID CONTACT WITH ORGANIC AND INORGANIC SOLVENTS. MATERIAL IS NON-CORROSIVE TO METAL.

7. ENVIRONMENTAL DATA

ENVIRONMENTAL TOXICITY DATA: N/A

SPILL AND LEAK PROCEDURES:
SPILL SHOULD BE CONTAINED AND PLACED IN SUITABLE CONTAINERS FOR DISPOSAL.

HAZARDOUS SUBSTANCE 40CFR 261: NO

WASTE DISPOSAL METHOD:
INCINERATE OR BURY AS A SOLID IN A LICENSED FACILITY. DO NOT DISCHARGE INTO WATERWAYS OR SEWER SYSTEMS.

8. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
APPROVED ORGANIC VAPOR OR DUST RESPIRATOR AS NECESSARY, IF THERE IS NOT ADEQUATE VENTILATION THROUGHOUT STORAGE AND PROCESSING AREAS. USE LOCAL, MECHANICAL EXHAUST AS NECESSARY TO CONTROL P.E.L. WEARING EYE GOGGLES FOR PROTECTION IS RECOMMENDED. USE PROTECTIVE BODY COVERING CLOTHING. PROTECTIVE GLOVES OPTIONAL.

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN HAVE BEEN COMPILED BY SYNTHETIC RUBBER TECHNOLOGIES, INC. BASED UPON ITS BEST KNOWLEDGE AND CONVEYANCE OF MSDS DATA SUPPLIED BY ITS SUPPLIERS. NO WARRANTY, GUARANTEE OR REPRESENTATION IS MADE BY SYNTHETIC RUBBER TECHNOLOGIES AS TO THE ABSOLUTE CORRECTNESS OR SUFFICIENCY OF ANY REPRESENTATION CONTAINED IN THIS DATA SHEET AND ASSUMES NO RESPONSIBILITY IN CONNECTION THEREWITH; NOR CAN IT BE ASSUMED THAT ALL ACCEPTABLE SAFETY MEASURES ARE CONTAINED IN THIS SAFETY DATA SHEET OR THAT ADDITIONAL MEASURES MAY NOT BE REQUIRED UNDER PARTICULAR OR EXCEPTIONAL CONDITIONS OR CIRCUMSTANCES.

ITEM: 3WY36 - FLASHLIGHT COMBO

PICK_REQ: 1114905521 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A6399**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A6399

Associated Grainger Item: 3WY36 - FLASHLIGHT COMBO

4JC13, 4JC14, 4VZ51, 5RV33, 5RV36

ENERGIZER(R*)

PRODUCT SAFETY DATA SHEET

ALKALINE BATTERIES

10/17/03

THE INFORMATION CONTAINED WITHIN IS PROVIDED FOR YOUR INFORMATION ONLY. THIS BATTERY IS AN ARTICLE PURSUANT TO 29 CFR 1910.1200 AND, AS SUCH, IS NOT SUBJECT TO THE OSHA HAZARD COMMUNICATION STANDARD REQUIREMENT FOR PREPARATION OF A MATERIAL SAFETY DATA SHEET. THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE MADE IN GOOD FAITH AND ARE BELIEVED TO BE ACCURATE AS OF THE DATE OF PREPARATION. HOWEVER, EVEREADY BATTERY COMPANY, INC., MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON IT.

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: EVEREADY BATTERY

TYPE NO.:

VOLTS:

TRADE NAMES: ENERGIZER, ENERGIZER E2, INDUSTRIAL ZMA; HERCULES

APPROXIMATE WEIGHT:

CHEMICAL SYSTEM: ALKALINE MANGANESE DIOXIDE-ZINC

DESIGNED FOR RECHARGE: NO

SECTION I - MANUFACTURER INFORMATION

EVEREADY BATTERY COMPANY, INC.
25225 DETROIT ROAD
WESTLAKE, OH 44145

TELEPHONE NUMBERS FOR INFORMATION:
(440) 835-7368
(800) 383-7323 (USA)

DATE PREPARED: OCTOBER 17, 2003

SECTION II - HAZARDOUS INGREDIENTS

IMPORTANT NOTE:
THE BATTERY SHOULD NOT BE OPENED OR BURNED. EXPOSURE TO THE INGREDIENTS CONTAINED WITHIN OR THEIR COMBUSTION PRODUCTS COULD BE HARMFUL.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/WT.
GRAPHITE (CAS# 7782-42-5)	15 MG/M3 TWA (TOTAL DUST) 5 MG/M3 TWA (RESPIRABLE FRACTION)	2 MG/M3 TWA (RESPIRABLE FRACTION)	2-6
MANGANESE DIOXIDE (CAS# 1313-13-9)	5 MG/M3 CEILING (AS Mn)	0.2 MG/M3 TWA (AS Mn)	30-45
POTASSIUM HYDROXIDE (CAS# 1310-58-3)	NONE ESTABLISHED	2 MG/M3 CEILING	4-8
ZINC (CAS# 7440-66-6)	15 MG/M3 TWA PNOR* (TOTAL DUST) 5 MG/M3 TWA PNOR* (RESPIRABLE FRACTION)	10 MG/M3 TWA PNOC** (INHALABLE PARTICULATE) 3 MG/M3 TWA PNOC** (RESPIRABLE PARTICULATE)	12-25

*PNOR: PARTICULATES NOT OTHERWISE REGULATED
**PNOC: PARTICULATES NOT OTHERWISE CLASSIFIED

SECTION III - FIRE AND EXPLOSION HAZARD DATA

IN CASE OF FIRE, IT IS PERMISSIBLE TO USE ANY CLASS OF EXTINGUISHING MEDIUM ON THESE BATTERIES OR THEIR PACKING MATERIAL. COOL EXTERIOR OF BATTERIES IF EXPOSED TO FIRE TO PREVENT RUPTURE.

FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS.

SECTION IV - HEALTH HAZARD DATA

UNDER NORMAL CONDITIONS OF USE, THE BATTERY IS HERMETICALLY SEALED.

INGESTION: SWALLOWING A BATTERY CAN BE HARMFUL.

CONTENTS OF AN OPEN BATTERY CAN CAUSE SERIOUS CHEMICAL BURNS OF MOUTH, ESOPHAGUS, AND GASTROINTESTINAL TRACT.

IF BATTERY OR OPEN BATTERY IS INGESTED, DO NOT INDUCE VOMITING OR GIVE FOOD OR DRINK. SEEK MEDICAL ATTENTION IMMEDIATELY. CALL NATIONAL BATTERY INGESTION HOTLINE FOR ADVICE AND FOLLOW-UP (202-625-3333 COLLECT) FOR ADVICE AND FOLLOW-UP, DAY OR NIGHT.

INHALATION:
CONTENTS OF AN OPEN BATTERY CAN CAUSE RESPIRATORY IRRITATION. PROVIDE FRESH AIR AND SEEK MEDICAL ATTENTION.

SKIN CONTACT:
CONTENTS OF AN OPEN BATTERY CAN CAUSE SKIN IRRITATION AND/OR CHEMICAL BURNS. REMOVE CONTAMINATED CLOTHING AND WASH SKIN WITH SOAP AND WATER. IF A CHEMI BURN OCCURS OR IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

EYE CONTACT:
CONTENTS OF AN OPEN BATTERY CAN CAUSE SEVERE IRRITATION AND CHEMICAL BURNS. IMMEDIATELY FLUSH EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF THE CHEMICAL REMAINS. SEEK MEDICAL ATTENTION.

SECTION V - PRECAUTIONS FOR SAFE HANDLING AND USE

STORAGE:
STORE IN A COOL, WELL VENTILATED AREA. ELEVATED TEMPERATURES CAN RESULT IN SHORTENED BATTERY LIFE.

MECHANICAL CONTAINMENT:
IF POTTING OR SEALING THE BATTERY IN AN AIRTIGHT OR WATERTIGHT CONTAINER IS REQUIRED, CONSULT YOUR EVEREADY BATTERY COMPANY REPRESENTATIVE FOR PRECAUTIONARY SUGGESTIONS. BATTERIES NORMALLY EVOLVE HYDROGEN WHICH, WHEN COMBINED WITH OXYGEN FROM THE AIR, CAN PRODUCE A COMBUSTIBLE OR EXPLOSIVE MIXTURE UNLESS VENTED. IF SUCH A MIXTURE IS PRESENT, SHORT CIRCUITS, HIGH TEMPERATURE, OR STATIC SPARKS CAN CAUSE AN IGNITION.

DO NOT OBSTRUCT SAFETY RELEASE VENTS ON BATTERIES. ENCAPSULATION (POTTING) OF BATTERIES WILL NOT ALLOW CELL VENTING AND CAN CAUSE HIGH PRESSURE RUPTURE.

HANDLING:
ACCIDENTAL SHORT CIRCUIT FOR A FEW SECONDS WILL NOT SERIOUSLY AFFECT THE BATTERY. PROLONGED SHORT CIRCUIT WILL CAUSE THE BATTERY TO LOSE ENERGY, AND CAN CAUSE THE SAFETY RELEASE VENT TO OPEN. SOURCES OF SHORT CIRCUITS INCLUDE JUMBLED BATTERIES IN BULK CONTAINERS, METAL JEWELRY, METAL COVERED TABLES OR METAL BELTS USED FOR ASSEMBLY OF BATTERIES INTO DEVICES.

IF SOLDERING OR WELDING TO THE BATTERY IS REQUIRED, CONSULT YOUR EVEREADY BATTERY COMPANY REPRESENTATIVE FOR PROPER PRECAUTIONS TO PREVENT SEAL DAMAGE SHORT CIRCUIT.

CHARGING:
THIS BATTERY IS MANUFACTURED IN A CHARGED STATE. IT IS NOT DESIGNED FOR RECHARGING. RECHARGING CAN CAUSE BATTERY LEAKAGE OR, IN SOME CASES, HIGH PRESSURE RUPTURE. INADVERTENT CHARGING CAN OCCUR IF A BATTERY IS INSTALLED BACKWARDS.

LABELING:
IF THE EVEREADY LABEL OR PACKAGE WARNINGS ARE NOT VISIBLE, IT IS IMPORTANT TO PROVIDE A PACKAGE AND/OR DEVICE LABEL STATING:

WARNING:
DO NOT INSTALL BACKWARDS, CHARGE, PUT IN FIRE, OR MIX WITH OTHER BATTERY TYPE MAY EXPLODE OR LEAK CAUSING INJURY. REPLACE ALL BATTERIES AT THE SAME TIME.

WHERE ACCIDENTAL INGESTION OF SMALL BATTERIES IS POSSIBLE, THE LABEL SHOULD INCLUDE:
KEEP AWAY FROM SMALL CHILDREN. IF SWALLOWED, PROMPTLY SEE DOCTOR; HAVE DOCTOR PHONE (202) 625-3333 COLLECT.

DISPOSAL:
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATION APPROPRIATE DISPOSAL TECHNOLOGIES INCLUDE INCINERATION AND LANDFILLING.

SECTION VI - SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS: NOT NECESSARY UNDER NORMAL CONDITIONS.

RESPIRATORY PROTECTION: NOT NECESSARY UNDER NORMAL CONDITIONS.

EYE PROTECTION:
NOT NECESSARY UNDER NORMAL CONDITIONS. WEAR SAFETY GLASSES WITH SIDE SHIELDS HANDLING AN OPEN OR LEAKING BATTERY.

GLOVES:
NOT NECESSARY UNDER NORMAL CONDITIONS. USE NEOPRENE OR NATURAL RUBBER GLOVES HANDLING AN OPEN OR LEAKING BATTERY.

SECTION VII - REGULATORY INFORMATION

THE TRANSPORTATION OF DRY CELL BATTERIES MANUFACTURED OR SOLD BY EVEREADY BATTERY COMPANY IS NOT REGULATED BY THE U.S. DEPARTMENT OF TRANSPORTATION OR THE MAJOR INTERNATIONAL REGULATORY BODIES.

SARA/TITLE III - AS AN ARTICLE, THIS BATTERY AND ITS CONTENTS ARE NOT SUBJECT TO THE REQUIREMENTS OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT.

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[redacted]

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Common Name: ANTI-SLIP-TILE RED, AS5468
Manufacturer: RUST-OLEUM
MSDS Revision Date: 2/7/2001

Grainger Item Number(s): 1F718, 3XH18
Manufacturer Model Number(s): AS5468, AS5479-300

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MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ANTI-SLIP-TILE RED

IDENTIFICATION NUMBER: AS5468 402

DATE PRINTED: 02/07/01

PRODUCT USE/CLASS: ANTI-SLIP ONE STEP EPOXY FLOOR

SUPPLIER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY

VERNON HILLS, ILLINOIS 60061
USA

(847) 367-7700 RUST-OLEUM CORP.
8:00 AM - 4:30 PM/24-HR EMER. ASSIST

MANUFACTURER:
RUST-OLEUM CORPORATION
11 HAWTHORN PARKWAY
VERNON HILLS, ILLINOIS 60061
USA

(847) 367-7700 RUST-OLEUM CORP.
8:00 AM - 4:30 PM/24-HR EMER. ASSIST

PREPARER: MTM

PHONE: 847-816-2445

PREPARE DATE: 02/07/01

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	XYLENE	1330-20-7	20.0 %
02	SILICON DIOXIDE (QUARTZ)	14808-60-7	20.0 %
03	ALUMINUM OXIDE	1344-28-1	15.0 %
04	EPOXY RESIN	PROPRIETARY	15.0 %
05	CARBON BLACK	1333-86-4	5.0 %
06	PROPYLENE GLYCOL METHYL ETHER	107-98-2	5.0 %
07	ETHYLBENZENE	100-41-4	5.0 %
08	TITANIUM DIOXIDE	13463-67-7	5.0 %

	EXPOSURE LIMITS					
	ACGIH		OSHA		MEXICAN	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	100 PPM	150 PPM	100 PPM	N.E.	100 PPM	YES
02	0.1 MG/M3	N.E.	10 MG/M3/%Q+2	N.E.	N.E.	NO
03	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO
04	N.E.	N.E.	N.E.	N.E.	N.E.	NO
05	3.5 MG/M3	N.E.	3.5 MG/M3	N.E.	N.E.	NO
06	100 PPM	150 PPM	100 PPM-NIOSH	N.E.	N.E.	NO

07	100 PPM	125 PPM	100 PPM	N.E.	N.E.	YES
08	10 MG/M3	N.E.	15 MG/M3	N.E.	N.E.	NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
CAUSES EYE IRRITATION. CAUSES SKIN IRRITATION. VAPORS EXTREMELY IRRITATING TO EYES AND RESPIRATORY TRACT. FLAMMABLE LIQUID AND VAPOR. CAUSES NOSE AND THROAT IRRITATION. HARMFUL IF INHALED. MAY EFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. HIGH VAPOR CONCENTRATIONS CAN IRRITATE EYES, NOSE AND RESPIRATORY PASSAGES.

EFFECTS OF OVEREXPOSURE - EYE CONTACT:
CAUSES EYE IRRITATION. IRRITATING, AND MAY INJURE EYE TISSUE IF NOT REMOVED PROMPTLY.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT:
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION. CAUSES SKIN IRRITATION. ALLERGIC REACTIONS ARE POSSIBLE. MAY CAUSE SKIN SENSITIZATION, AN ALLERGIC REACTION, WHICH BECOMES EVIDENT ON REEXPOSURE TO THIS MATERIAL.

EFFECTS OF OVEREXPOSURE - INHALATION:
HARMFUL IF INHALED. AVOID BREATHING VAPORS OR MISTS. MAY CAUSE HEADACHES AND DIZZINESS. HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS. PROLONGED OR EXCESSIVE INHALATION MAY CAUSE RESPIRATORY TRACT IRRITATION.

EFFECTS OF OVEREXPOSURE - INGESTION:
HARMFUL IF SWALLOWED. ASPIRATION HAZARD IF SWALLOWED; CAN ENTER LUNGS AND CAUSE DAMAGE.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:
REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. OVEREXPOSURE TO XYLENE IN LABORATORY ANIMALS HAS BEEN ASSOCIATED WITH LIVER ABNORMALITIES, KIDNEY, LUNG, SPLEEN, EYE AND BLOOD DAMAGE AS WELL AS REPRODUCTIVE DISORDERS. EFFECTS IN HUMANS, DUE TO CHRONIC OVEREXPOSURE, HAVE INCLUDED LIVER, CARDIAC ABNORMALITIES AND NERVOUS SYSTEM DAMAGE. CONTAINS CRYSTALLINE SILICA AS SILICON DIOXIDE. EXCESSIVE INHALATION OF RESPIRABLE CRYSTALLINE SILICA DUST MAY CAUSE LUNG DISEASE, SILICOSIS OR LUNG CANCER. SIGNIFICANT EXPOSURE IS NOT ANTICIPATED DURING BRUSH OR TROWEL APPLICATION OR DRYING. RISK OF OVEREXPOSURE DEPENDS ON THE DURATION AND LEVEL OF EXPOSURE TO DUST FROM REPEATED SANDING OF SURFACES, MECHANICAL ABRASION OR SPRAY MIST AND ACTUAL CONCENTRATION OF CRYSTALLINE SILICA IN THE FORMULA. CRYSTALLINE SILICA IS LISTED AS GROUP 1 "CARCINOGENIC TO HUMANS" BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND GROUP 2, "REASONABLY ANTICIPATED TO BE A CARCINOGEN" BY THE NATIONAL TOXICOLOGY PROGRAM (NTP) CONTAINS CARBON BLACK. CHRONIC INFLAMMATION, LUNG FIBROSIS, AND LUNG TUMORS HAVE BEEN OBSERVED IN SOME RATS EXPERIMENTALLY EXPOSED FOR LONG PERIODS OF TIME TO EXCESSIVE CONCENTRATIONS OF CARBON BLACK AND SEVERAL INSOLUBLE FINE DUST PARTICLES. TUMORS HAVE NOT BEEN OBSERVED IN OTHER ANIMAL SPECIES (I.E., MOUSE AND HAMPSTER) UNDER SIMILAR CIRCUMSTANCES AND STUDY CONDITIONS. EPIDEMIOLOGICAL STUDIES OF NORTH AMERICAN WORKERS SHOW NO

EVIDENCE OF CLINICALLY SIGNIFICANT ADVERSE HEALTH EFFECTS DUE TO OCCUPATIONAL EXPOSURE TO CARBON BLACK. CARBON BLACK IS LISTED AS A GROUP 2B- "POSSIBLY CARCINOGENIC TO HUMANS" BY IARC AND IS PROPOSED TO BE LISTED AS A4 - "NOT CLASSIFIED AS A HUMAN CARCINOGEN" BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS. SIGNIFICANT EXPOSURE IS NOT ANTICIPATED DURING BRUSH APPLICATION OR DRYING. RISK OF OVEREXPOSURE DEPENDS ON DURATION AND LEVEL OF EXPOSURE TO DUST FROM REPEATED SANDING OF SURFACES OR SPRAY MIST AND THE ACTUAL CONCENTRATION OF CARBON BLACK IN THE FORMULA.

PRIMARY ROUTE(S) OF ENTRY:
SKIN ABSORPTION
INHALATION
EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT:
HOLD EYELIDS APART AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT:
WASH WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

FIRST AID - INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET IMMEDIATE MEDICAL ATTENTION.

FIRST AID - INGESTION:
ASPIRATION HAZARD:
DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 81 F (SETAFLASH CLOSED CUP)

LOWER EXPLOSIVE LIMIT: 1.0 %
UPPER EXPLOSIVE LIMIT: 10.9 %

AUTOIGNITION TEMPERATURE: ND

EXTINGUISHING MEDIA:
DRY CHEMICAL
FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS:
VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME.

SPECIAL FIREFIGHTING PROCEDURES:
WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND

POSSIBLE AUTOIGNITION OR EXPLOSION. EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. ELIMINATE ALL IGNITION SOURCES; USE EXPLOSION-PROOF EQUIPMENT. PLACE MATERIAL IN A CONTAINER AND DISPOSE OF ACCORDING TO LOCAL, PROVINCIAL, STATE AND FEDERAL REGULATIONS.

SECTION 7 - HANDLING AND STORAGE

HANDLING:
WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. USE WITH ADEQUATE VENTILATION. FOLLOW ALL MSDS/LABEL PRECAUTIONS EVEN AFTER CONTAINER IS EMPTIED BECAUSE IT MAY RETAIN PRODUCT RESIDUES.

STORAGE:
KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAME AND SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. PREVENT BUILD-UP OF VAPORS BY OPENING ALL DOORS AND WINDOWS TO ACHIEVE CROSS-VENTILATION.

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED TO EXCEED EXPOSURE LIMITS. PROTECTION PROVIDED BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR IF THERE IS ANY POTENTIAL FOR AN UNCONTROLLED RELEASE, EXPOSURE LEVELS ARE NOT KNOWN, OR ANY OTHER CIRCUMSTANCES WHERE AIR PURIFYING RESPIRATORS MAY NOT PROVIDE ADEQUATE PROTECTION.

SKIN PROTECTION:
USE IMPERVIOUS GLOVES TO PREVENT SKIN CONTACT AND ABSORPTION OF THIS MATERIAL THROUGH THE SKIN. NITRILE OR NEOPRENE GLOVES MAY AFFORD ADEQUATE SKIN PROTECTION.

EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PRCTECTIVE EQUIPMENT:

REFER TO SAFETY SUPERVISOR OR INDUSTRIAL HYGIENIST FOR FURTHER INFORMATION REGARDING PERSONAL PROTECTIVE EQUIPMENT AND ITS APPLICATION.

HYGIENIC PRACTICES:
WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING OR SMOKING.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE: 248 - 284 F

VAPOR DENSITY: IS HEAVIER THAN AIR

ODOR: SOLVENT

ODOR THRESHOLD: ND

APPEARANCE: LIQUID

EVAPORATION RATE: IS SLOWER THAN ETHER

SOLUBILITY IN H2O: SLIGHT

FREEZE POINT: ND

SPECIFIC GRAVITY: 1.6501

VAPOR PRESSURE: ND

pH @ 0.0%: ND

PHYSICAL STATE: LIQUID

VISCOSITY: ND

COEFFICIENT OF WATER/OIL DISTRIBUTION: ND

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: AVOID ALL POSSIBLE SOURCES OF IGNITION.

INCOMPATIBILITY:
INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS AND STRONG ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS:
BY OPEN FLAME, CARBON MONOXIDE AND CARBON DIOXIDE. WHEN HEATED TO DECOMPOSITION IT EMITS ACRID SMOKE AND IRRITATING FUMES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	LD50	LC50
XYLENE	RAT 4300 MG/KG	RAT 5000 PPM 4HR
SILICON DIOXIDE (QUARTZ)	N.E.	N.E.
ALUMINUM OXIDE	NO INFORMATION	NO INFORMATION
EPOXY RESIN	NO INFORMATION	NO INFORMATION
CARBON BLACK	N.A.	N.A.
PROPYLENE GLYCOL METHYL ETHER	RAT 7200 MG/KG	N.D.
ETHYLBENZENE	RAT 3500 MG/KG	N.A.
TITANIUM DIOXIDE	>10,000 MG/KG RAT	TCLO 250 MG/M3 INH

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
PRODUCT IS A MIXTURE OF LISTED COMPONENTS. ACCORDING TO OUR RAW MATERIAL SUPPLIERS, ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY AS REQUIRED OR MEET THE POLYMER EXEMPTION AS DEFINED IN SECTION 5.5.2 OF THE TOXIC SUBSTANCES CONTROL ACT.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
DISPOSE OF MATERIAL IN ACCORDANCE TO LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES. DO NOT ALLOW TO ENTER STORM DRAINS OR SEWER SYSTEMS.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: PAINT

DOT TECHNICAL NAME:

DOT HAZARD CLASS: 3
HAZARD SUBCLASS:

DOT UN/NA NUMBER: UN1263
PACKING GROUP: III
RESP. GUIDE PAGE: 127

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS

OSHA:
HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:
IMMEDIATE HEALTH HAZARD
CHRONIC HEALTH HAZARD
FIRE HAZARD

SARA SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
XYLENE	1330-20-7	20.0 %
ETHYLBENZENE	100-41-4	5.0 %

U.S. STATE REGULATIONS: AS FOLLOWS

NEW JERSEY RIGHT-TO-KNOW:
THE FOLLOWING MATERIALS ARE NON-HAZARDOUS, BUT ARE AMONG THE TOP FIVE COMPONENTS IN THIS PRODUCT:

CHEMICAL NAME	CAS NUMBER
NEPHELINE SYENITE	37244-96-5

PENNSYLVANIA RIGHT-TO-KNOW:
THE FOLLOWING NON-HAZARDOUS INGREDIENTS ARE PRESENT IN THE PRODUCT AT GREATER THAN 3%:

CHEMICAL NAME	CAS NUMBER
NEPHELINE SYENITE	37244-96-5
ORGANOPHILIC CLAY	71011-26-2

CALIFORNIA PROPOSITION 65:
WARNING:
THE CHEMICAL(S) NOTED BELOW AND CONTAINED IN THIS PRODUCT, ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:

CHEMICAL NAME	CAS NUMBER
SILICON DIOXIDE (QUARTZ)	14808-60-7

INTERNATIONAL REGULATIONS: AS FOLLOWS

CANADIAN WHMIS:

THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS:
B2
D2A

SECTION 16 - OTHER INFORMATION

HMIS RATINGS:
HEALTH 2
FLAMMABILITY 3
REACTIVITY 0

PREVIOUS MSDS REVISION DATE: 06/28/00

REASON FOR REVISION: TRANSPORTATION INFORMATION

LEGEND:
N.A. - NOT APPLICABLE
N.E. - NOT ESTABLISHED
N.D. - NOT DETERMINED

: NO INFORMATION.

THE INFORMATION CONTAINED ON THIS MSDS HAS BEEN CHECKED AND SHOULD BE ACCURATE. HOWEVER, IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

PRODUCT: AS5468 402

KMB00003499

ITEM: 1M879 - DRILL BIT 17/32 IN

PICK_REQ: 1132397647 MATERIAL SAFETY DATA SHEET (MSDS) MSDS: A6334

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A6334

Associated Grainger Item: 1M879 - DRILL BIT 17/32 IN

4GB74, 4GB75, 4GB76, 4GB77, 4GB78, 4GB79, 4GB80, 4GB81, 4GB82, 4GB83, 4GB84
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GREENFIELD INDUSTRIES, INC.

MATERIAL SAFETY DATA SHEET

MSDS #: 904

K-0963-904

DATE OF ISSUE: 5/01

SUPERSEDES: 4/99

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: HIGH SPEED STEEL CUTTING TOOLS

CHEMICAL NAME: FERROUS ALLOYS

SYNONYMS: TOOL STEEL

PRODUCT USE: METALWORKING TOOLS

MANUFACTURER:
GREENFIELD INDUSTRIES, INC.
P.O. BOX 2587
AUGUSTA, GA 30913

EMERGENCY TELEPHONE NUMBER:
THE 3E COMPANY: 1-800-451-8346

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS NUMBER	% BY WEIGHT	OSHA PEL TWA (MG/M3)	ACGIH TLV TWA (MG/M3)

IRON (Fe)	7439-89-6	50-90	10	NONE ESTABLISHED
**TUNGSTEN (W)	7440-33-7	1-20	15	5
MOLYBDENUM (Mo)	7439-98-7	0.5-10	15	10
*CHROMIUM (Cr)	7440-47-3	1-5	1	0.5
VANADIUM (V)	7440-62-2	1-5	5	5
*COBALT (Co)	7440-48-4	5-10	0.1	0.02

MATERIAL	NFPA HAZARD RATING SCALE 0-4 HEALTH	FIRE	REACTIVITY
IRON (Fe)	0	3	0
**TUNGSTEN (W)	1	3	0
MOLYBDENUM (Mo)	1	1	0
*CHROMIUM (Cr)	2	1	1
VANADIUM (V)	2	0	0
*COBALT (Co)	2	3	0

* IDENTIFIES SUBSTANCES THAT ARE SUBJECT TO THE REQUIREMENTS OF SECTION 313 OF TITLE III OF SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

** THIS SUBSTANCE IS REGULATED BY OSHA AS A PARTICULATE NOT OTHERWISE REGULATED (PNOR). THE EXPOSURE LIMIT LISTED FOR OSHA REFERS TO TOTAL DUST; THE OSHA PEL FOR THE RESPIRABLE FRACTION IS 5 MG/M3.

SECTION 3 - HAZARDS IDENTIFICATION

OPERATIONS SUCH AS WELDING, GRINDING, POLISHING, MELTING, AND BRAZING MAY CAUSE DUST OR FUME GENERATION WHICH CAN RESULT IN EXPOSURE TO THE ELEMENTS PRESENT IN THE ALLOY.

(NOTE: HEALTH EFFECTS LISTED ARE FOR EXPOSURE TO METALLURGICAL POWDERS, DUST, OR MIST FROM ALTERING THE TOOL. NO HEALTH EFFECTS HAVE BEEN REPORTED FOR EXPOSURE TO THIS MATERIAL IN SOLID FORM.)

INHALATION:
IRRITANT/SENSITIZER:
250 MG(Cr)/M3, 35 MG(V)/M3 OR 10 MG(Co)/M3 IS IMMEDIATELY DANGEROUS TO LIFE AND HEALTH.

ACUTE OVEREXPOSURE:
SYMPTOMS OF METAL FUME FEVER INCLUDING CHILLS, FEVER, SWEATING, NAUSEA, AND COUGH MAY APPEAR. METAL FUME FEVER BEGINS 4 TO 12 HOURS AFTER EXPOSURE AND LASTS 24 HOURS WITHOUT CAUSING PERMANENT DAMAGE. OTHER EFFECTS CAUSED BY DUST AND FUME INHALATION INCLUDE METALLIC TASTE, EYES, NOSE, AND THROAT IRRITATION, WHEEZING, DIFFICULTY BREATHING, AND CHEST PAIN.

CHRONIC OVEREXPOSURE:
MAY CAUSE RESPIRATORY IRRITATION, BRONCHITIS, ALLERGIC RESPIRATORY REACTION, OBSTRUCTED AIRWAYS, BUILD-UP OF DUST IN THE LUNGS, DAMAGE TO LUNG TISSUE, AND LUNG DISEASE, WITH SYMPTOMS AS DESCRIBED IN ACUTE OVEREXPOSURE, ESPECIALLY INFLAMMATION OF THE RESPIRATORY TRACT, NOSE AND THROAT IRRITATION, VIOLENT COUGHING, WHEEZING, RASPING, AND SHORTNESS OF BREATH. THERE MAY ALSO BE BLOOD CHANGES, LIVER AND KIDNEY DAMAGE, AND AN INCREASED SUSCEPTIBILITY TO RESPIRATORY CHANGES.

SKIN CONTACT: IRRITANT.

ACUTE OVEREXPOSURE: MAY CAUSE IRRITATION.

CHRONIC OVEREXPOSURE:
MAY CAUSE INFLAMMATION AND/OR RASH (IRRITANT OR ALLERGIC CONTACT DERMATITIS).

EYE CONTACT: IRRITANT.
ACUTE OVEREXPOSURE: MAY CAUSE IRRITATION WITH REDNESS, PAIN, AND ITCHING.
CHRONIC OVEREXPOSURE: MAY CAUSE CONJUNCTIVITIS.

INGESTION: IRRITANT.

ACUTE OVEREXPOSURE:
INGESTION OF LARGE AMOUNTS OF STEEL DUST IS HIGHLY UNLIKELY. HOWEVER, INGESTION OF SMALL AMOUNTS MAY OCCUR BY EATING OR SMOKING WITH CONTAMINATED HANDS.

CHRONIC OVEREXPOSURE:
MAY PRODUCE THE SAME SYMPTOMS AS FOR ACUTE OVEREXPOSURE. MAY ALSO ADVERSELY AFFECT THE PANCREAS, THYROID GLAND, HEART, OR BONE MARROW.

SECTION 4 - FIRST AID MEASURES

INHALATION:
IF SYMPTOMS OF PULMONARY INVOLVEMENT DEVELOP (COUGHING, WHEEZING, SHORTNESS OF BREATH), REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP AFFECTED PERSON WARM AND AT REST. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
IF IRRITATION OR RASH OCCURS, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF MATERIAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION.

EYE CONTACT:
IF IRRITATION OCCURS, WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF MATERIAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
IF THIS MATERIAL HAS BEEN SWALLOWED AND PERSON IS CONSCIOUS, IMMEDIATELY GIVE PERSON LARGE AMOUNTS OF WATER. DO NOT ATTEMPT TO MAKE AN UNCONSCIOUS PERSON DRINK OR VOMIT. GET MEDICAL ATTENTION IMMEDIATELY. INDUCE VOMITING ONLY IF SPECIFICALLY INSTRUCTED BY A PHYSICIAN.

SECTION 5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS:
FINE METAL PARTICLES PRODUCED WHEN GROUND, SAWED, ETC. CAN BURN. HIGH CONCENTRATIONS OF THESE PARTICLES IN THE AIR MAY PRESENT AN EXPLOSION HAZARD.

FLASH POINT: NONE REPORTED.

EXTINGUISHING MEDIA:
IN SOLID FINISHED FORM, WILL NOT BURN. USE WATER TO COOL.

SPECIAL FIREFIGHTING PROCEDURES:
DO NOT RELEASE RUNOFF FROM FIRE CONTROL METHODS TO SEWERS OR WATERWAYS. BECAUSE FIRE MAY PRODUCE TOXIC THERMAL DECOMPOSITION PRODUCTS, WEAR A SELF-CONTAINED BREATHING APPARATUS (SCBA) WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
SWEEP UP WITH MINIMUM AMOUNT OF DUST GENERATION AND PLACE IN SUITABLE CLEAN, DRY CONTAINERS FOR LATER DISPOSAL OR RECLAMATION. RESIDUE SHOULD BE CLEANED UP USING A HIGH EFFICIENCY PARTICULATE FILTER VACUUM OR WET CLEAN UP.

SECTION 7 - HANDLING AND STORAGE

HANDLING PRECAUTIONS:
OPERATIONS SUCH AS WELDING, DUST GENERATION, OR FUME GENERATION CAN RESULT IN HAZARDOUS EXPOSURE TO THE ELEMENTS PRESENT IN THE ALLOY IF NECESSARY PRECAUTIONS AREN'T TAKEN. PROTECT AGAINST DUST AND FUME INHALATION AND SKIN OR EYE CONTACT. USE ONLY WITH LOCAL EXHAUST VENTILATION. IF THE STEEL IS CONTAMINATED WITH OIL OR OTHER COMPOUNDS, TAKE PRECAUTIONS TO PREVENT ADDITIONAL EXPOSURE TO THE CONTAMINANTS WHEN HANDLING, WELDING, CUTTING, AND/OR HEATING OR MELTING.

STORAGE REQUIREMENTS:
STORE IN A MANNER THAT PREVENTS ACCIDENTAL ENVIRONMENTAL CONTAMINATION FROM TRACES OF INDUSTRIAL LUBRICANTS OR WETTING OILS.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION TO MAINTAIN EXPOSURE LEVELS BELOW THE PEL AND TLV.

RESPIRATORY PROTECTION:

0.05 MG (Co)/M3 - SINGLE-USE APPROVED DUST AND MIST RESPIRATOR.

0.5 MG (Co)/M3 - DUST MASK, EXCEPT SINGLE-USE RESPIRATOR.

1 MG (Co)/M3 - DUST MASK, EXCEPT SINGLE-USE AND QUARTER-MASK RESPIRATOR. FUME OR HIGH EFFICIENCY PARTICULATE RESPIRATOR.

5 MG (Co)/M3 - HIGH EFFICIENCY PARTICULATE RESPIRATOR WITH A FULL FACEPIECE. SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE, HELMET OR HOOD. SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

20 MG (Co)/M3 - POWERED AIR-PURIFYING RESPIRATOR WITH A HIGH EFFICIENCY FILTER WITH A FULL FACEPIECE. TYPE "C" SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

FIREFIGHTING:
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. SOILED CLOTHING SHOULD BE LAUNDERED SEPARATELY.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES OR BARRIER CREAMS TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
SAFETY GLASSES WITH SIDE SHIELDS OR GOGGLES ARE RECOMMENDED. WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE. CONTACT LENSES SHOULD NOT BE WORN WHEN HANDLING THESE MATERIALS.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: SOLID, ODORLESS MATERIALS

BOILING POINT: 5000 DEG. F

SOLUBILITY IN WATER: PRACTICALLY INSOLUBLE

MELTING POINT: 2500 DEG. F

PETROLEUM BASED SOLVENT SOLUBILITY: PRACTICALLY INSOLUBLE

SPECIFIC GRAVITY: (H2O=1): 7.8 TO 8.2

SECTION 10 - STABILITY AND REACTIVITY

STABILITY: STABLE UNDER NORMAL TEMPERATURES AND PRESSURE.

DECOMPOSITION:
THERMAL OXIDATIVE DECOMPOSITION OF STEEL CAN PRODUCE METALLIC AND CARBON OXIDES.

INCOMPATIBILITIES:

IRON:
FLUORINE OR PHOSPHORUS: MAY BECOME INCANDESCENT WHEN HEATED.
CHLORINE TRIFLUORIDE: MAY CAUSE INCANDESCENT REACTION.
HYDROGEN PEROXIDE: VIGLENTLY DECOMPOSES ON CONTACT.

TUNGSTEN:

AIR + WIDE RANGE OF OXIDANTS: IGNITES UPON HEATING.

ALKALI, ALKALINE-EARTH METALS WITH HALOCARBONS:
RESULTS IN HEAT- OR IMPACT-SENSITIVE EXPLOSIONS.

BROMINE TRIFLUORIDE: REACTS VIGOROUSLY.

MOLYBDENUM:

BROMINE PENTAFLUORIDE:
INCANDESCENT AT AMBIENT OR SLIGHTLY ELEVATED TEMPERATURES.

BROMINE TRIFLUORIDE, CHLORINE TRIFLUORIDE, LEAD DIOXIDE, NITRYL FLUORIDE, OR IODINE PENTAFLUORIDE: INCANDESCENT REACTION WHEN HEATED.

FLUORINE: INCANDESCENT REACTION AT 205 DEG. C.

SODIUM PEROXIDE: EXPLOSIVE REACTION AT 240 DEG. C.

POTASSIUM PERCHLORATE: IGNITES AT 330 DEG. C.

CHROMIUM:

AMMONIUM NITRATE: MAY PRODUCE VIOLENT OR EXPLOSIVE REACTION.

CARBON DIOXIDE: CHROMIUM DUST MAY BECOME IGNITABLE AND EXPLOSIVE.

BROMINE PENTAFLUORIDE: MAY CAUSE VIOLENT REACTION.

NITROGEN OXIDE OR SULFUR DIOXIDE:
MAY PRODUCE VIGOROUS REACTION WITH INCANDESCENCE.

VANADIUM:
OXIDANTS, NITRYL FLUORIDE, LITHIUM, CHLORINE, BROMINE TRIFLUORIDE:
VIOLENT REACTION.

COBALT:

AMMONIUM NITRATE + METALS OR BROMINE PENTAFLUORIDE:
REACTS VIOLENTLY AND SOMETIMES EXPLOSIVELY.

HYDRAZINIUM NITRATE: DECOMPOSES EXPLOSIVELY UPON RAPID HEATING.

NITRYL FLUORIDE, ACETYLENE: REACTS INCANDESCENTLY.

SECTION 11 - TOXICOLOGICAL INFORMATION

MOLYBDENUM:
MOLYBDENUM IS AN EYE AND MUCOUS MEMBRANE IRRITANT. INDIVIDUALS WITH A HISTORY OF KIDNEY, CHRONIC RESPIRATORY, OR LIVER DISEASE MAY BE AT INCREASED RISK FROM EXPOSURE.

RAT INTRAPERITONEAL LDLO: 114 MG/KG.

RABBIT INTRATRACHEAL LDLO: 70 MG/KG

CHROMIUM:
CARCINOGENIC STATUS:
THERE IS EVIDENCE OF INCREASED INCIDENCE OF LUNG CANCER AMONG CHROMIUM ALLOY WORKERS. HOWEVER, ACCORDING TO IARC, THE CHROMIUM COMPOUNDS RESPONSIBLE CANNOT BE SPECIFIED.

COBALT:
CARCINOGENIC STATUS:
THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) LISTS COBALT AND COBALT COMPOUNDS AS CATEGORY 2B CARCINOGENS (POSSIBLY CARCINOGENIC TO HUMANS). COBALT FUMES OR DUST MAY CAUSE PULMONARY, SKIN, OR EYE IRRITATION. COBALT MAY BE A SENSITIZING AGENT FOR SKIN AND RESPIRATORY SYSTEM. CHRONIC EXPOSURE MAY AFFECT THE HEART, PANCREAS, THYROID GLAND, OR BONE MARROW.

RAT ORAL LDLO: 1500 MG/KG.
RABBIT ORAL LDLO: 20 MG/KG

RAT INTRAPERITONEAL LDLO: 250 MG/KG
RABBIT INTRATRACHEAL LDLO: 100 MG/KG

RAT INTRAVENOUS LDLO: 100 MG/KG

SECTION 12 - ECOLOGICAL INFORMATION

NO DATA ARE AVAILABLE.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
THIS IS A VALUABLE MATERIAL THAT SHOULD BE SENT TO AN APPROPRIATE RECLAMATION FACILITY IF AVAILABLE. IF MATERIAL CANNOT BE SENT TO A RECLAMATION FACILITY, DISPOSAL SHOULD BE MADE IN COMPLIANCE WITH FEDERAL, PROVINCIAL/STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14 - TRANSPORT INFORMATION

MAY BE CLASSIFIED AS A HAZARDOUS SUBSTANCE WHEN IT IS IN A QUANTITY, IN ONE PACKAGE, IN WHICH INDIVIDUAL, REGULATED COMPONENTS EQUAL OR EXCEED THE REPORTABLE QUANTITIES ESTABLISHED BY THE DEPARTMENT OF TRANSPORTATION.

SECTION 15 - REGULATORY INFORMATION

SOME INGREDIENTS IN GREENFIELD PRODUCTS, INCLUDING COBALT, NICKEL, COPPER, CHROMIUM AND CHROMIUM COMPOUNDS, ARE SUBJECT TO THE REQUIREMENTS OF SECTION 313 OF TITLE III OF SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

SECTION 16 - OTHER INFORMATION

ALTHOUGH GREENFIELD INDUSTRIES AND KENNAMETAL INC. HAVE ATTEMPTED TO PROVIDE CURRENT AND ACCURATE INFORMATION HEREIN, GREENFIELD INDUSTRIES AND KENNAMETAL INC. MAKE NO REPRESENTATIONS REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION AND ASSUMES NO LIABILITY FOR ANY LOSS, DAMAGE, INJURY OF ANY KIND WHICH MAY RESULT FROM OR ARISE OUT OF THE USE OF OR RELIANCE ON THE INFORMATION BY ANY PERSON.

FOR TECHNICAL INFORMATION CONTACT CORPORATE EHS:
PHONE: 724-539-5631
FAX: 724-539-5372.

FOR ADDITIONAL MSDSS, CONTACT GREENFIELD INDUSTRIES, PHONE: 404-863-7708.

PREPARED BY:
GREENFIELD INDUSTRIES AND KENNAMETAL INC. HAZARD COMMUNICATION COMMITTEE

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

R00879

HMIS CODES

Health	2*
Flammability	4
Reactivity	0

PRODUCT NAME

RUST TOUGH* Rust Preventive Enamel, Dark Machinery Gray (ASA-49)

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
Diversified Brands
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

25-OCT-05

INFORMATION TELEPHONE NO.

(800) 247-3266

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS		VAPOR PRESSURE
15	74-98-6	Propane					
			ACGIH TLV	2500	ppm		760 mm
			OSHA PEL	1000	ppm		
7	106-97-8	Butane					
			ACGIH TLV	800	ppm		760 mm
			OSHA PEL	800	ppm		
5	64742-89-8	V. M. & P. Naphtha					
			ACGIH TLV	300	ppm		12 mm
			OSHA PEL	300	ppm		
			OSHA PEL	400	ppm	STEL	
12	108-88-3	Toluene					
			ACGIH TLV	50	ppm	(Skin)	22 mm
			OSHA PEL	100	ppm	(Skin)	
			OSHA PEL	150	ppm	(Skin) STEL	
0.3	100-41-4	Ethylbenzene					
			ACGIH TLV	100	ppm		7.1 mm
			ACGIH TLV	125	ppm	STEL	
			OSHA PEL	100	ppm		
			OSHA PEL	125	ppm	STEL	
2	1330-20-7	Xylene					
			ACGIH TLV	100	ppm		5.9 mm
			ACGIH TLV	150	ppm	STEL	
			OSHA PEL	100	ppm		
			OSHA PEL	150	ppm	STEL	
32	67-64-1	Acetone					
			ACGIH TLV	500	ppm		180 mm
			ACGIH TLV	750	ppm	STEL	
			OSHA PEL	1000	ppm		
4	108-10-1	Methyl Isobutyl Ketone					
			ACGIH TLV	50	ppm		16 mm
			ACGIH TLV	75	ppm	STEL	
			OSHA PEL	50	ppm		
			OSHA PEL	75	ppm	STEL	

Continued on page 2

4	13463-67-7	Titanium Dioxide			
		ACGIH TLV	10	mg/m3	as Dust
		OSHA PEL	10	mg/m3	Total Dust
		OSHA PEL	5	mg/m3	Respirable Fraction
0.1	1333-86-4	Carbon Black			
		ACGIH TLV	3.5	mg/m3	
		OSHA PEL	3.5	mg/m3	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

Continued on page 4

PROTECTIVE GLOVES
None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	6.51 lb/gal	779 g/l
SPECIFIC GRAVITY	0.78	
BOILING POINT	<0 - 325 F	<-18 - 162 C
MELTING POINT	Not Available	
VOLATILE VOLUME	88 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	7.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 47.68 % Less Water and Federally Exempt Solvents

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

Continued on page 5

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Carbon Black is classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is insufficient evidence in humans for its carcinogenicity.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
74-98-6	Propane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
106-97-8	Butane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
64742-89-8	V. M. & P. Naphtha				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
108-88-3	Toluene				
		LC50	RAT	4HR	4000 ppm
		LD50	RAT		5000 mg/kg
100-41-4	Ethylbenzene				
		LC50	RAT	4HR	Not Available
		LD50	RAT		3500 mg/kg
1330-20-7	Xylene				
		LC50	RAT	4HR	5000 ppm
		LD50	RAT		4300 mg/kg
67-64-1	Acetone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5800 mg/kg
108-10-1	Methyl Isobutyl Ketone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		2080 mg/kg
13463-67-7	Titanium Dioxide				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
1333-86-4	Carbon Black				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Continued on page 6

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	12	
100-41-4	Ethylbenzene	0.2	
1330-20-7	Xylene	2	
108-10-1	Methyl Isobutyl Ketone	4	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

R00929
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

R00929

HMIS CODES

Health	2*
Flammability	4
Reactivity	0

PRODUCT NAME

RUST TOUGH* Rust Preventive Enamel, Gloss White

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
Diversified Brands
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

25-OCT-05

INFORMATION TELEPHONE NO.

(800) 247-3266

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
15	74-98-6	Propane				
			ACGIH TLV	2500	ppm	760 mm
			OSHA PEL	1000	ppm	
7	106-97-8	Butane				
			ACGIH TLV	800	ppm	760 mm
			OSHA PEL	800	ppm	
4	64742-89-8	V. M. & P. Naphtha				
			ACGIH TLV	300	ppm	12 mm
			OSHA PEL	300	ppm	
			OSHA PEL	400	ppm STEL	
10	108-88-3	Toluene				
			ACGIH TLV	50	ppm (Skin)	22 mm
			OSHA PEL	100	ppm (Skin)	
			OSHA PEL	150	ppm (Skin) STEL	
0.4	100-41-4	Ethylbenzene				
			ACGIH TLV	100	ppm	7.1 mm
			ACGIH TLV	125	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	125	ppm STEL	
2	1330-20-7	Xylene				
			ACGIH TLV	100	ppm	5.9 mm
			ACGIH TLV	150	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	150	ppm STEL	
32	67-64-1	Acetone				
			ACGIH TLV	500	ppm	180 mm
			ACGIH TLV	750	ppm STEL	
			OSHA PEL	1000	ppm	
4	108-10-1	Methyl Isobutyl Ketone				
			ACGIH TLV	50	ppm	16 mm
			ACGIH TLV	75	ppm STEL	
			OSHA PEL	50	ppm	
			OSHA PEL	75	ppm STEL	

Continued on page 2

7	13463-67-7	Titanium Dioxide			
		ACGIH TLV	10	mg/m3	as Dust
		OSHA PEL	10	mg/m3	Total Dust
		OSHA PEL	5	mg/m3	Respirable Fraction

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

Continued on page 4

PROTECTIVE GLOVES
None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	6.68 lb/gal	800 g/l
SPECIFIC GRAVITY	0.80	
BOILING POINT	<0 - 325 F	<-18 - 162 C
MELTING POINT	Not Available	
VOLATILE VOLUME	87 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	7.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 44.90 % Less Water and Federally Exempt Solvents

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS
Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.
Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Continued on page 5

TOXICOLOGY DATA

CAS No.	Ingredient Name				
74-98-6	Propane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
106-97-8	Butane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
64742-89-8	V. M. & P. Naphtha				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
108-88-3	Toluene				
		LC50	RAT	4HR	4000 ppm
		LD50	RAT		5000 mg/kg
100-41-4	Ethylbenzene				
		LC50	RAT	4HR	Not Available
		LD50	RAT		3500 mg/kg
1330-20-7	Xylene				
		LC50	RAT	4HR	5000 ppm
		LD50	RAT		4300 mg/kg
67-64-1	Acetone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5800 mg/kg
108-10-1	Methyl Isobutyl Ketone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		2080 mg/kg
13463-67-7	Titanium Dioxide				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Continued on page 6

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	10	
100-41-4	Ethylbenzene	0.3	
1330-20-7	Xylene	2	
108-10-1	Methyl Isobutyl Ketone	4	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

R10649
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

R10649

HMIS CODES

Health	2*
Flammability	4
Reactivity	0

PRODUCT NAME
RUST TOUGH* Fluorescent, Fluorescent Red

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
Diversified Brands
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
25-OCT-05

INFORMATION TELEPHONE NO.
(800) 247-3266

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
13	74-98-6	Propane				
			ACGIH TLV	2500	ppm	760 mm
			OSHA PEL	1000	ppm	
12	106-97-8	Butane				
			ACGIH TLV	800	ppm	760 mm
			OSHA PEL	800	ppm	
1	110-54-3	Hexane				
			ACGIH TLV	50	ppm	127 mm
			OSHA PEL	50	ppm	
9	64742-89-8	V. M. & P. Naphtha				
			ACGIH TLV	300	ppm	12 mm
			OSHA PEL	300	ppm	
			OSHA PEL	400	ppm STEL	
1	108-88-3	Toluene				
			ACGIH TLV	50	ppm (Skin)	22 mm
			OSHA PEL	100	ppm (Skin)	
			OSHA PEL	150	ppm (Skin) STEL	
2	100-41-4	Ethylbenzene				
			ACGIH TLV	100	ppm	7.1 mm
			ACGIH TLV	125	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	125	ppm STEL	
12	1330-20-7	Xylene				
			ACGIH TLV	100	ppm	5.9 mm
			ACGIH TLV	150	ppm STEL	
			OSHA PEL	100	ppm	
			OSHA PEL	150	ppm STEL	
15	67-64-1	Acetone				
			ACGIH TLV	500	ppm	180 mm
			ACGIH TLV	750	ppm STEL	
			OSHA PEL	1000	ppm	

Continued on page 2

17	471-34-1	Calcium Carbonate			
		ACGIH TLV	10	mg/m3	as Dust
		OSHA PEL	10	mg/m3	Total Dust
		OSHA PEL	5	mg/m3	Respirable Fraction

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Continued on page 3

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

Continued on page 4

PROTECTIVE GLOVES
None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	6.98 lb/gal	835 g/l
SPECIFIC GRAVITY	0.84	
BOILING POINT	<0 - 325 F	<-18 - 162 C
MELTING POINT	Not Available	
VOLATILE VOLUME	82 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	7.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 51.15 % Less Water and Federally Exempt Solvents

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

Continued on page 5

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged and repeated exposure to Hexane may cause damage to nerve tissue of the arms and legs (peripheral neuropathy), resulting in muscular weakness and loss of sensation. This effect may be increased by the presence of Methyl Ethyl Ketone.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name					
74-98-6	Propane					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
106-97-8	Butane					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
110-54-3	Hexane					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		28700	mg/kg
64742-89-8	V. M. & P. Naphtha					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
108-88-3	Toluene					
		LC50	RAT	4HR	4000	ppm
		LD50	RAT		5000	mg/kg
100-41-4	Ethylbenzene					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		3500	mg/kg
1330-20-7	Xylene					
		LC50	RAT	4HR	5000	ppm
		LD50	RAT		4300	mg/kg
67-64-1	Acetone					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		5800	mg/kg
471-34-1	Calcium Carbonate					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	

Continued on page 6

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
110-54-3	Hexane	1	
108-88-3	Toluene	1	
100-41-4	Ethylbenzene	2	
1330-20-7	Xylene	12	

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

R00699
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

R00699

HMIS CODES

Health	2
Flammability	4
Reactivity	0

PRODUCT NAME

RUST TOUGH* Rust Preventive Enamel, Red Oxide Primer

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
Diversified Brands
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

25-OCT-05

INFORMATION TELEPHONE NO.

(800) 247-3266

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
14	74-98-6	Propane				
			ACGIH TLV	2500	ppm	760 mm
			OSHA PEL	1000	ppm	
6	106-97-8	Butane				
			ACGIH TLV	800	ppm	760 mm
			OSHA PEL	800	ppm	
4	64742-89-8	V. M. & P. Naphtha				
			ACGIH TLV	300	ppm	12 mm
			OSHA PEL	300	ppm	
			OSHA PEL	400	ppm STEL	
19	108-88-3	Toluene				
			ACGIH TLV	50	ppm (Skin)	22 mm
			OSHA PEL	100	ppm (Skin)	
			OSHA PEL	150	ppm (Skin) STEL	
2	78-83-1	2-Methyl-1-propanol				
			ACGIH TLV	50	ppm	8.7 mm
			OSHA PEL	50	ppm	
35	67-64-1	Acetone				
			ACGIH TLV	500	ppm	180 mm
			ACGIH TLV	750	ppm STEL	
			OSHA PEL	1000	ppm	
7	14807-96-6	Talc				
			ACGIH TLV	2	mg/m3 as Resp. Dust	
			OSHA PEL	2	mg/m3 as Resp. Dust	
1	471-34-1	Calcium Carbonate				
			ACGIH TLV	10	mg/m3 as Dust	
			OSHA PEL	15	mg/m3 Total Dust	
			OSHA PEL	5	mg/m3 Respirable Fraction	

Continued on page 2

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Continued on page 3

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	6.76 lb/gal	809 g/l
SPECIFIC GRAVITY	0.81	
BOILING POINT	<0 - 325 F	<-18 - 162 C
MELTING POINT	Not Available	
VOLATILE VOLUME	91 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	7.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 45.36 % Less Water and Federally Exempt Solvents

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID
None known.

INCOMPATIBILITY
None known.

HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

Continued on page 5

CAS No.	Ingredient Name				
74-98-6	Propane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
106-97-8	Butane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
64742-89-8	V. M. & P. Naphtha				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
108-88-3	Toluene				
		LC50	RAT	4HR	4000 ppm
		LD50	RAT		5000 mg/kg
78-83-1	2-Methyl-1-propanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		2460 mg/kg
67-64-1	Acetone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5800 mg/kg
14807-96-6	Talc				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
471-34-1	Calcium Carbonate				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

Continued on page 6

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	19	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WL1111100
WL3333300

2002

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

WHITE LIGHTNING* STOP GAP!* Insulating Foam

WL1111100 Minimal Expanding
WL3333300 Triple Expanding

HMIS CODES

Health	3*
Flammability	4
Reactivity	1
Flammability	4

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS CO.
Consumer Group - Industrial
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
13-NOV-02

INFORMATION TELEPHONE NO.
(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
2-10	74-98-6	Propane		
		ACGIH TLV	2500 ppm	760 mm
		OSHA PEL	1000 ppm	
2-10	75-28-5	2-Methylpropane		
		ACGIH TLV	Not Available	760 mm
		OSHA PEL	Not Available	
1-8	115-10-6	Dimethyl Ether		
		ACGIH TLV	Not Available	760 mm
		OSHA PEL	Not Available	
7-20	101-68-8	4, 4'-Diphenylmethane Diisocyanate		
		ACGIH TLV	0.005 ppm	
		OSHA PEL	0.02 ppm CEILING	
20-55	9016-87-9	Diphenylmethane Diisocyanate Polymer		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

Continued on page 2

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.
CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

If INHALED:	If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	1.8	27.0

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
NFPA 30B Level 2 Aerosol

Continued on page 3

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

NO PERSON SHOULD USE THIS PRODUCT, OR BE IN THE AREA WHERE IT IS BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

None normally required.

PROTECTIVE GLOVES

To prevent skin contact, wear gloves recommended by glove supplier for protection against materials in Section 2. Butyl rubber, nitrile, or PVA gloves will be effective.

Continued on page 4

EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	8.4 lb/gal	1000 g/l
SPECIFIC GRAVITY	1.01	
BOILING POINT	<0 - 15 F	<-18 - -9 C
MELTING POINT	Not Available	
VOLATILE VOLUME	40 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide
HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.
Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Continued on page 5

TOXICOLOGY DATA

CAS No.	Ingredient Name				
74-98-6	Propane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
75-28-5	2-Methylpropane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
115-10-6	Dimethyl Ether				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
101-68-8	4, 4'-Diphenylmethane Diisocyanate				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
9016-87-9	Diphenylmethane Diisocyanate Polym				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
101-68-8	4, 4'-Diphenylmethane Diisocyanate	max 20	
9016-87-9	Diphenylmethane Diisocyanate Polymer	max 55	

TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Continued on page 6

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

The Western Group

LIST OF HAZARDOUS MATERIALS

JOB: Terminal 4 Clean + Seal Concrete Deck

JOB NO. 06-770 DATE(S): _____

Superintendent/Foreman: Make sure all hazardous materials **used or stored** on the job are listed below. Use the **"common name"** found on the Material Safety Data Sheet (MSDS). Make the MSDS for each material accessible for review. Update this list on a regular basis.

Employees: Review and become familiar with the Material Safety Data Sheet (MSDS) before using any hazardous material. If you have not been trained on the use of the material, check with your supervisor.

Hazardous Material (Common Name)
Enviroseal 20

11/98

degussa.

Construction Chemicals

ENVIROSEAL® 20

PRODUCT DATA

7 07190 **Water Repellents**

Description

Enviroseal® 20 is a clear, water-based 20% alkylalkoxysilane penetrating sealer. It protects against moisture and chloride intrusion.

Yield

Concrete:
100 – 175 ft²/gal (2.4 – 4.3 m²/L)

Brick:
100 – 175 ft²/gal (2.4 – 4.3 m²/L)

Stucco:
60 – 100 ft²/gal (1.5 – 2.4 m²/L)

Always apply a test area to determine actual coverage rates. Coverage rates will vary greatly with the porosity of the substrate.

Packaging

5 gallon (19 L) pails

54 gallon (205 L) drums

Color

Milky white liquid; clear when dry

Shelf Life

18 months when properly stored

Storage

Store in unopened containers in a clean, dry area between 35 and 110° F (2 and 43° C).

Features

- Water based, VOC compliant
- USDA compliant (nonfood contact areas)
- Transparent, nonstaining
- Breathable
- One component
- Water repellent

Benefits

Environmentally friendly

Use in food manufacturing and service structures

Does not alter surface appearance

Allows interior moisture to escape without damaging sealer

Easy to apply; saves labor

Protects against damage from moisture intrusion and chloride ion penetration

Where to Use

LOCATION

- Horizontal and vertical
- Exterior or interior
- Above grade

SUBSTRATE

- Concrete
  - Architectural
  - Exposed aggregate
  - Glass-fiber reinforced
  - Precast
  - Cast in place/precast
  - Silica fume
- Hard burnt brick
- Stucco
  - Troweled/smooth
  - Integrally colored
- Brick pavers
- Tile (unglazed)

How to Apply

Surface Preparation

1. Verify substrate has properly cured. Concrete should obtain 80% of design strength, typically achieved within 14 – 28 days.

2. Clean all surfaces of all sand, surface dust and dirt, oil, grease, chemical films and coatings; and other contaminants prior to application. Use waterblast, sandblast, or shotblast as necessary to achieve the desired surface condition.

3. Air, material, and surface temperatures should be 40° F (4° C) or higher during application. Do not apply sealer when temperatures are expected to fall below 40° F (4° C) within 12 hours.

4. Surfaces to be treated can be slightly damp; however, a dry surface is suggested for maximum penetration of sealer. Do not apply Enviroseal® 20 if standing water is visible on the surface to be treated.

5. Crack control, caulking, patching, and expansion joint sealants can be installed before or after application of the sealer. Allow a minimum of 6 – 12 hours curing time for caulking and sealant materials (or until they have skinned over).

HYDROZO

KMB00003535

Technical Data

Composition

Enviroseal® 20 is a water-based alkylalkoxysilane sealer.

Compliances

- USDA acceptance on nonfood contact areas
- Alberta DOT, Type 1a

Typical Properties

PROPERTY	VALUE
Solids and active ingredients, % by weight	20
Specific gravity, kg/L	0.98
Density, lb/gal)	8.16
Penetration, in (mm), average depth, depending upon substrate	0.14 (3.6)

Test Data

PROPERTY	RESULTS	TEST METHODS
Flash point, ° F (° C)	> 200 (> 93)	ASTM D 3278, SETA
VOC content, lb/gal (g/L)	< 2.92 (< 350)	EPA Method 24
Moisture-vapor transmission rate, %	102	OHD-L-35
Water absorption, %, 48 hours	0.53	ASTM C 642
Scaling resistance rating, non-air-entrained concrete, 100 cycles treated concrete	0 – No Scaling	ASTM C 672
Resistance to chloride ion penetration, lb/yd³ (kg/m³)		AASHTO T 259 and T 260
Criteria of 1.5 at 1/2" (13 mm)	< 0.27 (< 0.16)	
Criteria of 0.75 at 1" (25 mm)	0.00 (0.00)	
Water weight gain, % reduction	86 – exceeds criteria	NCHRP 244 Series II-cube test
Absorbed chloride, % reduction	92 – exceeds criteria	NCHRP 244 Series II-cube test
Absorbed chloride, % reduction	99 – exceeds criteria	NCHRP 244 Series IV - Southern climate
Water repellent performance, %	85.6	Alberta Transportation and Utilities Procedures - Type 1a
Surface appearance after application	Unchanged	Federal Reflectance Test Method 6121

Test results are averages obtained at a coverage rate of 125 ft²/gal (3.12 m²/3.8 L) under laboratory conditions. Reasonable variations can be expected.

KMB00003536

Application

1. Test a small area of the surface (generally a 5 by 5 ft [1.5 by 1.5 m] section) before starting general application of any clear, penetrating sealers to ensure desired results and coverage rates. Allow 5 – 7 days for the product to fully react before evaluating. Refer to Appendix HY-3: Test Area Application.

2. Stir material thoroughly before and during application.

3. Low-pressure non-atomizing spray application is recommended.

4 On vertical surfaces, apply from the bottom up. Flood surfaces using enough material to get a 8 – 12" (20 – 30 cm) material rundown.

5. For horizontal surfaces, apply to saturation. If necessary, follow by brooming for even distribution.

Drying Time

Typical drying time for Enviroseal® 20 is 4 hours at 70° F (21° C) and 50% relative humidity. Cooler temperatures or higher relative humidity can extend the drying time.

Clean Up

Clean equipment and tools with hot soapy water. Overspray can be cleaned immediately with hot soapy water. Dried residue can be cleaned with a mild citric acid or very hot water, then scrubbed with a plastic sponge.

For Best Performance

- Keep material from freezing.
- Do not dilute Enviroseal® 20.
- Do not apply during inclement weather or when inclement weather is anticipated within 12 hours.
- To prevent damage to nearby shrubbery and landscaping, cover or protect with drop cloth.
- Enviroseal® 20 may leave a temporary slippery surface for up to several hours after application. Therefore, do not reopen traffic-bearing surfaces until the treated surface is dry.
- Variations in the texture and porosity of the substrate will affect the coverage and performance of the product.
- Enviroseal® 20 will not inhibit water penetration through unsound or cracked surfaces, or surfaces with defective flashing, caulking, or structural waterproofing.
- Line striping can be done after application of the sealer.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current versions.
- Proper application is the responsibility of the user. Field visits by Degussa personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

Health and Safety

ENVIROSEAL® 20

Caution

Enviroseal® 20 contains alkoxysilane.

Risks

May cause skin, eye or respiratory irritation. Ingestion may cause irritation.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Avoid contact with skin, eyes, and clothing. Wash thoroughly after handling. Keep container closed when not in use. DO NOT take internally. Use only with adequate ventilation. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state and local regulations.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

Proposition 65

This product contains material listed by the state of California to cause cancer, birth defects, or other reproductive harm.

VOC Content

Less than 2.92 lbs/gal or 350 g/L, less water and exempt solvents.

For medical emergencies only, call ChemTrec (1-800-424-9300).

Degussa Building Systems

889 Valley Park Drive
Shakopee, MN. 55379

www.degussabuildingsystems.com

Customer Service 800-433-9517
Technical Service 800-243-6739

LIMITED WARRANTY NOTICE. Every reasonable effort is made to apply Degussa exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, Degussa MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and Degussa shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the Degussa Technical Manager.

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Form No. 1019665 3/03 (Replaces 1/02)
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Material Safety Data Sheet

degussa.
Construction Chemicals

ENVIROSEAL® 20

Version 1.3 12/08/2003

1. PRODUCT AND COMPANY INFORMATION

Company	:	**Degussa Building Systems** 889 Valley Park Drive Shakopee, MN 55379
Telephone	:	952-496-6000
Emergency telephone number	:	(800) 424-9300 (703) 527-3887 (Outside Continental US)
Product name	:	ENVIROSEAL® 20
MSDS ID No.	:	10196
TSCA Inventory	:	All components of this product are included, or are exempt from inclusion, in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
Canadian DSL	:	All components of this product are included, or are exempt from inclusion, in the Canadian Domestic Substance List (DSL).
Product Use Description	:	Coating

2. HAZARDOUS INGREDIENTS

Chemical	CAS No.	TLV	STEL	PEL	CEIL	Weight %
ALKOXYSILANE	Proprietary	N.E.	N.E.	N.E.	N.E.	15.00 - 30.00 %

3. HAZARDS IDENTIFICATION

	HEALTH	FLAMMABILITY	PHYSICAL HAZARD
HMIS® Rating	1	1	0

WHMIS Class : D2B

Primary Routes of Entry : Skin contact
Eye contact

Effects of Overexposure

Inhalation	:	Can cause slight irritation.
Skin	:	Can cause slight irritation.
Eyes	:	Can cause slight irritation.
Ingestion	:	Can cause slight irritation.
Chronic exposure	:	No known information available.

Carcinogenicity

	ACGIH	IARC	NTP	OSHA
ALKOXYSILANE	N.E.	N.E.	N.E.	N.E.

4. FIRST AID MEASURES

Eye contact	:	Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.
Skin contact	:	Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.
Ingestion	:	Do not induce vomiting without medical advice. If conscious, drink plenty of water. If a person feels unwell or symptoms of skin irritation appear, consult a physician. If a person vomits, place him/her in the recovery position. Never give anything by mouth to an unconscious person.
Inhalation	:	Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Flash point	:	> 200.01 °F (93.34 °C)
Autoignition temperature	:	no data available
Lower explosion limit	:	no data available
Upper explosion limit	:	no data available
Suitable extinguishing media	:	carbon dioxide (CO2) dry chemical water fog
Fire and Explosion Hazards	:	Containers can build up pressure if exposed to heat (fire). Cool closed containers exposed to fire with water spray.
Special Fire-fighting Procedures	:	As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Methods for cleaning up	:	Wear appropriate protective equipment. Take action to eliminate source of leak; prevent from entry into open streams or sewers; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

7. HANDLING AND STORAGE

Handling	:	Keep out of reach of children. For personal protection see section 8.
Storage	:	Keep tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye protection	:	Wear as appropriate: safety glasses with side-shields

		goggles face-shield
Hand protection	:	Wear as appropriate: impervious gloves
Body Protection	:	Wear as appropriate: impervious clothing preventive skin protection
Respiratory protection	:	In case of insufficient ventilation wear suitable respiratory equipment. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Hygienic Practices	:	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation, especially in confined areas. Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke. Handle in accordance with good industrial hygiene and safety practice.
Engineering Controls	:	Local exhaust ventilation can be necessary to control any air contaminants to within their TLVs during the use of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color	:	off-white
Physical State	:	liquid
Odor	:	mild alcoholic
pH	:	7 - 8
Odor Threshold	:	no data available
Vapor Pressure	:	no data available
Vapor Density	:	Heavier than air
Boiling point/range	:	208.00 °F (97.78 °C)
Water solubility	:	completely soluble
Specific Gravity	:	0.99
Viscosity	:	no data available
Evaporation rate	:	Slower than Butyl acetate
Partition coefficient (n-octanol/water)	:	no data available
VOC Concentration as applied (less water and exempt solvents)	:	< 350 g/l

10. STABILITY AND REACTIVITY

Stability	:	Stable under recommended storage conditions.

Conditions to avoid	:	Prolonged exposure to high temperatures
Materials to avoid	:	oxidizing agents
Hazardous decomposition products	:	Thermal decomposition can lead to release of irritating gases and vapours. Oxides of carbon nitrogen oxides (NOx)
Hazardous polymerization	:	Will not occur under normal conditions.

11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity

	Type	Value	Species	Exposure time
Product	LC50	no data available		
Component				
ALKOXYSILANE	LC50	no data available		

Acute oral toxicity

	Type	Value	Species
Product	LD50 (Oral)	no data available	
Component			
ALKOXYSILANE	LD50 (Oral)	no data available	

Acute dermal toxicity

	Type	Value	Species
Product	LD50 (Dermal)	no data available	
Component			
ALKOXYSILANE	LD50 (Dermal)	no data available	

12. ECOLOGICAL INFORMATION

Ecotoxicological Information : There is no data available for this product.

13. DISPOSAL CONSIDERATIONS

Recommendations: Use excess product in an alternate beneficial application. Handle disposal of waste material in manner which complies with local, state, province and federal regulation.

14. TRANSPORT INFORMATION

DOT	: Proper shipping name	Not regulated
IATA	: Proper shipping name	Not regulated

15. REGULATORY INFORMATION

SARA 311/312 (RTK)
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE (ACUTE) HEALTH HAZARD

SARA 313
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

Weight %	CAS No.	Chemical Name

This product contains no chemicals subject to the SARA 313 supplier notification requirements.

CERCLA
CERCLA section 103(a) specifically requires the person in charge of a vessel or facility to report immediately to the National Response Center (NRC) a release of a hazardous substance whose amount equals or exceeds the assigned RQ. The following hazardous substances are contained in this product.

RQ	CAS No.	Chemical Name

No CERCLA chemicals exist in this product above reportable concentrations.

TSCA Section 12(b) Export Notification
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(b) if exported from the United States:

CAS No.	Chemical Name

There are no TSCA 12(b) Chemicals in this product.

California Proposition 65
The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm. Unless otherwise specified in Section 2 of this MSDS, these chemicals are present at < 0.1%:

CAS No.	Chemical Name
75-07-0	ACETALDEHYDE

16. OTHER INFORMATION

Legend : N.E. - Not Established
TLV - Threshold Limit Value
STEL - Short Term Exposure Limit

ENVIROSEAL® 20

Version 1.3 12/08/2003

PEL - Permissible Exposure Limit
CEIL - Ceiling

Prepared By : Environment, Health and Safety Department

This information is furnished without warranty, representation, or license of any kind, except that this information is accurate to the best of the manufacturer's knowledge, or is obtained from sources believed by the manufacturer to be accurate and is not intended to be all inclusive. No warranty is expressed or implied regarding the accuracy of this information or the results to be obtained from its use thereof. The manufacturer assumes no responsibility for injuries proximately caused by use of the Material if reasonable safety procedures are not followed as stipulated in this Data Sheet. Additionally, the manufacturer assumes no responsibility for injuries proximately caused by abnormal use of the Material even if reasonable safety procedures are followed. Buyer assumes the risk in its use of the Material.

End of MSDS.

ITEM: 4E307 - Sealing Gum 2 Lb

PICK_REQ: 1033238475 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A2636**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A2636

Associated Grainger Item: 4E307 - Sealing Gum 2 Lb

PERMAGUM CORDS & SLUGS

MATERIAL SAFETY DATA SHEET

SECTION I - COMPANY IDENTIFICATION

PRODUCT: PERMAGUM CORDS & SLUGS

CAT. NO.: PP22, PP250, PP33, PP36

DISTRIBUTED BY:
VIRGINIA KMP CORPORATION
4100 PLATINUM WAY
DALLAS, TEXAS 75237

TELEPHONE NUMBERS:
OFFICE: 1-(214) 330-7731
EMERGENCY ONLY: 1-(800) 424-9300

SECTION II - HAZARDOUS INGREDIENTS

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)	EXPOSURE LIMITS: 8 HR. TWA OSHA PEL	ACGIH TLV
BUTENE HOMOPOLYMER (CAS# 9003-29-6)	NE	NE
CALCIUM CARBONATE (CAS# 471-34-1)	10 MG/M3	NE
HYDROUS MAGNESIUM SILICATE (CAS# 14807-96-6)	2 MG/M3	NE
OLEIC ACID (CAS# 112-80-1)	NE	NE
TITANIUM DIOXIDE (CAS# 13463-67-7)	10 MG/M3	NE

SECTION III - HAZARDS IDENTIFICATIONS

EMERGENCY OVERVIEW:
NOT A HAZARD IN NORMAL INDUSTRIAL USE. AVOID BREATHING DUST.

POTENTIAL HEALTH EFFECTS:
INHALATION: CAN CAUSE IRRITATION.
EYE CONTACT: CAN CAUSE EYE IRRITATION.
SKIN CONTACT: CAN CAUSE SKIN IRRITATION.
INGESTION: NONE KNOWN.

CHRONIC EFFECTS: NONE KNOWN.

NOTE:

CARCINOGENICITY:
LISTED IN NTP?: NO
IARC?: NO
OSHA REGULATED?: NO

SECTION IV - FIRST AID MEASURES

INHALATION:
NOT LIKELY. IN CASE OF DUST, REMOVE VICTIM TO FRESH AIR AND, IF NEEDED, BEGIN ARTIFICIAL RESPIRATION.

EYE CONTACT:
FLUSH EYES WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF SYMPTOMS DEVELOP AND PERSIST.

SKIN CONTACT:
FLUSH WITH WATER OR SOAP AND WATER FOR 15 MINUTES OR UNTIL ALL TRACES HAVE BEEN REMOVED. SEEK MEDICAL ATTENTION IF SYMPTOMS DEVELOP AND PERSIST.

INGESTION: RINSE OUT MOUTH WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

SECTION V - FIRE FIGHTING MEASURES

FLASHPOINT (TEST METHOD): >300 F

FLAMMABLE LIMITS:
LOWER: NA
UPPER: NA

AUTOIGNITION TEMPERATURE: NA

GENERAL HAZARD:

FIRE FIGHTING INSTRUCTIONS:
USE SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES IN ENCLOSED AREAS. DO NOT BREATHE FUMES.

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY CHEMICAL, WATER SPRAY OR FOG.

HAZARDOUS COMBUSTION PRODUCTS: SMOKE, CARBON DIOXIDE, CARBON MONOXIDE.

SECTION VI - ACCIDENTAL RELEASE MEASURES

LAND SPILL:
SCOOP SPILLED MATERIALS AND PLACE IN NON-LEAKING CONTAINERS FOR REUSE OR DISPOSAL.

WATER SPILL: NOTIFY PROPER AUTHORITIES.

SECTION VII - HANDLING AND STORAGE

HANDLING: NO SPECIAL REQUIREMENTS.

STORAGE:
FOLLOW NORMAL STORAGE PRACTICES. NO SPECIAL STORAGE REQUIREMENTS NECESSARY.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: LOCAL EXHAUST VENTILATION IS RECOMMENDED.

PERSONAL PROTECTION: NOT REQUIRED IN NORMAL INDUSTRIAL USE.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE @ 20 C: NA

VAPOR DENSITY (AIR = 1): NA

SPECIFIC GRAVITY (H2O = 1): 1.68

EVAPORATION RATE (H2O = 1): NA

SOLUBILITY IN WATER: NEGLIGIBLE

VOC (LB/GAL): 0

pH: NA

FREEZING POINT: NA

BOILING POINT: NA

APPEARANCE & ODOR: OFF-WHITE RUBBERY MASTIC, NEGLIGIBLE ODOR.

SECTION X - STABILITY AND REACTIVITY

STABILITY: STABLE.

CONDITIONS TO AVOID: NONE KNOWN.

MATERIALS TO AVOID: STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
CARBON DIOXIDE, CARBON MONOXIDE, AND SMOKE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION XI - TOXICOLOGICAL INFORMATION

OLEIC ACID:
15 MG/3 DAY INTERVAL - MOD (SKIN - HUMAN)
LD50: 74 G/KG (ORAL - RABBIT)

CALCIUM CARBONATE:
500 MG/2 H - MOD (SKIN - RABBIT)

HYDROUS MAGNESIUM SILICATE:
300 G/3 DAY INTERVAL - MILD (SKIN - HUMAN)

TITANIUM DIOXIDE:
300 G/3 DAY INTERVAL - MILD (SKIN - HUMAN)

SECTION XII - ECOLOGICAL INFORMATION

NA

SECTION XIII - DISPOSAL CONSIDERATIONS

RECOVER SPILLED MATERIAL AND PLACE IN CONTAINER FOR REUSE OR DISPOSAL.

SECTION XIV - TRANSPORTATION INFORMATION

PROPER SHIPPING NAME: NOT REGULATED MATERIAL

HAZARD CLASS: NA

IDENTIFICATION NUMBER: NA

DOT EMERGENCY GUIDE #: NA

REPORTABLE QUANTITY (RQ): NA

INTERNATIONAL: NA

SECTION XV - REGULATORY INFORMATION

TSCA (TOXIC SUBSTANCE CONTROL ACT):
COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT): NA

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): NA

CALIFORNIA PROPOSITION 65: NOT LISTED.

SECTION XVI - OTHER INFORMATION

STATE RIGHT-TO-KNOW PROGRAMS: MA, PA, NJ

NFPA RATINGS:
HEALTH 1

FLAMMABILITY 0
REACTIVITY 0
HMIS PROTECTIVE EQUIPMENT X SEE YOUR SUPERVISOR

REVISED: 10/2001

PREPARED BY: VIRGINIA KMP CORPORATION

PRINTED: 4/18/02

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JASCO/BIX MSDS

MATERIAL SAFETY DATA SHEET

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):	**JASCO/BIX PREMIUM PAINT & EPOXY REMOVER**
PRODUCT CODE:	0201-1, 0202-1, 0203-1, 0204-1
PRODUCT USE:	Paint removal.
SUPPLIER/MANUFACTURER'S NAME:	**HOMAX PRODUCTS, Inc.**
ADDRESS:	200 Westerly Rd. Bellingham, WA 98226
CHEMTREC EMERGENCY NO.:	1-800-424-9300 (United States) 1-703-527-3887 (International Collect)
BUSINESS PHONE:	1-800-729-9029
DATE OF PREPARATION:	October 9, 2007

This product is sold to consumers for household use in containers of relatively small volume (i.e. 5 gallon or less in size). This MSDS has been developed to address safety concerns affecting those individuals working in warehouses and other places where large numbers of these containers are stored, as well as those affecting potential users of this product in industrial /occupational settings. All pertinent health, safety and environmental information have been presented in this document, per the requirements of the US Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and Canadian WHMIS.

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR						
			ACGIH-TLV		OSHA-PEL		NIOSH-REL		
			TWA	STEL	STEL	STEL	STEL	STEL	IDLH
			mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	ppm
Methylene chloride	75-09-2	60-100	174	NE	87	433.75	LFC		2300
Methyl alcohol	67-56-1	10-30	262; skin	328; skin	260	NE	260; skin	325; skin	6000
Aliphatic petroleum distillates	8052-41-3	1-5	525	NE	2900	NE	350	1800	3450
Paraffin wax	64742-43-4	1-5	NE	NE	NE	NE	NE	NE	NE
Methyl hydroxyethyl cellulose	9032-42-2	0.5-1.5	NE	NE	NE	NE	NE	NE	NE
Water and ingredients present in concentrations of less than 1%(or less than 0.1% if carcinogens)		Balance	The ingredients in the balance of this product do not contribute any significant, additional hazards beyond those described fully in this document. All pertinent health, safety and environmental information have been presented, per the requirements of the US Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and Canadian WHMIS (12 and Schedule I to the Controlled Products Regulations).						

LFC = Lowest feasible concentration, NE = Not Established. See Section 16 for Definitions of Terms Used.
NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

PHYISCAL DESCRIPTION: This product is a viscous, water-white to amber liquid with a pungent, ether-like odor.

HEALTH HAZARD: This product is harmful if swallowed, inhaled, or absorbed through the skin, it may be fatal or cause blindness if swallowed. Overexposure may cause nausea, vomiting, diarrhea, dizziness, lethargy and disorientation. This product can also irritate the skin, eyes, and respiratory system. Use only with adequate ventilation. This product contains Methylene chloride which is a carcinogen.

FIRE HAZARD: This product requires considerable pre-heating before ignition and combustion will occur.

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REACTIVITY HAZARD: The product is stable under ordinary conditions. The product is not compatible with strong oxidizers, strong reducing agents, strong bases and strong acids

ENVIRONMENTAL HAZARD: This product does not normally present a significant hazard to aquatic or terrestrial life

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF ENTRY:

The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

INHALATION: Vapors, mists or sprays of this solution may cause irritation to the respiratory tract. This product can cause central nervous system depression when inhaled, which can result in mental confusion, light-headedness, fatigue, nausea, vomiting, and headache. Methylene chloride, a component of this product, can cause adverse effects on the cardiovascular system. Though not anticipated under normal circumstances of use, exposure to high levels of this product's vapors can cause unconsciousness or death.

SKIN ABSORPTION: Methyl Alcohol, a component of this product, can potentially be absorbed through the skin.

CONTACT WITH SKIN or EYES: Prolonged or repeated skin contact can cause burns and dermatitis. The liquid and vapors of this product can cause eye irritation; contact can lead to pain, inflammation, and temporary eye damage.

INGESTION: **DO NOT SWALLOW OR TAKE INTERNALLY!** Though an unlikely route of occupational exposure, if this product is swallowed, gastric discomfort could occur. Symptoms of ingestion exposure include irritation of the throat, esophagus, and other tissues of the digestive system. If vomiting results in aspiration, chemical pneumonia could follow. Ingestion of this product may cause blindness. Severe ingestion overexposures can be fatal.

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound.

Hazardous Materials Identification System (HMIS)

Health	3*
Flammability	1
Physical Hazard	0
Protective Equipment	C

See Section 16 for Definition of Ratings

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**.

ACUTE: Depending on the duration of contact, overexposures can irritate the eyes, skin, mucous membranes or other exposed tissue. Inhalation overexposure can result in central nervous system depression, dizziness, fatigue, vomiting, and headaches. These symptoms of exposure generally alleviated when overexposure ends. Overexposures by all routes of entry can cause blindness. Severe inhalation and ingestion overexposures can be fatal.

CHRONIC: Prolonged or repeated skin overexposure to this product can cause dermatitis. Methylene Chloride, a component of this product, may cause cancer. Long-term exposure to Methylene Chloride may lead to neurological effects such as memory loss, speech and balance problems.

TARGET ORGANS: Acute: Eyes, skin, central nervous system, respiratory system, and the optic nerve. Chronic: Blood, liver, and cardiovascular system.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Take a copy of label and MSDS to physician or health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing. Victim must seek immediate medical attention if any adverse exposure symptoms develop.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. Victim must seek immediate medical attention if any adverse exposure symptoms develop. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing skin disorders, eye problems, impaired liver, kidney, respiratory or lymphoid system function can be more susceptible to health effects associated with overexposures to this product.

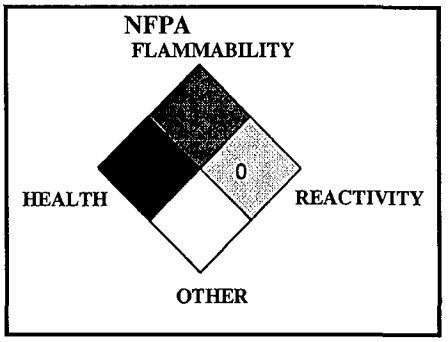
RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations can prove useful. Consultation with an ophthalmologist is recommended if eye exposure leads to tissue damage.

5. FIRE-FIGHTING MEASURES

FLASH POINT: None measurable by standard method.
AUTOIGNITION TEMPERATURE: N/A
FLAMMABLE LIMITS (in air by volume, %):
Lower: 1%
Upper: 36%

FIRE EXTINGUISHING MATERIALS: This material will not significantly contribute to the intensity of a fire. Methylene Chloride, the main component of this product, is a fire suppressant. The product requires considerable pre-heating before ignition and combustion will occur. Use extinguishing material suitable to the surrounding fire.

Water Spray: OK
Carbon Dioxide: OK
Foam: OK
Dry Chemical: OK
Halon: OK
Other: Any "ABC" Class



UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., carbon monoxide, carbon dioxide, hydrogen chloride, phosgene, and formaldehyde).

Explosion Sensitivity to Mechanical Impact: Not sensitive under normal conditions.

Explosion Sensitivity to Static Discharge: Not sensitive under normal conditions.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Trained personnel using pre-planned procedures should respond to uncontrolled releases. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Fire extinguishing media should be readily accessible to responders.

RESPONSE TO INCIDENTAL RELEASES: Personnel who have received basic chemical safety training can generally handle small-scale releases, such as 1 container of this product. Respond to incidental chemical releases by wearing gloves, goggles, and appropriate body protection.

RESPONSE TO NON-INCIDENTAL RELEASES: Respond to non-incidental chemical releases of this product, such as the simultaneous puncturing of several containers, by clearing the impacted area and contacting appropriate emergency personnel. Clean up should only be done by qualified personnel. Responders should wear the level of protection appropriate to the type of chemical released, the volume of the material spilled, and the location where the incident has occurred. Minimum Personal Protective Equipment should be Level B: triple-gloves, chemical resistant apron, boots, and splash goggles and Self-Contained Breathing Apparatus. Level B should also be used when oxygen levels are below 19.5% or are unknown.

RESPONSE EQUIPMENT AND PROCEDURES: Spark-proof tools and equipment should be utilized. Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater. Place all spill residues in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

See Section 16 for Definition of Ratings

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after using this product. Do not eat or drink while using this material. Avoid generating mists and sprays of this product. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to use it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

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8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control dusts, mists, fumes or vapors. Maintain airborne contaminate concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres use of a full-face-piece pressure/demand SCBA or a full face-piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (29 CFR 1910.134). The following NIOSH Respiratory Protection Guidelines are applicable to Methylene Chloride (the main component of this product) and are provided for additional information:

At Any Detectable Concentration (due to potential its status as a potential carcinogen): Positive pressure, full-face-piece Self Contained Breathing Apparatus; or positive pressure, full-face-piece supplied-air respirator with an auxiliary positive-pressure Self Contained Breathing Apparatus.

Escape: Gas-mask with organic vapor canister; or escape-type Self Contained Breathing Apparatus.

EYE PROTECTION: For consumer use, wearing eye protection (such as splash goggles) is advisable. However, for specific industrial applications, enhanced eye protection may be necessary. Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian standards.

HAND PROTECTION: For consumer use, wearing protective gloves is recommended. For specific industrial applications, wear chemical impervious gloves (e.g., Neoprene, nitrile). If necessary, refer to U.S. OSHA 29 CFR 1910.138 or the appropriate standards of Canada.

BODY PROTECTION: For consumer use, no specific body protection is normally needed. For specific industrial applications, body protection is not normally needed. Use body protection appropriate for task (e.g., Tyvek suit, rubber apron). If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: Industrial Use situations: C; Safety Glasses, Gloves and Body Protection.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Methylene chloride, the main component of this product:

RELATIVE VAPOR DENSITY (air = 1): 2.93
EVAPORATION RATE (nBuAc=1): 27.5
SPECIFIC GRAVITY: 1.19
MELTING/FREEZING POINT: -142°F (-97°C)
SOLUBILITY IN WATER: Moderately.
BOILING POINT: 103.6° F (39.8°C)
VAPOR PRESSURE, mm Hg @ 24°C: 400
pH: Not applicable.
ODOR THRESHOLD: 150 ppm
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): 1.25

The following information is for this product:

V.O.C., less water and exempt: 661 g/L
Weight % V.O.C.: 13.7 %

APPEARANCE, ODOR AND COLOR: This product is a water-white to amber liquid with a pungent, ether-like odor

HOW TO DETECT THIS SUBSTANCE (warning properties): The odor and appearance of this product may act as a warning property in the event of an accidental release.

10. STABILITY and REACTIVITY

STABILITY: Stable under normal circumstances of use and handling. Methylene chloride, a component of this product, slowly decomposes to form Hydrogen chloride upon prolonged contact with water.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate irritating fumes, and toxic gases (e.g., Hydrogen Chloride, Carbon monoxide and Carbon dioxide).

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is not compatible with strong acids, oxidizers and bases. Components of this product may attack some forms of plastic, rubber, metal and coatings.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1% in concentration.

The following data is available for Methylene chloride:

Skin-Rabbit, adult 810 mg/24H Severe irritation effects

11. TOXICOLOGICAL INFORMATION (cont.)

Eye effects-Rabbit, adult 162 mg Moderate irritation effects
Eye effects-Rabbit, adult 10 mg Mild irritation effects
Eye effects-Rabbit, adult 17,500 mg/m3/10M
DNA Inhibition-Human: fibroblast 5000 ppm/1H-C
DNA Inhibition-Hamster: lung 5000 ppm/1H-C

Methylene chloride continued:
Sister Chromatid Exchange-Hamster: lung 5000 ppm/1H-C
Inhalation-Rat TCLo: 4500 ppm/24H (1-17D preg): Reproductive effects
Inhalation-Mouse TCLo: 1250 ppm/7H (6-15D preg): Teratogenic effects
Inhalation-Rat TCLo: 3500 ppm/6H/2Y-I:Carcinogenic effects
Inhalation-Mouse TCLo: 2000 ppm/5H/2Y-C:Carcinogenic effects
Oral-Human LDLo: 357 mg/kg: Central nervous system effects
Inhalation-Rat TCLo: 500 ppm/6H/2Y:Equivocal tumorigenic agent
Oral-Human LDLo: 357 mg/kg: Peripheral nervous system effects, Central nervous system effects
Inhalation-Human TCLo: 500 ppm/8H:Central nervous system effects
Oral-Rat LD_{50}: 1600 mg/kg
Inhalation-Rat LC_{50}: 88,000 mg/m3/30M
Oral-Rabbit, adult LDLo:1900 mg/kg
Inhalation-Rabbit, adult LCLo: 10,000 ppm/7H

The following data is available for Methyl alcohol:
Skin-Rabbit, adult 20 mg/24H Moderate irritation effects
Eye effects-Rabbit, adult 100 mg/24H Moderate irritation effects
DNA Inhibition-Human: lymphocyte 300 mmol/L
Microsomal Mutageniticity Assay-Mouse: lymphocyte 7900 mg/L
Oral-Rat TDLo:7500 mg/kg (17-19D preg):Reproductive effects
Inhalation-Rat TCLo:10,000 ppm/7H (7-15D preg):Teratogenic effects
Oral-Man LDLo:6422 mg/kg: Central nervous system effects, Pulmonary system effects, Gastrointestinal tract effects
Oral-Man TDLo:3429 mg/kg: Eye effects
Oral-Human LDLo:428 mg/kg: Central nervous system effects, Pulmonary system effects
Oral-Human LDLo:143 mg/kg: Eye effects, Pulmonary system effects, Gastrointestinal tract effects
Oral-Woman TDLo:4 g/kg: Eye effects, Pulmonary system effects, Gastrointestinal tract effects
Inhalation-Human TCLo:86,000 mg/m3:Eye effects, Pulmonary system effects
Inhalation-Human TCLo:300 ppm:Eye effects, Central nervous system effects, Pulmonary system effects
Oral-Woman TDLo:4 g/kg
Oral-Rat LD_{50}:5628 mg/kg
Inhalation-Rat LC_{50}:64,000 ppm/4H

The following data is available for Methyl alcohol (continued):
Oral-Mouse LD_{50}:7300 mg/kg
Oral-Monkey LDLo:7000 mg/kg
Inhalation-Monkey LCLo:1000 ppm
Skin-Monkey LDLo:393 mg/kg

The following data is available for Aliphatic Petroleum Distillates:
Eye effects-Human 470 ppm/15M

SUSPECTED CANCER AGENT: The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.

11. TOXICOLOGICAL INFORMATION - continued

CHEMICAL	IARC	NTP	NIOSH	ACGIH	OSHA	PROPOSTION 65
Methylene Chloride	2B	Anticipated	YES	A3	NO	CARCINOGEN
Methyl Alcohol	NO	NO	NO	NO	NO	NO
Aliphatic Petroleum Distillates	NO	NO	NO	NO	NO	NO
Paraffin Wax	NO	NO	NO	NO	NO	NO
Methyl hydroxyethyl cellulose	NO	NO	NO	NO	NO	NO

IRRITANCY OF PRODUCT: This product can be severely irritating to contaminated tissue. Prolonged exposure can lead to tissue damage.

SENSITIZATION TO THE PRODUCT: The components of this product are not reported to be sensitizers.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: Methylene Chloride, the main component of this product, can be metabolized to carbon monoxide, other exposures to carbon monoxide (e.g., smoking, exhaust fumes) can have synergistic effects.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: When used as directed, this product is not expected to produce mutagenic effects in humans. Methylene chloride, a component of this product, is classified as a mutagen.

Embryotoxicity: When used as directed, this product is not expected to produce embryotoxic effects in humans.

Teratogenicity: When used as directed, this product is not expected to produce teratogenic effects in humans. Methylene chloride and Methanol, components of this product, have shown teratogenic effects in animal studies.

Reproductive Toxicity: When used as directed, this product is not expected to produce adverse reproductive effects in humans. Methylene chloride and Methanol, components of this product, have shown reproductive toxicity in animal studies.

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): Methyl Alcohol: 15 mg/L of methanol in urine at end of shift.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: When released into the soil, this material may leach into the groundwater. When released into the soil, this product is expected to quickly evaporate. When released into the water, this product may biodegrade to a moderate extent. This product is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxy radicals. When released into the air, this product may be removed from the atmosphere to a moderate extent by wet deposition. The following information is pertinent to the components of this product:

Methylene Chloride: Slowly decomposes to form hydrochloric acid upon prolonged contact with water. Measured log octanol/water partition coefficient is 1.25. Henry's Law Constant is estimated to be 3.69×10^{-3}. Potential for soil mobility is very high; soil organic carbon/waster coefficient is estimated to be 24. Methylene Chloride has a half-life in air of grater than 30 days.

Methyl alcohol: When released into the water, this material has a half-life of 1-10 days; in the air, the half-like is 10-30 days.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product can be harmful to animal life if large volumes of it are released into the environment. Refer to Section 11, "Toxicological Information", for specific animal data.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product can be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment). The following ecotoxicity data is available for the components of this product.

Methylene chloride:

LC_{50} in water flea (Daphnia magna) = 244 mg/L
LC_{50} in fathead minnow (Pimephales promelas) = 320 mg/L
LC_{50} in bluegill (Lepomis Macrocirus) = 224 mg/L
LC_{50} in mysid (Mysidopsis bahia) = 256 mg/L
LC_{50} in golden orfe (Leucicus idus) is 5225 mg/L
Maximum acceptable toxicant concentration in fathead minnow (Pimephales promelas) = 108 mg/L
Acute mobilization EC_{50} in water flea (Daphnia magna) = 480 mg/L

Methyl alcohol

Fathead minnow: 29.4 g/L (96 hr);
Fathead minnow: LC_{50}: 29400 mg/L (96 hr);
Goldfish LC_{50}: 250 ppm (11 hr);
Rainbow trout: LC_{50}: 8000 mg/L (48 hr) (48 hr) (pH 7.63, 25^0C);
Rainbow trout LC_{50}13-68 mg/L (96 hr);
Phytobacterium phosphoreum: EC_{50}: 51,000 - 320,000 mg/L (30 minutes)

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: **Consumer Waste:** Dispose of according to pertinent state and local household waste and requirements. **Industrial Use:** Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.

EPA WASTE NUMBER: The specific RCRA codes depend on the exact nature of the discarded material. The following waste codes are applicable to wastes consisting only of this product: F002 (spent halogenated solvents).

14. TRANSPORTATION INFORMATION

THIS PRODUCT IS HAZARDOUS PER 49 CFR 172.101, THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Toxic liquids organic, n.o.s. (Methylene chloride)
HAZARD CLASS NUMBER and DESCRIPTION:	6.1
UN IDENTIFICATION NUMBER:	UN 2810
DOT LABEL(S) REQUIRED:	Toxic
PACKAGING GROUP:	III
NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (2000):	153

MARINE POLLUTANT: No component is designated as a DOT Marine Pollutant.

Toxic material products shipped in containers less that 4L (1 gallon) in volume or 5.0 kg (11 pounds): Per 49 CFR 173.153, Limited quantities of poisonous materials (Class 6.1) in **Packing Groups III** are exempted from specification packaging requirements, unless offered for transportation by aircraft. Limited quantities are not subject to Subpart F (Placarding). Each package must conform to the packaging requirements of subpart B and can not exceed 30 kg (66 lbs).

Consumer commodities: A limited quantity that conforms to the paragraph above and is a consumer commodity (per 49 CFR 171.8) can be renamed "Consumer commodity" and reclassified as an ORM-D Material. Packages of ORM-D materials are excepted from the specification packaging requirements and from the labeling requirements of subpart E. Shipments of ORM-D Material are not subject to shipping paper requirements of subpart C of part 172, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or are offered for transportation and transported by aircraft. Additional exceptions, as provided in §173.156 may also apply.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is considered as dangerous goods, per Transport Canada regulations. Use above U.S. DOT information for Canadian shipments.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

EPA REPORTING REQUIREMENTS: The following reporting requirements are applicable to components of this product:

CHEMICAL	SECTION 302 (40 CFR 355, Appendix A)	SECTION 304 (40 CFR Table 302.4)	SECTION 313 (40 CFR 372.65)
Methylene chloride	NO.	RQ = 1000 lbs	YES
Methyl alcohol	NO	RQ = 5000 lbs.	YES
Aliphatic petroleum distillates	NO	NO	NO
Paraffin wax	NO	NO	NO
Methyl hydroxyethyl cellulose	NO	NO	NO

15. REGULATORY INFORMATION - continued

U.S. SARA SECTION 311/312 FOR PRODUCT: Immediate health hazard; delayed health hazard.

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): "WARNING: This product contains a chemical known to the State of California to cause cancer."

ENVIRONMENTAL HAZARDS: Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

CANADIAN WHMIS SYMBOLS: **D2A: Poisonous and infectious materials – other effects – very toxic**

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

THIS PRODUCT IS SOLD TO CONSUMERS FOR HOUSEHOLD USE IN CONTAINERS OF RELATIVELY SMALL VOLUME (I.E. 5 GALLON OR LESS IN SIZE). THIS MSDS HAS BEEN DEVELOPED TO ADDRESS SAFETY CONCERNS AFFECTING THOSE INDIVIDUALS WORKING IN WAREHOUSES AND OTHER PLACES WHERE LARGE NUMBERS OF THESE CONTAINERS ARE STORED, AS WELL AS THOSE AFFECTING POTENTIAL USERS OF THIS PRODUCT IN INDUSTRIAL /OCCUPATIONAL SETTINGS. ALL PERTINENT HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION HAVE BEEN PRESENTED IN THIS DOCUMENT, PER THE REQUIREMENTS OF THE US FEDERAL OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) AND CANADIAN WHMIS.

DISCLAIMER: AS THE HANDLING AND USE OF PRODUCTS UNDER USER'S CONDITIONS ARE BEYOND OUR CONTROL, NO WARRANTY, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, IS MADE CONCERNING THIS PRODUCT. THE USER ASSUMES ALL RISK OF USE OR HANDLING WHETHER OR NOT IN ACCORDANCE WITH ANY DIRECTIONS OR SUGGESTIONS OF THE SUPPLIER. SELLER SHALL NOT BE LIABLE TO PURCHASER OR ANY OTHER PERSON FOR LOSS OR DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE USE OF OUR PRODUCTS, FROM BREACH OF ANY WARRANTY OR FROM ANY OTHER CAUSE, THE EXCLUSIVE REMEDY AGAINST THE SELLER BEING TO REQUIRE REPLACEMENT OR REPAIR OF DEFECTIVE GOODS.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these, which are commonly used, include the following:
CAS #: This is the Chemical Abstract Service Number that uniquely identifies each compound.
ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.
TLV - Threshold Limit Value - an airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.
OSHA - U.S. Occupational Safety and Health Administration.
PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by Court Order.
IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.
HAZARD RATINGS:
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can cause permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).
NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System". **FLAMMABILITY LIMITS IN AIR:**
Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.
TOXICOLOGICAL INFORMATION:
Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo, LDLo, LDo, TC, TCo, LCLo,** and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: **EC** is the effect concentration in water.

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Data from several sources are used to evaluate the cancer-causing potential of the material. The sources and ratings are: **IARC** - the International Agency for Research on Cancer; 1 = Carcinogenic to humans, 2A, 2B = Probably carcinogenic to humans, 3 = Unclassifiable as to carcinogenicity in humans, and 4 = Probably not carcinogenic to humans. **NTP** - the National Toxicology Program; K =Known to be a human carcinogen, and R = Reasonably anticipated to be a human carcinogen. **RTECS** - the Registry of Toxic Effects of Chemical Substances. **OSHA** - Occupational Safety and Health Administration and **CAL/OSHA** - California's subunit of the Occupational Safety and Health Administration; Ca = Carcinogen defined with no further categorization. **ACGIH** – American Conference of Governmental Industrial Hygienists; A1 = Confirmed human carcinogen, A2 = Suspected human carcinogen, A3 = Confirmed animal carcinogen with unknown relevance to humans, A4 = Not classifiable as a human carcinogen, and A5 = Not suspected as a human carcinogen. **NIOSH** – U.S. National Institute for Occupational Safety and Health; Ca = Potential occupational carcinogen, with no further categorization. **EPA** – U.S. Environmental Protection; A = Human carcinogen, B = Probable human carcinogen, C = Possible human carcinogen, D = Not classifiable as to human carcinogenicity, E = Evidence of Non-carcinogenicity for humans, K = Known human carcinogen, L = Likely to produce cancer in humans, CBD = Cannot be determined, NL = Not likely to be carcinogenic in humans, and I = Data are inadequate for an assessment of human carcinogenic potential.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDSL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA or Superfund**); and various state regulations. This section also includes information on the precautionary warnings that appear on a material's industrial package l

MATERIAL SAFETY DATA SHEET

B20W2251
19 00

DATE OF PREPARATION
Mar 5, 2010

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER
B20W2251
PRODUCT NAME
PROMAR® 200 Interior Latex Eg-Shel Enamel, Extra White
MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

Telephone Numbers and Websites

Product Information	www.sherwin-williams.com
Regulatory Information	(216) 566-2902 www.paintdocs.com
Medical Emergency	(216) 566-2917
Transportation Emergency*	(800) 424-9300
**for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)*	

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

% by Weight	CAS Number	Ingredient	Units	Vapor Pressure
2	107-21-1	**Ethylene Glycol**		
		ACGIH TLV	100 MG/M3 CEILING (aerosol)	0.12 mm
		OSHA PEL	50 PPM CEILING	
0.1	14464-46-1	**Cristobalite**		
		ACGIH TLV	0.025 mg/m3 as Resp. Dust	
		OSHA PEL	0.05 mg/m3 as Resp. Dust	
15	471-34-1	**Calcium Carbonate**		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	15 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	
13	13463-67-7	**Titanium Dioxide**		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

SECTION 3 — HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

HMIS Codes

Health	2*
Flammability	0
Reactivity	0

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.

In a confined area vapors in high concentration may cause headache, nausea or dizziness.
Prolonged overexposure to hazardous ingredients in Section 2 may cause adverse chronic effects to the following organs or systems:
- the liver
- the urinary system

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

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SECTION 4 — FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

SECTION 5 — FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL	FLAMMABILITY CLASSIFICATION
Not Applicable	N.A.	N.A.	Not Applicable

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
- Remove all sources of ignition. Ventilate the area.
- Remove with inert absorbent.

SECTION 7 — HANDLING AND STORAGE

STORAGE CATEGORY
Not Applicable
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).
Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	10.85 lb/gal	1299 g/l
SPECIFIC GRAVITY	1.31	
BOILING POINT	212 - 388 °F	100 - 197 °C
MELTING POINT	Not Available	
VOLATILE VOLUME	58%	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	9.2	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

0.78lb/gal	94g/l	Less Water and Federally Exempt Solvents
0.35lb/gal	42g/l	Emitted VOC

SECTION 10 — STABILITY AND REACTIVITY

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

SECTION 11 — TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Crystalline Silica (Quartz, Cristobalite) is listed by IARC and NTP. Long term exposure to high levels of silica dust, which can occur only when sanding or abrading the dry film, may cause lung damage (silicosis) and possibly cancer.

IARC's Monograph No. 93 reports there is sufficient evidence of carcinogenicity in experimental rats exposed to titanium dioxide but inadequate evidence for carcinogenicity in humans and has assigned a Group 2B rating. In addition, the IARC summary concludes, "No significant exposure to titanium dioxide is thought to occur during the use of products in which titanium is bound to other materials, such as paint."

Ethylene Glycol is considered an animal teratogen. It has been shown to cause birth defects in rats and mice at high doses when given in drinking water or by gavage. There is no evidence to indicate it causes birth defects in humans.

TOXICOLOGY DATA

CAS No.	Ingredient Name			
107-21-1	**Ethylene Glycol**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		4700 mg/kg
14464-46-1	**Cristobalite**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
471-34-1	**Calcium Carbonate**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
13463-67-7	**Titanium Dioxide**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available

SECTION 12 — ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

SECTION 13 — DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

SECTION 14 — TRANSPORT INFORMATION

US Ground (DOT)
Not Regulated for Transportation.
Canada (TDG)
Not Regulated for Transportation.
IMO
Not Regulated for Transportation.

SECTION 15 — REGULATORY INFORMATION

SARA 313 *(40 CFR 372.65C)* SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
107-21-1	Ethylene Glycol	2	

CALIFORNIA PROPOSITION 65
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

SECTION 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

OFFICE SUPPLIES

KMB00003560

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910, 1200, Standard must be
consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*	*Note: Blank, spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.*
D-Q23 Developer	

Section I

Distributor's Name	Emergency Telephone Number 054-256-4114 (Japan)
Address *(Number, Street, City, State, and ZIP Code)*	Telephone Number for Information 054-256-4114 (Japan)
Manufacturer's Name Tomoegawa Paper CO., Ltd.	Date Prepared November 15, 1993
Address 3-1, Mochimuné Tomoe-cho, Shizuoka-shi, 421-01 Japan	Signature of Preparer *(optional)*

Section II — Hazardous Ingredients/Identity Information

Hazardous Components *(Specific Chemical Identity: Common Name(s))*	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
Non-hazardous ingredients				
Ferrite (CAS No. 1317-38-0) (CAS No. 1314-13-2) (CAS No. 1309-37-1)	Not Listed	Not listed	None	95.5
T-Q23 Toner				4.5

Section III — Physical/Chemical Characteristics

Boiling Point	* N.A.	Specific Gravity ($H_2O=1$)	4.7
Vapor Pressure (mm Hg)	N.A.	Melting Point	Not Known
Vapor Density (AIR=1)	N.A.	Evaporation Rate (Butyl Acetate=1)	N.A.
Solubility in Water	Negligible		
Appearance and Odor	Black fine powder, odorless		

Section IV — Fire and Explosion Hazard Data

Flash Point *(Method Used)*	N.A.	Flammable Limits	LEL N.A.	UEL N.A.
Extinguishing Media	Water fog, foam, CO_2 or dry chemicals.			
Special Fire Fighting Procedures	Wear full emergency equipment with self-contained breathing apparatus and full protective gear in case of burning in large quantities.			
Unusual Fire and Explosion Hazards	This material has no unusual fire or explosion hazards.			

(Reproduce locally) OSHA 174. Sept. 1985

* N.A.=Not Applicable

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Section V — Reactivity Data

Stabilty	Unstable		Conditions to Avoid	None
	Stable	×		
Incompatibility *(Materials to Avoid)*			None	
Hazardous Decomposition or Byproducts			CO, CO_2, and NO_x	
Hazardous Polymerization	May Occur		Conditions to Avoid	None
	Will Not Occur	×		

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation ? Yes	Skin ? No	Ingestion ? Yes, but unusual

Health Hazards *(Acute and Chronic)* No data available.

Carcinogenicity:	NTP ? None	IARC Monographs ? None	OSHA Regulated ? None

Signs and Symptoms of Exposure: Minimum irritation to respiratory tract may occur as with exposure to any non-toxic dust.

Medical Conditions Generally Aggravated by Exposure: Accumulation of dust in the respiratory system.

Emergency and First Aid Procedures: Eye contact : Flush eyes immediately with large amounts of water for at least 5 minutes. Inhalation : Remove to fresh air. If effects occur, consult local medical personnel.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Sweep up or clean up with a vacuum cleaner.

Waste Disposal Method: Incinerate or dump under the conditions which meet all federal, state and local environmental regulations.

Precautions to Be Taken in Handling and Storing: None

Other Precautions: Keep away from heat, sparks, and open flame.

Section VIII — Control Measures

Respiratory Protection *(Specify Type)*: None required under normal use.

Ventilation	Local Exhaust	None	Special	None
	Mechanical *(General)*	None	Other	None
Protective Gloves		None	Eye Protection	None

Other Protective Clothing or Equipment: None required under normal use.

Work/Hygienic Practices: Inhalation should be avoided.

S H A R P

Date Revised: July. 22. 2002
Date Issued :May. 28. 1998

MATERIAL SAFETY DATA SHEET (1/4)

MSDS No. B-1020

Section 1. Product and Company Identification

Product Name : Toner Cartridge of FO-47ND / FO-47DC / FO-47DCCN / FO-44ND / FO-50ND / DUNT-455BSCZZ

Supplier Identification : Sharp Corporation
22-22 Nagaike-cho, Abeno-ku, Osaka, Japan

Local suppliers are listed below. Please contact the nearest supplier for additional information.

(Country)	(Name and Telephone Number)
U.S.A.	Sharp Electronics Corporation Telephone number for information: 1-800-237-4277 Emergency telephone number : 1-800-255-3924
Canada	Sharp Electronics of Canada Ltd. Telephone number for information : 905-890-2100 Emergency telephone number : 1-800-255-3924
United Kingdom	Sharp Electronics (U. K.) Ltd. Telephone number for information : 01923-474013
Australia New Zealand	**AUSTRALIA** SHARP CORPORATION OF AUSTRALIA PTY. LTD.: (Phone) 02-9830-4600, 1800 807 820 **NEW ZEALAND** SHARP CORPORATION OF NEW ZEALAND LTD.: (Phone) 09-634-2059

Section 2. Ingredients

Ingredients	Cas No.	Proportion	OSHA Z-Tables	ACGIH TLV	IARC	DFG-MAK(GER)	Other Limits
Polyester resin	Trade Secret	>90%	—	—	—	—	—
(Trade secret No. 361615 -5042-P in New Jersey)							
Carbon black	1333-86-4	1-5%	3.5mg/m3	3.5mg/m3	2B	III 3B	TWA(Austl) : 3 mg/m^3
Polyolefin wax	9003-07-0	1-5%	—	—	—	—	—
Organic pigment	Trade Secret	1-5%	—	—	—	—	—
(Trade secret No. 361615 -5025-P in New Jersey)							

Section 3. Hazardous Identification

Most Important Hazards and Effects of the Products

For Human Health: This toner is not classified as a human carcinogen. No symptoms expected with intended use.

For the Environment: No data are available on the adverse effects of this product on the environment.

For others: None

Specific hazards: Dust explosion (like most finely divided organic powders)

Section 4. First-Aid Measures

Symptoms of Overexposure: No symptoms expected with intended use.

Routes of Entry: Eye contact, inhalation, ingestion

Information

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air and obtain medical advice.

Skin Contact: Flush with gently flowing water (preferably lukewarm) and soap for 15 minutes or until particle is removed. If irritation does occur, obtain medical advice.

Eye Contact: Do not allow victim to rub eye(s). Flush with gently flowing water (preferably lukewarm) for 15 minutes or until particle is removed. Have victim look right and left, and, then up and down. If irritation does occur, obtain medical attention. DO NOT attempt to manually remove anything stuck to the eye(s).

Ingestion: If irritation or discomfort occurs, obtain medical attention immediately.

Note to Physician: None

Section 5. Fire-Fighting Measures

Suitable Extinguishing Media: CO2, water spray, foam and dry chemical

Extinguishing Media to Avoid: Full water jet

Special Firefighting Procedures: None

Fire and Explosion Hazards: If dispersed in air, toner, like most finely divided organic powders, may form an explosive mixture.
Protection of Firefighters: Use self-contained breathing apparatus (SCBA).

Section 6. Accidental Release Measures

Personal Precautions: None
Environmental Precautions: None
Methods for Cleaning Up: Wipe off with paper or cloth. DO NOT use vacuum cleaner when a large amount is released. It, like most finely divided organic powders, may create a dust explosion.

Section 7. Handling and Storage

Handling
Technical Measures: None
Precautions: None
Safe Handling Advice: Try not to disperse the particles.
Storage
Technical Measures: None
Storage Conditions: Keep container closed. Store in a cool and dry place. Keep out of reach of children.
Incompatible Products: None

Section 8. Exposure Control/Personal Protection

Engineering Measures
Ventilation: None required with intended use.
Control Parameters(As total dust)
OSHA-PEL(USA): 15mg/m3 ACGIH-TLV(USA): 10mg/m3 DFG-MAK(GER): 6mg/m3 Worksafe-TWA(Austl.): 10mg/m3
Personal Protective Equipment
Personal Protective Equipment
None required when used as intended in Sharp equipment. For use other than normal customer-operating procedures (such as in bulk toner processing facilities), goggles and respirators may be required.
Hygiene Measures: Wash hands after handling.

Section 9. Physical and Chemical Properties

Appearance
Physical State: Solid Form: Powder Color: Black

Odor:	Faint odor	Explosion Properties:	No data available
Particle Size(μm):	5 - 15	Density(g/cm³):	1.2 (bulk density: 0.5)
Boiling Point:	Not applicable	Solubility in water:	Negligible
Melting Point(°C):	No data available	Oxidizing Properties:	No data available
Softening Point(°C):	120 - 130 *	Ignition Temperature(°C):	450 *
Flash Point:	Not applicable	Vapor Pressure:	Not applicable
pH:	Not applicable		
Partition Coefficient, n-Octanol/Water:	Not applicable		

Section 10. Stability and Reactivity

Stability: Stable [X] Unstable [ ]
Hazardous Reactions: Dust explosion, like most finely divided organic powders.
Conditions to avoid: Electric discharge, throwing into fire.
Materials to Avoid: Oxidizing materials.

Hazardous Decomposition Products: CO, CO2

Section 11. Toxicological Information

Health Effects from Exposure: No symptoms expected with intended use.

Toxicological Data

Acute Toxicity:

Inhalation, LC50(mg/l): >0.74 (Rats,4hour exposure) * (This was the highest attainable concentration.)

Ingestion(oral), LD50(mg/kg): >5000 (Rats) *

Dermal, LD50(mg/kg): >2000 (Rats) *

Eye irritation: Non irritant (Rabbits) *

Skin irritation: Non irritant (Rabbits) *

Skin sensitizer: No data available

Mutagenicity: Negative * (AMES test)

(*= Based on data for other Products with similar ingredients)

Local Effects: see Chronic Toxicity or Long term Toxicity

Chronic Toxicity or Long Term Toxicity: Prolonged inhalation of excessive dust may cause lung damage. It is attributed to "lung overloading", a generic response to excessive amounts of any dust retained in the lungs for a prolonged interval. Use of this product, as intended, does not result in inhalation of excessive dust. In a study in rats by chronic inhalation exposure to a typical toner, a mild to moderate degree of lung fibrosis was observed in 92% of rats in the high concentration(16mg/m^3) exposure group, and a minimal to mild degree of fibrosis was noted in 22% of the animals in the middle(4mg/m^3) exposure group. But no pulmonary change was reported in the lowest (1mg/m^3) exposure group, the most relevant level to potential human exposures.

Carcinogenicity

IARC Monographs: Not listed

NTP (USA): Not listed

OSHA Regulated (USA): Not listed

In 1996 the IARC reevaluated carbon black as a Group 2B carcinogen (possible human carcinogen). This evaluation is given to Carbon Black for which there is inadequate human evidence, but sufficient animal evidence. The latter is based upon the development of lung tumors in rats receiving chronic inhalation exposures to free carbon black at levels that induce particle overload of the lung. Studies performed in animal models other than rats have not demonstrated an association between carbon black and lung tumors. Moreover, a two-year cancer bioassay using a typical toner preparation containing carbon black demonstrated no association between toner exposure and tumor development in rats.

Section 12. Ecological Information

No data are available on the adverse effects of this material on the environment.

Section 13. Disposal Consideration

Appropriate Methods of Disposal

Preparation(community provisions): Waste may be disposed or incinerated under conditions which meet all federal, state and local environmental regulations.

Contaminated Packaging: Waste may be disposed or incinerated under conditions which meet all federal, state and local environmental regulations.

Precautions: Do not throw the toner cartridge or toner into a n open flame. The hot toner may scatter and cause burns or other damage.

S H A R P

Date Revised: July. 22. 2002
Date Issued :May. 28. 1998

MATERIAL SAFETY DATA SHEET (4/4)

MSDS No. B-1020

Section 14. Transport Information

Special Precautions: None

Information on Code and Classifications According to International Regulations

UN Classification: None

Section 15. Regulatory Information

US Information

Information on the label: Not required

TSCA(Toxic Substances Control Act):

All chemical substances in this product comply with all applicable rules or order under TSCA.

SARA(Superfund Amendments and Reauthorization Act) Title III

302 Extreme Hazardous Substance: None

311/312 Hazard Categories: None

313 Reportable Ingredients: None

California Proposition 65:

This product contains no chemical substances subject to California Proposition 65.

EU Information

Information on the label (88/379/EEC) and 67/548/EEC) :

Symbol & Indication : Not required

R-phrase : Not required

S-phrase : Not required

76/769/EEC:

All chemical substances in this product comply with all applicable rules or order under 76/769/EEC.

Section 16. Other Information

NFPA Hazard Rating: The National Fire Protection Agency(USA): Health: 1 Flammability: 1 Reactivity: 0

HMIS Rating: The National Paint and Coating Association(USA): Health: 1 Flammability: 1 Reactivity: 0

Recommended Uses: Toner for Electrophotographic Equipment

Restrictions: This information relates only to the specific material designated as supplied by the manufacturer. This information is supplied to us by the manufacturer and Sharp offers no warranties as to its accuracy and accepts no responsibilities for any typographical errors which may appear on these sheets. It is the responsibility of the user to determine the suitability of this product for each particular use.

Literature References:

ANSI Z400.1-1993

ISO 11014-1

Commission Directive 91/155/EEC

The Material Safety Data sheet: A Practical Guide to First Aid: Canadian Centre for Occupational Health and Safety's publication

HMIS IMPLEMENTATION MANUAL: National Paint & Coatings association

IARC(1996): IARC monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Vol. 65, Printing Process and Printing Inks, Carbon Black and Some Nitro Compounds, Lyon, pp.149-261

H.Muhle, B.Bellmann, O.Creutzenberg, C.Dasenbrock, H.Ernst, R.Kilpper, J.C.MacKenzie, P.Morrow, U.Mohr, S.Takenaka, and R.Mermelstein(1991) Pulmonary Response to Toner upon Chronic Inhalation Exposure in Rats. Fundamental and Applied Toxicology 17, pp.280-299.

Rivision Record : July / 22/2002 Addition : Product Name FO-44ND / FO-50ND

SHARP

Date Revised : Jan.18,1996
Date Issued : Nov. 1,1992

MATERIAL SAFETY DATA SHEET (2/2)

MSDS No. F-0381

Section 6. Physical Chemical Characteristics

Boiling/Melting Point	: Not applicable	Specific Gravity	: 1.1
Vapor Pressure	: Not applicable	Solubility in Water	: Negligible
Vapor Density	: Not applicable	PH	: Not applicable
Evaporation Rate	: Not applicable	Viscosity	: Not applicable
Appearance	: Fine powder	Color	: Black
Odor	: Odorless		

Section 7. Fire and Explosion Data

Flash Point (Method Used)	:	Not applicable
Ignition Temperature	:	> 350°C
Flammable Limits	:	(LEL); Not applicable (UEL); Not applicable
Extinguishing Media	:	CO_2, dry chemical, foam or water
Special Fire Fighting Procedure	:	None
Unusual Fire and Explosion Hazard	:	This material has no unusual fire or explosion hazards.
Sensitivity to Mechanical Impact	:	None
Sensitivity to Static Charge	:	None

Section 8. Reactivity Data

Stability	:	Stable
Incompatibility (Material to Avoid)	:	None
Hazardous Decomposition	:	CO and NOx
Hazardous Polymerization	:	Will not occur.

Section 9. Precautions for Safe Handling and Use

Personal Protection Information (Respiratory, Eye Protection and Protective Glove):
None required under normal use.

Engineering Control/Ventilation	:	Not required.
Work/Hygienic Practice	:	When handling large quantity, inhalation should be avoided.

Steps to be taken in case of Spill or Leak : Sweep up or clean up with vacuum cleaner.

Waste Disposal Method	:	Waste material may be dumped or incinerated under conditions which meet all federal, state and local environmental regulations.

Section 10. Other Information

NFPA Rating (U.S.A.)	:	Health = 1 Flammability = 1 Reactivity = 0
WHMIS Legislation (Canada)	:	This product is not a controlled product.
Transport Information	:	This product is not a hazardous material.
UN No.	:	None allocated.

SHARP

Date Revised : Jan.18,1996
Date Issued : Nov. 1,1992

MATERIAL SAFETY DATA SHEET (1/2)

MSDS No. F-3381

Section 1. Product Identification

Product
SF-235ND1/SF-235DV1 (Black Developer)

Section 2. Supplier's Name and Address

Sharp Corporation
22-22 Nagaike-cho, Abeno-ku, Osaka, Japan
Local suppliers are listed below. Please contact the nearest supplier for additional information.

(Country)	(Name and Telephone Number)
U.S.A.	Sharp Electronics Corporation Telephone number for information :201-529-8200 Emergency telephone number :1-800-255-3924
Canada	Sharp Electronics of Canada Ltd. Telephone number for information :905-890-2100 Emergency telephone number :1-800-255-3924
United Kingdom	Sharp Electronics (U.K.) Ltd. Telephone number for information :01923-474013

Section 3. Ingredients

Ingredients	CAS No.	Proportion	OSHA PEL	ACGIH TLV	Other Limits
Carbon black	1333-86-4	< 0.3%	3.5mg/m³	3.5mg/m³	None
Ferrite carrier		> 94%	Not listed	Not listed	None
Zinc oxide	1314-13-2				
Iron oxide	1309-37-1				
Copper oxide	1317-38-0				
Styrene-acrylate copolymer	25767-47-9	< 5%	Not listed	Not listed	None

Section 4. Hazardous Identification (Emergency Overview)

Based on our tests, it does not present acute health hazard.

Section 5. Health Hazard Data

Route(s) of Entry	:	Inhalation?	Skin?	Ingestion?
		Yes	No	Possible but very unusual.

Health Hazards : This toner, which is included in this developer, has been tested on "Acute oral toxicity" and "Ames test". It does not represent a health hazard.

Carcinogenicity	:	NTP?	IARC Monographs?	OSHA Regulated?
		No	No	No

Signs and Symptoms of Exposure :
Minimal irritation to respiratory tract may occur as with exposure to any non-toxic dust.
Medical Conditions Generally Aggravated by Exposure : None
Emergency and First Aid Procedures :
Inhalation ; Remove to fresh air. If effects occur, consult medical personnel.
Eyes ; In case of contact, immediately flush eyes with water for 15 minutes.

TCADZ1054FCZ1

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SHARP

Date Revised : Jan.18,1996
Date Issued : Nov. 1,1992

MATERIAL SAFETY DATA SHEET (2/2)

MSDS No. F-3381

Section 6. Physical Chemical Characteristics

Boiling/Melting Point	:	Not applicable	Specific Gravity	:	About 5
Vapor Pressure	:	Not applicable	Solubility in Water	:	Negligible
Vapor Density	:	Not applicable	PH	:	Not applicable
Evaporation Rate	:	Not applicable	Viscosity	:	Not applicable
Appearance	:	Fine powder	Color	:	Black
Odor	:	Odorless			

Section 7. Fire and Explosion Data

Flash Point (Method Used)	:	Not applicable
Ignition Temperature	:	> 350°C
Flammable Limits	:	(LEL); Not applicable (UEL); Not applicable
Extinguishing Media	:	CO_2, dry chemical, foam or water
Special Fire Fighting Procedure	:	None
Unusual Fire and Explosion Hazard	:	This material has no unusual fire or explosion hazards.
Sensitivity to Mechanical Impact	:	None
Sensitivity to Static Charge	:	None

Section 8. Reactivity Data

Stability	:	Stable
Incompatibility (Material to Avoid)	:	None
Hazardous Decomposition	:	CO and NOx
Hazardous Polymerization	:	Will not occur.

Section 9. Precautions for Safe Handling and Use

Personal Protection Information (Respiratory, Eye Protection and Protective Glove):
None required under normal use.

Engineering Control/Ventilation	:	Not required.
Work/Hygienic Practice	:	When handling large quantity, inhalation should be avoided.

Steps to be taken in case of Spill or Leak : Sweep up or clean up with vacuum cleaner.

Waste Disposal Method	:	Waste material may be dumped or incinerated under conditions which meet all federal, state and local environmental regulations.

Section 10. Other Information

NFPA Rating (U.S.A.)	:	Health = 1 Flammability = 1 Reactivity = 0
WHMIS Legislation (Canada)	:	This product is not a controlled product.
Transport Information	:	This product is not a hazardous material.
UN No.	:	None allocated.

SHARP

Date Revised : Jan.18,1996
Date Issued : Nov. 1,1992

MATERIAL SAFETY DATA SHEET (1/2)

MSDS No. F-0381

Section 1. Product Identification

Product
SF-235NT1/SF-235T1 (Black Toner)

Section 2. Supplier's Name and Address

Sharp Corporation
22-22 Nagaike-cho, Abeno-ku, Osaka, Japan
Local suppliers are listed below. Please contact the nearest supplier for additional information.

(Country)	(Name and Telephone Number)	
U.S.A.	Sharp Electronics Corporation	
	Telephone number for information	:201-529-8200
	Emergency telephone number	:1-800-255-3924
Canada	Sharp Electronics of Canada Ltd.	
	Telephone number for information	:905-890-2100
	Emergency telephone number	:1-800-255-3924
United Kingdom	Sharp Electronics (U.K.) Ltd.	
	Telephone number for information	:01923-474013

Section 3. Ingredients

Ingredients	CAS No.	Proportion	OSHA PEL	ACGIH TLV	Other Limits
Carbon black	1333-86-4	< 6%	3.5mg/m³	3.5mg/m³	None
Styrene-acrylate copolymer	25767-47-9	> 90%	Not listed	Not listed	None
Organic ammonium salt	102561-46-6	< 2%	Not listed	Not listed	None
Polypropylene	9003-07-0	< 2%	Not listed	Not listed	None

Section 4. Hazardous Identification (Emergency Overview)

Based on our tests, it does not present acute health hazard.

Section 5. Health Hazard Data

Route(s) of Entry	:	Inhalation?	Skin?	Ingestion?
		Yes	No	Possible but very unusual.

Health Hazards : This material has been tested on "Acute oral toxicity" and "Ames test".
It does not represent a health hazard.

Carcinogenicity	:	NTP?	IARC Monographs?	OSHA Regulated?
		No	No	No

Signs and Symptoms of Exposure :
Minimal irritation to respiratory tract may occur as with exposure to any non-toxic dust.
Medical Conditions Generally Aggravated by Exposure : None
Emergency and First Aid Procedures :
Inhalation ; Remove to fresh air. If effects occur, consult medical personnel.
Eyes ; In case of contact, immediately flush eyes with water for 15 minutes.

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MATERIAL SAFETY DATA SHEET
U.S. DEPARTMENT OF LABOR

REVIEWED: MARCH 1, 2001
Abbrev.

COMPLIES WITH USDL SAFETY AND HEALTH REGULATIONS (29 CFR 1910.1200)

SECTION 1: MANUFACTURER:

Amerex Corporation
P.O. Box 81
Trussville, AL 35173-0081

EMERGENCY:
Chemtrec:1-800-424-9300
Amerex:1-205-655-3271

PRODUCT IDENTIFICATION

ABC Dry Chemical
Multi-Purpose Dry
Chemical

SECTION 2: HAZARDOUS INGREDIENTS

		%	*ACGIH mg/m³			*OSHA mg/m³		OTHER
CHEMICAL NAME	CAS #	W/W	TLV	STEL	PEL	STEL	IDLH	
Mono Ammonium Phosphate and	7722-76-1		NE	NE	NE	NE	NE	NE
Ammonium Sulfate	7783-20-2	95*	NE	NE	NE	NE	NE	NE
Mica	12001-26-2	< 3	3	NE	3	NE	NE	NE
Attaclay	8031-18-3	< 3	NE	NE	NE	NE	NE	NE
Silicone Oil	63148-57-2	< 1	NE	NE	NE	NE	NE	NE
Calcium Carbonate	471-34-1	< 1	NE	NE	NE	NE	NE	NE
Silica (Precipitated)	112926-00-8	< 1	2	NE	6	NE	NE	NE
Yellow Pigment	5468-75-7	< 1	NE	NE	NE	NE	NE	NE

*ACGIH TLV for particulates not otherwise classified = 10; OSHA PEL for Particulates Not Otherwise Regulated; Total Dust = 15
Respirable Fraction 5
*NE = Not Established

SECTION 3: PHYSICAL DATA

BOILING POINT: Not Applicable.
VAPOR PRESSURE: Not Applicable.
VAPOR DENSITY: Not Applicable.
SOLUBILITY IN WATER: Not soluble. Water repellent coated.
SPECIFIC GRAVITY: Approximately 0.85.
PERCENT VOLATILE BY VOLUME: Not Applicable.
EVAPORATION RATE: Not Applicable.
pH: (10% solution) approximately 4-5.
APPEARANCE & COLOR: This material is a finely divided yellow powder.

SECTION 4: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable.
FLAMMABLE LIMITS: Not Applicable.
EXTINGUISHING MEDIA: None. Product is a fire extinguishing agent.
SPECIAL FIREFIGHTING PROCEDURES: Incipient fire responders should wear protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Quimby Corp. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Quimby Corp. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration **(OSHA)**. NIOSH issues exposure guidelines called Recommended Exposure Levels **(RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury).

NATIONAL FIRE PROTECTION ASSOCIATION (Continued):

Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

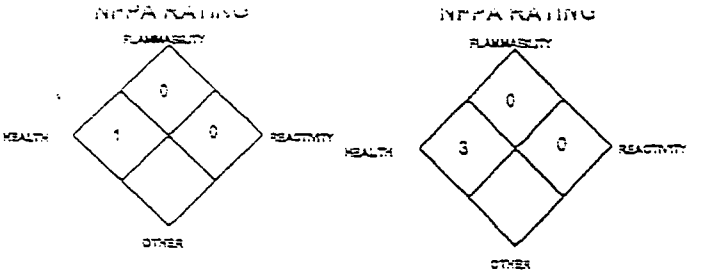
TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.

MATERIAL SAFETY DATA SHEET



Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME: CLASS: **NITROGEN - N_2**
LIQUEFIED NITROGEN N_2,
(Cryogenic)
Document Number: 00016

PRODUCT USE: For general analytical/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME: Quimby Corporation
ADDRESS: 1603 NW 14th Ave

Portland, OR 97209

BUSINESS PHONE: 1-503-221-1100
EMERGENCY PHONE: INFOTRAC: 1-800-535-5053

DATE OF PREPARATION: May 12, 1996
SECOND REVISION : June 15, 2000

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Nitrogen	7727-37-9	99.995 %	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Maximum Impurities		<0.1 (50 ppm)	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalents standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used

NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

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11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Nitrogen on the human reproductive system.

Mutagenicity: Nitrogen is not expected to cause mutagenic effects in humans.
Embryotoxicity: Nitrogen is not expected to cause embryotoxic effects in humans.
Teratogenicity: Nitrogen is not expected to cause teratogenic effects in humans.
Reproductive Toxicity: Nitrogen is not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (e.g., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by overexposure to Nitrogen.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary. Treat symptoms and reduce overexposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable to Nitrogen.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Nitrogen occurs naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas.

NITROGEN: Log K_{ow} = 0.92; Water solubility = 1.49% v/v (25°C, 1 atm.).

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen deficient environments. No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of Nitrogen on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Quimby Corporation Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

	Nitrogen Gas:	**Nitrogen Liquid:**
PROPER SHIPPING NAME:	Nitrogen, compressed	Nitrogen, refrigerated liquid
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)	2.2 (Non-Flammable
UN IDENTIFICATION NUMBER:	UN 1066	UN 1977
PACKING GROUP:	Not Applicable	Not Applicable
DOT LABEL(S) REQUIRED:	Non-Flammable Gas	Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 121 (Gas); 120 (Liquid)

MARINE POLLUTANT: Nitrogen is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Nitrogen is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO NITROGEN WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus Personal Protective equipment should be worn.

Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

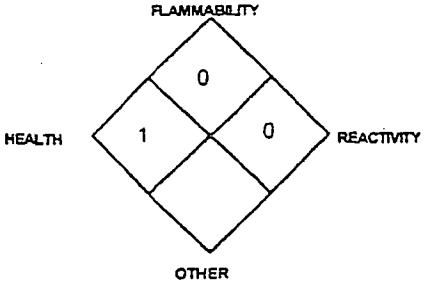
In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area of the body in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

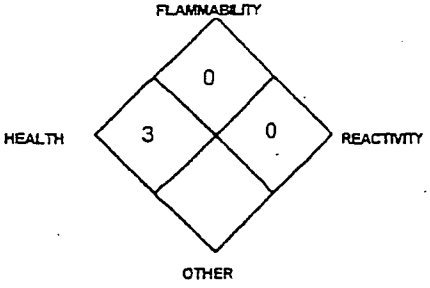
NITROGEN GAS

NFPA RATING



LIQUID NITROGEN

NFPA RATING



See Section 16 for Definition of Ratings

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable, inert gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Nitrogen does not burn; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

RESPONSE TO FIRE INVOLVING CRYOGEN: Cryogenic liquids can be particularly dangerous during fires because of their potential to rapidly freeze water. Careless use of water may cause heavy icing. Furthermore, the relatively warm water greatly increases the evaporation rate of Nitrogen. If large concentrations of Nitrogen gas are present, the water vapor in the surrounding air will condense, creating a dense fog that may make it difficult to find fire exits or equipment. Liquid Nitrogen, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed cylinders if it can be done without risk to firefighters. Otherwise, cool containers with hose stream and protect personnel. Withdraw immediately in case of rising sounds from venting safety device or any discoloration of tanks due to the fire.

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6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a *release*, clear the affected area and protect people.

Minimum Personal Protective Equipment should be **Level B: protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus.** Locate and seal the source of the leaking gas. Allow the gas to dissipate. Monitor the surrounding area for oxygen levels. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

RESPONSE TO CRYOGENIC RELEASE: Clear the affected area and allow the liquid to evaporate and the gas to dissipate. After the gas is formed, follow the instructions provided in the previous paragraph. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection must be worn.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Nitrogen IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Nitrogen could occur without any significant warning symptoms, due to oxygen deficiency.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from incompatible materials such as magnesium (see Section 10, Stability and Reactivity for more information), which can react violently. Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Liquid Nitrogen. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Keep Dewar flasks covered with loose fitting cap. This prevents air or moisture from entering the container, yet allows pressure to escape. Use only the stopper or plug supplied with the container. Ensure that ice does not form in the neck of flasks. If the neck of Dewar flask is blocked by ice or "frozen" air, follow manufacturer's instruction for removing it. Ice can also cause pressure release valves to fail. Never tamper with pressure relief devices. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place (if provided), until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap (if provided). Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. For cryogenic liquids, refer to CGA P-12, *Safe Handling of Cryogenic Liquids*. Also see CGA P-9, the Inert Gases, Argon, Nitrogen, and Helium; CGA P-14, Accident Prevention in Oxygen Rich and Oxygen Deficient Atmospheres; CGA Safety Bulletin SB-2, Oxygen Deficient Atmospheres.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

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VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to maintain oxygen levels above 19.5% in the workplace. Local exhaust ventilation is preferred, because it prevents Nitrogen dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of oxygen.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Nitrogen. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards.

EYE PROTECTION: Splash goggles, face-shields or safety glasses. Face-shields must be worn when handling cryogenic Nitrogen.

HAND PROTECTION: Wear mechanically resistant-gloves when handling cylinders of Nitrogen. Use low-temperature protective gloves (e.g., Kevlar) when working with containers of Liquid Nitrogen.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well provide sufficient insulation from extreme cold.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 1.153 kg/m^3 (0.072 lb/ft^3)

EVAPORATION RATE (nBuAc = 1): Not applicable.

SPECIFIC GRAVITY (air = 1): 0.967

FREEZING POINT: -210°C (-345.8°F)

SOLUBILITY IN WATER (v/v): 1.49%

BOILING POINT @1 atm: -320.4°F (-195.8°C)

EXPANSION RATIO: 696.5 (cryogenic liquid)

pH: Not applicable.

ODOR THRESHOLD: Not applicable. Odorless.

VAPOR PRESSURE (psia): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Log K_{ow} = 0.92.

SPECIFIC VOLUME (ft^3/lb): 13.8

APPEARANCE AND COLOR: Nitrogen is a colorless, odorless gas or a colorless and odorless, cryogenic liquid.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of Nitrogen. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state. With cryogenic liquid, when exposed to air, oxygen in the air may condense into the Liquid Nitrogen. Liquid Nitrogen contaminated with oxygen may present the same hazards as Liquid Oxygen and could react violently with organic materials, such as oil and grease.

DECOMPOSITION PRODUCTS: None

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium, neodymium, lithium, zirconium and ozone react with Nitrogen. Calcium, strontium, and barium will react with red heat to form nitrides. Hydrogen reacts on sparking to form ammonia. Liquid Nitrogen in cryogenic grinding of fatty materials can lead to an explosion. A mixture of magnesium powder and Liquid Nitrogen reacts very violently when lit with a fuse, forming magnesium nitride. Liquid Nitrogen is not corrosive to metals.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data for pure Nitrogen are given below.

Eye Irritation (rabbit): Liquid Nitrogen poured into the eye for one or two seconds with the lids held apart, produced no discernible injury. When the exposure was extended to five seconds, slight lesions of the cornea were observed. By the next day, all eyes were entirely normal.

SUSPECTED CANCER AGENT: Nitrogen is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC; therefore it is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: Nitrogen is not a sensitizer upon prolonged or repeated contact.

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3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Nitrogen is a colorless, odorless, non-flammable gas, or a colorless, odorless, cryogenic liquid. The main health hazard associated with releases of this gas is asphyxiation, by displacement of oxygen. The cryogenic liquid will rapidly boil to the gas at standard temperatures and pressures. The liquefied gas can cause frostbite to any contaminated tissue.

NITROGEN GAS

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	1
FLAMMABILITY	(RED)	0
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		B

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

LIQUID NITROGEN

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	3
FLAMMABILITY	(RED)	0
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		X

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

See Section 16 for Definition of Ratings

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION	**SYMPTOMS OF EXPOSURE**
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea and vomiting, collapse or loss of consciousness.
Below 6%:	*Convulsive movements, possible respiratory collapse, and death.*

OTHER POTENTIAL HEALTH EFFECTS: Contact with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Nitrogen may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Nitrogen.

TARGET ORGANS: Respiratory system.

CANADIAN DSL/NDSL INVENTORY STATUS: Nitrogen is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Nitrogen is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Nitrogen is covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: No.
California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen.
Florida - Substance List: No.
Illinois - Toxic Substance List: No.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: No.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: No.
Missouri - Employer Information/Toxic Substance List: No.
New Jersey - Right to Know Hazardous Substance List: Nitrogen.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Nitrogen.
Rhode Island - Hazardous Substance List: Nitrogen.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

LABELING (For Compressed Gas):

CAUTION:
HIGH PRESSURE GAS.
CAN CAUSE RAPID SUFFOCATION.
Store and use with adequate ventilation.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

FIRST AID:
IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
DO NOT REMOVE THIS PRODUCT LABEL.

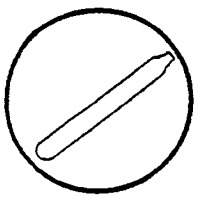
LABELING (for Liquid):

ALWAYS KEEP CONTAINER IN UPRIGHT POSITION.

WARNING:
EXTREMELY COLD LIQUID AND GAS UNDER PRESSURE.
CAN CAUSE RAPID SUFFOCATION.
CAN CAUSE SEVERE FROSTBITE.
Store and use with adequate ventilation.
Do not get liquid in eyes, on skin or clothing.
For liquid withdrawal, wear face shield and gloves.
Do not drop. Use hand truck for container movement.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

FIRST-AID:
IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
IN CASE OF FROSTBITE, obtain immediate medial attention.
DO NOT REMOVE THIS PRODUCT LABEL.

CANADIAN WHMIS SYMBOLS: **Class A:** Compressed Gases



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SECTION 5: HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH TLV for Particulates, Not Otherwise Classified = 10;
OSHA PEL: For Particulates Not Otherwise Regulated, Total Dust = 15, Respirable Fraction = 5.
EFFECTS OF OVEREXPOSURE: This product may cause mild skin irritation, moderate eye irritation and possible gastric distress. This product is not known to cause chronic illness.

EMERGENCY FIRST-AID PROCEDURES:
SKIN EXPOSURE: If spilled on skin IMMEDIATELY begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. If reddening or irritation occurs, victim and rescuers must seek immediate medical attention.
EYE EXPOSURE: If chemical is splashed in eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. MINIMUM flushing is for 15 minutes.
INHALATION: If chemical is inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

SECTION 6: REACTIVITY DATA

STABILITY DATE: Stable.
INCOMPATIBILITY: Strong alkali, magnesium, swimming pool sanitizers (inorganic perchlorates, sodium dichloroisocyanurate dihydrate, trichloroisocyanuric acid, calcium hypochlorite, and other strong oxidizers).
HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur oxides, carbon monoxide and carbon dioxide.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 7: SPILL OR LEAK PROCEDURES

SMALL SPILLS: Sweep or vacuum. Place in a double plastic bag & seal.
LARGE SPILLS: If it is determined that exposure guidelines for nuisance particulates-10 mg/m3 (total particulates) or 5 mg/m3 (respirable particulates) is exceeded use Level C: triple gloves, chemically resistant suit and boots, hard hat, and air purifying respirator with HEPA filter. Sweep or vacuum.
FOLLOW STATE AND LOCAL REGULATIONS FOR DISPOSAL OF LARGE NON-RECLAIMABLE SPILLS.

SECTION 8: SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not expected to be needed. Maintain airborne contaminant concentrations below guidelines for nuisance particulates (see Section 5).
VENTILATION: Use with adequate ventilation. Use fan or vent to outside.
PROTECTIVE GLOVES: Wear rubber gloves for routine industrial use.
EYE PROTECTION: Safety glasses.
OTHER PROTECTIVE EQUIPMENT: None except for large spills (see Section 7).

HMIS: 1-0-0 NFPA: 1-0-0

SECTION 9: SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Follow reasonable and safe practices. Avoid getting chemicals ON YOU or IN YOU.
OTHER PRECAUTIONS: None.

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CARBON DIOXIDE, GAS

1. Chemical Product and Company Identification

BOC Gases,
Division of,
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER: CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER: (905) 501-0802
EMERGENCY RESPONSE PLAN NO: 2-0101

PRODUCT NAME: CARBON DIOXIDE, GAS
CHEMICAL NAME: Carbon Dioxide
COMMON NAMES/SYNONYMS: Carbonic Anhydride
TDG (Canada) CLASSIFICATION: 2.2
WHMIS CLASSIFICATION: A

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/1/99

2. Composition, Information on Ingredients

EXPOSURE LIMITS[1]:

INGREDIENT	% VOLUME	PEL-OSHA[2]	TLV-ACGIH[3]	LD_{50} or LC_{50} Route/Species
Carbon Dioxide FORMULA: CO_2 CAS: 124-38-9 RTECS #: FF6400000	99.8 TO 99.999	5000 ppm TWA	5000 ppm TWA 30,000 ppm STEL	Not Available

[1] Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.
[2] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
[3] As stated in the ACGIH 1998-1999 Threshold Limit Values for Chemical Substances and Physical Agents.
IDLH (Carbon Dioxide): 40,000 ppm

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

3. Hazards Identification

EMERGENCY OVERVIEW

Odorless, colorless, nonflammable gas. Simple Asphyxiant – This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Carbon dioxide exposure can cause nausea and respiratory problems. High concentrations may cause vasodilation leading to circulatory collapse. Contents under pressure. Use and store below 125 °F.

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ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	No	No
Teratogen	Reproductive Hazard	Mutagen
No	No	No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:
No adverse effects anticipated.

SKIN EFFECTS:
No adverse effects anticipated.

INGESTION EFFECTS:
No adverse effects anticipated.

INHALATION EFFECTS:
Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low concentrations. Low concentrations of carbon dioxide cause increased respiration and headache.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health: 1	Health: 1	0 = No Hazard
Flammability: 0	Flammability: 0	1 = Slight Hazard
Instability: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
		4 = Severe Hazard

4. First Aid Measures

EYES:
None required.

SKIN:
None required.

INGESTION:
Not anticipated.

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON DIOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. Fire Fighting Measures

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:
Nonflammable. Cylinder may rupture violently from pressure when involved in a fire situation.

EXTINGUISHING MEDIA:
None required. Use media appropriate for surrounding fire.

FIRE FIGHTING INSTRUCTIONS:
Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear. Continue to cool fire-exposed containers until well after flames are extinguished.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical Classification:
Non-Hazardous

Dry carbon dioxide can be handled in most common structural materials. Moist carbon dioxide is generally corrosive by its formation of carbonic acid. For applications with moist Carbon Dioxide, 316, 309 and 310 stainless steels may be used as well as Hastelloy ® A, B, & C, and Monel ®. Ferrous Nickel alloys are slightly susceptible to corrosion. At normal temperatures carbon dioxide is compatible with most plastics and elastomers.

Use only in well-ventilated areas. Carbon dioxide vapor is heavier than air and will accumulate in low areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Do not heat cylinder by

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any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the system.
Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1, AV-7, G-6, G-6.1, G-6.2, G-6.3, G-6.5, G-6.7, PS-5 and TB-10.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS:
Local exhaust to control air contaminants to at or below acceptable exposure guidelines.

EYE/FACE PROTECTION:
Safety goggles or glasses as appropriate for the job.

SKIN PROTECTION:
Protective gloves of any material appropriate for the job.

RESPIRATORY PROTECTION:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION:
Safety shoes.

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12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Carbon Dioxide	Carbon Dioxide
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1013	UN 1013
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III HAZARD CLASSES:
Acute Health Hazard.
Sudden Release of Pressure Hazard

16. Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure at 70 °F	: 856	psia
Vapor density at 70 °F, 1 atm (Air = 1)	: 1.53	
Evaporation point	: Not Available	
Boiling point (CO2 Sublimes)	: -109.3	°F
	: -78.5	°C
Freezing point	: -69.8	°F
	: -56.6	°C
pH	: Not Available	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H_20)	: Very soluble	
Odor threshold	: Not Applicable	
Odor and appearance	: A colorless, odorless gas.	

10. Stability and Reactivity

STABILITY:
Stable

INCOMPATIBLE MATERIALS:
Certain reactive metals, hydrides, moist cesium monoxide, or lithium acetylene carbide diammino may ignite. Passing carbon dioxide over a mixture of sodium peroxide and aluminum or magnesium may explode.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon monoxide and oxygen when heated above 3092 °F (1700°C). Carbonic acid is formed in the presence of moisture.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. Toxicological Information

REPRODUCTIVE:
Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Exposure of female rats to 60,000 ppm carbon dioxide for 24 hours has produced toxic effects to the embryo and fetus in pregnant rats. Toxic effects to the reproductive system have been observed in other mammalian species at similar concentrations.

OTHER:
Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations may cause rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations.

KMB00003585

PRODUCT NAME: CARBON DIOXIDE, GAS

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	No	No
Teratogen	Reproductive Hazard	Mutagen
No	No	No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:
No adverse effects anticipated.

SKIN EFFECTS:
No adverse effects anticipated.

INGESTION EFFECTS:
No adverse effects anticipated.

INHALATION EFFECTS:
Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low concentrations. Low concentrations of carbon dioxide cause increased respiration and headache.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health: 1	Health: 1	0 = No Hazard
Flammability: 0	Flammability: 0	1 = Slight Hazard
Instability: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
		4 = Severe Hazard

4. First Aid Measures

EYES:
None required.

SKIN:
None required.

INGESTION:
Not anticipated.

#27

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards and European EU Standards

SECTION 1. PRODUCT IDENTIFICATION

PRODUCT NAME: HALON 1211
CHEMICAL NAME: BROMOCHLORODIFLUOROMETHANE
SYNONYMS: R 12B1; BCF; Chlorodifluoromonobromomethane; Flugex 12B1; Fluorocarbon 1211; Freon 12B1; Halon 1211; Methane, bromochlorodifluoro-
PRODUCT USE: Fire Extinguishing Material
MANUFACTURER:

ADDRESS: **H3R Clean Agent Specialists, Inc.**
483 Magnolia Ave
Larkspur, CA, U.S.A.
PHONE: 800/249-4289
FAX: 415/945-0311
WEB SITE: www.h3rcleanagents.com

24 HOUR EMERGENCY CONTACT, CHEMTREC: 800/424-9300 (U.S. domestic calls)
703/527-3887 (collect for international calls)

DATE OF PREPARATION: September 21, 2006

SECTION 2. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical Name	Chemical Formula	CAS #	EINECS #	% Composition	EU Classification For Components
Bromochlorodifluoromethane	$CBrClF_2$	353-59-3	206-537-9	99%	HAZARD CLASSIFICATION: Not applicable RISK PHRASES: Not Applicable

See Section 15 (Regulatory Information) for full EU Risk and Safety Phrase information.

SECTION 3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: **Product Description:** Halon 1211 is a colorless, liquefied gas, with a sweet odor, shipped under pressure. **Health Hazards:** The main acute health hazard associated with releases of this gas is asphyxiation by displacement of oxygen. This gas is heavier than air and will sink into low areas, creating an asphyxiation hazard. The main chronic health hazard associated with releases of this gas is possible adverse effects to the central nervous system and possible cardiac sensitization and arrhythmias. Chronic skin exposure may cause dermatitis. **Flammability Hazards:** This gas is not flammable. **Reactivity Hazards:** This gas is not reactive. **Environmental Hazards:** Release of this product to the environment is not expected to cause environmental harm. **Emergency Response Considerations:** Emergency responders must wear the proper personal protective equipment suitable for the situation to which they are responding. **WARNING**—If rescue personnel need to enter an area suspected of having a low level of Oxygen, they should be equipped with Self-Contained Breathing Apparatus (SCBA) and appropriate personal protective equipment.

EU LABELING/CLASSIFICATION: Currently, there is no classification applicable per Directives 67/548/EEC and 1999/45/EC and subsequent Directives.
EU Risk Phrases: Not Applicable
EU Safety Phrases: Not Applicable

ROUTES OF ENTRY, SYMPTOMS OF ACUTE EXPOSURE: **WARNING**-If rescue personnel need to enter an area in which a release of Halon 1211 has occurred, they should be equipped with Self-Contained Breathing Apparatus (SCBA) and appropriate personal protective equipment. High concentration of this gas will create an oxygen-deficient atmosphere, creating the risk of asphyxiation.

EYE CONTACT: Release of a high-pressure gas may result in airborne objects.

INGESTION: Ingestion of this gas is not a likely route of industrial exposure.

INHALATION: Inhalation of high concentrations of this gas may lead to heart arrhythmias. High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances of over-exposure, death may occur, due to the displacement of oxygen. The effects associated with various levels of oxygen are described on the following page.

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SECTION 3. HAZARD IDENTIFICATION (Continued)

INHALATION (continued):

CONCENTRATION of OXYGEN	EXPOSURE SYMPTOM
20.9% Oxygen:	Normal oxygen concentration in air.
15–19% Oxygen:	Decreased ability to perform tasks. May impair coordination and may induce early symptoms in persons with heart, lung, or circulatory problems.
12–15% Oxygen:	Breathing increases, especially in exertion. Pulse up. Impaired coordination, perception, and judgment.
10–12% Oxygen:	Breathing further increases in rate and depth, poor coordination and judgment, lips slightly blue.
8-10%Oxygen:	Mental failure, fainting, unconsciousness, ashen face, blueness of lips, nausea (upset stomach), and vomiting.
6–8% Oxygen:	8 minutes, may be fatal in 50–100% of cases; 6 minutes, may be fatal in 25 to 50% of cases; 4–5 minutes, recovery with treatment.
4–6% Oxygen:	Coma in 40 seconds, followed by convulsion, breathing failure, death.

WARNING: Exposure to atmospheres containing 8–10% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

SKIN CONTACT: Transitory skin contact should not cause any adverse effects.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2*
FLAMMABILITY HAZARD	(RED)	0
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

OTHER ACUTE HEALTH EFFECTS: Contact with rapidly expanding gases (which are released from under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain caused by frostbite can quickly subside, masking the injury. In addition, the sudden release of a pressurized gas (such as may occur in the event of a valve failure), presents a severe hazard of mechanical injury.

ACUTE EXPOSURE TARGET ORGANS: Respiratory system.

ROUTES OF ENTRY, SYMPTOMS OF CHRONIC EXPOSURE:

INHALATION: In animal tests, rats were exposed by inhalation for 21 days, dosed 6 hours per day, 5 days per week, at 3,300 ppm and no adverse effects of toxicological significance (NOAEL) were observed. At 10,000 ppm, there were signs of central nervous system depression. However, there were no signs of toxicity or histopathological changes observed and no potentiation of cardiac sensitization potential. Other animal testing resulted in cardiac sensitization at various concentrations for varying exposure times. Refer to Section 11 (Toxicological Information) for more details. Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system.

SKIN CONTACT: Prolonged contact may cause dermatitis (dry, red, cracked skin) due to defatting of the skin.

ACUTE EXPOSURE TARGET ORGANS: Skin, cardiac system, central nervous system.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None are anticipated.

CARCINOGENICITY: CARCINOGENICITY: Halon 1211 is not listed as a carcinogen or as a potential carcinogen on EPA, NIOSH, GERMAN MAK, OSHA, NTP, IARC, or CAL/OSHA Carcinogen lists.

SECTION 4. FIRST AID MEASURES

EYE CONTACT: If mechanical injury occurs, cover eye with bandage and seek appropriate medical attention.

INGESTION: Ingestion is an unlikely route of exposure for this gas.

INHALATION: Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.

SKIN CONTACT: If skin contact causes adverse effects, begin decontamination with warm, running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention if any adverse effect occurs. In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

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SECTION 4. FIRST AID MEASURES (Continued)

NOTES TO PHYSICIANS: Administer oxygen, if necessary, and treat symptoms. This gas is an asphyxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenalin or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable

AUTOIGNITION: Not Applicable

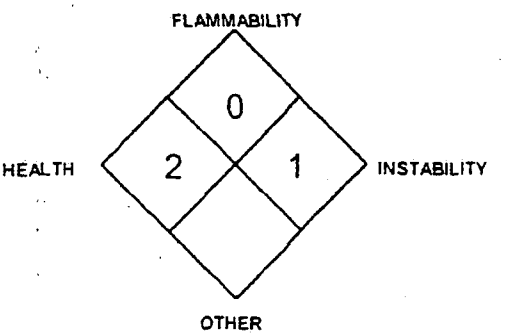
FLAMMABLE RANGE: Not Applicable

EXTINGUISHING MEDIA: This is a non-flammable; use fire-extinguishing media appropriate for the surrounding materials.

SPECIAL FIRE-FIGHTING PROCEDURES: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas does not burn; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Most cylinders have a pressure release device, which will vent contents if the cylinder is exposed to high temperatures. This gas is heavier than air, creating an asphyxiation hazard in low areas.

NFPA RATING



Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate
3 = Serious 4 = Severe

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: Not sensitive.

HAZARDOUS COMBUSTION PRODUCTS: Combustion or decomposition products above 481.7 C (900 F) include hydrogen bromide, hydrogen chloride, hydrogen fluoride, free halogens, and small amounts of carbonyl halides. These by-products have a sharp irritating odor and are dangerous even in low concentrations and in sufficient concentrations can result in personal injury or death.

SECTION 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: All release to the environment should be avoided as this material has an ozone depletion potential and a global warming potential.

In the event of a release of this product, operator should close the gas source if possible to do so safely. Evacuate area in the event of a significant release. Only trained personnel, wearing Self-Contained Breathing Apparatus (SCBA) should re-enter a contaminated area if oxygen levels are below 19.5% or unknown.

If leak is in user's gas handling equipment or system, close cylinder valve, and safely vent high pressure before attempting repairs. If leak is from the cylinder, cylinder valve or the valve pressure relief device (PRD), contact your supplier.

Detection systems should be available to monitor for level of oxygen. The level of oxygen should above 19.5% before personnel can be allowed in the area without SCBA.

SECTION 7. HANDLING AND STORAGE

STORAGE: Cylinders should be stored upright (with valve protection caps or plugs in place) and firmly secured to prevent falling or being knocked over. Cylinders should be stored in dry, well-ventilated areas. Protect from salt or other corrosive materials. Storage should be away from heavily traveled areas, walkways, elevators, platform edges or other objects or situations that could damage the cylinder wall. Do not store in a manner that will block emergency exits, fire extinguishers or other safety equipment. Do not allow storage temperature to exceed 125 F (52 C). Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. Store empty cylinders away from full cylinders. **NOTE:** Use only DOT or ASME code cylinders designed for compressed gas storage. Cylinders must not be recharged except by or with the consent of owner.

HANDLING: Releases of Halon 1211 can create an oxygen-deficient atmosphere. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Helium-3 could occur without any significant warning symptoms, due to oxygen-deficiency. Wearing contact lenses is not recommended when handling this gas.

Cylinder valves should be inspected regularly for physical damage or corrosion (apparent by discoloration or rust). Care should be taken to inspect the following valve locations for corrosion: neck (where valve inserts into cylinder); bonnet nut (where handle attaches to valve body). Close valve after each use and when empty.

Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure regulator to safely discharge product from cylinder. Use a check valve to prevent reverse flow into cylinder. Once cylinder has been connected to properly purged process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings; doing so may damage valve, causing a leak to occur. Use an adjustable strap-wrench to remove over-tight or rusted caps.

Do not heat cylinders by any means to increase the discharge rate of product from the cylinder. Never apply flame or localized heat directly to any part of the cylinder. Cylinders should not be artificially cooled as certain types of steel undergo property changes when cryogenically cooled, thus making the cylinder unstable.

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SECTION 7. HANDLING AND STORAGE (Continued)

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Relieve pressure before attempting repairs.

SPECIAL PRECAUTIONS: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas could occur without any significant warning symptoms. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. (telephone 703-412-0900) pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers*. Local regulations may require specific equipment for storage and use.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Forced ventilation systems for the general work area should be provided. If appropriate, install automatic monitoring equipment to detect the level of oxygen.

EXPOSURE LIMITS:

Chemical Name	CAS #	OSHA PELs ppm	ACGIH TLVs ppm	NIOSH RELs ppm	NIOSH IDLH ppm	DFG MAKs ppm	AIHA WEELs ppm
Halon 1211	353-59-3	NE	NE	NE	NE	NE	NE

NE = Not Established

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132.) equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory protection, EN 374 for hand protection, EIN 465 for protective clothing and EN 166 for face/eye protection). Please reference applicable regulations and standards for relevant details.

INTERNATIONAL EXPOSURE LIMITS: Currently, there following international exposure limits are in place for Halon 1211 (specific country limits may become available or change-consult individual countries for most current information).

BROMOCHLORODIFLUOROMETHANE:
Russia: STEL = 1000 mg/m³, JAN 1993

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection). Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen level is below 19.5%, or during emergency response to a release of this product. If respiratory protection is required, follow the requirements of the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent U.S. State standards, standards of Canada, the European Standard EN149, and EU member states.

EYE PROTECTION: Use approved safety goggles or safety glasses, when cylinders are not closed and capped. Be aware that particles or objects propelled by high pressure gas can fly significant distances. Eyewear should be as described in OSHA 29 CFR 1910.133, Canadian Standards or by the European Standard EN166.

SKIN PROTECTION: Work (such as leather) gloves are recommended when handling cylinders of this gas. Wear gloves appropriate to the specific operation for which this gas is used. Use triple gloves for spill response. If necessary, refer to U.S. OSHA 29 CFR 1910.138, and the European Standard DIN EN 374, or appropriate Standards of Canada.

OTHER PROTECTIVE EQUIPMENT: Use body protection appropriate for task. Safety shoes are recommended when handling cylinders. Information on general protective measures can be found in U.S. OSHA 29 CFR 1910.136. If necessary, refer appropriate Standards of Canada or the European Standard DIN EN 465.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

	Halon 1211
Molecular Weight	165.36
Boiling Point @ 1 atm	-4°C (26°F)
Freezing/Melting Point @ 1 atm	-159.5°C (319.1°F)
Specific Gravity [Relative Density] (air = 1)	1.83
Solubility in Water :	Negligible
Vapor Pressure:	37.5 psi @ 70°F; 2,270 hPa @ 20°C
Vapor Density (air=1)	5.7
Odor Threshold	Not determined

APPEARANCE, ODOR AND STATE: *Colorless gas with a sweet odor.*

WARNING PROPERTIES FOR THIS GAS: The odor may be a warning of a release. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

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SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: Cylinders should not be exposed to temperatures in excess of 125°F (52°C).

MATERIALS WITH WHICH GAS IS INCOMPATIBLE: Metal halides. Contact with acids can evolve highly toxic hydrogen chloride.

REACTIVITY:

A) HAZARDOUS DECOMPOSITION PRODUCTS: Combustion or decomposition products above 900°F include hydrogen bromide, hydrogen chloride, hydrogen fluoride, free halogens, and small amounts of carbonyl halides. These by-products have a sharp irritating odor.

B) HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There toxicology data are currently available for Halon 1211.

BROMOCHLORODIFLUOROMETHANE:

TCLo (Inhalation-Man) 4 pph/1 minute: Peripheral Nerve and Sensation: paresthesis; Behavioral: hallucinations, distorted perceptions; Cardiac: EKG changes not diagnostic of specified effects

TCLo (Inhalation-Human) 295,200 mg/m³/1 minute: Peripheral Nerve and Sensation: paresthesis

LC_{50} (Inhalation-Rat) 20 pph/15 minutes: Behavioral: tremor, convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: respiratory depression

LC_{50} (Inhalation-Rat) 2,140,000 mg/m³/5 minutes

LCLo (Inhalation-Dog) 5 pph/30 minutes: Behavioral: tremor, convulsions or effect on seizure threshold; Cardiac: other changes

LCLo (Inhalation-Guinea Pig) 30 pph/2 hours: Behavioral: convulsions or effect on seizure threshold

TCLo (Inhalation-Rat) 396,000 mg/m3/10 minutes: Behavioral: general anesthetic

TCLo (Inhalation-Rat) 210 mg/m³/4 hours/12 weeks-intermittent: Blood: pigmented or nucleated red blood cells; Blood: changes in erythrocyte (RBC) count, changes in platelet count

TCLo (Inhalation-Rat) 1 pph/6 hours/3 weeks-intermittent: Behavioral: somnolence (general depressed activity)

TCLo (Inhalation-Rat) 50,000 ppm: female 6-15 day(s) after conception: Reproductive: Maternal Effects: other effects

Mutation in Microorganisms (Bacteria-*Salmonella typhimurium*) 10 pph

ADDITIONAL TOXICOLOGICAL DATA:

ACUTE: Inhalation-Rat: At 50,000 ppm, no effects were noted. At 75,000 ppm, slightly accelerated respiration was noted. At 100,000 ppm, mild excitement was seen. At 200,000 ppm, within 1 to 2 minutes marked excitation and some convulsions were noted. At 60 to 90 minutes, 2 of the 4 animals died. A concentration of 300,000 ppm immediately gave rise to convulsions and narcosis and all animals died within 50 min. Inhalation-Dog: At 25,000 to 75,000 ppm for 3.5 hours, there was reversible myocardial lesions and fatty degeneration of the liver.

CHRONIC: A case of occupational rhabdomyolysis in an individual susceptible to malignant hyperthermia was described. A 43 year old male was found to have a serum creatine-kinase activity of 650 international units per liter, normal range 10 to 200 international units/liter, suggesting that he was susceptible to malignant hyperthermia. His susceptibility was confirmed by in vitro testing of a muscle specimen with halothane and caffeine. The subject was subsequently employed in a factory that made fire extinguishers where one of his jobs consisted of discharging Bromochlorodifluoromethane from fire extinguishers before refilling them. Although discharging was done in open air, some gas was commonly inhaled. Eighteen months after beginning this work, he was examined for complaints of malaise and stiffness and weakness in the forearms and hands. The symptoms progressively worsened during the week and improved the weekends. Serum creatine-kinase activity was 1056 IU/l on one Saturday and 544 IU/l the following Monday. Because of the similarity in structure between Bromochlorodifluoromethane and halothane, the effects of the former on contractions of a muscle specimen were examined. Bromochlorodifluoromethane induced contractions identical to those of halothane. The patient was advised to change jobs. After he did so his symptoms immediately improved. It was concluded that the patient's rhabdomyolysis is due to recurring exposures to Bromochlorodifluoromethane. They recommended that persons susceptible to malignant hyperthermia avoid exposure to similar halogenated hydrocarbons. Inhalation-Human: At 4 to 5% for 1 minute using face mask, subjects at 30 seconds became slightly dizzy and light-headed. Over the next few seconds, these symptoms rapidly increased in severity until at 1 minute the subjects felt as though they were about to lose consciousness and exposure was stopped. Paresthesia of the fingers and other parts of the body was sometimes noted towards the end of the experiment. Heart rate rose by approximately 30% during the early stages of exposure and remained at that level through the experiment. Depression of the T wave was consistently observed on the ECG tracings. The subjects recovered rapidly on cessation of exposure and felt perfectly normal again within 5 minutes. The heart rate and the ECG reverted to normal within 1 minute. There were no delayed after effects. Inhalation-Dog: At 5,000 to 100,000 ppm resulted in cardiac sensitization above 20,000 ppm and in 10 to 0.5 minutes, depending on concentration.

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION OF PRODUCT: Halon 1211 is not a human skin or respiratory sensitizer, but has been shown to be a cardiac sensitizer in animal studies.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Halon 1211 on the human reproductive system.

Mutagenicity: Halon 1211 is not reported to cause mutagenic effects in humans.

Embryotoxicity: Halon 1211 is not reported to cause embryotoxic effects in humans.

Teratogenicity: Halon 1211 is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: Halon 1211 is not reported to cause adverse reproductive effects in humans.

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SECTION 11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION (continued): *A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.*

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) have not been determined for Halon 1211.

SECTION 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are currently available for Halon 1211.

BROMOCHLORODIFLUOROMETHANE (Halon 1211):

Terrestrial Fate: Based on a classification scheme, an estimated Koc value of 49, determined from a structure estimation method, indicates that Bromochlorodifluoromethane is expected to have very high mobility in soil. Volatilization of Bromochlorodifluoromethane from moist soil surfaces is expected to be an important fate process given an estimated Henry's Law constant of 9.4X10-2 atm-cu m/mole, using a fragment constant estimation method. Volatilization of Bromochlorodifluoromethane from dry soil surfaces is expected to be rapid based upon a vapor pressure of 2.07X10+3 mm Hg. Based upon the highly halogenated structure of Bromochlorodifluoromethane, biodegradation is expected to be slow.

Aquatic Fate: Based on a classification scheme, an estimated Koc value of 49, determined from a structure estimation method, indicates that Bromochlorodifluoromethane is not expected to adsorb to suspended solids in water. Volatilization from water surfaces is expected based upon an estimated Henry's Law constant of 9.4X10-2 atm-cu m/mole, developed using a fragment constant estimation method. Using this Henry's Law constant and an estimation method, volatilization half-lives for a model river and model lake are 1.3 hrs and 5.1 days, respectively. According to a classification scheme, an estimated BCF of 5.8, from an estimated log Kow and a regression-derived equation, suggests the potential for bioconcentration in aquatic organisms is low. Based upon the highly halogenated structure of Bromochlorodifluoromethane, biodegradation is expected to be slow.

Atmospheric Fate: According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, Bromochlorodifluoromethane, which has a vapor pressure of 2.07X10+3 mm Hg at 25 C, is expected to exist in the gas phase in the ambient atmosphere. Gas-phase Bromochlorodifluoromethane is slowly degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be greater than 44 years.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Immediate adverse effect on plants would be related to oxygen-deficient environments or frost from rapidly expanding gases, unless exposure occurs in a confined space.

EFFECT OF CHEMICAL ON AQUATIC LIFE: There is currently no evidence of adverse effects from exposure to Halon 1211 on aquatic life.

MOBILITY: Using a structure estimation method based on molecular connectivity indices, the Koc for Halon 1211 can be estimated to be about 49. According to a classification scheme, this estimated Koc value suggests that Halon 1211 is expected to have very high mobility in soil.

PERSISTENCE AND BIODEGRADABILITY: Photodegradation: > 50% after 14 years.

POTENTIAL TO BIOACCUMULATE: An estimated BCF of 5.8 was calculated for Halon 1211, using an estimated log Kow of 1.9 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

OZONE-DEPLETION POTENTIAL: Halon 1211 is rated as 3 (compared to trichlorofluoromethane nominally 1). Halon 1211 is a Class I ozone depleting chemical (40 CFR Part 82). Halon 1211 may contribute to global warming.

SECTION 13. DISPOSAL CONSIDERATIONS

UNUSED PRODUCT / EMPTY CONTAINER: Do not dispose of residual product. Return used product in cylinders to: H3R Clean Agent Specialists, Inc..

DISPOSAL INFORMATION: Relative to the environment, this material has an ozone depletion potential and a global warming potential. Refer to the regulations of the U.S. EPA or the State-specific regulations for proper waste disposal, regulations of Canada and its Provinces, or regulations of EU member states.

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SECTION 14. TRANSPORT INFORMATION

U.S. SHIPPING INFORMATION: The following shipping information applies when this product is supplied in fire-extinguishing cylinders:

U.S. SHIPPING INFORMATION:

U.S. DOT PROPER SHIPPING NAME:	Fire extinguisher with compressed or liquefied gas
UN IDENTIFICATION NUMBER:	UN 1044
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
U.S. DOT SHIPPING LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable
PLACARD (When required):	Class 2.2 (Non-Flammable Gas)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position in a well-ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.

CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).

ERG (EMERGENCY RESPONSE GUIDEBOOK) #: 126

SPECIAL PROVISIONS: T50 Portable tanks - Applies to various liquefied compressed gases: Consult the regulations for specific requirements Sec. 172.102 Special Provision Portable Tank Code T50.

CANADIAN SHIPPING INFORMATION:

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is classified as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

PROPER SHIPPING NAME:	Fire extinguisher with compressed or liquefied gas
UN IDENTIFICATION NUMBER:	UN 1044
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable
HAZARD SHIPPING LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
SPECIAL PROVISIONS:	None
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX:	0.125
ERAP INDEX:	None
PASSENGER CARRYING SHIP INDEX:	None

PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: 75

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):

UN IDENTIFICATION NUMBER:	UN 1044
PROPER SHIPPING NAME/DESCRIPTION:	Fire extinguisher with compressed or liquefied gas
HAZARD CLASS or DIVISION:	2.2 (Non-Flammable Gas)
HAZARD LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable

PASSENGER and CARGO AIRCRAFT PACKING INSTRUCTION: 213
PASSENGER and CARGO AIRCRAFT MAXIMUM NET QUANTITY PER PKG: 75 kg
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY PACKING INSTRUCTION: None
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY MAXIMUM NET QUANTITY PER PKG: None
CARGO AIRCRAFT ONLY PACKING INSTRUCTION: 213
CARGO AIRCRAFT ONLY MAXIMUM NET QUANTITY PER PKG: 150 kg

SPECIAL PROVISIONS:	A19
ERG CODE:	2L

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO):

UN No.:	1044
PROPER SHIPPING NAME:	Fire extinguisher with compressed or liquefied gas
HAZARD CLASS NUMBER:	2.2
PACKING GROUP:	None
SPECIAL PROVISIONS:	225
LIMITED QUANTITIES:	120 mL
PACKING INSTRUCTIONS:	P003
EmS:	F-C, S-V
STOWAGE CATEGORY:	Category E. Clear of living quarters.

MARINE POLLUTANT: This material is not designated by the IMO to be a Marine Pollutant.

SECTION 14. TRANSPORT INFORMATION (Continued)

EUROPEAN SHIPPING INFORMATION:

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This material is classified by the Economic Commission for Europe to be dangerous goods. Additional information is as follows:

UN NO.:	1044
NAME and DESCRIPTON:	Fire extinguisher with compressed or liquefied gas
CLASS:	2.2
CLASSIFICATION CODE:	6A
PACKING GROUP:	None
LABELS:	2.2
SPECIAL PROVISIONS:	225, 394
LIMITED QUANTITIES:	LQ0
PACKING INSTRUCTIONS:	P003
MIXED PACKING PROVISIONS:	MP9
HAZARD IDENTIFICATION No.:	None

The following shipping information applies when the product is supplied in types of cylinders other than fire extinguishers:

U.S. DOT PROPER SHIPPING NAME:	*Chlorodifluorobromomethane* ***or*** *Refrigerant* gas R12B1
UN IDENTIFICATION NUMBER:	UN 1974
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
U.S. DOT SHIPPING LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable
PLACARD (When required):	Class 2.2 (Non-Flammable Gas)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position in a well-ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.

CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).

ERG (EMERGENCY RESPONSE GUIDEBOOK) #: 126

SPECIAL PROVISIONS: T50 Portable tanks - Applies to various liquefied compressed gases: Consult the regulations for specific requirements Sec. 172.102 Special Provision Portable Tank Code T50.

CANADIAN SHIPPING INFORMATION:

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is classified as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

PROPER SHIPPING NAME:	Chlorodifluorobromomethane ***or*** Refrigerant gas R12B1
UN IDENTIFICATION NUMBER:	UN 1974
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable
HAZARD SHIPPING LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
SPECIAL PROVISIONS:	None
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX:	0.125
ERAP INDEX:	None
PASSENGER CARRYING SHIP INDEX:	None

PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: 75

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):

UN IDENTIFICATION NUMBER:	UN 1974
PROPER SHIPPING NAME/DESCRIPTION:	Chlorodifluorobromomethane
HAZARD CLASS or DIVISION:	2.2 (Non-Flammable Gas)
HAZARD LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
PACKING GROUP:	Not Applicable

PASSENGER and CARGO AIRCRAFT PACKING INSTRUCTION: 200
PASSENGER and CARGO AIRCRAFT MAXIMUM NET QUANTITY PER PKG: 75 kg
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY PACKING INSTRUCTION: None
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY MAXIMUM NET QUANTITY PER PKG: None
CARGO AIRCRAFT ONLY PACKING INSTRUCTION: 200
CARGO AIRCRAFT ONLY MAXIMUM NET QUANTITY PER PKG: 150 kg

SPECIAL PROVISIONS:	None
ERG CODE:	2L

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SECTION 14. TRANSPORT INFORMATION (Continued)

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO):

UN No.:	1974
PROPER SHIPPING NAME:	Chlorodifluorobromomethane *or* Refrigerant gas R12B1
HAZARD CLASS NUMBER:	2.2
PACKING GROUP:	None
SPECIAL PROVISIONS:	None
LIMITED QUANTITIES:	120 mL
PACKING INSTRUCTIONS:	P200
EmS:	F-C, S-V
STOWAGE CATEGORY:	Category A

MARINE POLLUTANT: This material is not designated by the IMO to be a Marine Pollutant.

EUROPEAN SHIPPING INFORMATION:

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This material is classified by the Economic Commission for Europe to be dangerous goods. Additional information is as follows:

UN NO.:	1974
NAME and DESCRIPTON:	Chlorodifluorobromomethane *or* Refrigerant gas R12B1
CLASS:	2.2
CLASSIFICATION CODE:	2A
PACKING GROUP:	None
LABELS:	2.2
SPECIAL PROVISIONS:	None
LIMITED QUANTITIES:	LQ1
PACKING INSTRUCTIONS:	P200
MIXED PACKING PROVISIONS:	MP9
HAZARD IDENTIFICATION No.:	20

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY:

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (40 CFR Parts 117 and 302)
Reportable Quantity (RQ): Not Applicable

SARA TITLE III: Superfund Amendment and Reauthorization Act

SECTIONS 302/304: Emergency Planning and Notification (40 CFR Part 355)
Extremely Hazardous Substances: Halon 1211 is not listed.
Threshold Planning Quantity (TPQ): Not Applicable
Reportable Quantity (RQ): Not Applicable

SECTIONS 311/312: Hazardous Chemical Reporting (40 CFR Part 370)

IMMEDIATE HEALTH: No	PRESSURE: Yes
DELAYED HEALTH: No	REACTIVITY: No
	FIRE: No

SECTION 313: Toxic Chemical Release Reporting (40 CFR 372)
Releases of Halon 1211 require reporting under Section 313.

CLEAN AIR ACT:

SECTION 112 (r): Risk Management Programs for Chemical Accidental Release (40 CFR Part 68)
Threshold Planning Quantity (TPQ): Not Applicable

TSCA: Toxic Substances Control Act
Halon 1211 is listed in the TSCA Inventory

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR Part 1910.119: Process Safety Management of Highly Hazardous Chemicals.
Threshold Planning Quantity (TPQ): Not Applicable

OTHER U.S. FEDERAL REGULATIONS: Requirements under (40 CFR Part 82) may be applicable as Halon 1211 is designated as an ozone-depleting compound.

U.S. STATE REGULATORY INFORMATION:

CALIFORNIA PROPOSITION 65: Halon 1211 is NOT listed on the California Proposition 65 lists.

CANADIAN FEDERAL REGULATIONS:

CANADIAN DSL INVENTORY STATUS: Halon 1211 is listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Halon 1211 is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations. Halon 1211 is not on the CEPA Priorities Substances Lists.

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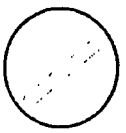
SECTION 15. REGULATORY INFORMATION (Continued)

CANADIAN FEDERAL REGULATIONS (continued):

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: **Class A:** Compressed Gas



EUROPEAN UNION REGULATIONS:

EU LABELING AND CLASSIFICATION: Currently, this substance is not classified, as per European Union Council Directives 67/548/EEC and 1999/45/EC and subsequent Directives.

EU CLASSIFICATION: Not Applicable

EU RISK PHRASES: Not Applicable

EUROPEAN UNION ANNEX II HAZARD SYMBOL: Not Applicable

SECTION 16. OTHER INFORMATION

Information contained in this Material Safety Data Sheet is provided to our customers so they may comply with 29 CFR 1910.1200, Hazard Communication Standard, the Canadian WHMIS Standard, and the requirements of the European Union Directives. The intent of this Material Safety Data Sheet is to provide end users of this product with the health and physical hazards associated with possible exposure to this product. All statements, technical data and recommendations are based on readily available texts and data that H R Clean Agent Specialists, Inc. believes to be reliable and accurate. Clean Agent Specialists, Inc. makes no warranties, guarantees or representations of any kind with respect to this product or this data. It is the responsibility of the user to obtain and use the most recent version of this MSDS.

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
800/441-3365

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS # This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DFG MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances which have been shown to induce genetic damage in germ cells of humans or animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances which are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*, in exceptional cases, substances for which there are no *in vivo* data, but which are clearly mutagenic *in vitro* and structurally related to known in vivo mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some *time in the future, it is conceivable that a Category 4 could be established for* genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

DFG MAK Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed. **Group B:** Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. **Group C:** There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. **Group D:** Classification in one of the groups A-C is not yet possible because, although the data available may indicate a trend, they are not sufficient for final evaluation.

IDLH-Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

LOQ: Limit of Quantitation

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

EXPOSURE LIMITS IN AIR (continued):

NIOSH RELs: NIOSH's Recommended Exposure Limits

PEL-Permissible Exposure Limit: OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based on the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register 58 35338-35351 and 58 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by Court Order.

SKIN: *Used when a there is a danger of cutaneous absorption*

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

SKIN: Used when a there is a danger of cutaneous absorption

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

TLV-Threshold Limit Value: An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

TWA-Time Weighted Average: Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD:

0 (Minimal Hazard - No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation*: Essentially non-irritating. PII or Draize = "0". *Eye Irritation*: Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = "0". *Oral Toxicity LD_{50} Rat*: < 5000 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC_{50} Rat*: < 20 mg/L.); **1** (Slight Hazard - Minor reversible Injury may occur, slightly or mildly irritating. *Skin Irritation*: Slightly or mildly irritating. *Eye Irritation*: Slightly or mildly irritating. *Oral Toxicity LD_{50} Rat*: > 500-5000 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 1000-2000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 2-20 mg/L.); **2** (Moderate Hazard - Temporary or transitory injury may occur. *Skin Irritation*: Moderately irritating, primary irritant, sensitizer. PII or Draize > 0, < 5. *Eye Irritation*: Moderately to severely irritating and/or corrosive, reversible corneal opacity, corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD_{50} Rat*: > 50-500 mg/kg. *Dermal Toxicity LD_{50} Rat or Rabbit*: > 200-1000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.5-2 mg/L.); **3** (Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given, high level of toxicity, corrosive.

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DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD (continued):

2 (continued): *Skin Irritation* Severely irritating and/or corrosive, may destroy dermal tissue, cause skin burns, dermal necrosis. Pill or Draize > 5-8 with destruction of tissue. *Eye Irritation* Corrosive, irreversible destruction of ocular tissue, corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD. Rat* > 1-50 mg/kg. *Dermal Toxicity LD. Rat or Rabbit* > 20-200 mg/kg. *Inhalation Toxicity LC. 4 hrs Rat* > 0.05-0.5 mg/L). **4** (Severe Hazard- Life-threatening, major or permanent damage may result from single or repeated exposure. *Skin Irritation* Not appropriate. Do not rate as a "4" based on skin irritation alone. *Eye Irritation* Not appropriate. Do not rate as a "4" based on eye irritation alone. *Oral Toxicity LD Rat* < 1 mg/kg. *Dermal Toxicity LD. Rat or Rabbit* < 20 mg/kg. *Inhalation Toxicity LC. 4 hrs Rat* < 0.05 mg/L)

FLAMMABILITY HAZARD:

0 (Minimal Hazard-Materials that will not burn in air when exposure to a temperature of 815.5 C [1500 F] for a period of 5 minutes.). **1** (Slight Hazard-Materials that must be pre-heated before ignition can occur. Material require considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur, including: Materials that will burn in air when exposed to a temperature of 815.5 C (1500 F) for a period of 5 minutes or less. Liquids, solids and semisolids having a flash point at or above 93.3 C [200 F] (e.g. OSHA Class IIIB, or, Most ordinary combustible materials [e.g. wood, paper, etc.]. **2** (Moderate Hazard-Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres in air, including: Liquids having a flash-point at or above 37.8 C [100 F]. Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres. Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp. Solids and semisolids that readily give off flammable vapors.) **3** (Serious Hazard- Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8 C [73 F] and having a boiling point at or above 29 C [100 F] and below 37.8 C [100 F] [e.g. OSHA Class IB and IC]. Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]. Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]).**4** (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases, Flammable cryogenic materials, Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8 C [73 F] and a boiling point below 37.8 C [100 F] [e.g. OSHA Class IA. Material that ignite spontaneously when exposed to air at a temperature of 54.4 C [130 F] or below [e.g. pyrophoric])

PHYSICAL HAZARD:

0 (*Water Reactivity* Materials that do not react with water. *Organic Peroxides* Materials that are normally stable, even under fire conditions and will not react with water. *Explosives* Substances that are Non-Explosive Unstable. *Compressed Gases* No Rating. *Pyrophorics* No Rating. *Oxidizers* No "0" rating allowed. *Unstable Reactives* Substances that will not polymerize, decompose, condense or self-react.). **1** (*Water Reactivity* Materials that change or decompose upon exposure to moisture. *Organic Peroxides* Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. *Explosives* Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases* Pressure below OSHA definition. *Pyrophorics* No Rating. *Oxidizers* Packaging Group III. Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate:cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%w)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives* Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.). **2** (*Water Reactivity* Materials that may react violently with water. *Organic Peroxides* Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. *Explosives* Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD (continued):

2 (continued): An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases* Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70 F) [500 psig]. *Pyrophorics* No Rating. *Oxidizers* Packing Group II. Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate:cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%):cellulose mixture and the criteria for Packing Group I are not met. *Unstable Reactives* Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature). **3** (*Water Reactivity* Materials that may form explosive reactions with water. *Organic Peroxides* Materials that are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation, or materials that react explosively with water. *Explosives* Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases* Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics* No Rating. *Oxidizers* Packing Group I. Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate:cellulose mixture. Liquids: Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%):cellulose mixture. *Unstable Reactives* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion.). **4** *Water Reactivity* Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides* Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives* Division 1.1 & 1.2-explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases* No Rating. *Pyrophorics* Add to the definition of Flammability "4". *Oxidizers* No "4" rating. *Unstable Reactives* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a high potential to cause significant heat generation or explosion.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS

HEALTH HAZARD **0** (materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials) Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 2000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 2000 mg/kg. Materials that are essentially non-irritating to the respiratory tract, eyes and skin. **1** (materials that, under emergency conditions, can cause significant irritation). Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 10 mg/L but less than or equal to 200 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. Materials that cause slight to moderate irritation to the respiratory tract, eyes and skin. **2** (materials that, under emergency conditions, can cause temporary incapacitation or residual injury). Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 3,000 ppm but less than or equal to 5,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 2 mg/L but less than or equal to 10 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 200 mg/kg but less than or equal to 1000 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. **3** (materials that, under emergency conditions, can cause serious or permanent injury): Gases and vapors whose LC_{50} for acute inhalation toxicity is greater than 1,000 ppm but less than or equal to 3,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials whose LD_{50} for acute dermal toxicity is greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials whose LD_{50} for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg.

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DEFINITIONS OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS

HEALTH HAZARD *(continued)* **2 (continued):** *Any liquid whose saturated* vapor concentration at 20° C (68° F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30° C (-22° F) and -55° C (-66.5° F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. **4** *Materials that, under emergency conditions, can be lethal. Gases and* vapors whose LC_{50} for acute inhalation toxicity is less than or equal to 1,000 ppm. Dusts and mists whose LC_{50} for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD_{50} for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD_{50} for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20° C (68° F) is equal to or greater than one-fifth its LC_{50} for acute inhalation toxicity, if its LC_{50} is less than or equal to 1000 ppm.

FLAMMABILITY HAZARD **0** *Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete,* stone, and sand. Materials that will not burn in air when exposed to a temperature of 816° C (1500° F) for a period of 5 minutes in according with Annex D. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Materials that will burn in air when exposed to a temperature of 816° C (1500° F) for a period of 5 minutes in accordance with Annex D. Liquids, solids and semisolids having a flash point at or above 93.4° C (200° F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35° C (95° F) that do not sustain combustion when tested using the *Method of Testing for Sustained Combustibility*, per 49 CFR 173, Appendix H or the UN *Recommendation on the Transport of Dangerous Goods, Model Regulations* (current edition) and the related *Manual of Tests and Criteria* (current edition). Liquids with a flash point greater than 35° C (95° F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85 percent by weight. Liquids that have no fire point when tested by ASTM D 92 Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to a boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed up flash point of the solvent. Most ordinary combustible materials. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8° C (100° F) and below 93.4° C (200° F) (i.e. Class II and Class IIIA liquids). Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8° C (73° F) and having a boiling point at or above 37.8° C (100° F) and those liquids having a flash point at or above 22.8° C (73° F) and below 37.8° C (73° F) and below 37.8° C (100° F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environmental conditions, can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily. Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73° F) and a boiling point below 37.8°C (100° F) (i.e. Class IA *liquids). Materials that ignite when exposed to air. Solids containing greater* than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

INSTABILITY HAZARD **0** Materials that in themselves are normally stable, even under fire conditions. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250° C (482° F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500° C (932° F) when tested by differential scanning calorimetry.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

INSTABILITY HAZARD *(continued)* **1** *Materials that in themselves are normally* stable, but that can become unstable at elevated temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250° C (482° F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250° C (482° F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that *require a strong initiating source or that must be heated under confinement* before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250° C (482° F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250° C (482° F) of 1000 W/mL or greater. Materials that are sensitive to *localized thermal or mechanical shock at normal temperatures and pressures.*

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which *a liquid gives off sufficient vapors to form an ignitable mixture with air.* Autoignition Temperature - The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals. **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals. **ppm** concentration expressed in parts of material per million parts of air or water. **mg/m^3** concentration expressed in weight of substance per volume of air. **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom. **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer, **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

ECOLOGICAL INFORMATION:

EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL_m** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S. and CANADA:

ACGIH: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**), the Canadian Domestic/Non-Domestic Substances List (**DSL/NDSL**), the U.S. Toxic Substance Control Act (**TSCA**), Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA or Superfund**), and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration.

KMB00003598

MATERIAL SAFETY DATA SHEET

AMEREX CORPORATION
P. O. BOX 81, TRUSSVILLE, AL 35173-0081
RESPONSIBLE PARTY: MSDS COORDINATOR
TELEPHONE: 205-655-3271
DATE PREPARED: 8-1-91
SUPERSEDES: 6-22-88
EMERGENCY TELEPHONE NO. DAY/NIGHT: CHEMTREC 1-800-424-9300

IDENTIFICATION

PRODUCT NAME: HALON 1211
SYNONYMS: BROMOCHLORODIFLUOROMETHANE, BCF

HAZARDOUS INGREDIENTS

MATERIAL	CAS NO.	OSHA PEL TWA - PPM	ACGIH TLV TWA - PPM
Bromochlorodifluoromethane	353-59-3	None Established	None Established

OTHER INGREDIENTS

MATERIAL	CAS NO.
NONE	

PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (^{o}F): 26	SPECIFIC GRAVITY(H_2O = 1): 1.83 (liquid)	VAPOR PRESSURE (MM HG): 778 @ 60° F
PERCENT VOLATILE (%): 100	VAPOR DENSITY (AIR = 1): 5.7	EVAPORATION RATE: High
SOLUBILITY IN WATER: None	REACTIVITY IN WATER: NA	MELTING POINT(^{o}F): NA
pH: No Data	APPEARANCE & ODOR: Colorless gas and liquid with very faint, sweet odor	
FLASH POINT (^{o}F): None	AUTO IGNITION TEMPERATURE (^{o}F): NA	FLAMMABLE LIMITS IN AIR BY VOL: NA

EXTINGUISHER MEDIA: None. This material is an extinguishing agent.

SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus with full facepiece and protective clothing when entering fire areas.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When Halon 1211 is discharged onto a fire, it decomposes above 900°F, releasing bromide ions, the extinguishing agent. Halogen compounds, such as halogen acids, are also formed. These by-products, although harmful if inhaled, are easily detected. Only a few PPM create an unpleasant, acrid odor which serves as a warning to the user. After the extinguisher is discharged, the area should be vacated until ventilation clears the atmosphere.

PHYSICAL HAZARDS

STABILITY: Stable
CONDITIONS TO AVOID: Decomposes under fire conditions

INCOMPATIBILITY (MATERIALS TO AVOID): Active metals such as powdered alumina and magnesium and fires of metal hydrides.

HAZARDOUS DECOMPOSITION PRODUCTS: Decomposes above 900° F to give free halogens, halogen acid and small amounts of carbonyl halides.

HAZARDOUS POLYMERIZATION: Will not occur

HEALTH EFFECTS AND FIRST AID

EFFECTS OF ACUTE OVEREXPOSURE FOR PRODUCT:

EYES: The liquid form of this material can produce chilling sensations and discomfort.

SKIN: Evaporation of liquid from the skin can produce chilling sensations.

BREATHING: Exposures for more than a few minutes above 2% (8.5 lbs/1000 cu. ft. air) concentration can produce dizziness, impaired coordination, and cardiac effects.

SWALLOWING: Not likely to occur since this material is a gas at room temperature.

FIRST AID:

IF IN EYES: Flush with water for 15 minutes. If redness, itching, or a burning sensations develops, have eyes examined and treated by medical personnel.

IF ON SKIN: Wash with soap and water. If redness, itching, or a burning sensations develops, seek medical attention.

IF BREATHED: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel.

IF SWALLOWED: Give 1 or 2 glasses of warm water to drink and seek medical attention. Do not induce vomiting.

PRIMARY ROUTES OF ENTRY: Eyes, Skin Contact, Breathing

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: In susceptible individuals, cardiac sensitization to circulating epinephrine compounds can result in potentially fatal heart arrhythmias.

EFFECTS OF CHRONIC OVEREXPOSURE FOR PRODUCT: Unknown.

PRODUCT LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN:

NATIONAL TOXICOLOGY PROGRAM:	IARC MONOGRAPHS:	OSHA:
[ ] YES	[ ] YES	[ ] YES
[X] NO	[X] NO	[X] NO

CONTROL MEASURES AND PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION (TYPE): Not normally needed. If needed, use MSHA/NIOSH approved respirator for organic vapors. Wear NIOSH approved self-contained breathing apparatus at concentrations above 2%.

VENTILATION: GENERAL AREA: Recommended LOCAL EXHAUST: Recommended

SKIN PROTECTION: Impervious Gloves for Liquid exposure EYE PROTECTION: Safety Glasses. DO NOT WEAR CONTACT LENSES.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Eye wash station and safety shower in work area when working with liquified product.

WORK/HYGIENE PRACTICES: Use good personal hygiene and good housekeeping practices.

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in cool area with good ventilation. Keep vapors away from high temperature surfaces to avoid toxic and corrosive decomposition products.

OTHER PRECAUTIONS: Enforce "No Smoking" rules in areas of use.

STEPS TO BE TAKEN IN CASE PRODUCT IS RELEASED OR SPILLED: Ventilate spill area and recover any liquid.

HMIS RATINGS:

HEALTH	2
FLAMMABILITY	0
REACTIVITY	0

HMIS HAZARD INDEX:

MINIMAL	0
SLIGHT	1
MODERATE	2
SERIOUS	3
SEVERE	4

The information provided herein is offered in good faith and is to the best of our knowledge current. Although certain hazards are described herein we cannot state that these are the only hazards which exist. Final determination of suitability and safe usage of this material is the sole responsibility of the user who is obligated to review this data in the specific context of the intended use and determine appropriateness. No guarantee is implied or expressed regarding the accuracy of this information or the use of this material since the conditions of use are beyond our control.

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MATERIAL SAFETY DATA SHEET
PREMIERE ICE MELTER WITH CMA

4W973, 4W974

CP INDUSTRIES
503 NORTH 400 WEST
SALT LAKE CITY, UT 84103
800-453-4931

DATE PREPARED: SEPTEMBER 16, 1993

HAZARDOUS INGREDIENTS
NO SUBSTANCES DEFINED AS HAZARDOUS PRESENT

OTHER INGREDIENTS

SODIUM CHLORIDE CAS 7647-14-5
CALCIUM MAGNESIUM ACETATE (CMA) CAS 76123-46-1
SODIUM SILICATES CAS 6834-92-0
ETHANOL AMINES CAS 102-71-6

PHYSICAL/CHEMICAL CHARACTERISTICS
SOLUBILITY IN WATER: SOLUBLE
APPEARANCE AND ODOR: BLUE CRYSTALLINE SOLID

REACTIVITY DATA
HAZARDOUS POLYMERIZATION: CANNOT OCCUR
STABILITY: STABLE
INCOMPATIBILITY: AVOID CONTACT WITH STRONG OXIDIZING AGENTS.

HEALTH HAZARD DATA
EYE IRRITANT. MAY IRRITATE SKIN. MAY BE HARMFUL IF SWALLOWED, ESPECIALLY IN LARGE AMOUNTS. INGESTION OF SMALL AMOUNTS MAY BE IRRITATING IF INGESTED BECAUSE OF PRESENCE OF A SMALL AMOUNT OF ALKALINE SALTS.

FIRST AID PROCEDURES
EYES: FLUSH WITH WATER. IF IRRITATION OR REDNESS ARE SEVERE OR PERSIST, CONSULT PHYSICIAN.
SKIN: WASH OFF WITH WATER.
INGESTION: DRINK LIQUIDS TO DILUTE AND CONSULT PHYSICIAN.

SPILL OR LEAK PROCEDURES
SMALL SPILLS: MAY BE FLUSHED AWAY WITH WATER OR SWEEP UP.
LARGE SPILLS: SWEEP OR SCOOP UP FOR REUSE OR DISPOSAL.

WASTE DISPOSAL METHODS = 75290 =
SMALL SPILLS: MAY BE SEWERED
LARGE SPILLS: SHOULD BE DISPOSED OF IN LANDFILL ACCORDING TO REGULATIONS.

4W973, 4W974

PROTECTIVE EQUIPMENT TO BE USED
GOOD INDUSTRIAL PRACTICE SUGGESTS THE USE OF PROPER EYE PROTECTION AND THE USE OF GLOVES.

SPECIAL PRECAUTIONS OR OTHER COMMENTS: THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE REGARDLESS OF WHOM IT ORIGINATES WITH. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

PREPARED TO COMPLY WITH OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CPMP-M8409

Price quote $8.95 ea

K Crawford

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Liquid

POP Deicer
1-13-97

CODE 1

MATERIAL SAFETY DATA SHEET
REILLY INDUSTRIES, INC

PRODUCT INFORMATION

PRODUCT NAME: ICE-STOP™ Cl Ice Control Agent
CHEMICAL NAME: Not applicable

PRODUCT NUMBER: Not applicable
SYNONYMS: Not applicable

MANUFACTURERS NAME: Reilly Wendover
a Division of Reilly Industries, Inc.
CAS NUMBER: Not applicable
MOLECULAR WEIGHT: Not applicable

ADDRESS: 1510 Market Square Center
151 North Delaware Street
Indianapolis Indiana 46204
CHEMICAL FORMULA: Not applicable
DOT NUMBER: Not regulated

PRODUCT USE: Ice melting.
IMO: Not regulated

EMERGENCY TELEPHONE NUMBER: 317-247-8141
HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0

SUPPLIER INFORMATION: Reilly Industries, Inc
HAZARD CODE(0 = NONE; 1 = SLIGHT; 2 = MODERATE; 3 = SEVERE; 4 = EXTREME)

HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	CAS #	CONCENTRATIONS (%)	EXPOSURE LIMITS		LD 50 (ORAL)/LC 50
			OSHA PEL	ACGIH TLV	
Magnesium chloride	7786-30-3	25	Not applicable	Not applicable	2800 mg/kg (rats); Not available

PHYSICAL DATA

PHYSICAL STATE: SOLID LIQUID X GAS
pH: 7
VAPOR PRESSURE: Not applicable

ODOR & APPEARANCE: Colorless liquid.
FREEZING POINT: -13 F
SPECIFIC GRAVITY: 1.25 @ 68 F

SOLUBILITY (WATER): Miscible

ODOR THRESHOLD: Not available DENSITY: See specific gravity.
EVAPORATION RATE: Not available VAPOR DENSITY: Not available

MELTING POINT: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

BOILING POINT: 244.6 F.

REACTIVITY DATA

PHYSICAL (REACTIVITY) HAZARD WARNING: Not applicable

STABLE: Yes IF NO, UNDER WHICH CONDITIONS:

INCOMPATIBILITIES Mildly corrosive to metals.

REACTIVE: No IF YES, UNDER WHAT CONDITIONS:

HAZARDOUS DECOMPOSITION PRODUCTS: If evaporated to dryness, and heated to a minimum of 500 C, HCl vapors could be liberated.

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V FIRE AND EXPLOSION HAZARDS

PHYSICAL HAZARD WARNING: Not applicable SENSITIVITY TO > STATIC DISCHARGE: No ; MECHANICAL IMPACT: No

FLAMMABLE: No IF YES, UNDER WHICH CONDITIONS:

FLASHPOINT (METHOD): Not applicable FLAMMABLE LIMITS (% BY VOL.): UEL: Not applicable LEL: Not applicable

AUTO IGNITION TEMPERATURE: Not applicable

HAZARDOUS COMBUSTION PRODUCTS: Not applicable

MEANS OF EXTINCTION: Water spray, carbon dioxide, dry chemical. As this material is virtually non-flammable, use proper equipment to fight surrounding fire.

UNUSUAL FIRE/EXPLOSION HAZARDS: None

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear full protective equipment and use normal firefighting procedures.

VI TOXICOLOGICAL PROPERTIES

HEALTH HAZARD WARNING: Irritant.

ROUTES OF ENTRY > SKIN CONTACT: X SKIN ABSORPTION: EYE CONTACT: X INHALATION: X INGESTION:

EFFECTS OF ACUTE EXPOSURE: This material may be irritating to the skin and eyes on contact. If inhaled it may also be irritating to the respiratory tract.

IRRITANCY OF PRODUCT: Skin/eye irritant. SENSITIZATION TO PRODUCT: Not applicable

EFFECTS OF CHRONIC EXPOSURE: Not applicable

CARCINOGEN: REPRODUCTIVE EFFECTS:) BRIEF DESCRIPTION: Not applicable

TERATOGENICITY: MUTAGENICITY:)

SYNERGISTIC MATERIALS: None known

MEDICAL CONDITIONS AGGRAVATED: None known

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FIRST AID MEASURES

SKIN: Wash exposed area twice with soap and water. The exposed area should be examined by medical personnel if irritation or pain persists after the area has been washed.

EYE: Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. GET MEDICAL ATTENTION.

INHALATION (BREATHING): Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. GET MEDICAL ATTENTION.

INGESTION (SWALLOWING): If conscious induce vomiting to prevent further absorption. Give oxygen if respiration is shallow. GET MEDICAL ATTENTION. Do not give anything by mouth to an unconscious person.

DECONTAMINATION PROCEDURES: Use emergency shower if available. Remove all contaminated clothing to prevent further irritation. Wash all clothing and exposed areas of the body twice with soap and water.

PREVENTIVE MEASURES

SECTION VII

<PERSONAL PROTECTIVE EQUIPMENT> GLOVES (SPECIFY): Impervious gloves FOOTWEAR (SPECIFY): Boots

EYE (SPECIFY): Safety glasses or chemical goggles. CLOTHING (SPECIFY): Not applicable

RESPIRATORY (SPECIFY): NIOSH approved chemical cartridge respirator, if necessary.

OTHER (SPECIFY): Use protective equipment as conditions necessitate.

PERSONAL HYGIENE PRACTICES: Contact lenses should not be worn when handling this material. Do not smoke or eat in areas where this material is handled. Wash hands thoroughly before eating or smoking.

SECTION VIII

ENGINEERING CONTROLS: All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided.

LEAK AND SPILL PROCEDURE: For small spills use suitable absorbent material and collect for later disposal. For large spills the area may require diking to contain the spill. Material can then be collected (eg. suction) for later disposal. Wear protective equipment as needed during clean-up. After collection of material flush area with water.

WASTE DISPOSAL METHOD: Dispose of the material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state, or local laws. Wear protective equipment as necessary.

HANDLING PROCEDURES AND EQUIPMENT: Protect containers against physical damage. Wear protective equipment as necessary when performing maintenance on contaminated equipment.

STORAGE REQUIREMENTS: Store in dry, well ventilated area. Keep away from strong acids.

SPECIAL SHIPPING INFORMATION: Chemicals, NOI (ICE-STOP™ CI Ice Control Agent), Non-Hazardous.

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KMB00003605

ICE-STOP ™ CI Ice Control Agent

ADDITIONAL COMMENTS

Hazardous Materials Guide Number - Not applicable

No OSHA or ACGIH exposure limits have been established for this compound.

"FOR CHEMICAL EMERGENCY"
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC - Day or Night
800-424-9300
Toll free in the U.S., Puerto Rico, Virgin Islands,
and Canada. For calls originating outside the U.S.:
202-483-7616 (collect calls are accepted).

SECTION 313 SUPPLIER NOTIFICATION: this product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

CAS #	CHEMICAL NAME	% BY WEIGHT
Not appl.	Not applicable	Not appl.

Based upon the criteria set forth in section 34 through 36 of the Controlled Products Regulations of Canada this Product is classified as:

Not applicable

PRECAUTIONARY STATEMENT: PLEASE NOTE that the information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

PREPARATION INFORMATION

Prepared under the direction of Paul H. Rivers Ph.D., Director of Corporate Environmental Affairs

PHONE NUMBER 317-247-8141

DATE: January 21, 1993 - Original date of issue: January 15, 1990

P.05

Jan-14-97 12:16p Western Asphalt Rcy

KMB00003606

MATERIAL SAFETY DATA SHEET

AMEREX CORPORATION
P. O. BOX 81, TRUSSVILLE, AL 35173-0081
RESPONSIBLE PARTY: MSDS COORDINATOR
TELEPHONE: 205-655-3271
DATE PREPARED: 8-1-91
SUPERSEDES: 6-22-88
EMERGENCY TELEPHONE NO. DAY/NIGHT: CHEMTREC 1-800-424-9300

IDENTIFICATION

PRODUCT NAME: REGULAR DRY CHEMICAL
SYNONYMS: SDC, SODIUM BICARBONATE

HAZARDOUS INGREDIENTS

MATERIAL	CAS NO.	OSHA PEL TWA - mg/m3	ACGIH TLV TWA - mg/m3
Kaolin	1332-58-7	10 Total Dust 5 Respirable Fraction	10 (c)

OTHER INGREDIENTS

MATERIAL	CAS NO.	OSHA PEL TWA - mg/m3	ACGIH TLV TWA - mg/m3
Sodium Bicarbonate	144-55-8	15 Total Dust (a) 5 Respirable Fraction	10 (b)
Hydros Alumina Silicate	1318-94-1	15 Total Dust (a) 5 Respirable Fraction	10 (b)

(a) Particulate matter not otherwise classified. Milligrams substance per cubic meter air.
(b) Particulate matter not otherwise classified. Total dust containing no asbestos & less than 1% crystalline silica.
(c) Total dust containing no asbestos & less than 1% crystalline silica.

PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (^{o}F): NA	SPECIFIC GRAVITY (H_2O=1): 0.90	VAPOR PRESSURE (MM HG): NA
PERCENT VOLATILE (%): NA	VAPOR DENSITY (AIR = 1): NA	EVAPORATION RATE: NA
SOLUBILITY IN WATER: Material is water repellant coated	REACTIVITY IN WATER: None	MELTING POINT(^{o}F): Decomposes
pH: 8.3	APPEARANCE & ODOR: White powder. No characteristic odor.	
FLASH POINT (^{o}F): None	AUTO IGNITION TEMPERATURE (^{o}F): NA	FLAMMABLE LIMITS IN AIR BY VOL: NA
EXTINGUISHER MEDIA: None. This material is an extinguishing agent.		
SPECIAL FIRE FIGHTING PROCEDURES: None	UNUSUAL FIRE AND EXPLOSION HAZARDS: None	

PHYSICAL HAZARDS

STABILITY: Stable
CONDITIONS TO AVOID: NA

INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Sodium Carbonate, Carbon Dioxide

HAZARDOUS POLYMERIZATION: Will not occur

HEALTH EFFECTS AND FIRST AID

EFFECTS OF ACUTE OVEREXPOSURE FOR PRODUCT:

EYES:	Slight irritant.
SKIN:	Slight irritant.
BREATHING:	Irritant to respiratory tract. Treat as a mineral dust.
SWALLOWING:	Ingestion of large quantity can lead to systemic alkalosis.

FIRST AID:

IF IN EYES:	Flush with water for 15 minutes. If irritation persists, seek medical attention.
IF ON SKIN:	Wash with soap and water. If irritation persists, seek medical attention.
IF BREATHED:	Remove victim to fresh air. Seek medical attention if discomfort continues.
IF SWALLOWED:	Rinse mouth and drink large amounts of water. Seek medical attention.

PRIMARY ROUTES OF ENTRY: Eyes, Skin Contact, Breathing, Swallowing

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known

EFFECTS OF CHRONIC OVEREXPOSURE FOR PRODUCT: No adverse chronic effects could be found for this substance.

PRODUCT LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN:

NATIONAL TOXICOLOGY PROGRAM:	[ ] YES [X] NO	IARC MONOGRAPHS:	[ ] YES [X] NO	OSHA:	[ ] YES [X] NO

CONTROL MEASURES AND PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION (TYPE): Dust respirator required when exposure limits are exceeded. Dust respirator recommended whenever airborne dust is present.

VENTILATION: GENERAL AREA: Recommended LOCAL EXHAUST: Recommended

SKIN PROTECTION: Protective Gloves EYE PROTECTION: Safety Glasses

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: None required

WORK/HYGIENE PRACTICES: Use good personal hygiene and good housekeeping practices.

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in closed, moisture-free containers in cool, dry location. Avoid unnecessary dustiness.

OTHER PRECAUTIONS: Do not cross contaminate with other extinguisher agents.

STEPS TO BE TAKEN IN CASE PRODUCT IS RELEASED OR SPILLED: Contain and sweep up. Dispose of in accordance with local, state and federal regulations.

HMIS RATINGS:

HEALTH	1
FLAMMABILITY	0
REACTIVITY	0

HMIS HAZARD INDEX:

MINIMAL	0
SLIGHT	1
MODERATE	2
SERIOUS	3
SEVERE	4

The information provided herein is offered in good faith and is to the best of our knowledge current. Although certain hazards are described herein we cannot state that these are the only hazards which exist. Final determination of suitability and safe usage of this material is the sole responsibility of the user who is obligated to review this data in the specific context of the intended use and determine appropriateness. No guarantee is implied or expressed regarding the accuracy of this information or the use of this material since the conditions of use are beyond our control.

MATERIAL DATA SAFETY SHEET

Identity: Eyesaline® solution - Product #s 32-000400, 32-000401, 32-000433, 32-000445, 32-00446, 32-000448, 32-000449, 32-000450, 32-000451, 32-000452, 32-000454, 32-000455, 32-000456, 32-000457, 32-000458, 32-000460, 32-000461, 32-000462, 32-000463, 32-000470, 32-000471, 32-000492, 32-000493, 32-000494, 32-000496, 32-000502, 32-000504, 32-000505, 32-000506, 32-000507, 32-000508, 32-000510, 32-000512, 32-000533, 32-000534, 32-000535, 32-001050, 32-001170

Section I

Manufacturer: Fendall, Inc.	**Emergency Telephone:** 1-401-232-1200
Address: 825 East Highway 151	**Information Telephone:** 800-543-4842
Platteville, WI 53818 USA	**Date Prepared:** 05/01/03

Section II - Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other limits recommended	% (optional)
BENZALKONIUM CHLORIDE CAS #8001-54-5	NONE	NONE	N/A	<0.1%

Section III - Physical/Chemical Characteristics

Boiling Point: 200ºF (93.3ºC)	**Specific Gravity (H2O)=1:** NOT DETERMINED
Vapor Pressure (mm Hg.): 760	**Melting Point:** N/A
Vapor Density (Air = 1): NOT DETERMINED.	**Evaporation Rate (Butyl Acetate = 1):** NOT DETERMINED

Solubility in Water: 100%

Appearance and Odor: COLORLESS LIQUID WITH NO DISCERNABLE ODOR.

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used): N/A	**Flammable Limits:**	**LEL:** N/A	**UEL:** N/A

Extinguishing Media: THIS IS A NONFLAMMABLE AQUEOUS SOLUTION.

Special Fire Fighting Procedures: N/A

Unusual Fire and Explosion Hazards: N/A

Section V - Reactivity Data

Stability	**Unstable:** NO **Stable:** YES	**Conditions to Avoid:** THIS PRODUCT IS STABLE AND CONSIDERED NON-REACTIVE UNDER NORMAL CONDITIONS OF STORAGE AND USAGE.

Incompatibility (Materials to Avoid): NONE KNOWN

Hazardous Decomposition or Byproducts: NONE

Hazardous Polymerization	**May Occur:** NO **Will Not Occur:** YES	**Conditions to Avoid:** NONE

Section VI - Health Hazard Data

Route(s) of Entry: **Inhalation?** NO **Skin?** NO **Ingestion?** YES

Health Hazards (Acute and Chronic): INGESTION OF VOLUMES IN EXCESS OF 20 LITERS MAY CAUSE GASTRIC IRRITATION.

Carcinogenicity: **NTP?** NO **IARC Monographs?** NO **OSHA Regulated?** NO

Signs and Symptoms of Exposure: N/A

Medical Conditions Generally Aggravated by Exposure: N/A

Emergency First Aid Procedures: NOTES TO PHYSICIAN: IN THE UNLIKELY EVENT OF RAPID INGESTION OF LARGE VOLUMES OF THE SOLUTION. INDUCE VOMITING AND OBSERVE THE PATIENT FOR GASTRIC IRRITATION.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: FLUSH AREA WITH WATER. THE SOLUTION IS NOT RCRA HAZARDOUS WASTE.

Waste Disposal Method: N/A

Precautions to Be Taken in Handling and Storing: DO NOT FREEZE OR EXPOSE TO TEMPERATURES IN EXCESS OF 110ºF (43ºC) FOR EXTENDED PERIODS.

Other Precautions: N/A

Section VIII - Control Measures

Respiratory Protection: N/A

Ventilation	**Local Exhaust:** N/A **Mechanical:** N/A	**Special:** N/A **Other:** N/A

Protective Gloves: N/A **Eye Protection:** N/A

Other Protective Clothing: N/A

Work Hygienic Practices: N/A

Part #32-003731 Rev D

FICHE SIGNALÉTIQUE

Nom du produit : Solution Eyesaline® - Numéros de produit 32-000400, 32-000401, 32-000433, 32-000445, 32-000446, 32-000448, 32-000449, 32-000450, 32-000451, 32-000452, 32-000454, 32-000455, 32-000456, 32-000457, 32-000458, 32-000460, 32-000461, 32-000462, 32-000463, 32-000470, 32-000471, 32-000492, 32-000493, 32-000494, 32-000496, 32-000502, 32-000504, 32-000505, 32-000506, 32-000507, 32-000508, 32-000510, 32-000512, 32-000533, 32-000534, 32-000535, 32-001050, 32-001170

Section I

Fabricant : Fendall, Inc.	**Téléphone** (en cas d'urgence) **:** 1-401-232-1200
Adresse : 825 East Highway 151 Platteville, WI 53818 USA	**Téléphone** (pour obtenir des informations) **:** (800) 543-4842
	Date de la préparation : 1 mai 2003

Section II – Ingrédients dangereux/Renseignements signalétiques

Composants dangereux (Dénomination chimique spécifique ; noms communs)	OSHA PEL	ACGIH TLV	Autres limites recommandées	% (facultatif)
CHLORURE DE BENZALKONIUM N° CAS : 8001-54-5	NÉANT	NÉANT	SANS OBJET	<0,1 %

Section III – Caractéristiques physiques et chimiques

Point d'ébullition : 93,3 °C (200 °F)	**Densité spécifique** (H_2O = 1) **:** AUCUNE DONNÉE DISPONIBLE
Tension de vapeur (mm Hg) : 760	**Point de fusion :** SANS OBJET
Densité de vapeur (Air = 1) : AUCUNE DONNÉE DISPONIBLE	**Taux d'évaporation (acétate de butyle = 1) :** AUCUNE DONNÉE DISPONIBLE

Solubilité dans l'eau : 100 %

Apparence et odeur : LIQUIDE INCOLORE SANS ODEUR DISCERNABLE.

Section IV – Risques d'incendie ou d'explosion

Point d'éclair (méthode utilisée) : SANS OBJET	**Limites d'inflammabilité :**	**LIE :** SANS OBJET	**LSE :** SANS OBJET

Moyens d'extinction : CETTE SOLUTION AQUEUSE EST ININFLAMMABLE.

Procédures spéciales de lutte contre l'incendie : SANS OBJET

Risques inhabituels d'incendie et d'explosion : SANS OBJET

Section V – Réactivité

Stabilité	**Instable :** NON **Stable :** OUI	**Conditions à éviter :** CE PRODUIT EST CONSIDÉRÉ COMME ÉTANT NON-RÉACTIF ET STABLE DANS DES CONDITIONS NORMALES D'ENTREPOSAGE ET D'USAGE.

Incompatibilité (matériaux à éviter) : AUCUN CONNU

Produits ou sous-produits de décomposition dangereux : NÉANT

Polymérisation dangereuse	**Peut avoir lieu :** NON **N'aura pas lieu :** OUI	**Conditions à éviter :** NÉANT

Section VI – Risques pour la santé

Voies d'exposition : **Inhalation ?** NON **Peau ?** NON **Ingestion ?** OUI

Risques pour la santé (aigus et chroniques) : L'INGESTION DE PLUS DE 20 LITRES RISQUE DE PROVOQUER UNE IRRITATION GASTRIQUE.

Cancérogénicité : **NTP ?** NON **Monographies CIRC ?** NON **Réglementation OSHA ?** NON

Signe et symptômes d'exposition : SANS OBJET

Troubles médicaux généralement aggravés par l'exposition : SANS OBJET

Premiers soins : NOTES À L'INTENTION DU MÉDECIN : DANS LE CAS PEU PROBABLE D'UNE INGESTION RAPIDE DE GRANDES QUANTITÉS DE LA SOLUTION, PROVOQUER LE VOMISSEMENT ET OBSERVER LE PATIENT POUR TOUTE IRRITATION GASTRIQUE.

Section VII – Précautions à prendre pour une manutention et une utilisation sécuritaires

Précautions à prendre en cas de fuite ou de déversement de matériau : RINCER LA SURFACE À L'EAU. LA SOLUTION N'EST PAS UN DÉCHET DANGEREUX DE LA RCRA DE L'EPA DES ÉTATS-UNIS.

Méthode d'élimination des résidus : SANS OBJET

Précautions à prendre lors de la manutention et de l'entreposage : NE PAS CONGELER NI EXPOSER À DES TEMPÉRATURES SUPÉRIEURES À 43°C (110 °F) PENDANT DES PÉRIODES PROLONGÉES.

Autres précautions : SANS OBJET

Section VIII – Mesures de contrôle

Protection des voies respiratoires : SANS OBJET

Ventilation	**Locale :** SANS OBJET **Mécanique :** SANS OBJET	**Spéciale :** SANS OBJET **Autre :** SANS OBJET

Gants de protection : SANS OBJET **Protection des yeux :** SANS OBJET

Autres vêtements de protection : SANS OBJET

Pratiques d'hygiène au travail : SANS OBJET

ANSUL® ANSUL INCORPORATED
MARINETTE, WI 54143-2542

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the preparation

Product Name:	"FORAY®"
Chemical Name:	N/A – This is a mixture/preparation.
CAS No.:	N/A – This is a mixture/preparation.
Chemical Formula:	N/A – This is a mixture/preparation.
EINECS Number:	N/A – This is a mixture/preparation.

1.2. Use of the preparation

The intended or recommended use of this preparation is as a FIRE EXTINGUISHING AGENT.

1.3. Company identification

Manufacturer/Supplier:	ANSUL INCORPORATED
Address:	One Stanton Street, Marinette, WI 54143-2542
Prepared by:	Safety and Health Department
Phone:	715-735-7411
Internet/Home Page:	http://www.ansul.com
Date of Issue:	September, 2003

1.4. Emergency telephone

CHEMTREC 800-424-9300 or 703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

2.1.

Ingredient Name:	Monoammonium Phosphate.
Chemical Formula:	$NH_4H_2PO_4$.
CAS No.:	7722-76-1.
EINECS Number:	231-764-5.
Concentration, Wt %:	65-82 %.
Hazard Identification:	See Heading 3.
Ingredient Name:	Ammonium sulfate
Chemical Formula:	$(NH_4)_2SO_4$.
CAS No.:	7783-20-2.
EINECS Number:	231-984-1.
Concentration, Wt %:	12-25 %.
Hazard Identification:	See Heading 3.
Ingredient Name:	Magnesium Aluminum Silicate (Attapulgite Clay or Fuller's Earth).
Chemical Formula:	$Mg_xAl_y(SiO4)_z$.
CAS No.:	8031-18-3.
EINECS Number:	(b).
Concentration, Wt %:	5-7 %.
Hazard Identification:	See Heading 3.
Ingredient Name:	Calcium Carbonate.
Chemical Formula:	$CaCO_3$.
CAS No.:	471-34-1.
EINECS Number:	207-439-9.
Concentration, Wt %:	<2 %.
Hazard Identification:	See Heading 3.
Ingredient Name:	Methyl Hydrogen Polysiloxane.
Chemical Formula:	Mixture/preparation.
CAS No.:	63148-57-2.
EINECS Number:	(a).
Concentration, Wt %:	<1 %.
Hazard Identification:	See Heading 3.

5. FIRE-FIGHTING MEASURES

This preparation is an extinguishing media.
There are NO extinguishing media which must not be used for safety reasons.
NO special protective equipment is needed for fire-fighters. Wear protective equipment appropriate for the fire conditions.

6. ACCIDENTAL RELEASE MEASURES

For personal protection: Prevent skin and eye contact, see Heading 8.
Clean up: Sweep up and recover for use or place in closed container for disposal, see Heading 13.
NO harm to the environment is expected from an accidental release of this preparation.

7. HANDLING AND STORAGE

7.1. Handling

Care should be taken in handling all chemical substances and preparations.
See incompatibility information in Heading 10.

7.2. Storage

NO special conditions are needed for safe storage.
See incompatibility information in Heading 10.
Store in original container or Ansul fire extinguisher. Keep tightly closed until used.
There is minimal danger to the environment from a storage release.

7.3. Specific use

The intended or recommended use of this preparation is as a FIRE EXTINGUISHING AGENT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limit values

Nuisance dust limit:
OSHA TWA: 15 mg/m^3
ACGIH TLV-TWA: 10 mg/m^3.

8.2. Exposure controls

8.2.1. Occupational exposure controls

8.2.1.1. Respiratory protection

Dust mask where dustiness is prevalent, or TLV is exceeded. Use mechanical filter respirator if exposure is prolonged.

8.2.1.2. Hand protection

None normally needed. Use chemical resistant gloves when handling the preparation.

8.2.1.3. Eye protection

Use safety glasses with side shields or safety goggles.

8.2.1.4. Skin protection

No special equipment is needed.

8.2.2. Environmental exposure controls

No special controls are needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General information

Appearance:	Powder.
Odor:	Yellow.

9.2. Important health, safety, and environmental information

pH:	Not determined.
Boiling point/boiling range:	Not applicable.
Flash point:	None.
Flammability (solid/gas):	Not flammable.
Explosive properties:	Not explosive.
Oxidizing properties:	Not an oxidizer.

14. TRANSPORT INFORMATION

Hazard Class or Division: Not a hazardous substance..
For additional transport information, contact Ansul Incorporated.
No harm to the environment is expected from this preparation.

15. REGULATORY INFORMATION

Product:

EU Classification:		Harmful.
R Phrases:	22	Harmful if swallowed.
	36/37/38	Irritating to eyes, respiratory system, and skin.
S Phrases:	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	36	Wear suitable protective clothing.

Limit Values for Exposure:
Nuisance dust limit:
OSHA TWA: 15 mg/m^3
ACGIH TLV-TWA: 10 mg/m^3.
EINECS Status: All components are included in EINECS inventories or are exempt from listing.
EPA TSCA Status: All components are included in TSCA inventories or are exempt from listing.
Canadian DSL (Domestic Substances List): All components are included in the DSL or are exempt from listing.
Environmental restrictions: None are known.
Restrictions on Marketing and Use: None are known.
Refer to any other national measures that may be relevant.

16. OTHER INFORMATION

(HMIS) HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:

HEALTH:	1	4. Severe Hazard
FLAMMABILITY:	0	3. Serious Hazard
REACTIVITY:	0	2. Moderate Hazard
		1. Slight Hazard
		0. Minimal Hazard

(WHMIS) CANADIAN WORKPLACE HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:
This product is rated: **D2B – Product may irritate skin, eyes or mucous membranes.**

Format is from directive 2001/58/EC.
EINECS data is from http://exb.jrc.it/existing-chemicals/
Data used to compile the data sheet is from Ansul Material Safety Data Sheet, March, 2003.
Toxicological information added from the EINICS ESIS (Existing Substances Information System).
A rating under WHMIS has been added, following the Canadian guidelines.

17. DISCLAIMER

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT, BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ANSUL SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT.

N/A = Not Applicable NDA = No Data Available

MSDS available at http://www.ansul.com

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4. FIRST AID MEASURES

Eye Contact:	Avoid direct contact of high pressure gas discharge.
Skin Contact:	Avoid direct contact of high pressure gas discharge.
Inhalation:	Avoid direct inhalation of undiluted gas. Gas is an asphyxiant.
Ingestion:	Not a probable route of exposure.

5. FIRE-FIGHTING MEASURES

Non-flammable gas. Use agent appropriate to surrounding material.

Though gas cylinders are equipped with pressure and temperature relief devices, they should be removed from high temperature areas or fires, if safe to do so, to avoid risk of rupture.

There are NO extinguishing media which must not be used for safety reasons.

NO special protective equipment is needed for fire-fighters.

6. ACCIDENTAL RELEASE MEASURES

Material is a normal atmospheric gas.

NO harm to the environment is expected from an accidental release of this preparation.

7. HANDLING AND STORAGE

7.1. Handling

Care should be taken in handling all chemical substances and preparations.

Secure to prevent falling. Do not move without safety cap in place to prevent damage to valve.

See incompatibility information in Heading 10.

7.2. Storage

Store cylinders with restraints to prevent possibility of rupture. Store as a compressed gas in DOT approved vessels. Keep safety cap in place while in storage.

See incompatibility information in Heading 10.

Store in original container. Keep tightly closed until used.

There is NO danger to the environment from a storage release.

7.3. Specific use

The intended or recommended use of this preparation is to discharge a FIRE EXTINGUISHING AGENT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limit values

There are NO currently occupational exposure limit values for this component.

8.2. Exposure controls

8.2.1. Occupational exposure controls

8.2.1.1. Respiratory protection

Exposure to high concentrations requires the use of self-contained breathing apparatus. Other respirators will not protect in an oxygen deficient atmosphere.

8.2.1.2. Hand protection

Use leather gloves when handling cylinders.

8.2.1.3. Eye protection

Use safety glasses with side shields or safety goggles.

8.2.1.4. Skin protection

No special equipment is needed.

8.2.2. Environmental exposure controls

None needed. This material is a normal atmospheric gas.

13. DISPOSAL CONSIDERATIONS

No harm to the environment is expected from this preparation.
This material is a normal atmospheric gas.

14. TRANSPORT INFORMATION

Hazard Class or Division:	Nitrogen, Compressed, Class 2.2, UN1066.
Label:	Non-flammable gas.
Emergency response guide page number:	121; EMS (Intl): 2-04.

For additional transport information, contact Ansul Incorporated.
This material is a normal atmospheric gas.

15. REGULATORY INFORMATION

EU Classification:		Nonflammable gas.
R Phrases:		None.
S Phrases:	9	Keep container in a well ventilated place.
Exposure Limit Values:		None.
EINECS Status:		This component is included in EINECS inventories.
EPA TSCA Status		This component is included in TSCA inventories.
Canadian DSL (Domestic Substances List):		This component is included in DSL inventories.
Environmental restrictions:		None are known.
Restrictions on Marketing and Use:		None are known.

Refer to any other national measures that may be relevant.

16. OTHER INFORMATION

Toxicological information added from the EINICS ESIS (Existing Substances Information System). A rating under WHMIS has been added, following the Canadian guidelines.

(HMIS) HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:

HEALTH:	0	4. Severe Hazard
FLAMMABILITY:	0	3. Serious Hazard
REACTIVITY:	0	2. Moderate Hazard
		1. Slight Hazard
		0. Minimal Hazard

(WHMIS) CANADIAN WORKPLACE HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:

This product is rated **A Compressed Gas.**

Format is from directive 2001/58/EC.
EINECS data is from http://exb.jrc.it/existing-chemicals/
Data used to compile the data sheet is from Ansul Material Safety Data Sheet, February, 2002.

17. DISCLAIMER

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT, BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ANSUL SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT.

N/A = Not Applicable NDA = No Data Available

MSDS available at http://www.ansul.com

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KMB00003616

MATERIAL SAFETY DATA SHEET

PERMATEX INDUSTRIAL
705 North Mountain Road
Newington, CT 06111
Phone: (800) 641-7376

Issued: March 1, 1993

Clear Silicone Adhesive Sealant

I. PRODUCT IDENTIFICATION

Product Name:
Item No.:
Part No.:
Product Type: RTV-Silicone
Formula No.: Does not apply

II. COMPOSITION

Ingredients	CAS No.	%
SEALANT		
Poly(dimethylsiloxane), hydroxy terminated	70131-67-8	85-90
SILICA, AMORPHOUS (FUMED)	7631-86-9	5-10
Ethyltriacetoxysilane	17689-77-9	1-3
Methyltriacetoxysilane	4253-34-3	1-3
ACETIC ACID	64-19-7	***
PROPELLANT		
PROPANE	74-98-6	5-80
ISOBUTANE	75-28-5	5-80

***When this product is exposed to moisture, 3-5% acetic acid may be formed.

III. CHEMICAL AND PHYSICAL PROPERTIES

The information listed below refers to the base material only.

Vapor Pressure: 66 psig
Vapor Density: Heavier than air
Solubility in Water: Nil
Specific Gravity: 1.04
Boiling Point: None: Polymeric Material
Volatile Organic Compound (EPA Method 24): 4.6%
Evaporation Rate (Ether = 1): Not available
pH: Does not apply

The properties listed below apply to the base material only.

Appearance: Clear paste
Odor: Acetic acid

IV. FLAMMABILITY AND EXPLOSIVE PROPERTIES

Flash Point: 212°F (Base only) Method: Tag closed cup
Estimated NFPA Code:
- Health Hazard: 1
- Fire Hazard: 1
- Reactivity Hazard: 0
- Specific Hazard: Does not apply

Estimated HMIS Code:
- Health Hazard: 1
- Flammability Hazard: 1
- Reactivity Hazard: 0
- Personal Protection: See Section X.

Explosive Limits:
(% by volume in air)Lower: Acetic acid: 4%
(% by volume in air)Upper: Acetic acid: 19.9% at 200°F.
Recommended Extinguishing Agents: Carbon dioxide, water fog, dry chemical
Hazardous Products Formed by Fire or Thermal Decomp: Acetic acid, formaldehyde, silica fume.
Unusual Fire or Explosion Hazards: Containers may vent, rupture, or burst at elevated temperatures.
Compressed Gases: Propane/isobutane
Pressure at Room Temp.: 66 psig

V. SPILL OR LEAK AND DISPOSAL PROCEDURES

Steps to be taken in case of spill or leak: Wipe and/or scrape up spilled material. Maintain good ventilation for large spills. Place scrap material in a well-ventilated place and allow to cure to rubber.

Recommended methods of disposal: Cured rubber scrap can be incinerated. Follow EPA local regulations for disposal of aerosol cans.

Clear Silicone Adhesive Sealant

ITEM NO.	PART NO.	CONTAINER SIZE	ITEM NO.	PART NO.	CONTAINER SIZE
81856	66LA	4.5 oz Pressurized Can	81913	81913	8 oz Pressurized Can

V. SPILL OR LEAK AND DISPOSAL PROCEDURES (continued)

VI. STORAGE AND HANDLING PROCEDURES

Storage: Store in dry area, below 120°F away from heat, spark or open flame.
Handling: Avoid breathing vapor. Avoid eye contact or prolonged skin contact. Do not puncture containers.

VII. SHIPPING REGULATIONS

DOT (49 CFR 172)
- Proper Shipping Name: Ground: Consumer Commodity; Air: Consumer Commodity
- Hazard Class or Division: Ground: ORM-D; Air: ORM D-Air
- Identification Number: None

IATA
- Proper Shipping Name: Aerosols, flammable, n.o.s.
- Class or Division: Class 2.1
- UN or ID Number: UN 1950

IMO
- Substance: Aerosols
- Marine Pollutant Status: Non-pollutant
- Class: Class 9
- Subsidiary Risk Label: Does not apply
- IMDG Code Page: 9022
- UN Number: UN 1950

VIII. REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will not occur.
Hazardous Decomposition Products (non-thermal): Acetic acid fumes.
Incompatability: Adhesive is polymerized by contact with moisture. Acetic acid liberated.

IX. EMERGENCY TREATMENT PROCEDURES

Ingestion: Do not induce vomiting. Keep individual calm. Obtain medical attention.
Inhalation: Remove to fresh air. Treat symptomatically.
Skin Contact: Wipe off paste with paper towel or cloth. Wash exposed area with soap and water.
Eye Contact: Flush at least 15 minutes with water. Obtain medical attention.

X. PERSONAL PROTECTION

Eyes: Safety glasses or goggles.
Skin: Rubber or plastic gloves.
Ventilation: Provide local ventilation for prolonged use in a confined area.

XI. HEALTH HAZARD DATA

Toxicity: Eye and skin irritant.
Primary Routes of Entry: None known
Signs and Symptoms of Exposure: Acetic acid produced during cure irritates eyes, nose throat. May cause moderate corneal injury to eyes. Inhalation may cause difficulty in breathing. Ingestion may cause vomiting.
Existing Conditions Aggravated by Exposure: Heart disease and respiratory disorders. Methyltriacetoxysilane: Eye, skin, and pulmonary disorders.

Exposure Limits (TWA) Ingredients	ACGIH (TLV)	OSHA (PEL)	OTHER
SEALANT			
SILICA, AMORPHOUS (FUMED)	10mg/m3 TWA	6mg/m3 TWA	None
ACETIC ACID	10 ppm TWA 25 mg/m3	10 ppm TWA 25 mg/m3	None

PERMATEX INDUSTRIAL
705 North Mountain Road
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Clear Silicone Adhesive Sealant

XI. HEALTH HAZARD DATA (continued)

Ingredients	Exposure Limits (STEL) ACGIH (TLV)	OSHA (PEL)	
PROPELLANT			
PROPANE	Asphyxiant	1000 ppm 1800 mg/m3	None
SEALANT			
ACETIC ACID	15 ppm 37 mg/m3	None	

PROPELLANT

Ingredients for which no Exposure Limits have been established are not listed above.

Ingredients	Literature Referenced Target Organ and Other Health Effects	Carcinogen NTP	IARC	OSHA
SEALANT				
Poly(dimethylsiloxane), hydroxy terminated	No Data	NO	NO	NO
SILICA, AMORPHOUS (FUMED)	LUN	NO	N/A	NO
Ethyltriacetoxysilane	No Data	NO	NO	NO
Methyltriacetoxysilane	No Data	NO	NO	NO
ACETIC ACID	No Data	NO	NO	NO
PROPELLANT				
PROPANE	CAR NER	NO	NO	NO
ISOBUTANE	CAR LUN NER	NO	NO	NO

Abbreviations

N/A Not Applicable
LUN Lung
CAR Cardiac
NER Nervous System

XII. PREPARATION INFORMATION

Prepared By: Stephen Repetto
Title: Research Chemist, Environmental Health & Safety
Company: Loctite Corp., 705 N. Mt. Rd, Newington, CT 06111
(24hr.) Phone: (203) 278-1280
Revision Date: January 04, 1993 Revision: 0015

KMB00003618

56, A and B
Product (Common

MATERIAL SAFETY DATA SHEET

Manufacturer's Information

Magnolia Plastics, Inc. 5547 Peachtree Industrial Boulevard Chamblee, Georgia 30341	Emergency Telephone Number: 404-451-2777

Section I - Product Information

Common Name (Trade Name & Synonyms)	Macnobond 56, A and B	Chemical Family	Epoxy; Polyamide
Chemical Name	Epoxy Resin & Polyamide Curing Agent	CAS Number	Mixture

Section 2 - Hazardous Ingredients

Hazardous Components (Chemical Identity, Common Name)	%	ACGIH TLV (Un
Butyl Glycidyl Ether (BGE) BGE is mutagenic in vitro. Mutagenicity tests in mice gave mixed results.	4-8	25 ppm

Section 3 - Physical and Chemical Characteristics

Boiling Point, (°F)	>225	Specific Gravity (H_2O=1)	1.20
Vapor Pressure (mmHg)	Nil	Volatiles (% by volume)	0
Vapor Density (Air=1)	>1	Evaporation Rate (BuAc=1)	<1
Solubility in Water	Negligible		
Appearance and Odor	A: Smooth gray paste	B: Off-White semi-paste	

Section 4 - Fire and Explosion Data

Flash Point (Test Method): >200°F (PMCC)	Flammable Limits in Air % by volume	Lel NA	Uel NA

Extinguishing Media:

Water spray, foam, CO_2, dry chemical

Special Fire Fighting Precautions/Procedures:

Avoid breathing smoke. In confined areas, full fire fighting equipment including NIC self-contained breathing apparatus. Cool fire exposed containers with water.

Unusual Fire and Explosion Hazards:

None

Section 5 - Health Hazard Information

Threshold Limit Value	ANSI Hazard Class
Not established	A: 4 B: 4

Signs and Symptoms of Exposure

1. Acute Overexposure: A: Severely irritating to skin and eyes. Possible skin sensiti
B: Corrosive, Extremely irritating to eyes. Severe irritation skin.

2. Chronic Overexposure: A: Pre-existing skin & eye disorders may be aggravated.
B: Unknown

Routes of Exposure

Inhalation: A: May cause irritation to nose, throat and respiratory tract.
B: Vapors are irritating and may cause irritation of respiratory tract.

Ingestion: A: Moderately toxic. May be harmful.
B: Moderate toxicity. May cause burns of mouth and throat.

Skin Absorption: A: May possibly be absorbed through skin in toxic amounts.
B: Repeated or prolonged exposure may be harmful.

Eye Contact: A: Severely irritating
B: Moderate corneal damage.

Skin Contact: A: Severely irritating
B: May cause chemical burns. May develop allergic skin reaction

Carcinogenicity:	National Toxicology Program	IARC Monographs	OSHA
	No	No	No

Emergency and First Aid Procedures

Skin: Remove contaminated clothing. Wash from skin with soap & water. Launder clothing prior to re-use.

Eyes: Flush with water for 15 minutes while holding eyelids open. Get medical attention.

Inhalation: Remove victim to fresh air. Administer oxygen if necessary.

Ingestion: Do not induce vomiting. Give large doses of water. Get medical attention.

Section 6 - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	Elevated temperatures

Incompatability (Materials to Avoid): Strong oxidizing agents, strong acids and bases

Hazardous Decomposition Products: Oxides of carbon and nitrogen

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	Large mixtures in bulk. Curing process is exothermic.

KMB00003620

Section 7 - Spill or Leak Procedures

Steps To Be Taken If Material Is Spilled Or Released

Avoid contact with liquid and vapors. Wipe with a cloth or collect on absorbent material. Large spills: Dike & contain. Pump or shovel into salvage vessels.

Waste Disposal Method

Cure, then bury or incinerate where permitted by federal, state & local regulations. Remove salvage vessels to a waste disposal site operating in compliance with federal, state and local regulations.

Section 8 - Special Protection Information

Respiratory Protection (Specify Type)	For excessive vapors or to maintain below TLV limits. NIOSH approved respirator for organic vapors in compliance with 29 CFR 1910.13
Ventilation: Local Exhaust	Yes
Mechanical (General)	Yes
Other	N/A
Protective Gloves	Impervious Rubber
Eye Protection	Splash-proof chemical goggles
Other Protective Clothing or Equipment	For prolonged exposure, impervious clothing and boots to minimize personal contact. Eye-wash station, safety shower.

Section 9 - Special Precautions

Warning Statements

For Industrial Use Only

A: May cause skin irritation. Avoid contact with eyes.
B: Corrosive. May cause severe eye burns.

Precautions To Be Taken In Handling and Storage

Store in a cool, dry area in tightly closed containers. Avoid contact with skin & eyes. Use with adequate ventilation. Use good hygiene practices.

Other Precautions

RCRA Status: Not considered to be a hazardous waste
CERCLA Status: Not listed
DOT Class: A: Not regulated B: Corrosive Material, UN

This material safety data sheet (MSDS) has been prepared in compliance with the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. The information contained herein is based on data available to us and is believed to be accurate, However, Magnol Plastics, Inc. makes no warranty expressed or implied concerning the accuracy of the information contained herein. It is the user's responsibility to determine the safety, toxicity and suitability of the product described herein. All materials may present un health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

Date: New April 11, 1986
Revised August 4,1987

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER: RTV SEALANT - PRESSURIZED CONTAINER
M.C. #75544, 45, 46, 47
85544, 45, 46, 47

MANUFACTURERS NAME: Mechanics Choice, div. of Avnet
ADDRESS: P.O. BOX 7000, Ft. Washington, PA 19034
PHONE: 215-643-6020
PROPER SHIPPING NAME(49 CFR 172.101): CONSUMER COMMODITY
D.O.T. HAZARD NAME (49 CFR 172.101) COMPRESSED GAS
D.O.T. ID NO(49 CFR 172.101): 1956
D.O.T. HAZARD CLASS (49 CFR 172.101): CRM-D
RCRA HAZARD CLASS*(40 CFR 261): NONE
E.P.A. PRIORITY POLLUTANTS (40 CFR 122.53): NONE
HEALTH (NFPA): 1 FLAMABILITY (NFPA): 1 REACTIVITY (NFPA): 1
CAS.NO.: MIXTURE
GENERIC DESCRIPTION: SILICONE
* IF DISCARDED

SECTION II HAZARDOUS INGREDIENTS

Acetoxysilane	5 %	TLV (units): 10 ppm* * Based on Acetic Acid.

SECTION III HEALTH HAZARD DATA HEALTH (NFPA) 1

EFFECTS OF OVEREXPOSURE: Irritates eyes. Prolonged or repeated contact may irritate skin.

THRESHOLD LIMIT VALUE OF PRODUCT: 10 ppm (based on liberated acetic acid)

EMERGENCY AND FIRST AID PROCEDURES: Wipe off. Flush with water. Obtain medical attention for eyes if necessary.

SECTION IV FIRE AND EXPLOSION HAZARD DATA FLAMMABILITY (NFPA) 1

FLASH POINT (Method Used): Open Cup above 250°F/120°C
FLAMMABLE LIMITS IN AIR, % BY VOLUME: Lower: Not applicable
Upper: Not applicable
EXTINGUISHING MEDIA: Carbon dioxide or foam.
SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus and protective clothing should be worn in fighting fires involving chemicals.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Contents under pressure. High Temperatures may cause the container to rupture.

SECTION V PHYSICAL DATA

BOILING POINT: Above 300°F/149°C
SPECIFIC GRAVITY: 1.05
MELTING POINT: Not applicable
VAPOR PRESSURE: Less than 5 mm (RTV); 70 psig for pressurizing agent
VAPOR DENSITY (AIR=1): Not applicable
PERCENT VOLATILE BY VOLUME (%): Less than 5%
EVAPORATION RATE (ether =1): Less than 1
SOLUBILITY IN WATER (%): Less than 0.1%
FLASH POINT (method used): Open Cup above 250°F/120°C.
ODOR, APPEARANCE, COLOR: Acetic acid-like, paste, various.

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SECTION VI REACTIVITY DATA REACTIVITY (NFPA) 1

STABILITY: STABLE
CONDITIONS TO AVOID: AIR OR MOISTURE CAUSES POLYMERIZATION AND ACETIC ACID VAPORS ARE FORMED.

INCOMPATABILITY (MATERIALS TO AVOID): OXIDIZING MATERIAL CAN CAUSE A REACTION. HAZARDOU DECOMPOSITION PRODUCTS: SILICON DIOXIDE, CARBON DIOXIDE, AND TRACES OF INCOMPLETELY BURNED CARBON PRODUCTS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: NOT APPLICABLE

SECTION VII SPILL, LEAK AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: USE ABSORBENT MATERIAL TO COLLECT AND CONTAIN FOR SALVAGE OR DISPOSAL.

D.O.T.(49 CFR 171.8)/E.P.A.(40 CFR 117)SPILL REPORTING INFORMATION

HAZARDOUS SUBSTANCE:NONE RQ: NOT APPLICABLE
CONCENTRATION OF HAZARDOUS SUBSTANCE: NOT APPLICABLE
REPORTABLE QUANTITY OF PRODUCT: NOT APPLICABLE

SECTION VII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): ACID VAPOR TYPE.

VENTILATION
LOCAL EXHAUST: NONE SHOULD BE NEEDED.
SPECIAL: NONE KNOW TO BE REQUIRED
MECHANICAL (GENERAL): RECOMMENDED.
OTHER: NONE KNOW TO BE REQUIRED

PROTECTIVE GLOVES: RUBBER PLASTIC RECOMMENDED.

EYE PROTECTION: PROPER EYE PROTECTION SHOULD BE WORN IN ANY TYPE OF INDUSTRIAL OPERATION.
OTHER PROTECTIVE EQUIPMENT: AS REQUIRED BY YOUR COMPANY.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE BELOW 120°F/49 C
USE REASONABLE CARE.

OTHER PRECAUTIONS: NONE KNOWN TO BE REQUIRED

NOTE: NONE

THIS DATA IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESS OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE HOWEVER, THE USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.

MATERIAL SAFETY DATA SHEET

HILTI, INC.: P.O. Box 21148, Tulsa, OK 74121; Ph: 1 800 879 6000; Emergency No.: 1 800 879 4444

PRODUCT: HVU

DESCRIPTION: Adhesive anchor system in foil capsules

For: KINDER MORGAN BULK TERM +
P O BOX 83838
PORTLAND, OR 97283

P.O. No. 8400

INGREDIENTS AND EXPOSURE LIMITS

INGREDIENTS:	CAS NUMBER:	PEL:	TLV:	STEL:
Silicon dioxide (quartz sand)	14808-60-7	NA	NA	NE
Resin	19136100-5001p *	NE	NE	NE
Dicyclohexyl phthalate	00084-61-7	NE	NE	NE
Dibenzoyl peroxide	00094-36-0	NA	NA	NE

PEL = OSHA Permissible Exposure Limit. **TLV** = ACGIH Threshold Limit Value. These are 8 hour time-weighted averages unless otherwise indicated by **"C"** (Ceiling) or **"STEL"** (Short Term Exposure Limit). **NA** = Not Applicable. **NE** = None Established. * = New Jersey trade Secret Registry Number.

PHYSICAL DATA

APPEARANCE AND ODOR: Yellowish paste. Ester-like odor.

pH: Not Determined

BOILING POINT: Not Determined.

MELTING POINT: Not Determined

VOC CONTENT: None

VAPOR PRESSURE: Not Applicable

VAPOR DENSITY: Not Determined

EVAPORATION RATE: Not Determined

SOLUBILITY IN WATER: Insoluble

SPECIFIC GRAVITY: 1.1 resin; 2.6 (sand)

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: > 200° F

FLAMMABLE LIMITS: Not Applicable

EXTINGUISHING MEDIA: Water fog, CO_2, dry chemical, foam

SPECIAL FIRE FIGHTING PROCEDURES: A self-contained breathing apparatus and protective clothing should be worn when fighting fires involving chemical products.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None Known

REACTIVITY DATA

INCOMPATIBILITY: Strong oxidizers, peroxides, acids

STABILITY: Stable.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to decomposition, can yield CO_X and NO_X.

HAZARDOUS POLYMERIZATION: Will not occur. Dibenzoyl peroxide decomposes at temperatures >50º C.

CONDITIONS TO AVOID: Excessive heat for prolonged periods of time.

HEALTH HAZARD DATA

KNOWN HAZARDS: Eye and skin irritation. Possibly sensitization.

CARCINOGENICITY: IARC classifies crystalline silica (quartz sand) as a Gp I carcinogen based upon evidence among workers in industries where there has been long-term and chronic exposure (via inhalation) to silica dust; e.g. mining, quarry, stone crushing, refractory brick and pottery workers. This product does not pose a dust hazard; therefore, this classification is not relevant.

PRIMARY ROUTES OF EXPOSURE: Dermal.

SIGNS AND SYMPTOMS OF EXPOSURE: **Eyes** - can cause temporary discomfort (itching, dryness, redness, etc.). **Skin** - no effects expected during normal use. Prolonged and repeated contact may irritate the skin. Can possibly cause sensitization is susceptible individuals. **Inhalation** - No effects expected. **Ingestion** - Not considered a route of exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Eye and skin conditions.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Immediately flush with plenty of water while holding eyelids apart. Contact a physician if effects occur.

SKIN: Wipe off material and wash with soap and water. Launder contaminated clothing before reuse.

INHALATION: Move victim to fresh air if discomfort develops. If symptoms persist, consult a physician.

INGESTION: Give plenty of water to drink. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician. Call a physician immediately.

OTHER: Referral to a physician is recommended if there is any question about the seriousness of the injury/exposure.

CONTROL MEASURES AND PERSONAL PROTECTIVE EQUIPMENT

VENTILATION: General (natural or mechanically induced fresh air movements).

EYE PROTECTION: Safety glasses or goggles are recommended.

SKIN PROTECTION: Gloves (cotton or impermeable) are recommended.

RESPIRATORY PROTECTION: None normally required. Never enter a confined space without an appropriate air-supplied respirator (e.g. SCBA or airline with escape pack).

PRECAUTIONS FOR SAFE HANDLING AND USE

HANDLING AND STORING PRECAUTIONS: Observe good hygiene practices; i.e. do not eat, drink or smoke while using. Wash hands after using and before meals. Store in a dry place between 41 and 77º F. Keep from freezing. For industrial use only. Keep out of reach of children.

SPILL PROCEDURES: Allow to cure. Scrape up spilled material and place in a closed container for disposal.

REGULATORY INFORMATION

HAZARD COMMUNICATION: Prepared in accordance with the federal OSHA Hazard Communication Standard.

HMIS CODES: Health 1, Flammability 0, Reactivity 0, PPE A

DOT SHIPPING NAME: Non-regulated.

TSCA INVENTORY STATUS: Chemical components listed on TSCA inventory.

SARA TITLE III, SECTION 313: This product contains 1 - 5% dibenzoyl peroxide (CAS 94-36-0) which is subject to reporting under Section 313 of SARA Title III (40 CFR Part 372).

WASTE DISPOSAL METHODS: Consult with regulatory agencies or corporate personnel for disposal methods that comply with local, state and federal health and environmental regulations.

HEALTH / SAFETY CONTACTS: Steve Gerrard (x6309)
Jerry Metcalf (x6704)

The information and recommendations contained herein are based upon data believed to be correct; however, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

KMB00003625

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A0349

Associated Grainger Items

3W967

M A T E R I A L S A F E T Y D A T A S H E E T

HMIS CODES: H F R

1 0 0

========== SECTION I - CHEMICAL PRODUCT & COMPANY ==========

PRODUCT NAME: SET CEMENT GLUE

PRODUCT CODE: 3W967

MANUFACTURER'S NAME: BIL-DRY

ADDRESS : 5525 GRAYS AVENUE

PHILADELPHIA PA 19143

EMERGENCY PHONE :(CHEMTREC)800-424-3830 DATE PRINTED : 02/03/00

INFORMATION PHONE : 215-724-1000

========== SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS ==========

VAPOR PRESSURE

WEIGHT

REPORTABLE COMPONENTS CAS NUMBER MM HG @ TEMP

PERCENT

*** NO REPORTABLE QUANTITIES OF HAZARDOUS INGREDIENTS ARE PRESENT ***

ABBREVIATIONS: NE - NOT ESTABLISHED, N/A - NOT APPLICABLE, [CL] - CEILING LIMIT, D - NUISANCE PARTICLE TVL 10 MG/M3 TOTAL DUST, [C] - CARCINOGEN, [PC] - POTENTIAL CARCINOGEN, DD - INERT OR NUISANCE DUST PEL 15 MG/M3 TOTAL DUST, [1] NOT ESTABLISHED OR USE STODDARD SOLVENT AS A GUIDE.

*** NO TOXIC CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF

TITLE III AND OF 40 CFR 372 ARE PRESENT. ***

========== SECTION III - HAZARDS IDENTIFICATION ==========

* EMERGENCY OVERVIEW *

NO SPECIAL CONDITONS APPLY.

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: INHALATION, SKIN CONTACT/ABSOBTION, AND EYE CONTACT.

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

INFORMATION IS BASED ON MATERIALS USED IN THIS PRODUCT. THE FOLLOWING SECTION INCLUDES SIGNS AND SYMTOMS OF OVEREXPOSURE.

ACUTE INHALATION.....: NONE KNOWN, BUT THE INHALATION OF ANY FOREIGN MATERIAL SHOULD BE AVOIDED.

CHRONIC INHALATION.....: NONE KNOWN. BUT PROLONGED INHALATION OF DUST OR VAPORS SHOULD BE AVOIDED.

ACUTE SKIN CONTACT.....: MAY CAUSE IRRITATION.

CHRONIC SKIN CONTACT.....: REPEATED OR PROLONGED CONTACT CAN CAUSE PERSISTANT IRRITATION OR DERMATITUS.

ACUTE EYE CONTACT.....: MAY CAUSE IRRITATION.

CHRONIC EYE CONTACT.....: NONE KNOWN

ACUTE INGESTION.....: CAN CAUSE GASTROINTSTESTINAL IRRITATION, VOMITING, NAUSEA AND DIARRHEA.

M A T E R I A L S A F E T Y D A T A S H E E T

CHRONIC INGESTION.....: NOT A LIKELY FORM OF EXPOSURE. LOW TOXICITY. IF SUBSTANSIAL QUANTITIES ARE INGESTED, SEEK MEDICAL ATTENTION.

CARCINOGENICITY

NTP.....: NO

IARC....: NO

OSHA....: NO

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: CHRONIC REPSIRATORY CONDITIONS.

SKIN

ALLERGIES, ECZEMA.

==========SECTION IV FIRST AID MEASURES ==========

FIRST AID FOR EYES.....: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

FIRST AID FOR SKIN.....: WASH AFFECTED AREA WITH SOAP AND WATER. WASH CONTAMINATED CLOTHING BFORE USE.

FIRST AID FOR INHALATION.....: NOT LIKLY. BUT IF TROUBLE BREATHING, REMOVE TO FRESH AIR, CALL A PHYSICIAN.

FIRST AID FOR INGESTION.....: DO NOT INDUCE VOLMITING. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. CALL A PHYSICIAN.

========== SECTION V FIRE FIGHTING MEASURES ==========

FLASH POINT....: N/A BOILS

UPPER EXPLOSIVE LIMIT.....: NE

LOWER EXPLOSIVE LIMIT.....: NE

EXTINGUISHING MEDIA.....: FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIREFIGHTING PROCEDURES.....: NOT FLAMMABLE.

UNUSUAL FIRE AND EXPLOSION HAZARDS.....: NONE KNOWN

========== SECTION VI ACCIDENTAL RELEASE MEASURES ==========

SPILL OR LEAK PROCEDURES.....: SOAK UP WITH ABSORBANT MATERIAL AND REMOVE TO A CLOSED CONTAINER. WASH AREA WITH MILD DETERGENT AND WATER.

========== SECTION VII HANDLING AND STORAGE ==========

STORAGE TEMPERATURE (MIN./MAX.).....: 41 F (5 C) TO 74 F (20 C)

SHELF LIFE.....: 6 MONTHS IN ORIGINAL SEALED CONTAINER.

SPECIAL SENSITIVITY.....: NONE KNOWN.

HANDLING AND STORAGE PRECAUTIONS....: NO SPECIAL PRECAUTIONS.

========== EXPOSURE CONTROLS/PERSONAL PROTECTION ==========

EYE PROTECTION REQUIREMENTS.....: SOLVENT RESISTANT SAFETY EYEWEAR WITH SPLASH GUARDS OR SIDE SHIELDS IS RECOMMENDED. CONTACT LENSES SHOULD NOT BE WORN.

SKIN PROTECTION REQUIREMENTS.....: CHEMICAL RESISTANT GLOVES SHOULD BE WORN.

RESPIRATORY/VENILATION REQUIREMENTS.....: USE NIOSH APPROVED RESPIRATOR UNDER APPROPRIATE OSHA STANDARDS AND REGULATIONS. A COMBINATION OF BOTH PROPER VENTILATION AND RESPIRATORY PROTECTION WOULD TEND TO ELIMINATE MOST RISKS.

EXPOSURE LIMITS.....: NOT ESTABLISHED FOR PRODUCT AS A WHOLE, REFER TO SECTION II.

========== SECTION IX PHYSICAL AND CHEMICAL PROPERTIES ==========

PHYSICAL FORM.....: LIQUID

COLOR.....: MILKY WHITE

ODOR.....: SOAPY SWEET LATEX ODOR

BOILING POINT.....: 212 F

MELT POINT/FREEZE POINT: LIQUID, FREEZE AT 32F

PH.....: 5.4

SOLUBILITY IN WATER....: DISPERSIBLE.

SPECIFIC GRAVITY.....: 1.03

BULK DENSITY.....: 8.61 LB/GL

% VOLATILE BY WEIGHT....: 0.00 LB/GL

VAPOR PRESSURE.....: N/A

VAPOR DENSITY.....: UNKNOWN

========== SECTION X - REACTIVITY ==========

STABILITY.....: STABLE

HAZARDOUS POLYMERIZATION.....: WILL NOT OCCUR

INCOMPATIBILITIES.....: MINERAL ACIDS, ALKALIS

DECOMPOSITION PRODUCTS.....: MAY YIELD CARBON OXIDES AND TOXIC MONOMER FUMES.

========== SECTION XI - TOXICOLOGICAL INFORMATION ==========

CONCENTRATED PRODUCT WAS A NON-IRRITANT TO THE EYES OF A RABBIT. NON-IRRITANT TO THE SKIN OF A RABBIT.

========== SECTION XII - ECOLOGICAL INFORMATION ==========

NO INFORMATION IS AVAILABLE FOR PRODUCT AS A WHOLE.

REASON FOR ISSUE.....: REVISED FORMAT

PREPARED BY.....: JOHN J. DORAN

APPROVED BY.....: JOHN J. DORAN

TITLE.....: OPERATIONS MANAGER

APPROVAL DATE.....: APRIL 01, 1999

SUPERSEDES DATE.....: ALL PREVIOUS ISSUES

DISCLAIMER....: THIS PRODUCTS SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESING COMPLIANCE WITH HEALTH/SAFETY/ENVIROMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY USE, OR ANY OTHER WARRANTY IS EXPRESSED OR TO BE IMPLIED, REGARDING THE ACCURACY OF THIS DATA, THE RESULTS TO BE OBTAINED FROM THE USE THEREOF, OR THE HAZARDS CONNECTED WITH THE USE OF THE PRODUCT. SINCE THE USE OF THIS PRODUCT IS

M A T E R I A L S A F E T Y D A T A S H E E T

WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USERS OBLIGATION TO DETERMINE THE SAFE USE OF THIS PRODUCT. SUCH CONDITIONS SHOULD COMPLY WITH ALL THE FEDERAL REGULATIONS CONCERNING THE PRODUCT. THE "SELLER" ASSUMES NO LIABILITY FOR ANY INJURY OR DAMAGE, DIRECT OR CONSEQUENTIAL, RESULTING FROM THE USE OF THIS PRODUCT UNLESS SUCH INJURY OR DAMAGE IS ATTRIBUTABLE TO NEGLIGENCE ON THE PART OF THE "SELLER".

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Part No.: 0113 | Page 1

TITANIUM PUTTY RESIN

This product appears in the following stock number(s):
10760 10770 PT-500

Last revised: 11/01/01
Printed: 3/25/2002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Tradename: TITANIUM PUTTY RESIN
Product identifier: EPOXY RESIN
General use: This information applies to the resin component of the two-part kit; handle freshly-mixed resin and hardener as recommended for the hardener. After curing, the product is not hazardous.
Chemical family: Epoxy resin

MANUFACTURER
ITW Devcon
30 Endicott St.
Danvers, MA 01923

EMERGENCY INFORMATION
Emergency telephone number
(CHEMTREC): **(800) 424-9300**
Other Calls: **(978) 777-1100**

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS CONSTITUENTS — **Exposure limits**

Constituent	Abbr.	CAS No.	Weight percent	ACGIH TLV	OSHA PEL	Other Limits
Bisphenol A diglycidyl ether resin	DGEBPA	25068386	25-35	n/e	n/e	n/e

"TLV" means the Threshold Limit Value exposure (eight-hour, time-weighted average, unless otherwise noted) established by the American Conference of Governmental Industrial Hygienists. "STEL" indicates a short-term exposure limit. "PEL" indicates the OSHA Permissible Exposure Limit."n/e" indicates that no exposure limit has been established. An asterisk (*) indicates a substance whose identity is a trade secret of our supplier and unknown to us.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance, form, odor: viscous liquid with little odor.

WARNING! Eye and skin irritant. Potential skin sensitizer.

Potential health effects

Primary routes of exposure: ☒ Skin contact ☐ Skin absorption ☒ Eye contact ☐ Inhalation ☐ Ingestion

Symptoms of acute overexposure:

Skin: Moderate irritant. Contact at elevated temperatures can cause thermal burns which may result in permanent damage. May cause skin sensitization (itching, redness, rashes, hives, burning, swelling).

Eyes: Moderate irritant (stinging, burning sensation, tearing, redness, swelling). Contact at elevated temperatures can cause thermal burns which may result in permanent damage or blindness.

Inhalation:
The low vapor pressure of the resin makes inhalation unlikely in normal use. In applications where vapors (caused by high temperature) or mists (caused by mixing) are created, breathing may cause a mild burning sensation in the nose, throat and lungs.

Ingestion:
Acute oral toxicity is low. May cause gastric distress (nausea, vomiting, diarrhea).

Effects of chronic overexposure:
Prolonged or repeated skin contact may cause sensitization, with itching, swelling, or rashes on later exposure.

Carcinogenicity – OSHA regulated: No **ACGIH: No** **National Toxicology Program: No**
International Agency for Research on Cancer: No
Cancer-suspect constituent(s) : None

Medical conditions which may be aggravated by exposure:
Preexisting eye and skin disorders (e.g. eczema). Development of preexisting skin or lung allergy symptoms may increase.

Other effects:
See section 11.

4. FIRST AID MEASURES

First aid for eyes:
Flush eye with clean water for at least 20 minutes while gently holding eyelids open, lifting upper and lower lids. Get immediate medical attention.

First aid for skin:
Immediately remove contaminated clothing and excess contaminant. Flush skin with water for at least 15 minutes. Wash thoroughly with soap and warm water. Consult a physician if irritation develops.

First aid for inhalation:
Remove patient to fresh air. Administer oxygen if breathing is difficult. Get medical attention if symptoms persist.

First aid for ingestion:
Do NOT induce vomiting. Rinse mouth out with water, then sip water to remove taste from mouth. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips (if sitting) or to the side (if lying down) to prevent aspiration. Get medical attention.

5. FIRE FIGHTING MEASURES

Extinguishing media:
☐ Water ☒ Carbon dioxide ☒ Dry chemical ☒ Foam ☐ Alcohol foam

Flash Point (°F): >400 **Method:** PMCC

Explosive limits in air (percent) – Lower: n/d **Upper:** n/d

Special firefighting procedures:
Material will not burn unless preheated. Do not enter confined space without full bunker gear. Firefighters should wear self-contained breathing apparatus and protective clothing. Cool fire exposed containers with water.

Unusual fire and explosion hazards:
Heating above 300 deg F in the presence of air may cause slow oxidative decomposition and above 500 deg F may cause polymerization. Personnel in vicinity and downwind should be evacuated.

Hazardous products of combustion:
When heated to decomposition it emits fumes of Cl- , carbon monoxide, other fumes and vapors varying in composition and toxicity.

6. ACCIDENTAL RELEASE MEASURES

Spill control:
Avoid personal contact. Eliminate ignition sources. Ventilate area.

Containment:
Dike, contain and absorb with clay, sand or other suitable material.

Cleanup:
For large spills, pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand, or other suitable material and dispose of properly. Flush area with water to remove trace residue.

Special procedures:
Prevent spill from entering drainage/sewer systems, waterways, and surface waters. Collect run-off water and transfer to drums or tanks for later disposal. Notify local health authorities and other appropriate agencies if such contamination occurs.

7. HANDLING AND STORAGE

Handling precautions:
Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after using and particularly before eating, drinking, smoking, applying cosmetics, or using toilet facilities.
Launder contaminated clothing and protective gear before reuse. Discard contaminated leather articles.
Handle mixed resin and hardener in accordance with the potential hazard of the curing agent used. Provide appropriate ventilation/respiratory protection against decomposition products (see Section 10) during welding/flame cutting operations and to protect against dust during sanding/grinding of cured product.

Storage:
Store in a cool, dry area away from high temperatures and flames.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

Ventilation :
Use ventilation that is adequate to keep employee exposure to airborne concentrations below exposure limits (or to the lowest feasible levels when limits have not been established). Although good general mechanical ventilation is usually adequate for most industrial applications, local exhaust ventilation is preferred (see ACGIH - Industrial Ventilation). Local exhaust may be required for confined areas (see OSHA 1910.146).

Other engineering controls :
Have emergency shower and eye wash available.

Personal protective equipment

Eye and face protection:
Chemical goggles if liquid contact is likely, or Safety glasses with side shields.

Skin protection:
Chemical-resistant gloves (i.e. butyl) and other gear as required to prevent skin contact.

Respiratory protection:
None needed in normal use with proper ventilation. In poorly ventilated areas use NIOSH approved organic vapor cartidge respirator for uncured resin, dust/particle respirator during grinding/sanding operations for cured resin, or fresh airline respirator as exposure levels dictate (see OSHA 1910.134).

9. PHYSICAL AND CHEMICAL PROPERTIES

Specific gravity:	2.5	**Boiling point (°F):**	>500
Melting point (°F):	n/d	**Vapor density (air = 1):**	>1
Vapor pressure (mmHg):	0.03 mm Hg at 171 °F	**Evaporation rate (butyl acetate = 1):**	<<1
VOC (grams/liter):	0	**Solubility in water:**	Negligible
Percent volatile by volume:	0	**pH (5% solution or slurry in water):**	neutral
Percent solids by weight:	100		

10. STABILITY AND REACTIVITY

This material is chemically stable. Hazardous polymerization will not occur.

Conditions to avoid :
Open flame and extreme heat

Incompatible materials:
Strong Lewis or mineral acids, strong oxidizing agents, strong mineral and organic bases (especially primary and secondary aliphatic amines).

Hazardous products of decomposition:
Oxides of carbon; aldehydes, acids and other organic substances may be formed during combustion or elevated temperature (>500 deg F) degradation.

Conditions under which hazardous polymerization may occur:
Heat is generated when resin is mixed with curing agents; Run-a-way cure reactions may char and decompose the resin, generating unidentified fumes and vapors which may be toxic.

11. TOXICOLOGICAL INFORMATION

Acute oral effects: LD50 (rat): Not available.

Acute dermal effects: LD50 (rabbit): Not available.

Acute inhalation effects: LC50 (rat): Not available. **Exposure:** hours.

Eye irritation:
Not available.

Subchronic effects:
No data available.

Carcinogenicity, teratogenicity, and mutagenicity:
1) MUTAGENICITY: Liquid resins based on diglycidyl ether of Bisphenol A (DGEBPA), have proved to be inactive when tested by in vivo mutagenicity assays. These resins have shown activity in in vitro microbial mutagenicity

screening and have produced chromosomal aberrations in cultured rat liver cells. The significance of these tests to man is unknown. 2) CARCINOGENICITY: Recent 2-year bioassays in rats and mice exposed by the dermal route to DGEBPA yielded no evidence of carcinogenicity to the skin or any other organs. This study clarifies prior equivocal results from a 2-year mouse skin painting study, which were suggestive, but not conclusive, for weak carcinogenic activity. 3) The International Agency for Research on Cancer (IARC) concluded that DGEBPA is not classifiable as a carcinogen (IARC group 3), that is human and animal evidence of carcinogenicity is inadequate.

Other chronic effects:

DGEBPA: Prolonged or repeated skin contact may cause sensitization, with itching, swelling, or rashes on later exposure. Studies have shown bisphenol A diglycidyl ether resin to cause allergic contact dermititis.

Toxicological information on hazardous chemical constituents of this product:

Constituent	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 4hr, (rat)
Bisphenol A diglycidyl ether resin	11.4 g/kg	>20 ml/kg	no deaths

'n/d' = 'not determined'

12 ECOLOGICAL INFORMATION

Ecotoxicity:
No data available.

Mobility and persistence:
No data available.

Environmental fate:
No data available.

13. DISPOSAL CONSIDERATIONS

Please see also Section 15, Regulatory Information.

Waste management recommendations:
If this resin becomes a waste, it would not be a hazardous waste by RCRA criteria (40CFR 261). Dispose of according to applicable federal, state, and local regulations. Incineration is the preferred method of disposal.

14. TRANSPORT INFORMATION

Proper shipping name:	Non-regulated
Technical name :	N/A
Hazard class :	N/A
UN number:	N/A
Packing group:	N/A
Emergency Response Guide no.:	N/A
IMDG page number:	N/A
Other:	N/A

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA
All ingredients of this product are listed, or are exempt from listing, on the TSCA inventory.

The following RCRA code(s) applies to this material if it becomes waste:
None

Regulatory status of hazardous chemical constituents of this product:

Constituent	Extremely Hazardous*	Toxic Chemical**	CERCLA RQ (lbs)	TSCA 12B Export Notification
Bisphenol A diglycidyl ether resin	No	No	0.0	Not required

*Consult the appropriate regulations for emergency planning and release reporting requirements for substances on the SARA Section 301 Extremely Hazardous Substance list.

**Substances for which the "Toxic Chemical" column is marked "Yes" are on the SARA Section 313 list of Toxic Chemicals, for which release reporting may be required. For specific requirements, consult the appropriate regulations.

For purposes of SARA Section 312 hazardous materials inventory reporting, the following hazard classes apply to this material: - Immediate health hazard – Delayed health hazard -

Canadian regulations

WHMIS hazard class(es): D2B
All components of this product are on the Domestic Substances List.

16. OTHER INFORMATION

Hazardous Materials Identification System (HMIS) ratings:	Health	Flammability	Reactivity
	2*	1	1

The information and recommendations in this document are based on the best information available to us at the time of preparation, but we make no other warranty, express or implied, as to its correctness or completeness, or as to the results of reliance on this document.

ITW Devcon | **Material Safety Data Sheet**
Part No.: 0214 | Page 1

TITANIUM PUTTY HARDENER

This product appears in the following stock number(s):
10760 10770 DE032

Last revised: 11/29/01
Printed: 3/25/2002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Tradename: TITANIUM PUTTY HARDENER
Product Identifier: EPOXY HARDENER
General use: The following information applies to the hardener component of the two-part kit for metal rebuild and repair compounds. When properly mixed and cured, the product is not hazardous.
Chemical family: Polyamine curing agent

MANUFACTURER
ITW Devcon
30 Endicott St.
Danvers, MA 01923

EMERGENCY INFORMATION
Emergency telephone number
(CHEMTREC): (800) 424-9300
Other Calls: (978) 777-1100

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS CONSTITUENTS — **Exposure limits**

Constituent	Abbr.	CAS No.	Weight percent	ACGIH TLV	OSHA PEL	Other Limits
Phenol		108952	< 10	5 ppm	5ppm	5 ppm (Canada)
Triethylenetetramine	TETA	112243	< 10	n/e	n/e	1 ppm (skin) (AIHA-WEEL)
Crystalline silica		14808607	< 1	0.05 mg/m3	10/(%Q+2) m	0.10 mg/m^3 (Canada)
Formaldehyde polymer with phenol and TETA		32610778	20-40	n/e	n/e	n/e
2-Ethyl-4-Methylimidazole		931362	< 10	n/e	n/e	n/e

"TLV" means the Threshold Limit Value exposure (eight-hour, time-weighted average, unless otherwise noted) established by the American Conference of Governmental Industrial Hygienists. "STEL" indicates a short-term exposure limit. "PEL" indicates the OSHA Permissible Exposure Limit "n/e" indicates that no exposure limit has been established. An asterisk (*) indicates a substance whose identity is a trade secret of our supplier and unknown to us.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance, form, odor: Off-white paste with ammoniacal odor.

WARNING! Eye, skin and respiratory irritant. Harmful if absorbed through skin. Potential skin sensitizer.

KMB00003635

Potential health effects

Primary routes of exposure: ☒ Skin contact ☒ Skin absorption ☒ Eye contact ☒ Inhalation ☐ Ingestion

Symptoms of acute overexposure:

Skin: Severe irritation or burns, necrosis, blistering and permanent injury. Product can be absorbed through the skin and may cause nausea, headache and general discomfort.

Eyes: Severe irritation or burns. May cause lacrimation, conjunctivitis, corneal damage and may cause permanent injury (including blindness).

Inhalation:

If the hardener is poorly ventilated, strongly heated or atomized, the vapor or mist can cause severe irritation of the respiratory tract, damage contacted tissue and produce scarring. Coughing and chest pain may result, nausea and vomiting in severe cases.

Ingestion:

Causes severe damage to mucous membranes if swallowed. Burning of mouth, throat, and stomach with abdominal and chest pain. May cause malaise, headache, discomfort bleeding and vomiting of blood. Aspiration may result in lung damage.

Effects of chronic overexposure:

Repeated skin contact or inhalation may cause sensitization, with asthmatic or allergic symptoms on subsequent exposure (itching, rash, defatting, swelling, nausea, faintness, headache). Repeated or prolonged exposure may cause adverse respiratory effects (cough, tightness of chest, shortness of breath), eye effects (conjunctivitis, corneal damage), skin effects (rash, irritation, corrosion), liver effects (jaundice, liver enlargement), or kidney effects (edema, proteinuria). Effects from inhalation of vapors may be delayed.

Carcinogenicity – OSHA regulated: No **ACGIH: No** **National Toxicology Program: Yes**

International Agency for Research on Cancer: Yes

Cancer-suspect constituent(s) : silica

Medical conditions which may be aggravated by exposure:

Eye disease, skin disorders and allergies, asthma and respiratory diseases (e.g. Bronchitis, Emphysema). Kidney and liver disorders.

Other effects:

Repeated and/or prolonged exposure to low concentrations of vapor may cause: sore throat, eye irritation, nausea, faintness, headache, which are transient. Corneal edema may give rise to a perception of "blue haze" or "fog" around lights which is transient and has no known residual effect.

4. FIRST AID MEASURES

First aid for eyes:

Flush eye with clean water for at least 20 minutes while gently holding eyelids open, lifting upper and lower lids. Get immediate medical attention.

First aid for skin:

Immediately remove contaminated clothing and excess contaminant. Flush skin with water for at least 15 minutes. Wash thoroughly with soap and warm water. Consult a physician if irritation develops.

First aid for inhalation:

Remove patient to fresh air. Administer oxygen if breathing is difficult. Get medical attention if symptoms persist.

First aid for ingestion:

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips (if sitting) or to the side (if lying down) to prevent aspiration. Get immediate medical attention.

KMB00003636

5. FIRE FIGHTING MEASURES

General fire and explosion characteristics:
Class IIIB.

Extinguishing media:
☒ Water ☒ Carbon dioxide ☒ Dry chemical ☐ Foam ☒ Alcohol foam

Flash Point (°F): 277 **Method:** PMCC

Explosive limits in air (percent) – Lower: n/d **Upper:** n/d

Special firefighting procedures:
Do not enter confined space without full bunker gear. Firefighters should wear self-contained breathing apparatus and protective clothing to prevent all skin and eye contact with this material. Cool fire exposed containers with water.

Unusual fire and explosion hazards:
Sudden reaction and fire may result if product is mixed with an oxidizing agent. Personnel in vicinity and downwind should be evacuated.

Hazardous products of combustion:
Acrid and toxic fumes with organic amines, ammonia, oxides of carbon and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Spill control:
Avoid personal contact. Evacuate area. Eliminate ignition sources. Ventilate area.

Containment:
Dike, contain and absorb with clay, sand or other suitable material.

Cleanup:
For large spills, pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand, or other suitable material and dispose of properly. Flush area with water to remove trace residue. Clean-up waste water should be placed in appropriate containers for proper disposal.

Special procedures:
Prevent spill from entering drainage/sewer systems, waterways, and surface waters. Collect run-off water and transfer to drums or tanks for later disposal. Notify local health authorities and other appropriate agencies if such contamination occurs.

7. HANDLING AND STORAGE

Handling precautions:
Avoid breathing vapors. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after using and particularly before eating, drinking, smoking, applying cosmetics, or using toilet facilities.
Launder contaminated clothing and protective gear before reuse. Discard contaminated leather articles.
Handle mixed resin and hardener in accordance with the potential hazard of the curing agent used. Provide appropriate ventilation/respiratory protection against decomposition products (see Section 10) during welding/flame cutting operations and to protect against dust during sanding/grinding of cured product. Do NOT mix with sodium nitrite or other nitrosating agents as cancer-causing nitrosamines could be formed.

Storage:
Store in a cool, dry area away from high temperatures and flames. Do not store in reactive metal containers. Keep away from acids, oxidizers. Keep container tightly closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

Ventilation :
Use ventilation that is adequate to keep employee exposure to airborne concentrations below exposure limits (or to the lowest feasible levels when limits have not been established). Although good general mechanical ventilation is usually adequate for most industrial applications, local exhaust ventilation is preferred (see ACGIH - Industrial Ventilation). Local exhaust may be required for confined areas (see OSHA 1910.146).

Other engineering controls :
Have emergency shower and eye wash available.

Personal protective equipment

Eye and face protection:
Chemical goggles if liquid contact is likely, or safety glasses with side shields.

Skin protection:
Chemical-resistant rubber gloves and other protective gear as needed to prevent skin contact.

Respiratory protection:
None needed in normal use with proper ventilation. In poorly ventilated areas use NIOSH approved organic vapor cartidge respirator for uncured resin, dust/particle respirator during grinding/sanding operations for cured resin, or fresh airline respirator as exposure levels dictate (see OSHA 1910.134).

9. PHYSICAL AND CHEMICAL PROPERTIES

Specific gravity:	1.78	**Boiling point (°F):**	>350
Melting point (°F):	liquid	**Vapor density (air = 1):**	n/d
Vapor pressure (mmHg):	<10.4 at 70 °F	**Evaporation rate (butyl acetate = 1):**	n/d
VOC (grams/liter):	0	**Solubility in water:**	Appreciable
Percent volatile by volume:	0	**pH (5% solution or slurry in water):**	9.5-10.0
Percent solids by weight	100		

10. STABILITY AND REACTIVITY

This material is chemically stable. Hazardous polymerization will not occur.

Conditions to avoid :
Extreme heat or open flame. Product slowly corrodes copper, aluminum, zinc and galvanized surfaces.

Incompatible materials:
Oxidizers, acids, Cl-organic cmpds. Reactive metals (e.g. Na, Ca, zinc). Sodium/calcium hypochlorite. Nitrous acid/ oxide, nitrites. Peroxides. Mat'ls reactive with hydroxyl cmpds.

Hazardous products of decomposition:
Acrid and toxic fumes with organic amines, ammonia, oxides of carbon and nitrogen. Nitric acid. Nitrosamines. Aldehydes.

Conditions under which hazardous polymerization may occur:
Heat is generated when resin is mixed with curing agents; Run-a-way cure reactions may char and decompose the

resin, generating unidentified fumes and vapors which may be toxic.

11. TOXICOLOGICAL INFORMATION

Acute oral effects: LD50 (rat): > 2200 mg/kg
Phenol is a human poison by ingestion.

Acute dermal effects: LD50 (rabbit): Not available.
A moderate irritant to the skin of a rabbit. Phenol is rapidly absorbed through the skin and can cause death. TETA is toxic by skin absorption.

Acute inhalation effects: LC50 (rat): Not available. Exposure: hours.

Eye irritation:
A severe irritant to the eye of a rabbit.

Subchronic effects:
Absorption of phenolic solutions through the skin may be very rapid and cause death. Lesser exposures can cause damage to the kidneys, liver, pancreas and spleen, and edema of the lungs.

Carcinogenicity, teratogenicity, and mutagenicity:
TETA has tested positive in screening tests for mutagenicity. TETA was found fetotoxic and teratogenic when fed to rats at 0.83% and 1.67% of diet. When applied dermally to the skin of pregnant guinea pigs, there was a 90% abortion rate or death of fetus with developmental anomolies. Phenol has been shown to produce fetotoxic effects in laboratory animals. Phenol has been shown to be a mutagenic in germ cells, in vivo.

Other chronic effects:
It has been generally observed in animal studies that aliphatic amines can cause changes in the lungs and heart. TETA has been found to produce liver and kidney damage and brain congestion in dermally exposed animals. Sensitization has occurred in laboratory animals after repeated exposures to TETA. Repeated overexposure to phenol can cause effects on the heart and nervous system including changes in heart rate, blood pressure, respiration, as well as tremors and lung disorders. Chronic exposures can cause death from liver and kidney damage.

Toxicological information on hazardous chemical constituents of this product:

Constituent	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 4hr, (rat)
Phenol	317 mg/kg	630 mg/kg	> 3600 mg/m^3
Triethylenetetramine	2500 mg/kg	805 mg/kg	n/d
Crystalline silica	n/d	n/d	n/d
Formaldehyde polymer with phenol and TETA	n/d	n/d	n/d
2-Ethyl-4-Methylimidazole	3400 mg/kg	>2000 mg/kg	>10 mg/L

'n/d' = 'not determined'

12 ECOLOGICAL INFORMATION

Ecotoxicity:
No data.

Mobility and persistence:
Phenol: Biodegradability = 99.5% at 7days.

Environmental fate:

No data.

13. DISPOSAL CONSIDERATIONS

Please see also Section 15, Regulatory Information.

Waste management recommendations:
If this resin becomes a waste, it would not be a hazardous waste by RCRA criteria (40CFR 261). Dispose of according to applicable federal, state, and local regulations. Incineration is the preferred method of disposal.

14. TRANSPORT INFORMATION

Proper shipping name: Non-regulated
Technical name : N/A
Hazard class : N/A
UN number: N/A
Packing group: N/A
Emergency Response Guide no.: N/A
IMDG page number: N/A
Other: N/A

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA
All ingredients of this product are listed, or are exempt from listing, on the TSCA inventory.

The following RCRA code(s) applies to this material if it becomes waste:
None

Regulatory status of hazardous chemical constituents of this product:

Constituent	Extremely Hazardous*	Toxic Chemical**	CERCLA RQ (lbs)	TSCA 12B Export Notification
Phenol	Yes	Yes	1000.0	Required
Triethylenetetramine	No	No	0.0	Not required
Crystalline silica	No	No	0.0	Not required
Formaldehyde polymer with phenol and TETA	No	No	0.0	Not required
2-Ethyl-4-Methylimidazole	No	No	0.0	Not required

*Consult the appropriate regulations for emergency planning and release reporting requirements for substances on the SARA Section 301 Extremely Hazardous Substance list.

**Substances for which the "Toxic Chemical" column is marked "Yes" are on the SARA Section 313 list of

Toxic Chemicals, for which release reporting may be required. For specific requirements, consult the appropriate regulations.

For purposes of SARA Section 312 hazardous materials inventory reporting, the following hazard classes apply to this material: - Immediate health hazard – Delayed health hazard -

Canadian regulations

WHMIS hazard class(es) : D2B; D2A

16. OTHER INFORMATION

Hazardous Materials Identification System (HMIS) ratings:	Health	Flammability	Reactivity
	3*	1	1

The information and recommendations in this document are based on the best information available to us at the time of preparation, but we make no other warranty, express or implied, as to its correctness or completeness, or as to the results of reliance on this document.

ITEM: 4KM41 - RETAINING COMPOUND

PICK_REQ: 1005172058 **MATERIAL SAFETY DATA SHEET (MSDS)** **MSDS: A7402**

This MSDS should be attached or kept with the respective product with which it is associated.

##########

MATERIAL SAFETY DATA SHEET - A7402

Associated Grainger Item: 4KM41 - RETAINING COMPOUND

LOCTITE(R*)

MATERIAL SAFETY DATA SHEET

HENKEL TECHNOLOGIES

REVISION DATE: 12/10/2004

ISSUE DATE: 12/10/2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: LOCTITE(R*) 680 RETAINING COMPOUND SLIP FIT

ITEM NO.: 68035

PRODUCT TYPE: ANAEROBIC ADHESIVE

REGION: UNITED STATES

COMPANY ADDRESS:
HENKEL CORPORATION
1001 TROUT BROOK CROSSING
ROCKY HILL, CONNECTICUT 06067

CONTACT INFORMATION:

TELEPHONE: 860.571.5100

EMERGENCY TELEPHONE: 860.571.5100

INTERNET: WWW.LOCTITE.COM

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	%	ACGIH TLV	OSHA PEL	OTHER
AROMATIC DIMETHACRYLATE ESTER 24448-20-2	30-60	NONE	NONE	NONE
HYDROXYALKYL METHACRYLATE 27813-02-1	30-60	NONE	NONE	1 PPM TWA 3 PPM STEL
BISPHENOL A FUMARATE RESIN 39382-25-7	10-30	NONE	NONE	NONE
METHACRYLATE ESTER UNKNOWN	1-5	NONE	NONE	NONE
CUMENE HYDROPEROXIDE 80-15-9	1-5	NONE	NONE (6 MG/M3)	1 PPM SKIN (WEEL)
POLYGLYCOL DIMETHACRYLATE 25852-47-5	1-5	NONE	NONE	NONE
1-ACETYL-2-PHENYLHYDRAZINE 114-83-0	0.1-1	NONE	NONE	NONE

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

PHYSICAL STATE: LIQUID

COLOR: GREEN

ODOR: MILD

HMIS:
HEALTH 2*
FLAMMABILITY 1
PHYSICAL HAZARD 1
PERSONAL PROTECTION SEE SECTION 8

WARNING:

CAUSES EYE IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY BE HARMFUL IF SWALLOWED.

RELEVANT ROUTES OF EXPOSURE: SKIN, INHALATION, EYES

POTENTIAL HEALTH EFFECTS:
INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION.
SKIN CONTACT: MAY CAUSE SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
EYE CONTACT: CONTACT WITH EYES WILL CAUSE IRRITATION.
INGESTION: MAY BE HARMFUL IF SWALLOWED.

EXISTING CONDITIONS AGGRAVATED BY EXPOSURE:
EYE, SKIN, AND RESPIRATORY DISORDERS.

SEE SECTION 11 FOR ADDITIONAL TOXICOLOGICAL INFORMATION.

4. FIRST AID MEASURES

INHALATION:
REMOVE TO FRESH AIR. IF SYMPTOMS DEVELOP AND PERSIST, GET MEDICAL ATTENTION.

SKIN CONTACT:
WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION IF SYMPTOMS OCCUR.

EYE CONTACT:
FLUSH WITH COPIOUS AMOUNTS OF WATER, PREFERABLY, LUKEWARM WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS OPEN ALL THE TIME. GET MEDICAL ATTENTION.

INGESTION:
DO NOT INDUCE VOMITING. KEEP INDIVIDUAL CALM. OBTAIN MEDICAL ATTENTION.

5. FIRE-FIGHTING MEASURES

FLASH POINT: GREATER THAN 93 DEG. C (200 DEG. F) TAGLIABUE CLOSED CUP

AUTOIGNITION TEMPERATURE: NOT AVAILABLE

FLAMMABLE/EXPLOSIVE LIMITS-LOWER %: NOT AVAILABLE
FLAMMABLE/EXPLOSIVE LIMITS-UPPER %: NOT AVAILABLE

EXTINGUISHING MEDIA: FOAM, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING, SUCH AS TURN-OUT GEAR.

UNUSUAL FIRE OR EXPLOSION HAZARDS: NONE

HAZARDOUS COMBUSTION PRODUCTS:
OXIDES OF CARBON. OXIDES OF SULFUR. OXIDES OF NITROGEN. IRRITATING ORGANIC VAPORS.

6. ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL PRECAUTIONS:
PREVENT PRODUCT FROM ENTERING DRAINS OR OPEN WATERS.

CLEAN-UP METHODS:
ENSURE ADEQUATE VENTILATION. SOAK UP WITH INERT ABSORBENT. STORE IN A PARTLY FILLED, CLOSED CONTAINER UNTIL DISPOSAL.

7. HANDLING AND STORAGE

HANDLING:
USE ONLY WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPOR AND MIST. WASH THOROUGHLY AFTER HANDLING.

STORAGE:
FOR SAFE STORAGE, STORE AT OR BELOW 38 DEG. C (100 DEG. F). KEEP IN A COOL, WELL-VENTILATED AREA AWAY FROM HEAT, SPARKS AND OPEN FLAME. KEEP CONTAINER TIGHTLY CLOSED UNTIL READY FOR USE.

INCOMPATIBLE PRODUCTS: REFER TO SECTION 10.

FOR INFORMATION ON PRODUCT SHELF LIFE CONTACT HENKEL CUSTOMER SERVICE AT (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:
LOCAL EXHAUST VENTILATION IS RECOMMENDED WHEN GENERAL VENTILATION IS NOT SUFFICIENT TO CONTROL AIRBORNE CONTAMINATION BELOW OCCUPATIONAL EXPOSURE LIMITS.

RESPIRATORY PROTECTION:
USE NIOSH APPROVED RESPIRATOR IF THERE IS POTENTIAL TO EXCEED EXPOSURE LIMIT(S).

SKIN PROTECTION:
USE IMPERMEABLE GLOVES AND PROTECTIVE CLOTHING AS NECESSARY TO PREVENT SKIN CONTACT.

EYE/FACE PROTECTION: SAFETY GOGGLES OR SAFETY GLASSES WITH SIDE SHIELDS.

SEE SECTION 2 FOR EXPOSURE LIMITS.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: LIQUID

COLOR: GREEN

ODOR: MILD

VAPOR PRESSURE: LESS THAN 5 MMHg AT 27 DEG. C (80 DEG. F)

pH: NOT APPLICABLE

BOILING POINT/RANGE: GREATER THAN 149 DEG. C (300 DEG. F)

MELTING POINT/RANGE: NOT AVAILABLE

SPECIFIC GRAVITY: 1.11 AT 26.6 DEG. C (80 DEG. F)

VAPOR DENSITY: NOT AVAILABLE

EVAPORATION RATE: NOT AVAILABLE

SOLUBILITY IN WATER: SLIGHT

PARTITION COEFFICIENT (n-OCTANOL/WATER): NOT AVAILABLE

VOC CONTENT:
38.4%
426 GRAMS/LITER (EPA METHOD 24)

10. STABILITY AND REACTIVITY

STABILITY: STABLE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

HAZARDOUS DECOMPOSITION PRODUCTS:
OXIDES OF CARBON. IRRITATING ORGANIC VAPORS. PHENOLS.

INCOMPATIBILITY:
STRONG OXIDIZERS. REDUCING AGENTS, ACIDS, BASES. RUST. ZINC. ALUMINUM. IRON. COPPER. ALKALIS. ALDEHYDES. AMINES. FREE RADICAL INITIATORS. PEROXIDES.

CONDITIONS TO AVOID:
EXPOSURE TO SUNLIGHT. HEAT, FLAMES AND SPARKS. SEE "HANDLING AND STORAGE" (SECTION 7) AND "INCOMPATIBILITY" (SECTION 10).

11. TOXICOLOGICAL INFORMATION

PRODUCT TOXICITY DATA:
ACUTE ORAL LD50 GREATER THAN 5000 MG/KG (RAT) (ESTIMATED).
ACUTE DERMAL LD50 GREATER THAN 2000 MG/KG (RABBIT) (ESTIMATED).

CARCINOGEN STATUS:

HAZARDOUS COMPONENTS	NTP CARCINOGEN	IARC CARCINOGEN	OSHA CARCINOGEN
AROMATIC DIMETHACRYLATE ESTER 24448-20-2	NO	NO	NO
HYDROXYALKYL METHACRYLATE 27813-02-1	NO	NO	NO
BISPHENOL A FUMARATE RESIN 39382-25-7	NO	NO	NO
METHACRYLATE ESTER UNKNOWN	NO	NO	NO
CUMENE HYDROPEROXIDE 80-15-9	NO	NO	NO
POLYGLYCOL DIMETHACRYLATE 25852-47-5	NO	NO	NO
1-ACETYL-2-PHENYLHYDRAZINE 114-83-0	NO	NO	NO

LITERATURE REFERENCED TARGET ORGAN & OTHER HEALTH EFFECTS:

HAZARDOUS COMPONENTS	HEALTH EFFECTS/TARGET ORGANS
AROMATIC DIMETHACRYLATE ESTER 24448-20-2	ALLERGEN, IRRITANT
HYDROXYALKYL METHACRYLATE 27813-02-1	ALLERGEN, IRRITANT
BISPHENOL A FUMARATE RESIN 39382-25-7	ALLERGEN, IRRITANT
METHACRYLATE ESTER UNKNOWN	NO DATA
CUMENE HYDROPEROXIDE 80-15-9	ALLERGEN, CENTRAL NERVOUS SYSTEM, CORROSIVE, IRRITANT, MUTAGEN
POLYGLYCOL DIMETHACRYLATE 25852-47-5	ALLERGEN, IRRITANT
1-ACETYL-2-PHENYLHYDRAZINE 114-83-0	ALLERGEN, BLOOD, KIDNEY, MUTAGEN, SOME EVIDENCE OF CARCINOGENICITY

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: NOT AVAILABLE

13. DISPOSAL CONSIDERATIONS

INFORMATION PROVIDED IS FOR UNUSED PRODUCT ONLY.

RECOMMENDED METHOD OF DISPOSAL:
DISPOSE OF ACCORDING TO FEDERAL, STATE AND LOCAL GOVERNMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: NOT A RCRA HAZARDOUS WASTE.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION GROUND (49 CFR):
PROPER SHIPPING NAME: UNRESTRICTED
HAZARD CLASS OR DIVISION: NONE
IDENTIFICATION NUMBER: NONE
PACKING GROUP: NONE

INTERNATIONAL AIR TRANSPORTATION (ICAO/IATA):
PROPER SHIPPING NAME: UNRESTRICTED
HAZARD CLASS OR DIVISION: NONE
IDENTIFICATION NUMBER: NONE
PACKING GROUP: NONE

WATER TRANSPORTATION (IMO/IMDG):
PROPER SHIPPING NAME: UNRESTRICTED
HAZARD CLASS OR DIVISION: NONE
IDENTIFICATION NUMBER: NONE
PACKING GROUP: NONE
MARINE POLLUTANT: NONE

15. REGULATORY INFORMATION

UNITED STATES REGULATORY INFORMATION:

TSCA 8(B) INVENTORY STATUS:
ALL COMPONENTS ARE LISTED OR ARE EXEMPT FROM LISTING ON THE TOXIC SUBSTANCES CONTROL ACT INVENTORY.

TSCA 12(B) EXPORT NOTIFICATION: NONE. 4-METHOXYPHENOL (150-76-5).

CERCLA/SARA SECTION 302 EHS: NONE ABOVE REPORTING DE MINIMUS.

CERCLA/SARA SECTION 311/312: IMMEDIATE HEALTH HAZARD, DELAYED HEALTH HAZARD

CERCLA/SARA 313:
THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 (40 CFR 372). CUMENE HYDROPEROXIDE (CAS# 80-15-9).

CALIFORNIA PROPOSITION 65:
THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

CANADA REGULATORY INFORMATION:

CEPA DSL/NDSL STATUS:
ALL COMPONENTS ARE LISTED ON OR ARE EXEMPT FROM LISTING ON THE DOMESTIC SUBSTANCES LIST.

WHMIS HAZARD CLASS: D.2.B.

16. OTHER INFORMATION

THIS MATERIAL SAFETY DATA SHEET CONTAINS CHANGES FROM THE PREVIOUS VERSION IN SECTIONS: EXPANDED CHEMICAL INFORMATION IN SECTION 2 AND RELATED SECTIONS.

PREPARED BY: KYRA KOZAK WOODS, HEALTH AND REGULATORY AFFAIRS SPECIALIST

DISCLAIMER:
THE DATA CONTAINED HEREIN ARE FURNISHED FOR INFORMATION ONLY AND ARE BELIEVED TO BE RELIABLE. HOWEVER, HENKEL CORPORATION DOES NOT ASSUME RESPONSIBILITY FOR ANY RESULTS OBTAINED BY PERSONS OVER WHOSE METHODS HENKEL CORPORATION HAS NO CONTROL. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF HENKEL'S PRODUCTS OR ANY PRODUCTION METHODS MENTIONED HEREIN FOR A PARTICULAR PURPOSE, AND TO ADOPT SUCH PRECAUTIONS AS MAY BE ADVISABLE FOR THE PROTECTION OF PROPERTY AND PERSONS AGAINST ANY HAZARDS THAT MAY BE INVOLVED IN THE HANDLING AND USE OF ANY OF HENKEL CORPORATION'S PRODUCTS. IN LIGHT OF THE FOREGOING, HENKEL CORPORATION SPECIFICALLY DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARISING FROM SALE OR USE OF HENKEL CORPORATION'S PRODUCTS. HENKEL CORPORATION FURTHER DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, INCLUDING LOST PROFITS.

KMB00003644

AMERICAN COLLOID COMPANY

One North Arlington • 1500 West Shure Drive
Arlington Heights, Illinois 60004-7803 • USA
(708) 392-4600 • Telex ITT 4330321
Fax (708) 506-6188

12003
101

PRODUCT NAME: DRIED & CRUSHED BENTONITE

Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled - Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water, the product will become slippery when wet.

Waste Disposal Method - Follow federal, state and local regulations for solid waste.

Precautions to Be Taken in Handling and Storing - Avoid breathing dust, use NIOSH/MSHA approved respirator where TLV limits for Crystalline Silica may be exceeded.

Other Precautions - Slippery when wet.

Section VIII CONTROL MEASURES

Respiratory Protection (Specify Type) - OSHA standard 1910.134 or ANSI Z88.2-1980 specification.

Ventilation	- Local Exhaust	- As appropriate	Special	- None	
	- Mechanical (General)	- As appropriate	Other	- None	
Protective Gloves	- Not Required		Eye Protection	- Recommended	

Other Protective Clothing or Equipment - None
Work/Hygienic Practices - Use good housekeeping practices.

The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, American Colloid Company cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.

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MATERIAL SAFETY DATA SHEET - May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements. 12003 101

PRODUCT NAME: DRIED & CRUSHED BENTONITE

Section I MANUFACTURER'S INFORMATION

Manufacturer's Name & Address:

American Colloid Company
1500 West Shure Drive
One North Arlington
Arlington Heights, Illinois 60004

Emergency Telephone Number: 708-392-4600
Telephone Number for Information: 708-392-4600
Date Prepared: April 28, 1993

Section II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Crystalline Quartz CAS# 14808-60-7 (naturally occurring contaminant)	-	-	*	2-6%
Respirable Crystalline Quartz			NIOSH	
present (TWA)	0.1mg/m^3	0.1mg/m^3 TWA	50ug/m^3 TWA	<2%
proposed (TWA)		50ug/m^3 TWA	-	-
Nuisance Dust				
- Respirable	5mg/m^3	5mg/m^3	-	-
- Total Dust	15mg/m^3	10mg/m^3	-	-

* **WARNING:**
This clay product contains a small amount of crystalline silica which may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for crystalline silica may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 42, 1987) concludes that there is "limited evidence" of the carcinogenicity of crystalline silica to humans. IARC classification 2A.

PRODUCT IDENTIFICATION

Chemical Name: Bentonite Clay (100%)
Chemical Family: Natural Mineral, Montmorillonite
CAS No.: 1302-78-9 Bentonite is on the TSCA inventory.
FORMULA: Naturally occurring hydrated aluminosilicate of sodium, calcium, magnesium, and iron
NFPA/HMIS: Health - 1, Fire - 0, Reactivity - 0, Specific Hazard - See Section VI
Dot Class: Not Regulated

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12003
101

PRODUCT NAME: DRIED & CRUSHED BENTONITE

Section III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	- Not Applicable	Specific Gravity (H_2O = 1)	- 2.5
Vapor Pressure (mm Hg.)	- Not Applicable	Melting Point	- Not Applicable
Vapor Density (AIR = 1)	- Not Applicable	Evaporation Rate (Butyl Acetate = 1)	- Not Applicable
Solubility in Water	- Negligible		
Appearance and Odor	- Pale grey to buff powder or granules, odorless		

Section IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) - Not Applicable
Flammable Limits - Not Applicable LEL- - UEL- -
Extinguishing Media - Not Applicable
Special Fire Fighting Procedures - Inorganic Mineral/Non-Flammable
Unusual Fire and Explosion Hazards - Not Applicable

Section V REACTIVITY DATA

Stability Unstable -
Stable - X
Conditions to Avoid - None Known

Incompatibility (Materials to Avoid) - None Known
Hazardous Decomposition or By-products - None Known

Hazardous Polymerization May Occur -
Will Not Occur - X
Conditions to Avoid - None Known

Section VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No
Health Hazards (Acute and Chronic) - May cause delayed respiratory disease if dust inhaled over a prolonged period of time.

Carcinogenicity: NTP? No IARC Monographs? Yes OSHA Regulated? No

IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 42, 1987) concludes that there is "limited evidence" of the carcinogenicity of crystalline silica to humans. IARC classification 2A.

Signs and Symptoms of Exposure - Excessive inhalation of dust may result in shortness of breath and reduced pulmonary function.

Medical Conditions Generally Aggravated by Exposure - Individuals with pulmonary and/or respiratory disease including but not limited to asthma and bronchitis should be precluded from exposure to dust.

Emergency and First Aid Procedures - Eyes - Flush with water.
- Gross inhalation of dust - Remove to fresh air; give oxygen or artificial respiration if necessary; get medical attention.

MATERIAL SAFETY DATA SHEET

September, 1990

I. MATERIAL IDENTIFICATION

Name
Calcined Petroleum Coke

Manufacturers Name
Petrocokes Limited

Transportation Emergency Phone
415-788-5400 (Sumitomo San Francisco)

II. OSHA HAZARD DETERMINATION

The material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Sections VII and XI of the MSDS for more information.

III. PHYSICAL DATA

Appearance and Odor
Dark gray or black solid;

% Volatiles (Volume %)
0 - 1%

Boiling Point
Solid

Solubility in Water
Insoluble

Melting Point
Nonmelting solid

Bulk Density
Approximately 52 lb/cu ft

IV. REACTIVITY DATA

Stable: X Unstable: ___
Reactivity: Not reactive under normal conditions.
Hazardous Decomposition Materials: Combustion may produce oxides of sulfur and carbon. Incomplete combustion can produce carbon monoxide.

Hazardous Polymerization: Will not polymerize.

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V. FIRE AND EXPLOSION HAZARD DATA

Flash Point: No applicable test

Extinguishing Media: Use water spray, water fog.

The most effective method of extinguishing is to drench with water or water fog. Though other forms of extinguishing agent may be used, they are considered less effective for deep-seated, smoldering fires.

Special Fire and Explosion Hazared: None.

National Fire Protection Association (NFPA) Classification
Health 0 Fire 1 Reactivity 0

HAZARD RATING
Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Do not store with strong oxidizers. Store in accordance with National Fire Protection Association regulations.
Special Information: Must not be loaded in cargo vessels when temperatures exceed 225°F. (46 CFR 148.04-17)

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Calcined Petroleum Coke
PEL: None Established
TLV: None Established

Exposure Limits for Nuisance Dust
PEL: 15 mg/m^3 Total Dust
5 mg/m^3 Respirable Dust
TLV: 10 mg/m^3 Total Dust
Ceiling Value: Not Established

Primary Routes of Exposure/Entry: Skin, Inhalation
Signs and Symptons of Exposure/Medical conditions Aggravated by Exposure:
Excessive concentrations of nuisance dusts may reduce visibility, cause unpleasant deposits in the eyes, ears, and nasal passages, or irritate the skin and/or mucous membranes by chemical or mechanical action. The exposure limits of 5, 10, and 15mg/m^3 are for nuisance dusts that are biologically inert and not expected to cause a significant health effect when exposure is reasonably controlled.

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Ventilation: Keep area well ventilated to minimize exposure to dust.

Protective Gloves: Wear impervious gloves.

Eye Protection: Wear close fitting goggles.

Other Protective Equipment: Sufficient protective clothing to minimize skin exposure. Launder contaminated clothing before reuse.

Other Precautions: Wash thoroughly with soap and water to avoid any prolonged skin contact.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302
Not Applicable

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III SECTIONS 302, 304, 311, 312, 313

SECTION 302/304-Extremely Hazardous Substances (40 CFR 355)
The material is not known to contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)
The material should be reported under the following EPA hazard categories:

___ Immediate (Acute) Health Hazard
___ Sudden Release of Pressure
___ Delayed (Chronic) Health Hazard
___ Reactive
___ Fire
_X_ Not Hazardous

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)
The material is not known to contain chemical(s) at level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to toxic-chemical release reporting requirements.

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Carcinogencity:
This material is not known to contain any chemical listed as a carcinogen or suspected carcinogen by OSHA, IARC, or NTP at a concentration greater than 0.1%.

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconsious person. Call a physician.

IX. SPILL, LEAK, AND DISPOSAL INFORMATION

In Case of Spill or Leak: Contain spill immediately in smallest possible area. Recover as much of the product as possible by shovel or mechanical means. Nonrecyclable product and contaminated soils and other materials should be placed in proper container for storage and ultimate disposal. Avoid washing, draining, or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in Section VII. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respiratory protection factors.

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710
This material is in the TSCA Inventory of Chemical Substnaces and/or is otherwise in compliance with TSCA.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA),40, CFR 261, SUBPART C AND D
The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable, or reactive according to the U.S.EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine wheter it is a hazardous waste. If it is a hazardous waste, regulations 40 CFR 262, 263, 264,, and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, SECTION 311
The material is not known to contain any ingredient(s) subject to the Act.

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178
The material is not known to contain any ingredient(s) subject to the Regulations.

FOREIGN REGULATIN
CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)
The material is not a WHMIS Controlled Product.

STATE REGULATIONS
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 ("PROPOSITION 65")
The material contains ingredient(s) known to the State of California to cause cancer, birth defects, or other reproductive harm. Read and follow label directions and use care when handling or using all petroleum products.

Ingredient(s):
Nickel (<1.0%)

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6/6

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT
The material contains the following hazardous substances:
Categories: H = Hazardous Substance (≥ 1.0%)
S = Special Hazardous Substance (≥ 0.01%)
E = Environmental Hazard (≥1.0%)

Ingredient	CAS Registry Number	Category
Nickel	7440-02-0	E,S
Sulfur	7704-34-9	H

Nonhazardous ingredient(s) information is withheld as trade secret in accordance with Section 11 of Pennsylvania Worker and community Right to Know Act.

The above data are based on tests, experience, and other information which Petrocokes believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufactures. In these instances, Petrocokes, in good faith, relies on information provided by those third parties. Since conditions of use are outside our control, Petrocokes DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY Petrocokes WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO Petrocokes.

Y. TSURU
GENERAL MANAGER
ENGINEERING DEPT.
PETROCOKES LTD.

KMB00003653

Material Safety Data Sheet
Sodium Carbonate (Soda Ash)

Product Identification

Brand Name	ANSAC Soda ash
Chemical Name	Sodium carbonate
Common Name	Soda ash
Formula	Na_2CO_3
DOT Proper Shipping Name	Not applicable
DOT Hazard Class	Not applicable
DOT ID Number	Not applicable
Reportable Quantity (RQ)	Not applicable
CAS Number	497-19-8

Physical and Chemical Properties

State	Granulated solid
Melting Point °C	851
Boiling Point °C	Decomposes
Color	White
Odor	None
Bulk Density (g/cc)	0.86 – 1.12
Weight per Gallon	Not applicable
Specific Gravity	2.5 (water =1)
Water Solubility % by wt	33.2% maximum
Flash Point & Method	Not applicable
pH	11.4 (1% solution)

INTERNATIONAL LISTINGS

Australia	China	Japan	Korea	Philippines
AICS Listed	Listed	(1) - 164	KE-31380	PICCS Listed

Revised: 10/07

KMB00003654

PHYSICAL HAZARD INFORMATION

General: Irritant to eyes, mucous membranes and skin
Not expected to be toxic to the environment nor to aquatic animals

Explosive:	No	Upper Explosive Limit: Not applicable		Lower Explosive Limit: Not applicable
Pyrophoric:	No			
Flammable:	No	Flammability Class:	Not applicable	
Combustible:	No	Organic Peroxide:	No	
Oxidizer:	No	Compressed Gas:	No	

Reactivity: Normally stable. May react violently with strong acids. Carbon dioxide gas and large quantities of heat can be evolved. Reacts with hydrated lime in the presence of moisture to form caustic soda, a corrosive.

Incompatibilities: Keep away from aluminum powder, fluorine, phosphorous pentoxide, sulfuric acid, ammoniacal silver nitrate and molten lithium.

Hazardous Decomposition: Soda ash decomposes at temperatures above 1000°C, releasing carbon dioxide gas (CO_2). Carbon dioxide is an asphyxiant and may affect respiration rate or interfere with breathing. The sodium oxide residue sublimes at 1275 °C, forming vapors and mists of caustic soda on contact with moisture or water.

Conditions to Avoid: Do not expose to intense heat.

HEALTH INFORMATION

Precautionary Information: *CAUTION!* Causes irritation. This product is a severe irritant to the eyes and a moderate irritant to the nose and skin.

Symptoms of Exposure:
Eye, nose or skin irritation
Burning sensation to nose, throat and eyes
Redness of the skin
Sneezing and coughing

Restrictive Medical Conditions: Eye or skin diseases and breathing or respiratory disorders will be aggravated by exposure to this chemical.

FIRST AID PROCEDURES

Eye Contact:	Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
Skin Contact:	Flush with plenty of water. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Ingestion:	If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.
Inhalation:	If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
Note to Physician:	Exposure to sodium carbonate at high concentrations may produce corneal opacities, and vesicular skin reactions in humans with abraded skin. Internal toxicity is low. Treatment is symptomatic and supportive

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PRIMARY ROUTE(S) OF ENTRY

Eye and skin contact, inhalation (breathing), and ingestion (swallowing).

TOXICITY INFORMATION

Eye irritation –100 mg/24 hour (rabbit), severe irritant
Skin irritation – Non-irritating to intact skin. Minor irritation to abraded skin. [Toxicol. Appl. Pharmacol. 31:481 (1975)]. No Dermal LD_{50} data available.
Oral LD_{50} – 4090 mg/kg (rat) [RTECS 1986]
Inhalation LC_{50} – 2.3 mg/l (rat) [Environ, Res. 31:138 (1983)]

EXPOSURE LIMITS

Ingredients in this product are considered nuisance dust with no specific guidelines for exposure. Hence, based on guidance for particulates not otherwise regulated:
OSHA (PEL/TWA): 15 mg/m^3 (total dust); 5 mg/m^3 (respirable fraction)
MSHA (PEL/TWA): 10 mg/m^3 (total dust)
Specific work environments will dictate the selection of personal protective equipment (PPE)

Reported As A Potential Carcinogen:	☐ Not applicable	☐ National Toxicology Program
Or Carcinogen	☐ OSHA	☐ International Agency for Research on Cancer

KMB00003656

PRECAUTIONS FOR SAFE HANDLING AND USE

Avoid contact with eyes, skin and clothing
Avoid breathing dust
Use with adequate ventilation
Keep container closed when not in use
Wash thoroughly after handling

SPILL & LEAK PROCEDURES

Soil Release:	Shovel and sweep up. Dispose of in a chemical waste facility as permitted by federal (RCRA), state and local regulations.
Water Spill:	Dilute and disperse with water jets, propellers or similar agitation techniques.
Air Spill:	Keep upwind. Treat impact site as appropriate for soil or water spill.
Occupational Spill:	Vacuum or shovel and sweep up. As permitted, small spills may be washed to an industrial sewer. Large amounts can be disposed of in a chemical waste facility as permitted by federal, state and local regulations.
RCRA Waste Number:	No applicable

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

Ventilation:	Use general dilution and local exhaust ventilation techniques to meet nuisance dust exposure limit.
Respirator:	Use NIOSH/MSHA approved dust type respirator.
Eye Protection:	Use safety glasses or safety goggles. Ensure eyewash fountain is located in immediate work area.
Gloves:	Use gloves that will not allow alkaline solutions to penetrate.
Clothing:	Wear easily washable clothing. Change daily or more often if contaminated. Wash clothing before reuse.

EMERGENCY PROCEDURES

Fire: This product is not flammable and does not support combustion.

Spill or Leak: Vacuum or sweep up and shovel into containers for later disposal.

* *

Revision Summary
This MSDS replaces the 09/2005 revision
Changes in information are as follows:

- Addition of International chemical listing numbers as available
- First Aid Procedures/Physicians notes revised
- Toxicity information sources updated – No essential changes in content

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard. 29 CFR 1910.1200. Standard must be consulted for specific requirements.

GSL

IDENTITY
Potassium Sulfate

Section I

Manufacturer's Name
GSL Minerals

Address (Number, Street, City, State, and ZIP Code)
765 North 10500 West
Ogden, Utah 84404

Emergency Telephone Number
(801) 731-3100

Telephone Number for Information
(801) 731-3100

Date Prepared
July 16, 1996

Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
None				

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	2.7
Vapor Pressure (mm Hg.)	N/A	Melting Point	1067 degrees C
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water
1 gm per 8.3 ml

Appearance and Odor
Solid whitish color

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
N/A	N/A	N/A	N/A

Extinguishing Media
Not flammable

Special Fire Fighting Procedures
None

Unusual Fire and Explosion Hazards
None

Section V — Reactivity Data

Stability	Unstable: N/A		Conditions to Avoid: None
	Stable: X		

Incompatibility (Materials to Avoid): None

Hazardous Decomposition or Byproducts: None under normal conditions. SO_2 at extremely high temperatures

Hazardous Polymerization	May Occur: N/A		Conditions to Avoid: N/A
	Will Not Occur: X		

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? See below Skin? See below Ingestion? See below

Health Hazards (Acute and Chronic): None

Carcinogenicity: N/A NTP? N/A IARC Monographs? N/A OSHA Regulated? N/A

Signs and Symptoms of Exposure: Swallowing large doses would cause GI irritation

Medical Conditions Generally Aggravated by Exposure: None

Emergency and First Aid Procedures: Flush with water

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Readily soluble in water

Waste Disposal Method: Soluble in water - neutral or slightly basic solution occurs

Precautions to Be Taken in Handling and Storing: No special storage requirements

Other Precautions: Normal standard practices for good hygiene

Section VIII — Control Measures

Respiratory Protection (Specify Type): Simple dust mask for dusty conditions

Ventilation	Local Exhaust: As required for dust	Special: N/A
	Mechanical (General): As required for dust	Other: N/A

Protective Gloves: N/A Eye Protection: Goggles for dusty conditions

Other Protective Clothing or Equipment: N/A

Work/Hygienic Practices: N/A

KMB00003660

SOLVAY MINERALS

SOLVAY MINERALS, Inc., 20 Miles West of Green River at Westvaco Exit, Green River, Wyoming 82935
Tel . 307/872-6519 FAX . 307/872-5879
For missing pages, tel : 307/872-6519

CONFIDENTIALITY NOTICE

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Date: 06/16/99 11:21 AM

To:

Attention: **Brad**

Fax Number: 503-285-4467

From: **Jim Phillip** **No. of pages including cover sheet:** 5

Message: Sodium Sulfite MSDS

Solvay Minerals

SOLVAY

Responsible Care® A Public Commitment

PJ Luzmoor, Safety/Training Dept.
Solvay Minerals, Inc., Green River, WY.
Date: February 11, 1999
Supersedes edition: 05-29-96
Purpose of revision: Sections 16

SOLVAY MINERALS, INC.
MSDS NUMBER 003

HMIS: H=2 F=0 R=1 PERS PROTECTION=E

MATERIAL SAFETY DATA SHEET

The following information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations of mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

Telephone No. - General Information: 1-800-443-2785 (Solvay Minerals, Inc., Customer Service-Houston, TX.)
Telephone No. - Emergencies (USA) 307-872-6688(Solvay Minerals, Green River, WY.)
Telephone No. - Emergencies (USA) 1-800-424-9300 (CHEMTREC)
Telephone No. - Emergencies (INTERNATIONAL/MARITIME) 1-703-527-3887 (CHEMTREC)
Telephone No. - Emergencies (CANADA) 0-613-966-6666 (CANUTEC)
Telephone No. - Emergencies(MEXICO) 91-800-00-214(MEX. REPUBLIC)-0-11-52-5-575-0838:ELSEWHERE(SETIQ)

1. PRODUCT IDENTIFICATION

1.1	**Product Name: SODIUM SULFITE, ANHYDROUS**
1.2	**Chemical Name:** INORGANIC SODIUM COMPOUNDS.
1.3	**Synonyms:** ANHYDROUS SODIUM SULFITE (TECHNICAL GRADE)-(FOOD GRADE)-(PHOTOGRAPHIC GRADE)
1.4	**Trade Names:** SODIUM SULFITE.
1.5	**Formula:** Na_2SO_3
1.6	**Molecular Weight:** 126.04
1.7	**CAS No.:** 7757-83-7

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS/FORMULA	CAS #	PIN #	PERCENT
Sodium Sulfite-Na_2SO_3	7757-83-7	None	99%
Sodium Sulfate-Na_2SO_4	7757-82-6	None	1%

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3. HAZARD IDENTIFICATION

3.1 Sodium Sulfite is an odorless, free flowing white crystal.

3.2 Route(s) of Entry: ***Inhalation?*** *yes* ***Skin?*** *yes* ***Ingestion?*** *Yes*

3.3 Effects of exposure:

May cause mild irritation.

Inhalation (dust): May cause irritation. Sulfite-sensitive individuals may experience a severe allergic reaction.

Eyes (dust): May cause mild irritation.

Skin: May cause mild irritation.

Ingestion: Oral exposure or swallowing may produce gastrointestinal upset, nausea or vomiting. Ingestion may be fatal. Sulfite sensitive individuals may experience a severe allergic reaction.

4. FIRST AID MEASURES

4.1 First Aid:

Inhalation: Remove the patient to fresh air. If breathing has stopped or patient experiences difficulty in breathing, administer artificial respiration.

Eyes: Remove contact lenses. Gently flush the eyes and surrounding areas with lukewarm water for 15 minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wipe material from the skin. Rinse the affected area with large amounts of water for 15 minutes. If irritation persists, seek medical attention.

Ingestion: DO NOT ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Remove any evidence of the substance from the patient's mouth. If the patient is conscious and alert, give 8-12 ounces of water and seek medical attention.

4.2 Medical Conditions Aggravated by Exposure:

Breathing of dust may aggravate asthma or other pulmonary diseases.

5. FIRE FIGHTING MEASURES

5.1 Flash Point: Non combustible.

5.2 Auto-ignition Temperature: Not applicable.

5.3 Flammability Limits:

Lower & Upper Limit: Non flammable.

5.4 Unusual Fire and Explosion Hazards: Non-combustible. Generates hazardous SO_2 during decomposition.

5.5 Common Extinguishing Methods: Not applicable.

5.6 Fire Fighting Procedures: Wear NIOSH-approved self-contained breathing apparatus. Use water spray to keep containers cool and to knock down fumes.

6. ACCIDENTAL RELEASE MEASURES

6.1 Spills: Shovel back into the original **dry**, uncontaminated container or waste receptacle. Flush area with water, contain runoff, dispose of waste in accordance with applicable federal, state, and local environmental laws and regulations.

7. HANDLING AND STORAGE

7.1	**Handling:** Avoid prolonged or repeated contact with the skin or eyes. Do not wear contact lenses without proper eye protection when using this product. Wash exposed areas promptly and thoroughly after skin contact from working with this product and before eating, drinking, using tobacco products or using the rest room. Avoid prolonged or repeated breathing of dusts. Use vacuum or wet mop to clean up dust.
7.2	**Storage:** Keep in a closed, properly labeled container in a dry area away from acids. Protect from physical damage.
7.3	***For all operations:*** DO NOT TAKE INTERNALLY.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1	**Exposure Limits:** Control as particulate not otherwise classified (PNOC) ACGIH 1994-1995 TWA = 10 mg/m_3, OSHA PEL for nuisance particulates = 15 mg/m_3, for an 8 hour day. Exposure limits for sulfur dioxide (SO_2) is TWA = 2 ppm, STEL = 5 ppm.
8.2	**Ventilation:** In places with the possibility for creating dust, in excess of exposure limits, ventilation should be provided.
8.3	**Respiratory Protection:** In case of significant or accidental dust emissions, a NIOSH/MSHA approved respirator should be worn. If SO_2 is present, (see section 10), use a NIOSH-approved air supplied positive pressure respirator or acid gas canister.
8.4	**Protective Gloves:** Cotton gloves are adequate for routine handling of dry product. For solutions, wear impervious gloves.
8.5	**Eye Protection:** Wear chemical safety goggles. Do not wear contact lenses without proper eye protection.
8.6	**Other Protective Clothing or Equipment:** Wear boots, apron, long sleeves and other protective clothing suitable for use conditions to prevent contact with the skin. Provide eyewash stations for work areas.
8.7	**Other:** Persons with allergic symptoms should seek advice from medical personnel as to whether exposure to the substance should be curtailed or eliminated.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1	**Melting Point:** Decomposes at approximately 600°C (1112°F).
9.2	**Boiling Point:** Not applicable.
9.3	**Specific Gravity (H_2O=1):** 2.63 @ 20°C (68°F).
9.4	**Vapor Density (air=1):** Not applicable.
9.5	**Vapor Pressure:** Not listed.
9.6	**Solubility:** 21% by weight in water at 36°C (97°F).
9.7	**Decomposition Temperature:** Approximately 600°C (1112°F).
9.8	**Viscosity:** Not listed.
9.9	**pH:** 9.6-9.8 (1% solution).
9.10	**Other information: Bulk Density:** 85-95 lbs/ft^3.

10. STABILITY AND REACTIVITY

10.1	**Stability:** Stable at ambient temperatures and atmospheric pressure.
10.2	**Hazardous Decomposition Products:** Oxides of sulfur. SO_2.

10.3	**Conditions to Avoid:** High temperatures. Moisture.
10.4	**Materials and Substances to Avoid:** Contact with strong oxidizers cause vigorous exothermic reactions. Contact with acids will release SO_2.

11. TOXICOLOGICAL INFORMATION

11.1	**Acute toxicity:** LD_{50}-oral 820 mg/kg species: mouse
11.2	**Chronic toxicity:** Can cause allergic reactions(headaches, difficulty in breathing, rapid heart rate and anaphylaxis) to susceptible individuals after repeated contact.

12. ECOLOGICAL INFORMATION

12.1 **Aquatic Toxicity:** 96 hour LC50, goldfish: 100 mg/l. 24, 48, 96 hour TLm, mosquito fish: 2,600 ppm. BOD(Biological Oxygen Demand)= 0.12 LB/LB instantaneous. Sodium sulfite is an oxygen scavenger when introduced to water.

13. DISPOSAL CONSIDERATIONS

13.1	**Waste treatment:** Sodium Sulfite is not a listed hazardous waste under 40 CFR 261. However, state and local regulations for waste disposal may be more restrictive. Do not dump waste material into sewers, on the ground or into any body of water. It is recommended that Sodium Sulfite be land-filled after securing federal regulatory and local landfill operations approval.
13.2	**RCRA waste #:** Not listed.

14. TRANSPORT INFORMATION

14.1	**UN #:** Not listed. **NA #:** Not listed.
14.2	**STCC # :** 28-123-58.
14.3	**DOT guide # & Hazard class:** Not listed.

15. REGULATORY INFORMATION

15.1	**NFPA:** *Health - **not listed***	**HMIS:** *Health - 2*	**WHMIS:** *D-2*
	*Flammability - **not listed***	*Fire - 0*	
	*Reactivity - **not listed***	*Reactivity - 1*	
		Pers. Protection-E	
15.2	**Regulatory/Carcinogenicity Status: NTP & OSHA:** None (1987) **IARC:** None (1990)		
15.3	**CERCLA RQ & SARA Listing:** Not listed.		
15.4	**TSCA inventory:** Yes.		

16. OTHER INFORMATION

The National Sanitation Foundation(NSF) recommends that the maximum usage level is 22 mg/l for potable water treatment, unless usage is ozone reduction. To reduce ozone, this product may be used at a stoichiometric ratio of 1 to 1, or a ratio of 215 mg/l of sodium sulfite to 100 mg/l of ozone. Residual sodium sulfite levels shall not exceed 100 ppb in the finished water.

KMB00003665

MATERIAL SAFETY DATA SHEET

REVISION DATE: 2/91

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: SUL-FLOW, ANHYDROUS SODIUM SULFITE, TECHNICAL GRADE
SULF-LITE, ANHYDROUS SODIUM SULFITE, PHOTOGRAPHIC GRADE
ANHYDROUS SODIUM SULFITE, INDUSTRIAL GRADE

SYNONYM: Sodium Sulfite, Anhydrous

COMPANY NAME:
TENNECO MINERALS COMPANY
(Corporate Office)
12136 West Bayaud Avenue
P.O. Box 281300
Lakewood, CO 80228

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPLOSION OR ACCIDENT:
IN CONTINENTAL U.S.: Call CHEMTREC
24 Hour Number 1-800-424-9300
IN CANADA: Call CANUTEC Collect
24 Hour Number 0-613-996-6666

GENERAL PRODUCT INFORMATION:
Call Tenneco Minerals Company, Green River, WY Customer Service Information Number 1-800-443-2785 (8:00 A.M.- 5:00 P.M., Monday through Friday)

PRODUCT USE: Paper pulping, anti-chlor, corrosion inhibitor.
CHEMICAL FAMILY: Inorganic Salt
FORMULA: Na_2SO_3
CAS NUMBER: 7757-83-7
DOT PROPER SHIPPING NAME: Not Applicable
DOT HAZARD CLASS: None
UN/NA NUMBER: None

SECTION II - INGREDIENTS/RECOMMENDED EXPOSURE LIMITS

HAZARDOUS INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMIT (MG/M^3)
None			

OTHER INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMIT (MG/M^3)	
Sodium Sulfite	7757-83-7	>94	None	See Note Below *
Sodium Sulfate	7757-82-6	<5	None	See Note Below *
Sodium Chloride	7647-14-5	<2	None	See Note Below *

* NOTE: Control as a particulate not otherwise classified (PNOC) so-called "nuisance" dust (ACGIH 1990-1991 Threshold Li Values). Current OSHA PEL values for inert or nuisance dusts 15 mg/m^3 (total dust) and 5 mg/m^3 (respirable dust); AC 1990-1991 value for PNOC's is 10 mg/m^3 (total dust).

SECTION III - PHYSICAL DATA

GENERAL APPEARANCE: Free-flowing white crystal
ODOR: Odorless
BOILING POINT: Not Applicable
BULK DENSITY: 85-95 lbs/ft^3
MELTING POINT: Decomposes
VAPOR PRESSURE: Not Applicable
VAPOR DENSITY(AIR=1): Not Applicable
SOLUBILITY (WATER, % by weight): 21% at 68^oF
pH: 9-10 (1% solution)

SECTION IV - HEALTH HAZARD INFORMATION

HEALTH/SAFETY ALERT

WARNING

SULFITE-SENSITIVE PEOPLE WHO INHALE OR INGEST THIS PRODUCT MAY EXPERIENCE A SEVERE ALLERGIC REACTION.
AVOID PROLONGED OR REPEATED CONTACT AND OBSERVE GOOD HYGIENE AND SAFETY PRACTICES WHEN HANDLING THIS PRODUCT.
DO NOT USE THIS PRODUCT UNTIL MSDS HAS BEEN READ AND UNDERSTOOD.

EYE: May cause mild irritation.
SKIN: May cause mild irritation.
INHALATION: May cause irritation. Sulfite-sensitive individuals may experience a severe allergic reaction.
INGESTION: Oral exposure or swallowing may produce gastrointestinal upset. Sulfite sensitive individuals may experience a severe allergic reaction.

SECTION V - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: Remove contact lenses. Gently flush the eyes and surrounding areas with lukewarm water for 15 minutes. If irritation is present, seek medical attention.
SKIN CONTACT: Remove contaminated clothing. Wipe material from skin. Rinse the affected areas with large volumes of water for 15 minutes. If irritation is present, seek medical attention.
INHALATION: Remove the patient to fresh air. If breathing has stopped or is difficult, administer artificial respiration. If irritation is present, seek medical attention.
INGESTION: DO NOT ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Remove any evidence of the substance from the patient's mouth. If patient is conscious and alert, give 8-12 ounces of water or milk and seek medical attention.

SECTION VI - FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT & METHOD: Not Applicable
AUTOIGNITION TEMP: Not Applicable
FLAMMABLE LIMITS (% BY VOLUME/AIR): **LOWER:** Not Applicable **UPPER:** Not Applicable
EXTINGUISHING MEDIA: Not applicable. Use methods applicable surrounding area.
FIRE-FIGHTING PROCEDURES: Wear complete fire service protect equipment, including full-face MSHA/NIOSH approved self-contained breath apparatus. Use water to cool fire-exposed container/structure/prot personnel. Water or foam may cause frothing, if product is heated at 93°C/200°F.
FIRE AND EXPLOSION HAZARDS: See Section X - REACTIVITY DATA - Hazar Decomposition Products.

SECTION VII - SPILL, LEAK AND DISPOSAL INFORMATION

SPILL OR LEAK PROCEDURES (PRODUCT): Shovel back into original container or waste receptacle. Flush area with water.
WASTE DISPOSAL: Dispose of as an industrial waste in accordance wi federal, state and local regulations.

SECTION VIII - HANDLING/STORAGE INSTRUCTIONS

HANDLING: Avoid prolonged or repeated contact with skin or eyes. Do not wear contact lens without proper eye protection when using this product. Wash exposed areas promptly and thoroughly after skin contact from working with this product and before eating, drinking, using tobacco products or rest rooms. Avoid prolonged or repeated breathing of dusts. Use vacuum or wet mop to clean up dust.
STORAGE: Keep in a closed, properly labeled container in a well-ventilated area. Protect from physical damage.
OTHER: DO NOT TAKE INTERNALLY

SECTION IX - PERSONAL PROTECTION INFORMATION

EYE PROTECTION: Safety glasses with side shields.
SKIN PROTECTION: General purpose gloves and full cover clothing.
RESPIRATORY PROTECTION: If ventilation is inadequate, use appropriate dust MSHA/NIOSH approved respiratory protection.
VENTILATION: Use general room dilution or local exhaust ventilation where excessive dust may be released into the work environment.

SECTION X - REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: None
INCOMPATIBILITY: Liberates sulfur dioxide in presence of strong acids.
HAZARDOUS REACTIONS/DECOMPOSITION/COMBUSTION PRODUCTS: Oxides of sulfu fumes emitted when heated to decomposition.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: None

SECTION XI - COMMENTS

No known ingredients which occur at greater than 0.1% are listed as carcinogen in the IARC Monographs on the Evaluation of the Carcinogen Risk of Chemicals to Humans, the NTP Annual Report on Carcinogens or OS 29 CFR 1910.1001-1048 Subpart Z Toxic and Hazardous Substanc (Specifically Regulated Substances).

NOTICE: While the information and recommendations set forth herein believed to be accurate as of the date hereof, Tenneco Minerals makes warranties or representations with respect to the accuracy or suitabil of such information for application to purchaser's intended purpose or consequences of its use and assumes no liability arising out of reli thereon.

Canpotex Limited

OCCUPATIONAL HEALTH AND SAFETY MATERIAL SAFETY DATA SHEET

The following data on potash products provides a guideline only. Potash is not a controlled product as defined in the Controlled Product Regulations pursuant to the Hazardous Products Act (Canada). Any specific health concerns should be directed to a qualified industrial hygienist.

Section I: Material Identification and Use

Company name:	Canpotex Limited
Address:	#400, 111 - 2nd Avenue South Saskatoon, Saskatchewan, Canada S7K 3R7
Emergency telephone:	(306) 931-2200
Chemical name:	Potassium Chloride
Trade name and synonyms:	Potash, Muriate of Potash, Sylvite
Chemical family:	Inorganic Salt
Chemical formula:	KCl
Molecular weight:	74.6
Material use:	Fertilizer

Section II: Ingredients of Material

Ingredients	Approximate Concentration	CAS Numbers	Exposure Limits	LD_{50}/LC_{50} Specify Species/Route
KCl	95–99.8%	7447-40-7	n/a	2340 mg/kg oral, rat
NaCl	0–5%	7647-14-5	n/a	4000 mg/kg oral, mouse
Iron oxides	trace			

Loose bulk density, 1000 to 1	1041–1155 kg/m^3 (65–72 lb/ft^3)
Angle of repose	28–32°

Additives *(may be changed without notice)*

Fuel-oil hydrocarbons (diesel fuel)	0–0.1%
Primary aliphatic amines	0–0.04%
Ethylene glycol	0–0.02%
Unsaturated C_{18} fatty acids	0–0.08%
Diterpenic (rosin) acids	0–0.08%
Sterols, fatty alcohols	0–0.04%
Lubrication oil (dedusting)	0–0.25%

Hazardous mixtures of other liquids, solids, or gases: none

Section III: Physical Data

Appearance: White to red in colour, fine to 4 mm size granules.
Boiling point: n/a
Coefficient of water/oil distribution: n/a
Evaporation rate: negligible
Freezing point: 773°C
Odor: none to slight, oily diesel-fuel type odor
Percent volatile by volume: 0–0.5
pH: 8–9

n/a = not applicable or not available

Canpotex Limited

Section VII: Spill or Leak Procedures/Preventative Measures

Steps to be taken in case material is released or spilled:
Shovel or sweep up and place in waste disposal container. Flush area with water. Major spills (i.e. derailments) may be loaded into trucks with front-end loaders. Uncontaminated material may be recycled.

Waste disposal method:
Disposal must be made in accordance with Federal, State, Provincial, and locla regulations.

Personal protective equipment: dust mask for dusty conditions and safety glasses
Engineering controls: use local or area ventilation to remove dust
Spill procedures: place in containers or vehicle with shovels or loaders, flush area with water
Waste disposal: uncontaminated material may be used as fertilizer, waste may be disposed of in suitable land fill in accordance with applicable regulations
Handling procedures: avoid generating dust by unnecessary or excessively vigorous movements
Storage requirements: keep dry, avoid contact with carbon steel and aluminum
Shipping information: keep covered

Section VIII: Special Protection Information

Respiratory protection: for dusty conditions, particulate filtering disposable mask is adequate
Ventilation: n/a
Protective gloves: not required
Eye protection: safety glasses are adequate
Other protective equipment: not required

Section IX: Special Precautions

Precautions to be taken in handling and storing:
Heating products may lead to vaporization of additives. The need for respiratory protection should be determined by industrial hygiene evaluation.

Other precautions:
Keep Dry; potash is hygroscopic. Moisture causes caking. Avoid rough handling. Degradation results in dusty products.

Section X: First Aid Measures

Skin: Flush with water, obtain medical attention if rash develops
Eye: Flush with running water for at least 15 minutes and obtain medical attention
Inhalation: Obtain medical advice if symptoms persist
Ingestion: Obtain medical attention. Ingestion of large amounts usually causes purging of the stomach by vomiting.

n/a = not applicable or not available

Judgments as to the suitability of information herein for purchaser's purposes are necessarily the purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Canpotex extends no warranties, makes no representations and assumes no responsibility for the accuracy or suitability of such information for application to the purchaser's intendent purposes or for the consequences of its use.

Date of Issue: May 1995

Canpotex Limited

Section III: Physical Data *(continued)*

Solubility in water (by weight @20°C): 26%
Specific gravity (water=1): 2.0
Vapor density (air=1): n/a
Vapor pressure (mm Hg): n/a

Section IV: Fire and Explosion Hazard of Material

Auto ignition temperature: n/a
Explosive power: none
Extinguishing media: n/a
Flammable: no
Flash point: n/a
Hazardous combustion products: none
Means of extinction: n/a
Rate of burning: n/a
Sensitivity to chemical impact: none
Sensitivity to static discharge: none
Special extinguishing procedures: n/a
Special fire fighting procedures: none (product can be used to smother fires)
TDG flammability classification: none
Unusual fire and explosion hazards: none
Upper explosion & lower explosion limit: n/a

Section V: Health Hazard Data/Toxicological Properties of Product

Carcinogenic: no
Effects of acute exposure: minor skin, respiratory tract or eye irritation
Effects of chronic exposure to product: may reduce lung function
Effects of overexposure: none expected
Emergency and first aid procedures: ordinary personal hygiene should be adequate
Exposure limit: none established
Irritancy: causes minor eye and skin irritation
LC_{50}: n/a
LD_{50}: n/a
Mutagenic: no
Nuisance particulates TLV: 10 mg/m^3
Reproductive effects: none
Route of entry: skin contact, eye contact, inhalation, ingestion
Sensitization: not reported
Synergistic materials: none reported
Teratogenic: no
Threshold limit value: no specific TLV has been established

Section VI: Reactivity Data

Chemical Stable: yes
Conditions to avoid: none
Hazardous decomposition products: none
Hazardous polymerization: will not occur
Incompatible to other substances: no
Reactivity: none

n/a = not applicable or not available

MATERIAL SAFETY DATA SHEET

Sodium Carbonate, Anhydrous

MSDS Ref. No.: 497-19-8
Date Approved: 01/26/2004
Revision No.: 6

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the Canada's Workplace Hazardous Materials Information System (WHMIS) and, the EC Directive, 2001/58/EC.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Carbonate, Anhydrous

ALTERNATE PRODUCT NAME(S): Soda Ash, Sodium Carbonate Anhydrous

GENERAL USE: Glass manufacture, detergent manufacture, sodium chemicals and carbonate chemicals manufacture, pulp and paper, brine treatment, water hardness removal, pH adjustment in water or waste water, flue gas desulfurization, coal treatment, ion exchange resin regeneration.

This chemical is certified to ANSI/NSF Standard 60, Drinking Water Chemicals-Health Effects (as packaged in the original, unopened container). The maximum dosage level for this chemical is 150 mg/L

MANUFACTURER

FMC Wyoming Corporation
Alkali Chemicals Division
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.)
(303) 595-9048 (Medical - Call Collect)

(307) 872-2452 (Plant - Green River, WY)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- White, odorless, granular solid.
- Product is non-combustible.
- Reacts with acids to release carbon dioxide gas and heat.
- Irritating to the eyes and continuous contact may irritate the skin.
- Not expected to be toxic to the environment, nor to aquatic organisms.

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POTENTIAL HEALTH EFFECTS: Direct contact with the product causes irritation of the eyes and continuous contact may cause skin irritation (red, dry, cracked skin). Excessive levels of airborne dust may irritate the mucous membranes and upper respiratory tract.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Sodium carbonate	497-19-8	99.8	207-838-8	Xi, R36

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist as necessary.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: While internal toxicity is low, irritant effects of high concentrations may produce corneal opacities, and vesicular skin reactions in humans with abraded skin only. Treatment is symptomatic and supportive.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Water, water fog, carbon dioxide (CO_2), dry chemical

FIRE / EXPLOSION HAZARDS: Not applicable

FIRE FIGHTING PROCEDURES: Wear full protective clothing and self-contained breathing apparatus.

FLAMMABLE LIMITS: Not applicable

HAZARDOUS COMBUSTION PRODUCTS: Fumes of sodium oxide.

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SENSITIVITY TO IMPACT: None

SENSITIVITY TO STATIC DISCHARGE: None

6. ACCIDENTAL RELEASE MEASURES

COMMENTS: PERSONAL PRECAUTIONS: Refer to Section 8 "Exposure Controls / Personal Protection".

CONTAINMENT: Prevent large quantities of this product from contacting vegetation or waterways; large spills could kill vegetation and fish.

CLEAN-UP: This product, if spilled, can be recovered and re-used if contamination does not present a problem. Vacuum or sweep up the material. If the spilled product is unusable due to contamination, consult state or federal environmental agencies for acceptable disposal procedures and locations. See Section 13 "Disposal Considerations".

NOTIFICATION REQUIREMENTS: Federal regulations do not require notification for spills of this product. State and local regulations may contain different requirements; consult local authorities.

7. HANDLING AND STORAGE

HANDLING: Use air conveying / mechanical systems for bulk transfer to storage. For manual handling o bulk transfer use mechanical ventilation to remove airborne dust from rail car, ship or truck. Use approved respiratory protection when ventilation systems are not available. Selection of respirators is based on the dust cloud generation. Keep material out of lakes, streams, ponds and sewer drains.

STORAGE: Store in a cool dry area, away from acids.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Where possible, provide general mechanical and/or local exhaust ventilation to prevent release of airborne dust into the work environment.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Appropriate eye and face protection equipment (ANSI Z87 approved) should be selected for the particular use intended for this material. Safety glasses with side shields are recommended.

RESPIRATORY: Whenever dust in the worker's breathing zone cannot be controlled with ventilation or other engineering means, workers should wear respirators or dust masks approved by

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NIOSH/MSHA, EU CEN or comparable certification organization to protect them against airborne dust.

PROTECTIVE CLOTHING: Dry product is generally non-irritating to intact skin. However, this product can be irritating where skin has been damaged and can create skin irritation after long exposures when moisture is present. Under such conditions, gloves and long-sleeved clothing are recommended to minimize skin contact.

COMMENTS:

ADDITIONAL EXPOSURE GUIDELINES:

Federal guidelines treat the ingredient(s) in this product as a nuisance dust, as no product-specific guidelines have been issued for exposure. As with all nuisance dusts, worker breating zone concentrations should be measured by validated sampling and analytical methods. The following limits (OSHA and MSHA) apply to this material:

Particulates Not Otherwise Regulated:
OSHA (PEL / TWA): 15 mg/m³ (total dust); 5 mg/m³ (resp fraction)
MSHA (PEL / TWA): 10 mg/m³ (total dust)

The information noted above provides general guidance for handling this product. Specific work environments and material handling practices will dictate the selection and use of personal protection equipment (PPE).

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Odorless
APPEARANCE:	White, granular solid.
AUTOIGNITION TEMPERATURE:	Not applicable
BOILING POINT:	Decomposes
COEFFICIENT OF OIL / WATER:	Not applicable
DENSITY / WEIGHT PER VOLUME:	(g/ml) Dense Grades = 0.86 - 1.12; Light Grades = 0.70 - 0.90
EVAPORATION RATE:	Not applicable (Butyl Acetate = 1)
FLASH POINT:	Non-combustible
FREEZING POINT:	851°C (1564°F)
ODOR THRESHOLD:	Not applicable
OXIDIZING PROPERTIES:	Not applicable
PERCENT VOLATILE:	Not applicable

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pH:	11.4 (1% solution)
SOLUBILITY IN WATER:	33.2 % maximum
SPECIFIC GRAVITY:	2.509 (water = 1)
VAPOR DENSITY:	Not Applicable
VAPOR PRESSURE:	Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Contact with acids except under controlled conditions.
STABILITY:	Stable
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Reacts with acids with release of large volumes of carbon dioxide gas and heat.
HAZARDOUS DECOMPOSITION PRODUCTS:	Heated to decomposition, it emits fumes of sodium oxide.

COMMENTS:

Materials to Avoid: Aluminum powder, acids, fluorine, molten lithium

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Severe irritant (rabbit) [Toxicology 23:281 (1982)]

SKIN EFFECTS: Non-irritating to intact skin. Minor irritation may occur on abraded skin. [Toxicol. Appl. Pharmacol. 31:481 (1975)]

DERMAL LD_{50}: No data available for the product.

ORAL LD_{50}: 4,090 mg/kg (rat) [RTECS 1986]

INHALATION LC_{50}: 2.3 mg/l (2 h) (rat) [Environ, Res. 31:138 (1983)]

SENSITIZATION: 0.25% sodium carbonate: Non-sensitizing (human) [Toxicol. Appl. Pharmacol. 31:481 (1975)]

TARGET ORGANS: Eyes

ACUTE EFFECTS FROM OVEREXPOSURE: May cause severe irritation of the eyes, including corneal opacities. Dusts and mists may be irritating to the skin, mucous membranes and upper respiratory tract. No significant acute toxicological effects expected.

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CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product.

CARCINOGENICITY:

NTP:	Not listed
IARC:	Not listed
OSHA:	Not listed
OTHER:	(ACGIH) Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: 96-hour LC_{50} = 265 - 565 mg/L (daphnia magnia) (low toxicity)
96-hour LC_{50} = 300 - 320 mg/L (bluegill sunfish) (low toxicity)

CHEMICAL FATE INFORMATION: Biodegradability does not apply to inorganic substances. No significant toxicity to aquatic organisms is expected.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: When this product is discarded or disposed of, as purchased, it is neither a characteristic nor a listed hazardous waste according to US Federal RCRA regulations (40 CFR 261). As a non-hazardous waste the material may be disposed of in a landfill in accordance with government regulations; check local or state regulations for applicable requirements prior to disposal. Any processing, usage, alteration, chemical additions to, or contamination of, the product may alter the disposal requirements. Under Federal regulations, it is the generator's responsibility to determine if a waste is a hazardous waste.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Not regulated
PRIMARY HAZARD CLASS / DIVISION:	Not applicable
UN/NA NUMBER:	None
LABEL(S):	Not applicable

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PLACARD(S): Not applicable

MARKING(S): Not applicable

ADDITIONAL INFORMATION: Hazardous Substance/RQ: Not applicable
49 STCC Number: Not applicable

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

ADDITIONAL INFORMATION: Not regulated

ADR - EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD

ADDITIONAL INFORMATION: Not regulated

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

ADDITIONAL INFORMATION: Not regulated

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Not listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Not listed

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CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Not listed

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):
Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):
Waste Number: Refer to Section 13 "Disposal Considerations" for RCRA status.

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Product Identification Number:	Not applicable
Hazard Classification / Division:	Toxic, Class D, Div. 2, Subdiv. B
Ingredient Disclosure List:	Listed

E NUMBERS:

E 500

EU EINECS NUMBERS:

011-005-00-2

INTERNATIONAL LISTINGS

Australia (AICS): Listed
Korea: KE-31380
Japan (ENCS): (1)-164
Philippines (PICCS): Listed
China: Listed

COMMENTS:

CLEAN WATER ACT (CWA) - SECTION 307 / 311
Not listed as a hazardous pollutant (40 CFR 116), nor as a toxic pollutant (40 CFR 401.15)

CLEAN AIR ACT (CAA) - SECTION 112
Not regulated under the chemical accident prevention provisoins (40 CFR 68)

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16. OTHER INFORMATION

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:

Sodium carbonate:

EC Symbols:	Xi	(Irritant)
EC Risk Phrases:	R36	(Irritating to eyes.)
EC Safety Phrases:	S2	(Keep out of the reach of children.)
	S22	(Do not breathe dust.)
	S26	(In case of contact with eyes, rinse immediately with plenty of water and seek medical advice)

HMIS

Health	2
Flammability	0
Physical Hazard	0
Personal Protection (PPE)	B

Protection = B (Safety glasses and gloves)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	2
Flammability	0
Reactivity	0
Special	None

No special requirements

NFPA = National Fire Protection Association

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:

KMB00003680

Changes in information are as follows:
New Format, as well as text changes and/or updates to one or more Sections of this MSDS.

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Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*
5-56 (Aerosol) #765-1359, 765-1360

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name CRC Chemicals	Emergency Telephone Number 215-674-4300
Address *(Number, Street, City, State, and ZIP Code)* 885 Louis Dr. Warminster, PA 18974	Telephone Number for Information 215-674-4300 Date Prepared July 1986
	Signature of Preparer *(optional)*

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
Petroleum Distillate 64742-47-8 CAS#	NA	NA	200 ppm (est.)	53
Propane 74-98-6	1000	NA		28
Isobutane 75-28-5		NA	800	
*Inhibited paraffinic oil	for mist 5 mg/m^3			19

*The oil and additives are not hazardous according to OSHA standards

NOTE: The propane and isobutane function only as aerosol propellents

Section III — Physical/Chemical Characteristics (Without the propellent)

Boiling Point 380°F (Initial)		Specific Gravity (H_2O = 1) .8167	
Vapor Pressure (mm Hg.) 0.23 mm		Melting Point na	
Vapor Density (AIR = 1) Heavier than air		Evaporation Rate (Butyl Acetate = 1) Slow 0.01 (Toluene=1)	

Solubility in Water
Negligible in water - Dissolves in most organic solvents

Appearance and Odor
Amber liquid, pleasant odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
175°F COC	Propellent	1.8	9.5

Extinguishing Media
CO_2, Dry Chemical or foam

Special Fire Fighting Procedures

NA

Unusual Fire and Explosion Hazards
The aerosol propellent is a flammable gas, however it quickly dissipates after the application.

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(Reproduce locally)

OSHA 174, Sept. 1985

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Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	x	

Incompatibility (*Materials to Avoid*)
Strong oxidizing agents

Hazardous Decomposition or Byproducts
Carbon dioxide, carbon monoxide (In a fire)

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	x	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? yes Skin? yes Ingestion?

Health Hazards (*Acute and Chronic*)
Acute - Eyes - may cause burning & irritation. Skin - Excessive contact may cause drying. Inhalation - Mist may cause breathing problems. Vapors may cause headaches.

Chronic - Prolonged exposure to skin may cause dermititus.

Carcinogenicity: NTP? no IARC Monographs? no OSHA Regulated? no

Signs and Symptoms of Exposure
See Health Hazards above.

Medical Conditions
Generally Aggravated by Exposure na

Emergency and First Aid Procedures (If symptoms persist, call a physician)
Inhalation - Remove to fresh air - apply artificial respiration if necessary. Eyes - flush for 15 minutes with large amounts of water. Skin - Remove contaminated clothing. Wash skin with soap. Ingestion - Do not induce vomiting. Call a physician.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
Usually not an aerosol problem. Ventilate area. Remove sources of ignition. Use adsorbent to pick up waste material.

Waste Disposal Method
Discarded filled cans or partially used cans are Hazardous Waste - Observe Federal, State and Local regulations.

Precautions to Be Taken in Handling and Storing
Store in a cool dry area.

Other Precautions
Aerosol cans may explode if their contents are heated above 130°F.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
Use NIOSH approved mask for high mist concentration.

Ventilation	Local Exhaust	Special
Adequate	to maintain mist conc. below 5 mg/kg	
	Mechanical (*General*)	Other

Protective Gloves: Oil resistant
Eye Protection: Safety glasses

Other Protective Clothing or Equipment
Not normally recommended for aerosol use.

Work/Hygienic Practices

* U.S.G.P.O.: 1988-491-529/45775

KMB00003684

PRODUCT INFORMATION

BIO CLEAN - BIODEGRADABLE COLD TANK CLEANER

GENERAL DESCRIPTION:

BIO CLEAN is a completely biodegradable, water-based cold tank cleaner. Safely removes oil, grease, carbon deposits and "lacquer build-up" from carburators, pistons and other parts. Safe on soft metals, such as aluminum. Contains no petroleum distillates, halogenated hydrocarbons or phenolics. BIO CLEAN has a pleasant fragrance.

PROPERTIES:

Form	Liquid
Color	Light Blue-Green
Odor	Mild, Sweet

Safe on aluminum and other soft metals

USE DIRECTIONS:

Submerge parts completely, if possible, in BIO CLEAN. Do not soak parts more than 2 hours without checking. Avoid soaking parts overnight. BIO CLEAN may be diluted 50:50 with water. Rinse parts with fresh water before allowing parts to air dry.

CAUTION:

Contains detergents and sodium metasilicate. May cause eye or skin irritations. May be harmful if swallowed. For contact with skin or eyes, flush thoroughly with plenty of water - at least 15 minutes for eyes. For eye contact, get prompt medical attention. Do Not Ingest. Consult the Material Safety Data Sheet for additional precautions.

KEEP OUT OF REACH OF CHILDREN

PACKAGING:

55 gal. drum
6 gal. pail

11/95

MT. HOOD CHEMICAL CORPORATION
4444 N.W. YEON AVENUE, PORTLAND, OREGON 97210
(503) 227-3505 FAX (503) 225-9143
Call Toll Free (800) 547-2594

MT. HOOD CHEMICAL CORPORATION
4444 N.W. Yeon Avenue
Portland, Oregon 97210
Emergency Phone: 503-227-3505

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: BIO CLEAN

N/A = NOT APPLICABLE
NA = NOT AVAILABLE

PRODUCT NAME: **BIO CLEAN** | PREPARED BY: K. Woods | DATE: August 31,1995

CHEMICAL FAMILY: Synthetic Detergent Mixture | FORMULA: Proprietary

HAZARDOUS INGREDIENTS (CAS #):	%	EXPOSURE LIMITS, ppm: ACGIH TLV	OSHA-PEL
Sodium metasilicate (6834-92-0)	Less than 5%	N/A	N/A

CARCINOGENIC INGREDIENTS: Contains no known or suspected carcinogens.
SARA TITLE III, SECTION 313 REPORTABLE INGREDIENTS: None

PHYSICAL PROPERTIES:
- Boiling Point: About 200°F
- Solubility in Water: 100%
- Specific Gravity - Liquid (H_2O = 1): 0.98-1.00
- Odor and Appearance: Clear blue-green liquid; mild odor
- % Volatiles: NA
- % Volatile Organic Content (VOC): 0
- Vapor Pressure: NA
- Vapor Density (Air = 1): NA

FIRE AND EXPLOSION DATA:
- Flash Point: Over 200°F
- Flammability Limits: NA
- Extinguishing Media: Water, CO_2, foam, dry chemical
- Special Firefighting Procedures: None
- Unusual Hazards: None

HEALTH EFFECTS:
- Effects of overexposure: Contains concentrated detergents. May cause minor eye irritation. Skin contact may cause irritation. Ingestion may cause nausea and diarrhea.
- Chronic effects of overexposure: None known or expected.
- Medical conditions that may be aggravated by exposure: None known or expected.
- Primary routes of entry: Ingestion, skin contact

EMERGENCY AND FIRST AID PROCEDURES:
- Eye Contact: *Flush thoroughly with plenty of water for several minutes. If irritation persists, see a physician.*
- Skin Contact: Flush thoroughly from skin with water. Wash with soap and water. If irritaion persists, see a physician.
- Ingestion: Drink plenty of water and call a physician immediately. DO NOT INDUCE VOMITING.
- Inhalation of mist or vapor: N/A

REACTIVITY DATA:
- Stability: Stable
- Hazardous Polymerization: Will not occur
- Incompatibility: None
- Hazardous Decomposition Products: None
- Conditions to Avoid: None

SPILL OR LEAKAGE PROCEDURES:
- Steps to be taken if material is released or spilled: Flush to sewer with plenty of water, mop up, or absorb on an absorbent. Scrub floor well to remove residue to prevent slipperiness.
- Waste disposal method: According to local, state, or federal ordinances.

SPECIAL PROTECTION INFORMATION:
- Ventilation: NA
- Respiration Protection: None required
- Eye Protection: Wear safety goggles if spraying or if splashing is possible.
- Protective Gloves: Rubber or neoprene gloves recommended.
- Other Protective Equipment: None required

SPECIAL PRECAUTIONS:
- Precautions to be taken in handling and storage: Store in closed container in a dry place. Wash thoroughly after handling. KEEP OUT OF REACH OF CHILDREN.
- Other precautions: None

HAZARD RATING:

Health:	1	0 = Minimal	3 = Serious
Fire:	1	1 = Slight	4 = Severe
Reactivity:	0	2 = Moderate	
Specific Hazard:	N/A		

Clorox Professional Products Company
1221 Broadway
Oakland, CA 94612
Tel. (510) 271-7000

Material Safety Data Sheet

I Product: COMMERCIAL SOLUTIONS™ ULTRA CLOROX® GERMICIDAL BLEACH I

Description: CLEAR, LIGHT YELLOW LIQUID WITH CHLORINE ODOR

Other Designations	Distributor	Emergency Telephone Nos.
EPA Reg. No. 67619-8 Sodium Hypochlorite Solution	Clorox Sales Company 1221 Broadway Oakland, CA 94612	For Medical Emergencies Call: (800) 446-1014 For Transportation Emergencies Chemtrec (800) 424-9300

II Health Hazard Data

DANGER: CORROSIVE. May cause severe irritation or damage to eyes and skin. Harmful if Swallowed. The following medical conditions may be aggravated by exposure to high concentrations of vapor or mist; heart conditions or chronic respiratory problems such as asthma, chronic bronchitis or obstructive lung disease. Some clinical reports suggest a low potential for sensitization upon exaggerated exposure to sodium hypochlorite, particularly on damaged or irritated skin. Routine clinical tests conducted on intact skin with Clorox Liquid Bleach found no sensitization in the test subjects. Under normal consumer use conditions the likelihood of any adverse health effects are low.

FIRST AID:

EYE CONTACT: Rinse with plenty of water for at least 15 minutes. Get prompt medical attention.

SKIN CONTACT: Wash skin thoroughly with soap and water.

INGESTION: Drink large amounts of water. DO NOT induce vomiting. Call a physician or poison control center immediately.

INHALATION: If breathing problems develop remove to fresh air.

III Hazardous Ingredients

Ingredients	Concentration	Worker Exposure Limit
Sodium hypochlorite CAS # 7681-52-9	6.0-7.35%	not established
Sodium hydroxide CAS # 1310-73-2	<0.2%	2.0 mg/m3 TLV-C a

aTLV-C = ACGIH Threshold Limit Value-Ceiling Limit

None of the ingredients in this product are on the IARC, NTP or OSHA carcinogen list.

IV Special Protection and Precautions

Hygienic Practices: Wear safety glasses. With repeated or prolonged use, wear nitrile, neoprene, or butyl rubber gloves. Wash after contact with product. Avoid breathing vapors.

Engineering Controls: Use general ventilation to minimize exposure to vapor or mist.

Work Practices: Avoid eye and skin contact and inhalation of vapor or mist.

KEEP OUT OF THE REACH OF CHILDREN.

V Transportation and Regulatory Data

U.S. DOT Hazard Class: Not restricted

U.S. DOT Proper Shipping Name: Hypochlorite solution with not more than 7% available chlorine. Not Restricted per 49CFR172.101(c)(12)(iv).

EPA - SARA Title III/CERCLA:
Bottled product is not reportable under Sections 311/312; contains no chemicals regulated under Section 313; and contains chemicals (sodium hypochlorite ≤ 7.35% and sodium hydroxide ≤ 0.2%) which are regulated under Section 304/CERCLA.

TSCA Status: All component of this product are on the TSCA Inventory.

VI Spill Procedures/Waste Disposal

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

Waste disposal: Dispose of in accordance with all applicable federal, state and local regulations.

VII Reactivity Data

Stable under normal use and storage conditions. Strong oxidizing agent. Reacts with other household chemicals such as toilet bowl cleaners, rust removers, vinegar, acids or ammonia containing products to produce hazardous gases, such as chlorine and other chlorinated species. Prolonged contact with metal may cause pitting or discoloration.

VIII Fire and Explosion Data

Not flammable or explosive. In a fire, cool containers to prevent rupture and release of sodium chlorate.

IX Physical Data

Boiling point	212°F100°C decomposes)
Specific Gravity (H_2O=1)	1.085
Solubility in Water	complete
pH	11.4

®1983, 1991 THE CLOROX COMPANY

DATE PREPARED 10/00

DATA SUPPLIED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH

KMB00003687

PRODUCT NAME: BLITZ AIRBORNE # 1930 DATE ISSUED: 07/28/95
NATIONAL ITEM #: 1930XX SUPERCEDES:

CHRONIC EFFECTS: NONE KNOWN.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

EMERGENCY FIRST AID PROCEDURES

EYE CONTACT: FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATED, SEEK MEDICAL ATTENTION.

SKIN CONTACT: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.

INHALATION: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. DRINK TWO LARGE GLASSES OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): IF VAPOR CONCENTRATION EXCEEDS TLV, USE RESPIRATOR APPROVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.

PROTECTIVE GLOVES: LATEX, IF SKIN EASILY IRRITATED.

EYE PROTECTION: SAFETY GLASSES RECOMMENDED.

VENTILATION REQUIREMENTS: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.

OTHER PROTECTIVE CLOTHING & EQUIPMENT: NONE

HYGIENIC WORK PRACTICES: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.

WASTE DISPOSAL METHODS: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.

PRODUCT NAME: BLITZ AIRBORNE # 1930 DATE ISSUED: 07/28/95
NATIONAL ITEM #: 1930XX SUPERCEDES:

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURES ABOVE 130 F.

OTHER PRECAUTIONS &/OR SPECIAL HAZARDS: KEEP OUT OF REACH OF CHILDREN. AVOID FOOD CONTAMINATION. AVOID INHALATION OF SPRAY MIST. AVOID WATER CONTAMINATION.

WE BELIEVE THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE, BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND.

** CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN. (A) NTP (B) IARC MONOGRAPH (C) OSHA (D) NOT LISTED (E) ANIMAL DATA ONLY

KMB00003688

MANUFACTURED FOR:
NATIONAL SANITARY SUPPLY CO
255 EAST FIFTH STREET, SUITE 2900
CINCINNATI, OH 45202
24 HR. EMERGENCY NO. (800) 535-5053

PRODUCT NAME: BLITZ AIRBORNE # 1930
NATIONAL ITEM #: 1930XX
DATE ISSUED: 07/28/95
SUPERCEDES:

THIS MSDS COMPLIES WITH OSHA'S HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 AND OSHA FORM 174.

IDENTITY INFORMATION

NFPA RATING: HEALTH-1; FLAMMABILITY-2; REACTIVITY-0; SPECIAL-B
HMIS RATING: HEALTH-1; FLAMMABILITY-2; REACTIVITY-0; PERSONAL PROTECTION-B

DOT HAZARD CLASSIFICATION: ORM-D

IDENTITY (TRADE NAME AS USED ON LABEL): BLITZ AIRBORNE # 1930

MSDS NUMBER: 413
REVISION-5
PREPARED BY: ES/KD

NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (HAZARDOUS COMPONENTS 1% OR GREATER; CARCINOGENS 0.1% OR GREATER)	CAS NUMBER	SARA III LIST	OSHA PEL (PPM)	ACGIH TLV (PPM)	CARCINOGEN REF. SOURCE**
PETROLEUM DISTILLATE	91-20-3	YES	500	500	D
D-TRANS ALLETHRIN	584-79-2	YES	N/E	N/E	D
PIPERONYL BUTOXIDE	51-03-6	YES	N/E	N/E	D
ISOBUTANE/PROPANE BLEND	75-28-5	NO	800	800	D
ISOBUTANE/PROPANE BLEND	74-98-6	NO	1000	1000	D
N-OCTYL BICYCLOHEPTENE DICARBOXIMIDE	113-48-4	NO	N/E	N/E	D

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
SPECIFIC GRAVITY (H2O=1): CONCENTRATE ONLY = 0.953
VAPOR PRESSURE: PSIG @ 70 F (AEROSOLS): MAX. 60
VAPOR PRESSURE (NON-AEROSOLS)(MM HG AND TEMPERATURE): N/A
VAPOR DENSITY (AIR=1): N/E
EVAPORATION RATE (=1): N/E
SOLUBILITY IN WATER: MODERATE
WATER REACTIVE: NO
APPEARANCE AND ODOR: FINE MIST WITH FLORAL FRAGRANCE.

PRODUCT NAME: BLITZ AIRBORNE # 1930
NATIONAL ITEM #: 1930XX
DATE ISSUED: 07/28/95
SUPERCEDES:

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY AS PER USA FLAME PROJECTION TEST (AEROSOLS): NON-FLAMMABLE
AUTO IGNITION TEMPERATURE: N/E

FLAMMABILITY LIMITS IN AIR BY % IN VOLUME:
% LEL: N/E
% UEL: N/E

FLASH POINT AND METHOD USED (NON-AEROSOLS): N/A

EXTINGUISHER MEDIA: FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY.

SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE & EXPLOSION HAZARDS: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130 F OR THE CONTAINER MAY RUPTURE.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: (X) STABLE ( ) UNSTABLE

HAZARDOUS POLYMERIZATION: ( ) WILL (X) WILL NOT OCCUR

CONDITIONS TO AVOID: OPEN FLAME, WELDING ARCS, HEAT, SPARKS.

INCOMPATIBILITY (MAT. TO AVOID): STRONG OXIDIZERS, ALKALINE MEDIA, HEAVY METALS.

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO2.

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY:
(X) INHALATION
( ) INGESTION
( ) SKIN ABSORPTION
( ) EYE
( ) NOT HAZARDOUS

ACUTE EFFECTS:
INHALATION: EXCESSIVE INHALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS, NAUSEA.

EYE CONTACT: IRRITATION.

SKIN CONTACT: MILD IRRITATION.

INGESTION: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA, DIZZINESS, LOSS OF MUSCLE COORDINATION.

MATERIAL SAFETY DATA SHEET
COMPLIES WITH OSHA HCS 29 CFR 1910.1200 AND OSHA 174

MSDS# L-113 Revision # 1

PRODUCT NAME (AS USED ON LABEL): BORAXO[R] POWDERED HAND SOAP

ALTERNATE PRODUCT NAME: N/A

EMERGENCY TELEPHONE NUMBER: (602) 253-3334

****

SECTION I

MANUFACTURER/DISTRIBUTOR: THE DIAL CORP
1850 N. CENTRAL
PHOENIX, AZ 85077

TELEPHONE NUMBER FOR GENERAL INFORMATION: (602) 991-3000

****

SECTION II-HAZARDOUS INGREDIENTS

Finished Product: OSHA (PEL)-N/A ACGIH (TLV)-N/A
Hazardous Components:

Chemical/Common Name	CAS Number	PEL/TLV-Source
Sodium tetraborate, decahydrate/borax	1303-96-4	OSHA 8-hr TWA PEL, 10 mg/m^3 ACGIH TLV-TWA, 5 mg/m^3

*Values were set to protect workers from acute irritant effects on skin and mucous membranes of the eyes, nose, and other sites.

****

SECTION III-PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: ND
Vapor Density (Air=1): ND
Specific Gravity (Water=1): 0.898
Vapor Pressure (mm Hg.): ND
Volatiles by Weight (%): ND
Solubility in Water: Approximately 5% @ 20° C.
Appearance/Odor: White granular powder with slight floral odor.

Melting Point: ND
Freezing Point: ND
pH: 9.1 (1% Solution)
Evaporation Rate (*=1): ND
*Butyl Acetate

****

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point (°F)/Method Used: None
Flammable Limits (LEL/UEL): None
Extinguishing Media: Not required. Product is inherent fire retardant.
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

****

SECTION V-REACTIVITY DATA

Stability: Stable
Chemical Incompatibility: None
Hazardous Decomposition Products: None
Hazardous Polymerization: Will Not Occur
Conditions to Avoid: None

****

KMB00003690

BORAXO[R] POWDERED HAND SOAP (L-113)

SECTION VI-HEALTH HAZARD DATA

Route of Entry: Inhalation - Unlikely under normal use conditions
Skin - Likely
Ingestion - Unlikely under normal use conditions.
Eye - Unlikely under normal use conditions.

Health Hazards (Acute and Chronic):

Acute:

Inhalation - Respiratory tract irritation has been reported among individuals exposed to high dust levels of sodium tetraborates.

Ingestion - The acute oral LD_{50} for the product in rats is greater 6.81 g/kg body weight. This value is consistent with the acute oral toxicity in rats of the product's predominant ingredients, borax and soap. See paragraph below for additional information on borate toxicity following exposure by this and other routes, which are considered relevant for predicting borate toxicity by this route.

Skin - Although the primary skin irritation index of the product in rabbits is 0, no effect (16 CFR 1500.41), prolonged contact with aqueous solutions of it would be expected to be irritating to rabbit, and probably human, skin because under similar conditions sodium tetraborate and soap are irritating to rabbit skin. Also, occupational experience with sodium tetraborates, suggest prolonged skin contact with the dry product, which contains a high concentration of borax, would be irritating or drying to the skin.

The acute dermal LD_{50} for the product in rabbits is greater than 2.0 g/kg body weight (16 CFR 1500.40). See paragraph below for additional information on borate toxicity following exposure by this and other routes, which are considered relevant for predicting borate toxicity by this route.

Eyes - The product produces reversible conjunctivitis when instilled in the eyes of rabbits (16 CFR 1500.42). This effect is consistent with the ocular effects of sodium tetraborates and soap.

Chronic: ND for product.

Borate systemic toxicity. Acute and chronic exposure to sodium borates or boric acid, which is chemically and toxicologically similar to sodium borates, produce gastrointestinal, central nervous system, skin, renal and hepatic toxicity, and death in humans. Chronic exposure to these compounds produce growth suppression, testicular degeneration, infertility, death and, possibly red blood cell toxicity in animals.

Most borate poisonings among humans have followed ingestion, instillation into a body cavity, or application to damaged or diseased skin. Many of the reported cases involved infants, who may be a sensitive population to borate toxicity. Also, recent published literature on boric acid ingestions indicate the toxic potency of these compounds may be dramatically less than indicated in some of the older primary literature or recent secondary sources.

Carcinogenicity*:	NTP	IARC Monographs	OSHA Regulated
	NL	No	No

KMB00003691

*The product has not been tested for this effect.

Effects of Overexposure:

Inhalation - Dryness of mouth, nose, and throat, nose and throat irritation, nosebleeds, dry cough, chest tightness, shortness of breath, and dyspnea have been reported among workers exposed to high dust levels of sodium tetraborates.

Ingestion - Nausea, abdominal pain, vomiting, diarrhea, headache, lethargy, lightheadedness, delirium, convulsions, coma, diminished urine output, alopecia, and an erythematous desquamating rash have been reported among individuals poisoned by sodium tetraborates or boric acid.

Skin - Irritation and chapping.

Eyes - Temporary burning, stinging, or irritation.

Medical conditions generally aggravated by exposure: None

****

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Eye Protection - None necessary unless direct eye contact with the product is expected or unless high dust levels of the product are produced. In such situations, wear glasses or goggles as appropriate.

Skin Protection - None necessary unless prolonged or extensive exposure to the product is expected or unless skin is damaged or diseased. In such situations, wear borax impermeable gloves, garments, or shoes as appropriate.

Respiratory Protection - None necessary except in areas where airborne dust concentrations of sodium borax exceed established workplace limits. In those areas, wear appropriate NIOSH-approved respirator.

Handling: Retain package integrity.
Storage: Dry indoor storage.
Normal Clean Up: Sweep or vacuum. Rinse area with water.
Waste Disposal: Sanitary sewer or solid waste. Not a hazardous waste.

****

SECTION VIII-FIRST AID & MEDICAL EMERGENCY PROCEDURES

Eyes: Flush eyes with tepid water, occasionally lifting lids, until all visible material has been removed. If any more than transitory irritation or discomfort occur, call a physician, preferably an ophthalmologist.

Skin: Rinse all material from the skin.

Inhalation: Remove to fresh air.

Ingestion: For amounts exceeding a taste, immediately call a poison control center (e.g. 602-253-3334) or a physician.

****

SECTION IX-CONTROL MEASURES-OCCUPATIONAL

Respiratory Protection (Specify Type): Wear appropriate NIOSH-approved dust respirator in areas where airborne dust concentrations of borax exceed established workplace limits.

Ventilation: As necessary to prevent airborne concentrations of borax from exceeding applicable workplace limits.

KMB00003692

Protective Gloves - None necessary unless prolonged exposure to the product is expected or unless skin is damaged or diseased. In such situations wear borax impermeable gloves.

Eye Protection - None necessary unless direct eye contact with the product is expected or unless high dust levels of the product are produced. In such situations, wear glasses or goggles as appropriate.

Other Protective Clothing or Equipment - None necessary unless prolonged or extensive skin contact is expected or unless skin is damaged or diseased. In such situations, wear appropriate borax impermeable garments or shoes.

Work/Hygienic Practices: Do not eat or drink in work area.

REFERENCES

American Conference of Governmental Industrial Hygienists. (1988). Threshold Limit Values and Biological Exposure Indices for 1988-1989. American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

American Conference of Governmental Industrial Hygienists. Documentation of the Threshold Limit Values And Biological Exposure Indices. Fifth Ed. American Conference of Governmental Industrial Hygienists, Inc., Cincinnati, OH.

Cosmetic Ingredient Review. (1983). Final report on the safety assessment of sodium borate and boric acid. J. Am. Coll. Toxicol. 2 (7), 87-125.

Litovitz, T. Klein-Schwartz, W. Oderda, G., and Schmitz, B. (1988). Clinical manifestations of toxicity in a series of 784 boric acid ingestions. Am. J. Emerg. Med. 6 (3), 209-212.

Pfeiffer, C. C. and Jenney, E. H. (1950). The pharmacology of boric acid and boron compounds. Bull. Nat. Form. Comm. 18, 57-80.

Stokinger, H. E. (1981). The halogens and the nonmetals boron and silicon. In: Patty's Industrial Hygiene and Toxicology. 3rd Ed., (G. D. Clayton and F. E. Clayton, Eds.) Vol. IIB. Chap. 40, pp. 2984-2987. John Wiley and Sons, Inc., New York.

United States Occupational Safety and Health Administration. (1989).Air contaminants. Borates, tetra, sodium salts (anhydrous, pentahydrate, and decahydrate). Fed. Reg. 54(12), 2451-2452.

BORAXO[R] POWDERED HAND SOAP (L-113)

SECTION X-ENVIRONMENTAL IMPACT

Applicable Regulations: 16 CFR 500
DOT/EPA Hazard Class: None
Shipping Name: See product name

****

EPA - SARA Title III Section 313: Toxic chemical - no

****

****

NOTE: N/A=Not Applicable ND= Not Determined NL=Not Listed
NIF=No Information Found NE=None Established

****

The information contained herein is provided in good faith and is believed to be correct as of the date hereof. However, The Dial Corporation makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, The Dial Corporation will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to the information set forth herein or to the product to which the information refers.

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Date Prepared: 04/24/92

Change: Reviewed and Updated MSDS.

End of MSDS

KMB00003694

MATERIAL SAFETY DATA SHEET

PRODUCT NAME : QD CONTACT CLEANER (aerosol) #-MSDS03130
PRODUCTS- 3130
MANUFACTURED BY: CRC INDUSTRIES, INC. Phone:(215) 674-4300
885 LOUIS DRIVE, WARMINSTER, PA. 18974

1. INGREDIENTS	CAS #	ACGIH TLV	OSHA PEL	OTHER LIMITS:	%
Ethanol	64-17-5	1000 ppm	1000 ppm		62.0
Isopropyl Alcohol	67-63-0	400 ppm	400 ppm		7.0
Methanol	67-56-1	200 ppm	200 ppm		3.0
Hexane	110-54-3	50 ppm	50 ppm		2.4
Isohexanes	107-83-5	500 ppm	500 ppm		21.6
Carbon Dioxide	124-38-9	5000 ppm	10000		4.0

2. PHYSICAL DATA : without propellant

Specific Gravity : 0.760
Vapor Pressure : ND
% Volatile : 100
Boiling Point : 141 F initial
Evaporation Rate : >1 (butyl acetate=1)
Freezing Point : < 0 F
Vapor Density : >1 (air=1)
Appearance and Odor :
pH : NA

Clear liquid with alcohol odor.

Solubility : Partial solubility in water.

3. FIRE AND EXPLOSION DATA

Flashpoint : <20 F Method : TCC
Flammable Limits : LEL:1.2 UEL:19
Extinguishing Media : Dry chemical, foam, or CO2
Unusual Hazards : Vapors generated are extremely flammable. Aerosol containers may explode when heated above 130 F.

4. REACTIVITY AND STABILITY

Stability : Stable
Hazardous decomposition products
: CO2, CO (thermal)

Materials to avoid : Strong oxidizers, strong acids or bases.

5. PROTECTION INFORMATION

Ventilation : Maintain vapor conc. below the TLV. Use mechanical means if necessary.

Respiratory : Above TLV use self-contained breathing apparatus.

Gloves : Neoprene Eye & Face : safety glasses
Other Protective Equipment: Not usually required with aerosol product usage.

MATERIAL SAFETY DATA SHEET

PRODUCT NAME : QD CONTACT CLEANER (aerosol) #-MSDS03130
PRODUCTS- 3130
MANUFACTURED BY : CRC INDUSTRIES, INC. PHONE (215) 674-4300
885 LOUIS DRIVE, WARMINSTER, PA. 18974

6. HEALTH HAZARD DATA
Primary Routes of Entry : Inhalation, Skin

Signs and Symptoms of Exposure
1. Acute Overexposure:
Eyes- burning and irritation. Skin- mild irritation.
Inhalation- irritation of respiratory tract, dizziness, headaches, central nervous system depression.

2. Chronic overexposure: Repeated overexposures may cause harm to the nervous system.

Medical Conditions Generally Aggravated by Exposure
: Pre-existing lung disorders, asthma

Chemical Listed as Carcinogen : No National Toxicology Program
or Potential Carcinogen : No IARC Monographs
: No OSHA

Emergency and First Aid Procedures :(If symptoms persist, call a physician)

1. Inhalation : Remove to fresh air. Apply artificial respiration if necessary.

2. Eyes : Flush with large amounts of water for 15 minutes.

3. Skin : Wash area thoroughly with soap and water.

4. Ingestion : DO NOT induce vomiting. Call a doctor.

7. SPILL OR LEAK PROCEDURES
Precautions to be taken in Handling and Storage : Store in a cool, dry area.

Steps to be taken in case Material is released or spilled : Remove sources of ignition. Ventilate area. Absorb spill with an inert absorbent material.

Waste Disposal : All used and unused Product should be disposed of in conformance with local, state and federal regulations.

8. SPECIAL PRECAUTIONS AND USE DIRECTIONS :
Aerosol cans may explode when heated to temperatures above 130 F.
Use this product in areas of good ventilation. Vapors are heavier than air and will collect in low areas.

9. NFPA HAZARD RATINGS Health:2 Flammability:3 Reactivity:0

10. SARA Information
This product contains the following chemicals that are subject to release reporting under Section 313 of SARA Title III.

Chemical Name	CAS-#	Percent
Methanol	67-56-1	3.0

PREPARED BY: Allen Reed ORIGINAL DATE or DATE OF REVISION: 03/15/91

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*
Contact Cleaner #765-1442, 765-1443

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name CRC Chemicals	Emergency Telephone Number 215-674-4300
Address *(Number, Street, City, State, and ZIP Code)* 885 Louis Dr. Warminster, PA 18974	Telephone Number for Information 215-674-4300
	Date Prepared July 1986
	Signature of Preparer *(optional)*

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
Trichlorotrifluoroethane 76-13-1 CAS#		1000		96
Carbon Dioxide 124-38-9	5000	5000		4

Section III — Physical/Chemical Characteristics (Does not include Carbon Dioxide propellent)

Boiling Point 117.6°F		Specific Gravity (H_2O = 1) 1.57	
Vapor Pressure (mm Hg.) 5.5 psia 70°F		Melting Point na	
Vapor Density (AIR = 1) 6.5		Evaporation Rate (Butyl Acetate = 1) 0.3 (Carbon tet = 1)	

Solubility in Water
Slight Solubility in water - Soluble in many organic liquids

Appearance and Odor
Colorless liquid

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
None TCC, TOC	None		

Extinguishing Media
Not needed

Special Fire Fighting Procedures
NA

Unusual Fire and Explosion Hazards
Aerosol containers can explode if contents are heated to more than 130°F.

4th

(Reproduce locally)

OSHA 174, Sept. 1985

KMB00003697

Section V — Reactivity Data

Stability			
	Unstable		Conditions to Avoid
	Stable	x	

Incompatibility (*Materials to Avoid*)
Powdered metals such as aluminum, magnesium, calcium, zinc

Hazardous Decomposition or Byproducts
Halogens, halogen acids, possibility of phosgene (Thermal)

Hazardous Polymerization			
	May Occur		Conditions to Avoid
	Will Not Occur	x	

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	yes	yes	

Health Hazards (*Acute and Chronic*)
Acute overexposure--Inhalation - Drowsiness, lightheadedness, possible cardiac arrhythmias at high concentration. Skin - defatting action, may cause dermititus. Eyes - may irritate eyes. Chronic overexposure - may cause skin irritation with repeated skin contact.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	no	no	no

Signs and Symptoms of Exposure
See Health Hazards above.

Medical Conditions
Generally Aggravated by Exposure Impaired cardiovascular function such as cardiac arrhythmias might be sensitized by inhalation.

Emergency and First Aid Procedures (If symptoms persist, call a physician)
Inhalation - Remove to fresh air - apply artificial respiration if necessary. Eyes - Flush with large amounts of water. Skin - Wash with water. Ingestion - Induce vomiting. Call a physician.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
Due to high volatility material quickly evaporates. Ventilate area, evacuate personnel until concentration is below TLV or use self-contained breathing apparatus.

Waste Disposal Method
If possible pump into drums for reclamation.

Precautions to Be Taken in Handling and Storing
Store in a cool dry area.

Other Precautions
Aerosol containers may explode if exposed to termperatures over 130°F. Vapors are very heavy and will collect in low areas. Oxygen would be displaced and asphyxiation could result. Good ventilation is a must for low areas and confined spaces.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
Self-contained breathing apparatus above TLV.

Ventilation	Local Exhaust	Special
Maintain concentration below TLV.	Mechanical (*General*)	Other

Protective Gloves	Eye Protection
Neoprene	Safety goggles

Other Protective Clothing or Equipment
Protective clothing only if there is repeated contact with liquid.

Work/Hygienic Practices

* U.S.G.P.O.: 1988-491-529/45775

KMB00003698

MATERIAL SAFETY DATA SHEET

PRODUCT NAME Heavy Duty Degreaser (Aerosol) #3095	# MSDS003095
MANUFACTURED BY: CRC CHEMICALS	Phone (215) 674-4300
885 LOUIS DRIVE, WARMINSTER, PA. 18974	

1. INGREDIENTS	CAS #	ACGIH TLV	OSHA PEL	Other Limits	%
1,1,1 Trichloroethane	71-55-6	350	350		72
Perchloroethylene	127-18-4	50	100		24
Carbon Dioxide	124-38-9	5000			4

2. PHYSICAL DATA (Does not include carbon dioxide propellent)

Specific Gravity 1.385 (77°F)	Vapor Pressure 85 mm	% Volatile 100
Boiling Point 165--252°F	Evaporation Rate Rapid	
Freezing Point NA	Vapor Density 4.8 (Air = 1)	

Appearance and Odor Colorless liquid - Irritating odor at high conc.

Solubility Slight solubility in water - good solvent for many organic materials

3. FIRE AND EXPLOSION DATA

Flashpoint None	Method TCC, TOC, COC	Flammable Limits 212°F	
Extinguishing Media Water fog		LEL 7.5	UEL 14.5%

Unusual Hazards Aerosols may explode if their temperature exceeds 130°F

4. REACTIVITY AND STABILITY

Stability Good - Avoid exposures to open flames, arcs and high temp.

Hazardous decomposition products Thermal - Hydrogen chloride, chlorine & some phosgene

Materials to avoid Avoid storage in aluminum containers or contact with aluminum and zinc powder.

5. PROTECTION INFORMATION

Ventilation Maintain vapor concentration below TLV - Use mechanical means if necessary

Respiratory Above TLV use self contained air mask or vapor mask

Gloves Solvent resistant	Eye & Face Safety glasses

Other Protective Equipment Not normally required for aerosol products.

MSDS003095

6. HEALTH HAZARD DATA

Primary Routes of Entry Inhalation and skin contact

Signs and Symptoms of Exposure

1. Acute Overexposure Inhalation - headaches, dizziness, anesthesia, unconsciouness. Eyes - causes pain and some irritation. Skin--causes irritation on repeated exposures

2. Chronic Overexposure Repeated overexposures may cause liver and kidney effects.

Medical Conditions Generally Aggravated by Exposure High levels (8000 ppm +) of vapor may cause cardiac arrthymias

Chemical Listed as Carcinogen or Potential Carcinogen	National Toxicology Program	Yes ☐ No ☒	IARC Monographs	Yes ☐ No ☒	OSHA	Yes ☐ No ☒

Emergency and First Aid Procedures (If symptoms persist, call a physician)

1. Inhalation Remove to fresh air, apply artificial respiration if necessary.
2. Eyes Flush for 15 minutes with large amounts of water.
3. Skin Remove contaminated clothing. Wash exposed skin with soap.
4. Ingestion Do not induce vomiting - Call a physician.

7. SPILL OR LEAK PROCEDURES

Precautions to be taken in Handling and Storage Store in a cool dry area.

Steps to be taken in case Materials is released or spilled Usually not a problem with aerosols - Area should be ventilated and absorbent used to pick up excess material.

Waste Disposal Discarded filled cans or partially used cans are Hazardous Waste - Dispose of in conformance to Regulations

8. SPECIAL PRECAUTIONS AND USE DIRECTIONS

Avoid prolonged skin contact or breathing of vapors. Since vapors are heavier than air, aerosols should not be used in confined areas or low spots without adequate ventilation. If vapors are suspected in a low area, do not enter unless special breathing apparatus is used and an observer is present for assistance.

Keep aerosols away from heat.

PREPARED BY: A. P. Reed

ORIGINAL DATE OR DATE OF REVISION Nov. 1985

MATERIAL SAFETY DATA SHEET

S02020
01 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

S02020

HMIS CODES

Health	2
Flammability	0
Reactivity	0

PRODUCT NAME

SPRAYON* Plastics Contact Clearner

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
Consumer Group - Industrial
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.

(216) 566-2917

DATE OF PREPARATION

30-JUL-05

INFORMATION TELEPHONE NO.

(800) 251-2486

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
35	811-97-2	1,1,1,2-Tetrafluoroethane				
		ACGIH TLV	Not Available			760 mm
		OSHA PEL	Not Available			
5	67-63-0	2-Propanol				
		ACGIH TLV	400		ppm	33 mm
		ACGIH TLV	500		ppm STEL	
		OSHA PEL	400		ppm	
		OSHA PEL	500		ppm STEL	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Continued on page 2

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
Not Available
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.

Continued on page 3

VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
PROTECTIVE GLOVES
None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	11.12 lb/gal	1332 g/l
SPECIFIC GRAVITY	1.34	
BOILING POINT	<0 - 181 F	<-18 - 82 C
MELTING POINT	Not Available	
VOLATILE VOLUME	100 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
VOLATILE ORGANIC COMPOUNDS	(VOC Theoretical)	
Volatile Weight 5.00 %	Less Water and Federally Exempt Solvents	

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
811-97-2	1,1,1,2-Tetrafluoroethane				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
67-63-0	2-Propanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		5045 mg/kg

Continued on page 4

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

TSCA CERTIFICATION
All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 800-255-3924

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: GREEN APPLE 1867 DRY DEODORIZER
Date Issued: 05/17/96
Supercedes: 04/02/93
Type of Product: AEROSOL DEODORIZER
National Item#: 1867XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS#	%	SARA III LIST	OSHA/ PEL	ACGIH/ TLV

NJ TSRN 10001

THE SPECIFIC CHEMICAL IDENTITIES OF THE INGREDIENTS OF THIS MIXTURE ARE CONSIDERED TO BE TRADE SECRETS AND ARE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1910:1200 OF TITLE 29 OF THE CODE OF FEDERAL REGULATIONS.

SECTION 3. PHYSICAL DATA

Vapor Density (Air=1): N/E
Specific Gravity(H20=1): CONC. ONLY = < 1
Boiling Point or Range: N/A
Solubility in Water: SOLUBLE
Vapor Pressure: PSIG @70F(Aerosole): 70
Water Reactive: NO
Evaporation Rate =1: NA
Apperance and Odor: CLEAR, LIQUID WITH FRAGRANCES.

Section 4. FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST
(aersols) NONE-FLAMMABLE
Flash Point And Method Used (Non-Aerosol): NA
Auto Ignition Temperature: N/E
Flammable Limits in Air, Volume %: (LEL) N/E (UEL) N/E
Fire Extinuishing Materials: FOAM, DRY CHEMICAL, CARBON DIOXIDE WATER.
Special Firefighting Procedures: PROVIDE SHIELDING OR PERSONNEL. WEAR SELF-CONTAINED BREATHING APPARATUS. COOL CONTAINERS WITH WATER FOG TO PREVENT RUPTURING & SPEWING.
Unusual Fire and Explosion Hazards: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130F OR THE CONTAINER MAY RUPTURE.

Product Name: GREEN APPLE 1867 DRY DEODORIZER
National Item #1867
Date Issued: 05/17/96

SECTION 5. REACTIVITY DATA

Stability: STABLE
Conditions to Avoid: OPEN FLAME, WELDING ARCS, HEAT.
Incompatibility (materials to avoid): ALKAILS, OXIDIZING MATERIALS, AMINES.
Hazardous Polymerization: WILL NOT OCCUR
Conditions To Avoid: OPEN FLAME, WELDING ARCS, HEAT.
Hazardous Decomposition Products: CO, CO2.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Steps to be Taken if Material Is Spilled or Released: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.
Waste Disposal Methods: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE POSE NO DISPOSAL HAZARD.
Precautions to be Taken in Handling and Storage: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURES ABOVE 130F.
Other Precautions and/or Special Hazards: KEEP OUT OF REACH OF CHILDREN. AVOID FOOD CONTAMINATION. AVOID BREATHING VAPORS. REMOVE IGNITION SOURCES.

SECTION 7. HEALTH HAZARD DATA

Primary Route(s) of Entry: INHALATION
Acute Effects:
Inhalation: EXCESSIVE IHNALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.
Eye Contact: IRRITATION
Skin Contact: MAY CAUSE SLIGHT IRRITATION
Ingestion: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.
Chronic Effects: (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIALS OF THIS MIXTURE) MAY CAUSE CARDIAC ABNORMALITY, LIVER ABNORMALITIES, KIDNEY AND/OR LUNG DAMAGE.
Medical Conditions Generally Aggravated by Exposure: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: FLUSH WITH WATER FOR 15 MINUTES, GET MEDICAL ATTENTION.
Skin Contact: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.
Inhalation: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.
Ingestion: DO NOT INDUCE VOMITING. DRINK TWO LARGE GLASSES OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

Product Name: GREEN APPLE 1867 DRY DEODORIZER
National Item #1867
Date Issued: 05/17/96

SECTION 9. SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) IF VAPOR CONCENTRATION EXCEEDS TLV, USE RESPIRATOR APPROVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.
Protective Gloves: LATEX, IF SKIN EASILY IRRITATED.
Eye Protection: SAFETY GLASSES RECOMMENDED
Ventilation Requirements: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.
Other Protective Clothing and Equipment: NONE
Hygienic Work Practices: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

SECTION 10. ADDITIONAL INFORMATION

NFPA RATING: HEALTH -1 FLAMMABILITY -4 REACTIVITY -0 SPECIAL -0

HMIS RATING: HEALTH -1 FLAMMABILITY -4 REACTIVITY -0
PERSONAL PROTECTION -B

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF PRODUCT*

Product Name: HAPPY HONEY SUCKLE AIR FRESHENER GEL

Date Issued: 04/13/94
Supercedes: 05/24/89
National Item#: 1814XX

THE IDENTITY OF INDIVIDUAL COMPONENTS OF THIS MIXTURE IS PROPRIETARY INFORMATION AND IS REGARDED TO BE A TRADE SECRET. THIS MIXTURE CONTAINS NO SUSPECTED CARCINOGENS AS REPORTED BY NIP, OSHA OR IARC MONOGRAPHS. ONE OR MORE OF THE COMPONENTS PRESENT IN GREATER THAN 1% CONCENTRATION MAY PRESENT THE FOLLOWING HEALTH EFFECTS BASED ON EVALUATION OF THE INDIVIDUAL COMPONENTS: MAY CAUSE EYE, SKIN OR RESPIRATORY IRRITATION.

THE ABOVE EFFECTS ARE BASED ON EVALUATION OF INDIVIDUAL COMPONENTS AND THE RELEVANCY TO THE MIXTURE AS A WHOLE OR TO HUMANS IN UNKNOWN. EXCESSIVE EXPOSURE MAY CAUSE SIMILAR EFFECTS.

IN HUMANS, ONE OR MORE OF THE INDIVIDUAL COMPONENTS MAY CAUSE THE FOLLOWING HEALTH EFECTS: MAY BE IRRITATING TO EYES AND SKIN.

HAZARD RATING: HEALTH -1 FLAMMABILITY -2 REACTIVITY -0
PERSONAL PROTECTION -C

SECTION 2. PHYSICAL PROPERTIES

Physical State: GEL
Refractive Index @ 25c: N/A
Specific Gravity @ 25c: N/A
Density @ 25c: N/A

Color: PALE YELLOW
Soluble In: OIL
Melting Point (cc) (Deg F): 130-140
Flash Point (cc) (Deg F): 185-195

SECTION 3. PHYSICAL PROPERTIES

Type of Hazard: COMBUSTIBLE

Extinguishing Media: FOAM, CO2, DRY CHEMICAL
Special Fire Fighting Procedures: SELF CONTAINED BREATHING APPARATUS, PROTECTIVE CLOTHING.
Materials/Conditions to Avoid: OPEN FLAME, EXCESSIVE HEAT OR COLD.
Unusual Fire, Explosion and Stability Hazards: NONE FOUND

SECTION 4. HEALTH HAZARDS

Warning!! DIRECT CONTACT WITH EYE OR SKIN MAY CAUSE IRRITATION. BREATHING CONCENTRATED VAPORS MAY CAUSE RESPIRATORY IRRITATION.

Threshold Limit Value (TLV): NOT EXTABLISHED
OSHA Permissible Exposure Limit (PEL): NOT ESTABLISHED
Primary Route(s) of Entry: SKIN CONTACT, INHALATION, INGESTION.
Effects of Overexposure: NONE CURRENTLY KNOWN.

Section 5. FIRST AID PROCEDURES

Eyes: IMMEDIATELY FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTACT LENSES, CALL A PHYSICIAN IF IRRITATION PERSISTS.

Inhalation: REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED OR IS IRREGULAR, ADMINISTER ARTIICAL RESPIRATION AND OXYGEN. SEEK MEDICAL ATTENTION.

Skin: WASH WITH SOAP AND WATER, FLUSH WITH LARGE QUANTITIES OF WATER. KEEP CONTAMINATED CLOTHING AWAY FROM SKIN.

Ingestion: IF SWALLOWED, IMMEDIATELY DILUTE WITH TWO 8 OUNCE GLASSES OF WATER OR MILK. CONTACT PHYSICIAN IMMEDIATELY.

SECTION 7. PERSONAL PROTECTION

Eyes: THE USE OF SAFETY GLASSES IS RECOMMENDED. IF A MATERIAL IS TO BE HANDLED IN A MANNER WHERE SPLASHING MAY OCCUR, THE USE OF SPLASH GOGGLES OR FACE SHIELD IS RECOMMENDED.

Respiratory: IN WELL-VENTILATED AREAS, RESPIRATORY PROTECTION IS NOT NORMALLY REQUIRED. IN CONFINED, POORLY VENTILATED AREAS, THE USE OF "NOISH" APPROVED RESPIRATORY PROTECTION IS RECOMMENDED.

Equipment & Apparel: THE USE OF CHEMICAL RESISTANT GLOVES IS RECOMMENDED. ACCEPTABLE INDUSTRIAL HYGIENE PRACTICES SHOULD BE MAINTAINED.

Ventilation: PROVIDE ADEQUATE VENTILATION. USE LOCAL EXHAUST FAN IF NECESSARY.

SECTION 8. STORAGE AND HANDLING

IT IS RECOMMENDED THAT THIS MATERIAL BE STORED IN A COOL, WELL-VENTILATED AREA, AVOIDING OPEN FLAMES OR OTHER SOURCES OF IGNITION.

SECTION 9. SPILL, RELEASE AND WASTE DISPOSAL PROCEDURES

Spill or Release:
COVER LIQUIDS WITH ABSORPTIVE MATERIAL. SWEEP SPILLED MATERIAL AND DISCARD IN APPROVED DISPOSAL CONTAINER.

Disposal Procedures: USED CONTAINERS MAY CONTAIN FLAMMABLE OR COMBUSTIBLE RESIDUE. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION 10. OTHER INFORMATION

SECTION 11. SUPERFUND AMENDMENTS & REAUTHORIZATION ACT(SARA)TITLE III NOTICE

THIS PRODUCT IS NOT SUBJECT TO REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

THIS INFORMATION IS SUPPLIED IN GOOD FAITH, BUT NO WARRANTY EXPRESSED OF IMPLIED IS MADE. WATERBURY COMPANIES BELIEVES THAT IT IS ACCURATE TO THE BEST OF ITS KNOWLEDGE & RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)
Call nearest Sales Office for MSDS Information

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: ORANGE TWIST

Date Issued: 03/18/93
Supercedes: 05/08/89
National Item#: 1839XX

Product #650
Chemical Name And Synonyms: ORGANIC OILS
Chemical Family: FRAGANCES

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED	% (OPTIONAL)
D-LIMONENE	5989-27-5	NE	NE		95

SECTION 3. PHYSICAL DATA

Boiling Point (F): 350 F
Vapor Pressure: 2mm @25C
Vapor Density: >1 Air=1
Specific Gravity (Water=1): 0.840
Melting Point: N/A
Evaporation Rate : SLOWER THAN ETHER (ETHER=1)

Solubility in Water: INSOLUBLE
Appearance and Odor: YELLOW TINGE LIQUID, CITRUS ODOR.

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): 122 F TCC
Flammable Limits: LEL= 0.7 UEL= 6.1
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL, FOAM, FOG

Special Fire Fighting Procedures: USE SELF-CONTAINED BREATHING APPARATUS

Unusual Fire & Explosion Hazards: NONE

Product Name: ORANGE TWIST
Date Issued: 03/18/93

SECTION 5. REACTIVITY DATA

Stability: STABLE Conditions To Avoid: EXCESSIVE HEAT

Incompatibility - Materials to Avoid: AVOID STRONG OXIDIZING AGENTS

Hazardous Polymerization: WILL NOT OCCUR

Conditions to Avoid: NONE

Hazardous Decomposition Biproducts: FORMS CARBON MONOXIDE AND/OR DIOXIDE UPON BURNING.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill Response: NORMAL REFUSE REMOVAL

Waste Disposal Method: ANY METHOD FOR THE DISPOSAL OF CHEMICAL WASTES SUBJECT TO LOCAL REGULATIONS.

SECTION 7. HEALTH HAZARD DATA

Route(s) of Entry: INHALATION? -YES; SKIN? -YES; INGESTION? -YES;
Health Hazards (Acute and Chronic)
Acute: MAY BE IRRITATING TO THE EYES AND SKIN. INGESTION-CAN CAUSE GASTROLNTESTINAL DISTRUBANCES.

Chronic: NONE KNOWN
Carcinogenicity: NTP? -N/A IARC MONOGRAPHS? -N/A OSHA REGULATED? -N/A

Signs and Symptoms of Exposure: EYE AND SKIN IRRITATION

Medical Conditions Generally Aggravated: NONE

Emergency and First Aid Procedures:
Ingestion: DO NOT INDUCE VOMITING, CALL PHYSICIAN IMMEDIATELY
Skin Contact: WASH WITH SOAP AND WATER. IF IRRITATION PERSISTS, CALL PHYSICIAN.
Inhalation: REMOVE TO FRESH AIR.

Product Name: ORANGE TWIST
Date Issued: 03/18/93

SECTION 8. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled:
REMOVE ALL IGNITION SOURCES. SMALL SPILLS SHOULD BE ABSORBED BY DIRT, SAND OR OTHER SUITABLE ABSORBENTS FOR DISPOSAL. LARGE SPILLS CAN BE DIKED WITH DIRT, THEN PUMPED TO TANK TRUCK FOR DISPOSAL.

Waste Disposal: IN ACORDANCE WITH FEDERL, STATE AND LOCAL REGULATIONS.

Precautions to be Taken In Handling and Storage: UNUSAL PRECAUTIONS FOR COMBUSTIBLE LIQUIDS.

Other Precautions: KEEP OUT OF REACH OF CHILDREN.

SECTION 9. CONTROL MEASURES

Respiratory Protection Specifty Type: NOT MORMALLY REQUIRED, BUT IF VAPOR CONCENTRATION BECOMES HIGH, USE SELF CONTAINED AIR MASK.

Ventilation:
Local Exhaust: ONLY IF MECHANICAL IS INADEQUATE
Mechanical (General): SATISFACTORY
Special: NONE NECESSARY
Other: NONE NECESSARY
Protection Gloves: RUBBER OR NEOPRENE
Eye Protection: CHEMICAL GOGGLES
Other Protective Clothing/Equipment: EYE WASH STATION.
Work/Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE. WASH HANDS BEFORE EATING, AVOID INHALATION OR INGESTION.

SECTION 10. ADDITIONAL PRECAUTIONS

NFPA RATING:	HEALTH -1	FIRE -2	REACTIVITY -0	SPECIFIC -
HMIS RATING:	HEALTH -1	FIRE -2	REACTIVITY -0	PROTECTION -B

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

Manufactured For:

National Sanitary Supply Co.
255 East Fifth Street, Suite 2900
Cincinnati, OH 45202
24 Hr. Emergency No. (800) 535-5053

Product Name: PARA DICHLOROBENZENE BLOCKS
National Item #: 1808XX
Date Issued: 07/10/96
Supercedes:

PRODUCT IDENTIFICATION AND MANUFACTURER'S INFORMATION

Chemical Name: 1,4-dichlorobenzene
Identity: Deoderizer/air freshener Restroom Deoderant

Chemical Family: Chloronated Aromatic
Chemical Formula: C6H4C12 CAS#: 106-46-7
% by Wgt. in Product: 99.4-100.0%

SECTION 2- WARNING STATEMENTS

Warning! Causes irritation to eyes, skin and respiratory tract irritation. Harmful if swallowed. Keep out of reach of children. Keep away from food. Combustible vapor and material. Marine pollutant. Molten material can cause severe burns. Excessive exposure may cause liver and kidney damage. Warning! This material sha been shown to cause cancer when administered orally to rodents at high levels.

SECTION 3- PRECAUTIONS FOR SAFE HANDLING

Skin Protection: Wear appropriate protective clothing and chemical resistant resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Use face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before re-use. Wash thoroughly after handling.

Respiratory Protection: Avoid breathing vapor, mist or dust. Use NIOSH/MSHA approved respiratory protection equipment (full facepiece recommended) when airborne exposure limits are exceeded (see below). If used, full facepiece replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29C.F.R.1910-134.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

SECTION 3- PRECAUTIONS FOR SAFE HANDLING, Continued

Ventilation: Provide ventilation to control exposure levels below airborne exposure limits. Use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust systems.

Airbourne Exposure Limits: para-Dichlorobenzene(99.4-100% by wt. of product) OSHA PEL: 75 ppm 8-Hour TWA; 110 ppm short term exposure limit. ACGIH TLV: 10 ppm 8-Hour TWA.

NOTE: The National Toxicology Program finding of tumors in laboratory animals was not available when these airborne exposure limtis were set for para-Dichlorobenzene by OSHA and ACGIH.

SECTION 4- FIRST AID PROCEDURES

Eyes: Remove material from eyes, skin and clothing. Flush eyes for at least 15 min., call physician. Skin: Immediately flush with water, remove contaminated clothing. If hot, threat for thermal effects. If inhaled: remove to fresh air. If not breating, give artificial respiration, preferably mouth to mouth. If breating difficult, give oxygen. Call physician. If swallowed: Immediately get medical attention. DO NOT induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person.

SECTION 5- FIRE AND EXPLOSION HAZARD/REACTIVITY DATA

Flash Point(Method Used): 150 F (Tagliabue Closed Cup)
Extinguishing Media: Water spray, foam, CO2, dry chemical or any Class B Extinguishing agent.

Special Fire Fighting Procedures: Wear full protective clothing and self-contained breather apparatus where exposure to vapor or gases is possible. Firefighting equipment should be thoroughly decontaminated after use.

Stability: Stable under normal conditions; avoid strong oxidizers, oxidizing agents.

Incompatibility: None known.

Hazardous Decomposition: Carbon monoxide (CO), carbon dioxide (CO2), smoke, soot, chlorides and phosgene.

Hazardous Polymerization: Does not occur.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

SECTION 6- PHYSICAL DATA

Vapor Pr. (MM HG)20C@68f:,6mm Hg
Odor: Penetrating "mothball odor"
Melting Point: 53C(127.4F)
Vapor Density (Air=1): 5.1
Color: White crystals/pink
Boiling Point: 174C(345.2F)
Sec. Gravity @ 55/4C:1.25
H2O Solubility @25C % by wt.: .008

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

SECTION 7- SPILL, LEAK, & DISPOSAL INFORMATION

Emergency Spill and Leak Information: Keep people away. Shut off or extinguish all sources of ignition. Shut off lead if without risk. Small spills, keep upwind. Large spills, evacuate area. If necessary to enter spill area, wear self-contained breathing apparatus and full protective clothing including boots. Sweep up or shovel into clean metal containers. Run-off to sewers may create health and explosion hazards; notify fire, health and pollution control authorities.

Release of more than 100 pounds to the environment in a 24-hour period requires notification of the National Response Center. 1-800-424-8802. Notification of state authorities may also be required.

Disposal Information: This product can become a hazardous waste as designated by the Environmental Protection Agency under the authority of the Resource Conservation and Recovery Act (RCRA). Product (or waste) has RCRA Hazardous Waste Number U072 as designated in 40 CFR 268. Disposal by incineration is Best Available Demonstrated Treatment (BDAT). All federal, state, and local regulations should be followed in disposing of this substance.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

SECTION 8- TRANSPORT/REGULATORY

DOT Proper Shipping Name: p-Dichlorobenzene
DOT Hazard Class/ID No./Packing Group: 6.1/UN1592/III
DOT Label(s): Keep away from food. Marine polutant (overwater shipments)
US Surface Freight Classification: para-Dichlorobenzene

Reportable Quantity (RQ) Under US EPA Para Dichlorobenzene 100 lbs. (45.4kg) CERCLA Requaltions

Hazard Categories Under Criteria of SARA Title III (40CFR Part 370): Immediate, Delayed Fire.

Section 313 Toxic Chemical(s): This product contains the following substances which is defined as toxic chemicals under, and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372: p-Dichlorobenzene.

TSCA Inventory: 1,4-dichlorobenzene(para-Dichlorobenzene) appears on the inventory of Chemical Substances Control Act (TSCA).

Hazardous Chemical(s) under OSHA Hazard Communication Standards: This product is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard(29CFR 1910:1200).

SECTION 9- ENVIRONMENTAL EFFECTS

Environmental Toxicity Information: Oral LD50 Bobwhite quail: 1,685 mg/kg, Slightly Toxic 48-hr EC50 Daphni magna: 7.4 mg/l, Moderately Toxic 96-hr LC50 Fathead Minnow: 4.2-30mg/l, Moderately Toxic 96-hr LC50 Grass Shrimp: 60mg/l, Slightly Toxic
Feathead minnow eggs were exposed to PDCB at concentration of 1, 0.57, 1.0, 2.0, .1 and 8.7 mg/l. Fry did not survive the 32-day exposure at 2.0 mg/l and higher. Survival and weight of the fry was reduced at 1.0 mg/l.

PDCB was evaluated in a 24-hour semi-continuous activated sludge (SCAS) test and in the Thompson-Duthle-Sturm biodegradability assay. Primary degradation was greater than 95% in the SCAS test. Theoratical CO2 evolution was approximately 58% using the Thompson-Duthle-Sturm method. PDCB was intermediate to readily biodegradable in both assays.

SECTION 10- HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of paradichlorobenzene and development of Precautionary Statements and Occupational Control Procedures recommended in this document.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

A- EFFECTS OF EXPOSURE

Inhalation and skin contact are expected to be the primary routes of occupational exposure to paradichlorobenzene (PDCB). Eye contact with PDCB has been reported to produce pain in the eyes, but has not been reported to cause serious injury to the eyes. This material produces a burning sensation when held in contact with skin, though injury to the skin is minimal. Minor eye and nasal irritation have been reported with exposure to PDCB in air at concentrations as low as 50 ppm. Exposure to PDCB above recommended airborne exposure limits may result in headache, swelling around the eyes, inflammation of the mucous membranes of the nose, loss of appetite, nausea and liver toxicity as a result of overexposure. Toxicity studies indicate high doses of PDCB produces liver and kidney injury in laboratory animals.

B- TOXICOLOGICL DATA

Data from laboratory studies and from the scientific literature on PDCB are summarized hereby: Single exposure (acute) studies indicate: Oral- Slightly Toxic; Rat LD50 3,926 mg/kg) Category III Dermal-Practically Nontoxic; (rat 4-hr LC50> 6.0 mg/l) Eye Irritation-Severe irritation, clearing in 13 days; (Rabbit) Category 1 Skin Irritation-Slightly irritating; (Rabbit, 4-hr exposure 2.9/8.0) Category III

Repeated inhalation studies (up to 14 weeks) with PDCS, conducted in rats, rabbits, guinea pigs and dogs, have resulted in liver, kidney and lung damage, reversible eye changes (rabbits only), reduced body weights and number of white blood cells, clinical signs and animal deaths at high exposure levels, while no effects were reported in monkeys. No adverse effects were observed in rats following repeated skin exposure (3 weeks) to PDCS. In repeat oral dosing studies (4 to 31 weeks), rodents given PDCB exhibited changes in body weight, some organ weights and clinical parameters, porphyria and kidney damage (male rats only) with liver toxicity. Changes in bone marrow, spleen, thymus, and nasal turbinates were also observed in rats and dosages which produced some deaths.

No teratogenic effects were reported in the offspring of rats administered PDCB. Exposure of pregnant rats and rabbits to PDCB in inhalation produced no increase in treatment-related birth defects. No effects were seen on the ability of male or female rats to reproduce when exposed to PDCB in inhalation for 2 successive generations; kidney toxicity (male rat only) and liver toxicity with reductions in body weight and pup survival during days 0-4 of nursing were observed.

PDCB has generally produced no genetic changes in a variety of standard tests using animals and animal bacterial cells. A positive response was reported in one assay using animals and mixed responses were reported in another assay using animal cells. PDCB has been shown to bind to nucleic acids in mouse organs, but not to bind nucleic acids in rat organs and to increase cell replication in male rat kidneys.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

SECTION 10- HEALTH EFFECTS SUMMARY, Continued

C- CANCER STUDIES

Long-term inhalation exposure of rodents (57 and 76 weeks for rats and mice, respectively) did not produce an increase in tumors; liver and kidney weights and urine coproporphyrin were increased at the highest exposure level. In long-term oral dosing studies with rats and mice (2-year) conducted by the National Toxicology Program(NTP); reduced survival and body weights with tumors of the kidney (male rat only) and liver (male and female mice), as well as kidney damage in rat and chages in mouse liver, thyroid and adrenal gland were observed. Mechanistic data suggests the PDCB produces kidney tumors via a special mechanism unique to the male rat. These data show hyaline droplet kidney toxicity in the male rat only. This toxic response is considered to result from reaction of PDCB and/or its metabolite (2,5-dichlorophenol) with alpha-2u-globulin, a protein unique to the male rat (not found in female rats, mice or humans). The mechanism of male rat kidney tumor formation is considered to be secondary to the interaction of PDCB and alpha-2u-globulin.

As a consequence of the NTP studies, PDCB is listed as a substance that "may reasonably be anticipated to be" carcinogenic by NTP in the Annual Report on Carcinogens and is classified as "possibly carcinogenic to humans" by the International Agency for Research on Cancer (ARC Monographs, Vol. 29). The NTP and IARC listings are based on their determination that there is inadequate evidence for the carcinogenicity of PDCS in humans and sufficient evidence for the carcinogenicity of PDCB in experimental animals.

These listings are based exclusively on studies which found kidney tumors in male rats and liver tumors in male and female mice. There is a large body of scientific evidence beyond these studies which conclusively demonstrates the tumor findings have only minimal revalance in humans. Many regulatory and advisory groups throughout the world, such as the US Environmental Protection Agency (EPA), the US Consumer Product Safety Commision (CPSC), and the World Health Organization's review of the entire body of scientific evidence addressing the health effects of PDCB, EPA, for examples, rejected a proposal to classify PDCB as a "probable" human carcinogen and decided that less restrictive "possible" classification was warranted. CPSC more recently concluded that PDCB products should not be treated as "toxic" or "hazardous" products under federal law.

Para-dichlorobenzene is also listed as a carcinogen under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

Additional Information: Excretion of dichlorophenol, a metabolite of PDCB, in urine is revealed by its distinctive odor. Prolonged exposure to PDCB produces a noticable odor in urine of workers.

Product Name: PARA DICHLOROBENZENE BLOCKS Date Issued: 07/10/96
National Item #: 1808XX Supersedes: NEW

SECTION 10- HEALTH EFFECTS SUMMARY, Continued

ALTHOUGH THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE CORRECT AS OF THE DATE HEREOF, HOSPITAL SPECIALTY COMPANY MAKES NO REPRESENTATIONS AS TO THE COMPLETENESS OR ACCURACY THEREOF. INFORMATION IS SUPPLIED UPON THE CONDITION THAT THE PERSONS RECEIVING THE SAME WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSES PRIOR TO USE. IN NO EVENT WILL HOSPITAL SPECIALTY CO. BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FORM THE USE OF OR RELIANCE UPON INFORMATION. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Prepared by: Todd Carlson Date: 7/10/96

MANUFACTURED FOR:
NATIONAL SANITARY SUPPLY COMPANY
255 EAST FIFTH STREET, SUITE 2900
CINCINNATI, OH 45202
24 HR. EMERGENCY NO. (800) 535-5053

PRODUCT NAME: POWDER FRESH
NATIONAL ITEM #: 1865XX
DATE ISSUED: 12/03/97
SUPERCEDES:

THIS MSDS COMPLIES WITH OSHA'S HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 AND OSHA FORM 174.

IDENTITY INFORMATION

NFPA RATING: HEALTH-1; FLAMMABILITY-3; REACTIVITY-0; SPECIAL-0
HMIS RATING: HEALTH-1; FLAMMABILITY-3; REACTIVITY-0; PERSONAL PROTECTION-B

DOT HAZARD CLASSIFICATION: ORM-D

IDENTITY (TRADE NAME AS USED ON LABEL): POWDER FRESH

MSDS NUMBER: 238 BP
REVISION-3
PREPARED BY: DL

NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (HAZARDOUS COMPONENTS 1% OR GREATER; CARCINOGENS 0.1% OR GREATER)	CAS NUMBER	SARA III LIST	OSHA PEL (PPM)	ACGIH TLV (PPM)	CARCINOGEN REF. SOURCE**

THE SPECIFIC CHEMICAL IDENTITIES OF THE INGREDIENTS OF THIS MIXTURE ARE CONSIDERED TO BE TRADE SECRETS AND ARE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1910:1200 OF TITLE 29 OF THE CODE OF FEDERAL REGULATIONS.

NJ TSRN 238BP

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
SPECIFIC GRAVITY (H20=1): CONCENTRATE ONLY = LT 1
VAPOR PRESSURE: PSIG @ 70 F (AEROSOLS): 70
VAPOR PRESSURE (NON-AEROSOLS)(MM HG AND TEMPERATURE): N/A
VAPOR DENSITY (AIR=1): N/E
EVAPORATION RATE (=1): N/E
SOLUBILITY IN WATER: SOLUBLE
WATER REACTIVE: NO
APPEARANCE AND ODOR: CLEAR LIQUID WITH FRAGRANCE.

PRODUCT NAME: POWDER FRESH
NATIONAL ITEM #: 1865XX

DATE ISSUED: 12/03/97
SUPERCEDES:

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY AS PER USA FLAME PROJECTION TEST (AEROSOLS): NON-FLAMMABLE
AUTO IGNITION TEMPERATURE: N/E

FLAMMABILITY LIMITS IN AIR BY % IN VOLUME:
% LEL: N/E
% UEL: N/E

FLASH POINT AND METHOD USED (NON-AEROSOLS): N/A

EXTINGUISHER MEDIA: FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER.

SPECIAL FIRE FIGHTING PROCEDURES: PROVIDE SHIELDING FOR PERSONNEL. WEAR SELF-CONTAINED BREATHING APPARATUS. COOL CONTAINERS WITH WATER FOG TO PREVENT RUPTURING & SPEWING.

UNUSUAL FIRE & EXPLOSION HAZARDS: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130 F OR THE CONTAINER MAY RUPTURE.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: (X) STABLE ( ) UNSTABLE

HAZARDOUS POLYMERIZATION: ( ) WILL (X) WILL NOT OCCUR

CONDITIONS TO AVOID: OPEN FLAME, WELDING ARCS, HEAT.

INCOMPATIBILITY (MAT. TO AVOID): ALKALIS, OXIDIZING MATERIALS, AMINES.

HAZARDOUS DECOMPOSITION PRODUCTS: CO2, CO2.

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY:
(X) INHALATION
( ) INGESTION
( ) SKIN ABSORPTION
( ) EYE
( ) NOT HAZARDOUS

ACUTE EFFECTS: VAPOR CONCENTRATIONS AROUND 1000 PPM MAY CAUSE SLIGHT TRANSIENT IRRITATION TO THE UPPER RESPIRATORY TRACT.

INHALATION: EXCESSIVE INHALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.

EYE CONTACT: IRRITATION.

KMB00003720

PRODUCT NAME: POWDER FRESH DATE ISSUED: 12/03/97
NATIONAL ITEM #: 1865XX SUPERCEDES:

SKIN CONTACT: MAY CAUSE SLIGHT IRRITATION.

INGESTION: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.

CHRONIC EFFECTS: (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIALS OF THIS MIXTURE) MAY CAUSE MUCOUS MEMBRANE IRRITATION, OVERNIGHT HEADACHE, AND GENERAL WEAKNESS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

EMERGENCY FIRST AID PROCEDURES:
EYE CONTACT: FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATED, SEEK MEDICAL ATTENTION.

SKIN CONTACT: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.

INHALATION: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. DRINK TWO LARGE GLASSES OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): IF VAPOR CONCENTRATION EXCEEDS TLV, USE RESPIRATOR APPROVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.

PROTECTIVE GLOVES: LATEX, IF SKIN EASILY IRRITATED.

EYE PROTECTION: SAFETY GLASSES RECOMMENDED.

VENTILATION REQUIREMENTS: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.

OTHER PROTECTIVE CLOTHING & EQUIPMENT: NONE

HYGIENIC WORK PRACTICES: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

PRODUCT NAME: POWDER FRESH DATE ISSUED: 12/03/97
NATIONAL ITEM #: 1865XX SUPERCEDES:

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.

WASTE DISPOSAL METHODS: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURES ABOVE 130 F.

OTHER PRECAUTIONS &/OR SPECIAL HAZARDS: KEEP OUT OF REACH OF CHILDREN. AVOID FOOD CONTAMINATION. AVOID BREATHING VAPORS. REMOVE IGNITION SOURCES.

WE BELIEVE THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE, BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND.

** CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN. (A) NTP (B) IARC MONOGRAPH (C) OSHA (D) NOT LISTED (E) ANIMAL DATA ONLY

KMB00003721

MANUFACTURED FOR:
NATIONAL SANITARY SUPPLY COMPANY
255 EAST FIFTH STREET, SUITE 2900
CINCINNATI, OH 45202
24 HR. EMERGENCY NO. (800) 535-5053

PRODUCT NAME: POWDER FRESH
NATIONAL ITEM #: 1865XX
DATE ISSUED: 12/03/97
SUPERCEDES:

THIS MSDS COMPLIES WITH OSHA'S HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 AND OSHA FORM 174.

IDENTITY INFORMATION

NFPA RATING: HEALTH-1; FLAMMABILITY-3; REACTIVITY-0; SPECIAL-0
HMIS RATING: HEALTH-1; FLAMMABILITY-3; REACTIVITY-0; PERSONAL PROTECTION-B

DOT HAZARD CLASSIFICATION: ORM-D

IDENTITY (TRADE NAME AS USED ON LABEL): POWDER FRESH

MSDS NUMBER: 238 BP
REVISION-3
PREPARED BY: DL

NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (HAZARDOUS COMPONENTS 1% OR GREATER; CARCINOGENS 0.1% OR GREATER)	CAS NUMBER	SARA III LIST	OSHA PEL (PPM)	ACGIH TLV (PPM)	CARCINOGEN REF. SOURCE**

THE SPECIFIC CHEMICAL IDENTITIES OF THE INGREDIENTS OF THIS MIXTURE ARE CONSIDERED TO BE TRADE SECRETS AND ARE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1910:1200 OF TITLE 29 OF THE CODE OF FEDERAL REGULATIONS.

NJ TSRN 238BP

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
SPECIFIC GRAVITY (H2O=1): CONCENTRATE ONLY = LT 1
VAPOR PRESSURE: PSIG @ 70 F (AEROSOLS): 70
VAPOR PRESSURE (NON-AEROSOLS)(MM HG AND TEMPERATURE): N/A
VAPOR DENSITY (AIR=1): N/E
EVAPORATION RATE (=1): N/E
SOLUBILITY IN WATER: SOLUBLE
WATER REACTIVE: NO
APPEARANCE AND ODOR: CLEAR LIQUID WITH FRAGRANCE.

PRODUCT NAME: POWDER FRESH
NATIONAL ITEM #: 1865XX
DATE ISSUED: 12/03/97
SUPERCEDES:

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY AS PER USA FLAME PROJECTION TEST (AEROSOLS): NON-FLAMMABLE
AUTO IGNITION TEMPERATURE: N/E

FLAMMABILITY LIMITS IN AIR BY % IN VOLUME:
% LEL: N/E
% UEL: N/E

FLASH POINT AND METHOD USED (NON-AEROSOLS): N/A

EXTINGUISHER MEDIA: FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER.

SPECIAL FIRE FIGHTING PROCEDURES: PROVIDE SHIELDING FOR PERSONNEL. WEAR SELF-CONTAINED BREATHING APPARATUS. COOL CONTAINERS WITH WATER FOG TO PREVENT RUPTURING & SPEWING.

UNUSUAL FIRE & EXPLOSION HAZARDS: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130 F OR THE CONTAINER MAY RUPTURE.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: (X) STABLE ( ) UNSTABLE

HAZARDOUS POLYMERIZATION: ( ) WILL (X) WILL NOT OCCUR

CONDITIONS TO AVOID: OPEN FLAME, WELDING ARCS, HEAT.

INCOMPATIBILITY (MAT. TO AVOID): ALKALIS, OXIDIZING MATERIALS, AMINES.

HAZARDOUS DECOMPOSITION PRODUCTS: CO2, CO2.

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY:
(X) INHALATION
( ) INGESTION
( ) SKIN ABSORPTION
( ) EYE
( ) NOT HAZARDOUS

ACUTE EFFECTS: VAPOR CONCENTRATIONS AROUND 1000 PPM MAY CAUSE SLIGHT TRANSIENT IRRITATION TO THE UPPER RESPIRATORY TRACT.

INHALATION: EXCESSIVE INHALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.

EYE CONTACT: IRRITATION.

PRODUCT NAME: POWDER FRESH DATE ISSUED: 12/03/97
NATIONAL ITEM #: 1865XX SUPERCEDES:

SKIN CONTACT: MAY CAUSE SLIGHT IRRITATION.

INGESTION: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.

CHRONIC EFFECTS: (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIALS OF THIS MIXTURE) MAY CAUSE MUCOUS MEMBRANE IRRITATION, OVERNIGHT HEADACHE, AND GENERAL WEAKNESS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

EMERGENCY FIRST AID PROCEDURES:
EYE CONTACT: FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATED, SEEK MEDICAL ATTENTION.

SKIN CONTACT: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.

INHALATION: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. DRINK TWO LARGE GLASSES OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): IF VAPOR CONCENTRATION EXCEEDS TLV, USE RESPIRATOR APPROVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.

PROTECTIVE GLOVES: LATEX, IF SKIN EASILY IRRITATED.

EYE PROTECTION: SAFETY GLASSES RECOMMENDED.

VENTILATION REQUIREMENTS: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.

OTHER PROTECTIVE CLOTHING & EQUIPMENT: NONE

HYGIENIC WORK PRACTICES: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

PRODUCT NAME: POWDER FRESH DATE ISSUED: 12/03/97
NATIONAL ITEM #: 1865XX SUPERCEDES:

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.

WASTE DISPOSAL METHODS: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURES ABOVE 130 F.

OTHER PRECAUTIONS &/OR SPECIAL HAZARDS: KEEP OUT OF REACH OF CHILDREN. AVOID FOOD CONTAMINATION. AVOID BREATHING VAPORS. REMOVE IGNITION SOURCES.

WE BELIEVE THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE, BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND.

** CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN. (A) NTP (B) IARC MONOGRAPH (C) OSHA (D) NOT LISTED (E) ANIMAL DATA ONLY

KMB00003723

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 800-255-3924

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: RAIN FOREST 1866 DRY DEODORIZER
Date Issued: 05/17/96
Supercedes: 04/02/93
Type of Product: AEROSOL DEODORIZER
National Item#: 1866XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS#	%	SARA III LIST	OSHA/ PEL	ACGIH/ TLV

NJ TSRN 10007

THE SPECIFIC CHEMICAL IDENTITIES OF THE INGREDIENTS OF THIS MIXTURE ARE CONSIDERED TO BE TRADE SECRETS AND ARE IN ACCORDANCE WITH THE PROVIDIONS OF SECTION 1910.1200 OF TITLE 29 OF THE CODE OF FEDERAL REGULATIONS

SECTION 3. PHYSICAL DATA

Vapor Density (Air=1): N/E
Specific Gravity(H2O=1): CONC. ONLY= < 1
Boiling Point: N/A
Solubility in Water: SOLUBLE
Vapor Pressure: PSIG @70F(Aerosole): 70
Water Reactive: NO
Evaporation Rate =1: N/E
Apperance and Odor: CLEAR LIQUID WITH FRAGRANCE.

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flammability as per USA FLAME PROJECTION TEST (aerosols) NON-FLAMMABLE
Flash Point and Method Used (Non-Aerosole): N/A
Auto Ignition Temperature: N/E
Flammable Limits in Air by % in Volume %: (LEL) N/E (UEL) N/E
Fire Extinuishing Materials: FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER.
Special Firefighting Procedures: PROVIDE SHIELDING FOR PERSONNEL. WEAR SELF-CONTAINED BREATHING APPARATUS. COOL CONTAINERS WITH WATER FOG TO PREVENT RUPTURING & SEWING.
Unusual Fire and Explosion Hazards: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130F OR THE CONTAINER MAY RUPTURE.

Product Name: RAIN FOREST 1866 DRY DEODORIZER
National Item# 1866
Date Issued: 05/17/96

SECTION 5. REACTIVITY DATA

Stability: STABLE
Conditions to Avoid: OPEN FLAME, WELDING ARCS, HEAT.
Incompatibility (materials to avoid): ALKALIS, OXIDIZING MATERIALS, AMINES.
Hazardous Polymerization: WILL NOT OCCUR
Conditions To Avoid: OPEN FLAME, WELDING ARCS, HEAT.
Hazardous Decomposition Products: CO, CO2.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Steps to be Taken if Material Is Spilled or Released: ABSORB WITH SUITABLE ABSORBANT. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.
Waste Disposal Methods: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE POSE NO DISPOSAL HAZARD.
Precautions to be Taken in Handling and Storage: DO NOT PUNCTURE OR INCINERATE. DO NOT STORE AT TEMPERATURES ABOVE 130F.
Other Precautions and/or Special Hazards: KEEP OUT OF REACH OF CHILDREN. AVOID FOOD CONTAMINATION. AVOID BREATHING VAPORS. REMOVE IGNITION SOURCES.

SECTION 7. HEALTH HAZARD DATA

Primary Route(s) of Entry: INHALATION
Acute Effects:
Inhalation: EXCESSIVE IHNALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.
Eye Contact: IRRITATION.
Skin Contact: MAY CAUSE SLIGHT IRRITATION.
Ingestion: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.
Chronic Effects: (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIALS OF THIS MIXTURE) MAY CAUSE CARDIAC ABNORMALITY, LIVER ABNORMALITIES, KIDNEY AND/OR LUNG DAMAGE.
Medical Conditions Generally Aggravated by Exposure: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: FLUSH WITH WATER OR 15 MINUTES, GET MEDICAL ATTENTION.
Skin Contact: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.
Inhalation: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.
Ingestion: DO NOT INDUCE VOMITING. DRINK TWO LARGE GLASSES OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

Product Name: RAIN FOREST 1866 DRY DEODORIZER
National Item# 1866
Date Issued: 05/17/96

SECTION 9. SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) IF VAPOR CONCENTRATION EXCEEDS TLV, USE RESPIRATOR APPROVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.
Protective Gloves: LATEX, IF SKIN EASILY IRRITATED.
Eye Protection: SAFETY GLASSES RECOMMENDED.
Ventilation Requirements: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.
Other Protective Clothing and Equipment: NONE
Hygienic Work Practices: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

SECTION 10. ADDITIONAL INFORMATION

NFPA RATING: HEALTH -1 FLAMMABILITY -4 REACTIVITY -0 SPECIAL -0

HMIS RATING: HEALTH -1 FLAMMABILITY -4 REACTIVITY -0
PERSONAL PROTECTION -B

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061

MANUFACTURER:
THE DIAL CORPORATION
CONSUMER PRODUCTS GROUP
1850 NORTH CENTRAL AVE.

EMERGENCY NO. 602-253-3334
OTHER EMERGENCY NO. 602-9991-3000

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: LIQUID ANTIMICROBIAL SOAP
Trade Names/Synonyms: LIQUID DIAL SOAP; LIQUID DIAL - WITH MOISTURIZERS AND VITAMINE E; DIAOC087

Date Issued: 04/21/93
Supercedes: NEW
National Item#: 1121XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV	OTHER
AMMONIUM LAURYL SULFATE	2235-54-3				
GLYCOL DISTEARATE	627-83-8				
LAURAMIDE DEA	120-40-1				
SODIUM LAURETH SULFATE	9004-82-4				

Exposure Limits:
NO OCCUPATIONAL EXPOSURE LIMITS ESTABLISHED BY OSHA, ACGIH, OR NIOSH.
Carcinogen Status of Ingredients:
NTP - NO IARC MONOGRAPHS - NO OHSA REGULATED - NO

N/A = Not Applicable; N/D = Not Determined

SECTION 3. PHYSICAL DATA

Boiling Point (F): >200 F (>93C)
Vapor Pressure (mm Hg.):
Vapor Density (Air=1):
Solubility in Water: COMPLETE
Specific Gravity: 1.015-1.020 @ 25 C
Melting Point: NOT AVAILABLE
Evaporation Rate (=1):
pH Range: 6.0-6.6 @ 25 C
Appearance and Odor: CLEAR GOLD OR OPAQUE, WHITE LIQUID WITH A PLEASANT FRAGRANCE.

Product Name: LIQID ANTIMICROBIAL SOAP
Date Issued: 04/21/93
National Item#: ii2iXX

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method):
Flammable Limits: LEL= N/D UEL= N/D
Fire and Explosion Hazard: SLIGHT FIRE HAZARD WHEN EXPLOSED TO HEAT OR FLAME.
Firefighting Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5). FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).
Firefighting: MOVE CONTAINER FOR FIRE AREA IF YOU CAN DO IT WITHOUT RISK. APPLY COOLING WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. FOR MASSIVE FIRE IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES; IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF TANK DUE TO FIRE. ISOLATE FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN FIRE (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 27).
EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE FLOODING AMOUNTS OF WATER AS A FOG, SOLID STREAMS MAY BE INEFFECTIVE. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER, APPLY FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING VAPORS, KEEP UPWIND.

SECTION 5. REACTIVITY DATA

Reactivity: STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.
Incompatibilities: AMMONIYM LAURYL SULFATE; OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD. SEE AMMONIUM SALTS.
AMMONIUM SALTS:
NITRITE SALTS: VIOLENT EXPOSION IF MELTED.
Potassium Chlorate: VIOLENT REACTION.
Glycol Distearate: Oxidizers (Strong): FIRE AND EXPLOSION HAZARD.
Lauramide Dea: Oxidizers (Strong): FIRE AND EXPLOSION HAZARD.
Sodium Laureth Sulfate: Oxidizers (Strong): FIRE AND EXPLOSION HAZARD.
Decomposition: THERMAL DECOMPOSITION MAY RELEASE TOXIC AND / OR HAZARDOUS GASES.
Polymerization: HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

Product Name: LIQUID ANTIMICROBIAL SOAP
Date Issued: 04/21/93
National Item#: 1121XX

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Occupational Spill:
SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER APSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA. KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND RESTRICT ENTRY.

SECTION 7. HEALTH HAZARD DATA, EMERGENCY AND FIRST AID PROCEDURES

Inhalation:
Ammonium Lauryl Sulfate: IRRITANT.
ACUTE EXPOSURE - MAY CAUSE IRRITATION.
CHRONIC EXPOSURE - NO DATA AVAILABLE.
Glycol Distearate:
ACUTE EXPOSUREED - NO DATA AVAILABLE.
CHRONIC EXPOAURE - NO DATA AVAILABLE.
Lauramide Dea:
ACUTE EXPOSURE - NO DATA AVAILABLE.
CHRONIC EXPOSURE - NO DATA AVAILABLE.
Sodium Laureth Sulfate: ACUTE EXPOSURE - IN AN UPPER RESPIRATORY TRACT IRRITANCY TEST, RATS EXPOSED TO A CONCENTRATION OF 1794 MG/M3 SHOWED A 25% REDUCTION IN RESPIRATORY RATE, FURTHER TESTING WAS NOT POSSIBLE DUE TO GELLING OF THE SOLUTION.
CHRONIC EXPOSURE - NO DATA AVAILABLE.
First Aid - REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

Skin Contact:
Ammonium Lauryl Sulfate:
IRRITANT.
Acute Exposure: MAY CAUSE IRRITATION.
CHRONIC EXPOSURE - REPEATED OR PROLONGED EXPOSURE TO IRRITANTS MAY CAUSE DERMATITIS.
Glycol Distearate: ACUTE EXPOSURE - REPORTED TO BE NON-IRRITATING TO RABBIT SKIN. CHRONIC EXPOSURE - REPEATED APPLICATION IN MINERAL OIL TO HUMANS CAUSED NO IRRITATION OR SENSITIZATION. HOWEVER, REPEATED OR PROLONGED CONTACT HAS BEEN REPORTED TO CAUSE IRRITATION.
Lauramide DEA: ACUTE EXPOSURE - SLIGHT IRRITATION HAS BEEN REPORTED ON RABBIT SKIN. CHRONIC EXPOSURE - ON HUMAN SKIN, EXPOSURE OF 45 MINUTES TWICE DAILY FOR 3 WEEKS TO AN AQUEOUS SOLUTION CAUSED AN INCREASE IN TRANSEPIDERMAL WATER LOSS, SUGGESTING THE POTENTIAL FOR IRRITATION.
Sodium Laureth Sulfate: IRRITANT. ACUTE EXPOSURE - TWENTY-FOUR HOUR PATCH TESTS ON HUMANS WITH 18% CONCENTRATIONS RESULTED IN MILD TO NO IRRITATION. TEST ON RABBITS WITH SOLUTIONS VARYING FROM 5%-58% CONCENTRATIONS PRODUCED RESULTS RANGING FROM NO IRRITATION TO SEVERE
(Continued on next page)

IRRITATION. CHRONIC EXPOSURE - FORMULATED PRODUCTS CONTAINING VARIOUS CONCENTRATIONS WERE REPEATEDLY APPLIED TO HUMANS IN CLINICAL STUDIES; IRRITATION RANGED FROM MILDLY TO HIGHLY IRRITATING. IN RATS, CONCENTRATIONS OF 60% AND 30% APPLIED FOR 65 DAYS PRODUCED SEVERE IRRITATION AND IMPAIRMENT OF HAIR GROWTH. A TOPICAL SENSITAZATION TEST ON 25 HUMANS WITH A FORMULATED PRODUCT CONTAINING A 14.3% CONCENTRATION WAS NEGATIVE, AS WERE TOPICAL GUINEA PIG TESTS. INTRADERMAL TESTS IN GUINEA PIGS PRODUCED POSITIVE RESULTS. 0.1 ML OF 5% SOLUTION APPLIED TO MICE TWICE WEEKLY FOR 105 WEEKS RESULTED IN NO SKIN TUMORS.
First Aid - REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. RINSE AFFECTED AREA WITH WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS. GET MEDICAL ATTENTION IF PAIN OR IRRITATION PERSIST.

Eye Contact:
Ammonium Lauryl Sulfate:
IRRITANT.
ACUTE EXPOSURE - MAY CAUSE IRRITATION.
CHRONIC EXPOSURE - REPEATED OR PROLONGED EXPOSURE TO IRRITANTS MAY CAUSE CONJUNCTIVITIS.
Glycol Distearate:
ACUTE EXPOSURE - MAY CAUSE MILD IRRITATION. HOWEVER, NO IRRITATION WAS REPORTED FOR EXPOSED RABBITS.
CHRONIC EXPOSURE - PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION.
Lauramide DEA:
ACUTE EXPOSURE - APPLICATION OF A 5% SOLUTION TO RABBIT EYES RESULTED IN PERCEPTIBLE REDNESS IN UNWASED EYES AND MILD IRRITATION IN TWO OF THREE WASHED EYES, DISAPEARING BY THE SECOND DAY.
CHRONIC EXPOSURE - NO DATA AVAILABLE.
Sodium Laureth Sulfate: IRRITANT.
ACUTE EXPOSURE - EXPOSURE OF RABBITS TO CONCENTRATION FROM 1.3 - 58.0% RESULTED IN EFFECTS RANGING FROM NO IRRITATION TO SEVERE IRRITATION AND POSSIBLY PERMANENT DAMAGE. THE SLIGHTEST SPLASH OF SOME ANIONIC SURFACTANTS MAY CAUSE SEVERE DISCOMFORT.
CHRONIC EXPOSURE - REPEATED OR PROLONGED CONTACT WITH IRRITANTS MAY CAUSE CONJUNCTIVITIS.
First Aid - WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS. GET MEDICAL ATTENTION IF PAIN OR IRRITATION PERSIST.

Ingestion:
Ammonium Lauryl Sulfate: ACUTE EXPOSURE - SOME ANIONIC SURF
ACTANTS CAUSE
VOMITING OR MILD DIARRHEA. CHRONIC EXPOSURE - NO DATA AVAILABLE.
Glycol Distearate:
ACUTE EXPOSURE - RATS ADMINISTERED 13 GM/KG OR MORE IN CORN OIL EXPERIENCED DIARRHEA, WET OILY COATS, AND NASAL HEMORRHAGE WITHIN FOUR DAYS AFTER ADMINISTRATION.
Chronic Exposure - NO DATA AVAILABLE.
Lauramide DEA:
ACUTE EXPOSURE - THE LETHAL DOSE REPORTED IN RATS WAS 2700 MG/KG.
CHRONIC EXPOSURE - A REDUCTION IN HEMOGLOBIN CONCENTRATION, HEMATOCRIT
(Continued on next page)

AND RED CELL COUNTS WERE SEEN IN RATS FED 1-2% IN THE DIET FOR 90 DAYS. INCREASED GLUTAMIC-OXALOACETIC TRANSAMERASE WAS SEEN AT THE 0.5% LEVEL.

Sodium Laureth Sulfate:
ACUTE EXPOSURE - HIGH DOSES (16-64 G/KG) HAVE PRODUCED LETHARGY, DIARRHEA, RECTAL AND NASAL HEMORRHAGE, IMPAIRED LOCOMOTION AND DEATH IN TEST ANIMALS. SOME ANIONIC SURFACTANTS MAY CAUSE ORAL OR GASTROINTESTINAL IRRITATION AND VOMITING.
CHRONIC EXPOSURE - NO SIGNIFICANT ADVERSE EFFECTS WERE NOTED IN ANIMALS FED DIETARY LEVELS OF 40-5000 PPM FOR 13 WEEKS OR 0.1-5.5% FOR 105 WEEKS

First Aid - TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY. IF VOMITING OCCURS, KEEP HEAD LOWER THAN HIPS TO PREVENT ASPIRATION.

SECTION 8. PROTECTIVE EQUIPMENT

Ventilation: PROVIDE GENERAL DILUTION VENTILATION.

Respirator:
BASED ON THE COMPONENTS PRESENT AND/OR INFORMATION IN PHYSICAL DATA, HEALTH EFFECTS OR TOXICITY SECTIONS, NO RESPIRATOR WOULD BE REQUIRED UNDER THE NORMAL CONDITIONS OF USE. HOWEVER, AIR CONTAMINATION MONITORING SHOULD BE CARRIED OUT TO ASSURE THAT THE EMPLOYEES ARE NOT EXPOSED TO HARMFUL CONCENTRATIONS OF ANY OF THE ABOVE MENTIONED COMPONENT. IF RESPIRATORY PROTECTION IS REQUIRED, IT MUST BE BASED ON THE CONTAMINATION LEVELS FOUND IN THE WORKPLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

For Firefighting and Other Immediately Dangerous to Life or Health Conditions:
ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.
ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURED-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

Clothing: PROTECTIVE CLOTHING NOT REQUIRED UNDER NORMAL CONDITIONS.
PROTECTIVE GLOVES ARE NOT REQUIRED UNDER NORMAL CONDITIONS.

Eye Protection: EYE PROTECTION NOT REQUIRED UNDER NORMAL CONDITIONS.

SECTION 9. STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

Storage STORE AWAY FROM INCOMPATIBLE SUBSTANCES:

Product Name: LIQUID ANTIMICROBIAL SOAP
Date Issued: 04/21/93
National Item#: 1121XX

SECTION 10. CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. VAPORS MAY BE EXPLOSIVE. AVOID OVERHEATING OF CONTAINERS; MAY VIOLENTLY RUPTURE IN HEAT OF FIRE. AVOID CONTAMINATION OF WATER SOURCES.

SECTION 11. ENVIRONMENTAL IMPACT

APPLICABLE REGULATIONS: 21 CFR 701
DOT/EPA HAZARD CLASS: NONE
SHIPPING NAME: SEE PRODUCT NAME
SARA TITLE III SECTION 313: TOXIC CHEMICAL - NO

SECTION 12. ADDITIONAL INFORMATION

NFPA RATING HEALTH - U FIRE -1 REACTIVITY -0

(SCALE 0-4, U=UNRATED)

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

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13217 S. Figuroa Street
Los Angeles California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)
Call nearest Sales Office for MSDS Information

MANUFACTURER:
AMREP, INC.
990 INDUSTRIAL PARK DRIVE
MARIETTA, GA 30062
Information: 404-422-2071
Emergency: 800-255-3925

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: LEMON SHINE AEROSOL
Product Code: FPC002/787
Type of Product: FURNITURE POLISH AEROSOL

Date Issued: 08/03/93
Supercedes: 02/12/93
National Item#: 3220XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	%	OSHA PEL	ACGIH TLV
PETROLEUM SOLVENT	64742-48-9	10.0	300 PPM	300 PPM
ISOBUTANE/PROPANE BLEND	75-28-5/74-98-6	5.0	800 PPM	800 PPM
PETROLEUM DISTILLATES	68551-15-5	5.0	NE	NE

SECTION 3. PHYSICAL / CHEMICAL CHARACTERISTICS

Vapor Density (air=1): NE
Specific Gravity : H2O=1 CONCENTRATE ONLY= 0.956
Boiling Point : N/A
Solubility in Water: SLIGHT
Vapor Pressure, psig @ 70 F: AEROSOLS: MAX. 60
Evaporation Rate: NE
Appearance and Odor: CREAMY WHITE SPRAY WITH LEMON FRAGRANCE.

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point and Method Used (NON-AEROSOLS): N/A
Auto Ignition Temperature, : NE
Flammable Limits in Air, Volume %: LOWER (LEL) NE UPPER (UEL) NE
Fire Extinguishing Media : FOAM, DRY CHEMICAL, CARBON DIOXIDE
Special Firefighting Procedures: SELF CONTAINED BREATHING APPARATUS.
Unusual Fire And Exposion Hazards: DO NOT EXPOSE AEROSOLS TO TEMPERATURES ABOVE 130 F OR THE CONTAINER MAY RUPTURE.

SECTION 5. REACTIVITY DATA

Stability: STABLE
Conditions to Avoid: OPEN FLAME, WELDING ARCS, HEAT, SPARKS
Incompatibility (materials to avoid): STRONG OXIDIZERS AND ALKALIES.
Hazardous Decomposition Products: CO2, CO, HYDROGEN CHLORIDE
Hazardous Polmerization: WILL NOT OCCUR

SECTION 6. PRECAUTIONS FOR SAFE HANDLING AND USE / LEAK PROCEDURES

Steps to Be Taken If Material Is Spilled or Released: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE, OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.
Waste Disposal Methods: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.
Precautions To Be Taken In Handling And Storage: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURES ABOVE 130 F.
Other Precautions and/or Special Hazards: AVOID FOOD CONTAMINATION. KEEP OUT OF REACH OF CHILDREN. AVOID BREATHING VAPORS.

SECTION 7. HEALTH HAZARD DATA

Primary Route(s) of Entry: INHALATION, SKIN ABSORPTION
Acute Effects:
Inhalation: EXCESSIVE INHALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHES, DIZZINESS, ASPHYZIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.
Eye Contact: MILD IRRITANT
Skin Contact: MILD IRRITANT
Ingestion: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.
Chronic Effects (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIALS OF THIS MIXTURE) MAY CAUSE CARDIAC ABNORMALITY, LIVER ABNORMALITIES, KIDNEY AND/OR LUNG DAMAGE.
Medical Conditions Generally Aggravted By Exposure: MAY AGGRAVATE EXISTING EYE, SKIN, UPPER RESPIRATORY CONDITIONS, LIVER DISEASE & HEART IRREGULARITIES.

SECTION 8. EMERGENCY FIRST AID PROCEDURES

Eye Contact: FLASH WITH WATER FOR 15 MINUTES. IF IRRITATED, SEE PHYSICIAN.
Skin Contact: WASH WITH SOAP AND WATER. IF IRRITATED, SEE PHYSICIAN.
Inhalation: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL AID.
Ingestion: DO NOT INDUCE VOMITING. SEEK MEDICAL ATTENTION.

SECTION 9. CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type) IF VAPOR CONC. EXCEEDS TLV, USE RESPIRATOR APPOVED BY U.S. BUREAU OF MINES FOR ORGANIC VAPOR.
Protective Gloves: LATEX IF SKIN IS EASILY IRRITATED
Eye Protection: SAFETY GLASSES RECOMMENDED.
Ventilation Requirements: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.
Other Protective Clothing And Equipment : NONE
Hygienic Work Practices: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

SECTION 10. ADDITIONL INFORMATION

SARA TITLE III H&P RATINGS: Acute, YES: Chronic, YES: Fire, NO: Press. Release, YES: Reactive, NO:
NFPA RATINGS: HEALTH -2 FIRE -2 RECTIVITY -0 SPECIAL -0

HMIS: HEALTH -2 FLAMMABILITY -2 REACTIVITY -0 PERSONAL PROTECTION-B

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

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SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: PINK VELVET DISHWASHING LIQUID DETERGENT

Date Issued: 02/09/90
Supercedes: 11/25/85
National Item#: 1437XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	%	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV	OTHER
SODIUM DODECYL BENZENE SULFONATE	27176-87-0	25-30			NONE
NONYL PHENOL ETHOXYLATE	9016-45-9	1-5			NONE

N/A= NOT APPLICABLE; N/D= NOT DETERMINED

SECTION 3. PHYSICAL DATA

Boiling Point (F): <212
Vapor Pressure (mm Hg.): ND
Vapor Density (Air=1): ND
Solubility in Water: SOLUBLE
Specific Gravity (Water=1): 1.05
Percent Volatile (By Volume): 72
Evaporation Rate (Water =1): 1
pH Range: 8.0
Appearance and Odor: CLEAR PINK / FLORAL SCENT

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): NON-FLAMMABLE
Flammable Limits: LEL= N/A UEL= N/A
Extinguishing Media: CO2, DRY CHEMICAL, FOAM, WATER FOG

Special Fire Fighting Procedures: NORMAL FIRE FIGHTING PROCEDURES MAY BE USED. COOL AND USE CAUTION WHEN APPROACHING OR HANDLING FIRE-EXPOSED CONTAINERS.

Unusual Fire & Explosion Hazards: CONTAINERS MAY BURST IN HEAT.

SECTION 5. REACTIVITY DATA

Stability: STABLE

Incompatibility - Materials to Avoid: NONE KNOWN TO NSS

Hazardous Polymerization: WILL NOT OCCUR

Conditions to Avoid: NONE KNOWN TO NSS

Hazardous Decomposition Products: WHEN EXPOSED TO FIRE, PRODUCES NORMAL PRODUCTS OF COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill Response: FOR SMALL SPILLS, DILUTE WITH WATER AND PICK UP WITH MOP AND PAIL OR WET PICK UP VACUUM. FOR LARGE SPILLS, DIKE AREA TO CONTAIN SPILL. CLEAN UP USING ABSORBENT MATERIAL. PLACE ALL CONTAMINATED MATERIAL IN A CLOSED CONTAINER FOR DISPOSAL.

Product Disposal: WASTE FOR DILUTED PRODUCT MAY BE FLUSHED TO SEWER. UNDILUTED PRODUCT RECOVERED FROM SPILLS MAY BE SENT TO A LICENSED DISPOSAL FACILITY TO BE DISPOSED OF IN ACCORDANCE WITH FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.

Container Disposal: TRIPLE RINSE EMPTY CONTAINER THOROUGHLY WITH WATER AND DISCARD IN REGULAR TRASH COLLECTION IF ALLOWED BY LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION 7. HEALTH HAZARD DATA

Symptoms of Overexposure:

Eye Contact: EYE IRRITANT. DIRECT CONTACT WITH THE EYE WILL CAUSE IRRITATION.

Skin Contact: SKIN IRRITANT. PROLONGED OR REPEATED CONTACT WITH UNDILUTED PRODUCT MAY CAUSE IRRITATION.

Inhalation: NO HEALTH EFFECTS ARE KNOWN TO OCCUR FROM INHALATION OF THIS PRODUCT UNDER NORMAL USE IN A WELL VENTILATED AREA. HIGH AIRBORNE CONCENTRATIONS OF MISTS OR SPRAYS OF THIS PRODUCT MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT.

Ingestion: INGESTION OF THIS PRODUCT MAY CAUSE DAMAGE TO THE MEMBRANES OF THE MOUTH, THROAT, AND GASTROINTESTINAL TRACT WHICH THE PRODUCT CONTACTS. BURNS OF THE MOUTH AND THROAT, NAUSEA, VOMITING, CRAMPS, AND DIARRHEA MAY OCCUR.

Primary Route(s) of Entry: EYES, SKIN

THE SODUIM HYDROXIDE LISTED IN SECTION 2 IS NOT LISTED ON THE OSHA, NTP OR IRAC MONOGRAPH CARCENOGEN LISTS.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: IMMEDIATELY FLUSH THE EYE WITH LARGE QUANTITIES OF RUNNING WATER FOR A MINIMUM OF 15 MINUTES. HOLD THE EYELIDS APART DURING THE IRRIGATION TO ENSURE FLUSHING OF THE ENTIRE SURFACE OF THE EYE LID WITH WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

Skin Contact: FLUSH THE EFFECTED AREA WITH LARGE QUANTITIES OF RUNNING WATER WHILE REMOVING CONTAMINATED CLOTHES AND SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

Inhalation: REMOVE FROM CONTAMINATED AREA. IF SYMPTOMS OF RESPIRATORY DISCOMFORT PERSISTS, GET MEDICAL ATTENTION.

Ingestion: REQUIRES IMMEDIATE MEDICAL MANAGEMENT. DRINK MILK OR WATER AND GET MEDICAL ADVICE. VOMITING SHOULD BE INDUCED ONLY ON RECOMMENDATION OF MEDICAL PERSONNEL.

SECTION 9. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

Ventilation: ROOM VENTILATION IS ADEQUATE.

Protection Gloves: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

Eye Protection: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

Other Protective Clothing/Equipment: WHERE GROSS EYE OR SKIN CONTACT MAY OCCUR, USE APPROPRIATE PROTECTIVE EQUIPMENT.

SECTION 10. ADDITIONAL INFORMATION AND PRECAUTIONS

SARA TITLE III H&P RATINGS: Acute, YES: Chronic, NO: Fire, NO:
Press. Release: NO: Reactive, NO:
NFPA RATINGS: HEALTH -1 FIRE -0 REACTIVITY -0
Handling and Storage Precautions: STORE IN A COOL DRY PLACE. REPLACE CAP AFTER USE. KEEP OUT OF REACH OF CHILDREN.

SECTION 11. REGULATORY CLASSIFICATIONS

NON-REGULATED

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

RF128DMSDS

MATERIAL SA

Post-it® Fax Note 7671	Date 4.18.96	# of pages ▶ 4
To Brent McMullin	From Bob Connem	
Co./Dept.	Co. PGE	
Phone # 503-285-2990	Phone # 541-481-9352	
Fax # 503-285-7392	Fax #	

May be used to comply with OSHA's Haz
1910.1200. Standard must be consulte

SECTION 1 - PRODUCT IDENTIFICATION

PRODUCT NAME: Starbar Improved Golden Malrin Fly Bait

EPA REG. NO.: 2724-274-11787 FDA NO.: N/A RF NO.: 128D

COMPANY NAME: Sandoz Agro, Inc. EMERGENCY PHONE NO: 708-699-1616

ADDRESS: 1300 East Touhy Avenue

CITY, STATE, AND ZIP: Des Plaines, IL 60018

Date Prepared/Last Change: 4/94

SECTION 2 - HAZARDOUS/NON HAZARDOUS INGREDIENTS

Hazardous Components (Chemical and Common Name)	OSHA PEL	ACGIH TLV	OTHER EXPOSURE LIMITS	CAS NO
Methomyl: (S-Methyl N-[(methylcarbamoyl)oxy] thioacetimidate	2.5 mg/m3	2.5 mg/m3		16752-77-5
(Z)-9 Tricosene	NE	NE		27519-02-4
Sugar	15 mg/m3 TWA for total particulate 5 mg/m3 TWA for respirable fraction	10 mg/m3		57-50-1

SECTION 3 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point: N/A

Specific Gravity (H2O=1): > 1

Vapor Pressure (mm Hg) N/A

Vapor Density (Air = 1): N/A

Solubility in Water: Soluble

Evaporation Rate: N/A

% Volatile (volume): 0

Appearance and Odor: Solid yellow granules with characteristic sulfurous odor.

SAAG-00-0002.01

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point: N/A	Method Used: N/A	Flammable Limits in air - % by volume LEL lower: N/A UEL upper: N/A

Auto Ignition Temperature: Unknown

Extinguisher Media: Agent suitable for surrounding fire, i.e. - CO2, foam, or water spray (water may increase contamination hazard).

Special Fire Fighting Procedures:

Use proper protective clothing, eye protection, self-contained breathing apparatus. Remove people upwind from fire/smoke.

Unusual Fire and Explosion Hazards:

Will ignite if exposed to intense heat or open flame. Burning produces toxic fumes and carbon monoxide from incomplete combustion. Fire or intense heat may rupture container.

SECTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)

Stability: Unstable ____ **Conditions To Avoid:**

Stable X

Incompatibility (Materials to Avoid): Reacctive metals, strong oxidizers.

Hazardous Decomposition Products:

Oxides of nitrogen, CO, CO2.

Hazardous Polymerization	may occur		Conditions to Avoid:
	will not occur	X	

SECTION 6 - HEALTH HAZARDS

Signs and Symptoms of Over Exposure:

ACUTE:

Active ingredient is a cholinesterase inhibitor: may cause sweating, salivation, nausea, headaches, diarrhea, pin-point pupils, ataxia, tightness in chest, vomiting, cyanosis, pulmonary edema. Atropine is antidotal.
.pa

Oral LD50 (rat) 3,106 mg/kg

Dermal LD50 (rabbit) > 2,100 mg/kg

Eye Irritation (rabbit) - very minimal (transient)

Skin Irritation (rabbit) - non irritating to skin.

Skin sensitization potential: None

CHRONIC:

None known for product.

Emergency and First Aid Procedures:

If swallowed, drink 1 or 2 glasses of water and induce vomiting. Do not give anything by mouth or induce vomiting in unconscious person. If on skin, wash with soap and water. If in eyes, immediately flush with plenty of water. Call physician immediately.

NOTE: Methomyl is a cholinesterase inhibitor. Atropine is antidotal. Where symptoms are visible, atropine I.V. to effect is suggested.

Primary Routes of Entry:

Primary route would be oral; also inhalation of finer particulates.

CARCINOGENICITY STATUS: (NTP, IARC, OSHA): No component listed.

SECTION 7 - GENERAL PRECAUTIONS FOR SAFE HANDLING AND USE

Work/Hygienic Practices:

Avoid breathing dust, avoid contact with skin, eyes or clothing.

Precautions to be Taken in Handling and Storage:

See specific instructions on label regarding use patterns. Do not store near feed or foodstuffs. Keep out of reach of children and animals.

Steps to be Taken in Case Material is Released/Spilled:

Small amounts may be swept up and spread in planned use areas as directed on label or placed in container for disposal.

Waste Disposal Method (Consult federal, state, & local regulations):

Pesticide Disposal - Pesticide that cannot be used according to label must be disposed of as a hazardous waste according to applicable Federal, State, and local procedures. The container may be triple rinsed then offered for recycling or reconditioning - or puncture and dispose of in a sanitary landfill or by other approved state and local procedures. Entire contents must be used according to label directions. Triple rinsed containers may be disposed of as non-hazardous waste at an approved facility. Other quantities, as a waste, must be disposed of as a hazardous waste at an approved hazardous waste management facility.

SECTION 8 - GENERAL CONTROL MEASURES

Ventilation * **Local Exhaust** ____ **Mechanical (General)** ____ **Special** ____ **Other** ____

*Ventilate to keep airborne exposures below recommended limits.

Respiratory Protection:

Avoid inhalation of dust. If excessive airborne exposures are anticipated, use MSHA/NIOSH approved respirator for pesticide (organic vapor cartridge plus dust prefilter) in compliance with CFR 29-1910.34.

Protective Gloves: Impervious

Eye Protection:

Avoid contact with eyes. Goggles or safety glasses with side shields recommended during prolonged or repeated exposures.

Other Protective Clothing and Equipment: Wear appropriate clothing to prevent skin contact.

The information herein is given in good faith, but no warranty, expressed or implied, is made.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: SUD 'N' KLEEN AEROSOL
Product Code: BCF005/787
Type of Product: DISINFECTANT CLEANER
Trade Name: MULTI-PURPOSE DISIINFECTANT CLEANER

Date Issued: 03/02/93
Supercedes: 04/16/90
National Item#: 2650XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	SARA III LIST	OSHA PEL (PPM)	ACGIH TLV (PPM)
ISOBUTANE	75-28-5	NO	800	800
ETHYLENE GLYCOL MONOBUTYL ETHER	111-76-2	YES	25	25

SECTION 3. PHYSICAL DATA

Vapor Density (air=1): NE
Specific Gravity (H2O=1)Concentrate Only= 1.0
Boiling Point or Range: : N/A
Solubility In Water: COMPLETE SOLUBLE
Vapor Pressure, psig @ 70 F: MAX. 60
Appearance and Odor: WHITE FOAM, SWEET FRAGRANCE.

Evaporation Rate: NE
Vapor Pressure (Non-Aerosole) (mm Hg and Temperature): NA
Water Reactive: NO

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point, and Method Used (Non-Aerosole: N/A
Auto Ignition Temperature, F: NE
Flammable Limits In Air, Volume %: LEL NE UEL NE
Extinguishing Media: FOAM, DRY CHEMICAL, CARBON DIOXIDE.
Special Fire Fighting Procedures: SELF CONTAINED BREATHING APPERATUS.
Unusual Fire and Explosion Hazards: DO NOT EXPOSE AEROSOLE TO TEMPERATURES ABOVE 130 FOR THE CONTAINER MAY RUPTURE.

SECTION 5. REACTIVITY DATA

Stability: STABLE
Conditions to Avoid: HEAT, OPEN FLAME, WELDING ARCE.
Incompatibility (Materials to Avoid): STRONG OXIDIZERS.
Hazardous Decomposition Products: CARBON DIOXIDE, CARBON MONOXIDE.
Hazardous Polymerization: WILL NOT OCCUR.

Product Name: SUD 'N' KLEEN AEROSOL
National Item# 2650
Date Issued: 03/22/93

SECTION 6. PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

Steps To Be Taken If Material Is Spilled or Released: ABSORB WITH SUITABLE MEDIUM. INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE, OR FEDERAL REGULATIONS. DO NOT FLUSH TO SEWER.
Waste Disposal Methods: AEROSOL CANS WHEN VENTED TO ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.
Precautions to Be Taken In Handling and Storage: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO NOT STORE AT TEMPERATURER ABOVE 130F.
Other Precaution and / or Special Hazards: AVOID FOOD CONTEMINATION. KEEP OUT OF REACH OF CHILDREN. AVOID BREATHING VAPORS.

SECTION 7. HEALTH HAZARD DATA

Primary Routes of Entry: INHALATION, SKIN ABSORPTION
Acute Effects:
Inhalation: EXCESSIVE IHNALATION OF VAPORS CAN BE HARMFUL AND MAY CAUSE HEADACHE, DIZZINESS, ASPHYXIA, ANESTHETIC EFFECTS AND POSSIBLE UNCONSCIOUSNESS.
Eye Contact: IRRITATION
Skin Contact: MILD IRRITATION
Ingestion: NAUSEA. POSSIBLE CHEMICAL PEUMONITIS IF ASPIRATED INTO LUNGS. NAUSEA.
Chronic Effects: (EFFECTS DUE TO EXCESSIVE EXPOSURE TO THE RAW MATERIAL OF THIS MIXTTURE) MAY CAUSE DIARRHEA, VOMITING. GASTROINTESTINAL IRRITATION. LAB ANIMALS HAVE EXPERIENCED ANEMIA, LIVER KIDNEY, LUNG, BLOOD DAMAGE TO GLYCOL ETHER EB.

Medical Conditions Generally Aggravated by Exposure: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER RESPIRATORY CONDITIONS.

SECTION 8. EMERGENCY FIRST AID PROCDURES

Eye Contact: FLUSH WITH WATER FOR 15 MINTES.. IF IRRITATED, SEEK MEDICAL ATTENTION.
Skin Contact: WASH WITH SOAP AND WATER. IF IRRITATED, SEEK MEDICAL ATTENTION.
Inhalation: REMOVE TO FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL ATTENTION.
Ingestion: DO NOT INDUCE VOMITING. DRINK TWO LARGE OF WATER. GET IMMEDIATE MEDICAL ATTENTION.

Product Name: SUD 'N' KLEEN AEROSOL
National Item# 2650
Date Issued: 03/22/93

SECTION 9. CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type): IF VAPOR CONC. EXCEEDS TLV, USE RESPIRATOR APPROVED BY NIOSH IN A POSITIVE PRESSURE MODE.
Protective Gloves: LATEX GLOVES IF SKIN IS EASILY IRRITATED.
Eye Protection: SAFETY GLASSES RECOMMENDED
Ventilation Requirements: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW TLV.
Other Protective Clothing and Equipment: NONE
Hygienic Work Practices: WASH HANDS WITH SOAP AND WATER BEFORE HANDLING FOOD. REMOVE CONTAMINATED CLOTHING.

SECTION 10. LABELING AND ADDITIONAL PRECAUTIONS

SARA TITLE III H&P RATINGS:
Acute: YES; Chronic: NO; Fire: YES; Press. Release: YES, Reactive: NO

NFPA RATINGS:
HEALTH - 1 FLAMMABILITY - 1 REACTIVITY - 0 SPECIAL - 0

HMIS RATINGS:
HEALTH - 1 FLAMMABILITY - 1 REACTIVITY -0 PERSONAL PROTECTION-B

INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS OF USE, STORAGE AND DISPOSAL. ANY USE, STORAGE AND DISPOSAL OF THIS PRODUCT WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABELING IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED BY THE PRODUCT MANUFACTURER TO COMPLY WITH CAL/OSHA HAZARD COMMUNICATION REGULATIONS CONTAINED IN SECTION 5194 OF TITLE 8 OF THE CALIFORNIA ADMINISTRATIVE CODE. NO MODIFICATION TO THE INFORMATION OR CONTENTS OF THIS FORM ARE PERMITTED WITHOUT THE DIRECT WRITTEN PERMISSION OF THE MANUFACTURER.

PRODUCT INFORMATION

WILDCAT - ALL PURPOSE CLEANER AND DEGREASER

GENERAL DESCRIPTION: WILDCAT is an industrial strength cleaner and degreaser. WILDCAT is a great all-purpose cleaner for the kitchen - cleans the grease and grime from ovens, fryers, floors, walls and woodwork. WILDCAT can be used as a whitewall cleaner and general cleaner for auto detailing. WILDCAT is safe on all metals and paints.

PROPERTIES:

Form	Liquid
Color	Blue
pH (1%)	11.5
Detergents	Biodegradable
Silicates	Present
Phosphates	Present

USE DIRECTIONS: The dilution ratio depends on application and soil type. Spray or wipe on and rinse well with water.

Suggested dilution ratios:

For walls and woodwork:	1 to 2 oz. per gallon of water
For degreasing:	1 to 1 with water
For whitewalls:	Use as is; straight from container

CAUTION: May cause eye or skin irritation or burns. For contact with skin or eyes, flush with plenty of water for at least 15 minutes. For eyes, see a physician. Use in a well ventilated area. Wear gloves when handling. Wear goggles if splashing is possible. Do not ingest.

KEEP OUT OF REACH OF CHILDREN.

PACKAGING:

55 gallon drum
30 gallon drum
6 gallon pail

MT. HOOD CHEMICAL CORPORATION
4444 N.W. YEON AVENUE, PORTLAND, OREGON 97210
(503) 227-3505 FAX (503) 225-9143
Call Toll Free (800) 547-2594

MT. HOOD CHEMICAL CORPORATION
4444 N.W. Yeon Avenue
Portland, Oregon 97210
Emergency Phone: 503-227-3505

N/A = NOT APPLICABLE
NA = NOT AVAILABLE

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: WILDCAT

PRODUCT NAME: **WILDCAT** | PREPARED BY: K. Woods | DATE: June 6, 1994

CHEMICAL FAMILY: Alkaline Detergent Mixture | FORMULA: Proprietary

HAZARDOUS INGREDIENTS (CAS #):	%	EXPOSURE LIMITS, ppm: ACGIH TLV	OSHA-PEL
2-butoxyethanol (111-76-2)	Less than 10%	25	50
Sodium metasilicate (6834-92-0) – non corrosive – soft on aluminum	Less than 10%	N/A	N/A

Sodium Hydroxide = corrosive

CARCINOGENIC INGREDIENTS: Contains no known or suspected carcinogens.

PHYSICAL PROPERTIES:
- Boiling Point: About 200°F
- Solubility in Water: 100%
- Specific Gravity - Liquid (H_2O = 1): 1.05-1.06
- Odor and Appearance: Clear blue liquid; mild sweetish scent
- % Volatiles: NA
- % Volatile Organic Content (VOC): Less than 10%
- Vapor Pressure: NA
- Vapor Density (Air = 1): NA

FIRE AND EXPLOSION DATA:
- Flash Point: 162°F, TCC
- Flammability Limits: NA
- Extinguishing Media: Water, CO_2, foam, dry chemical
- Special Firefighting Procedures: None
- Unusual Hazards: None

HEALTH EFFECTS:
- Effects of overexposure: May cause eye or skin irritation. Ingestion may cause nausea or diarrhea. Ingestion may also cause irritation or burns to mouth, throat, and esophagus. Overexposure to vapors or absorption of 2-butoxyethanol through the skin may cause headache, dizziness, or nausea.
- Chronic effects of overexposure: Chronic overexposure may produce effects in blood due to 2-butoxyethanol absorption.
- Medical conditions that may be aggravated by exposure: Liver, kidney, blood disorders may be aggravated.
- Primary routes of entry: Ingestion, skin contact, inhalation of mists or vapors.

EMERGENCY AND FIRST AID PROCEDURES:
- Eye Contact: Flush thoroughly with plenty of water for several minutes. If irritation persists, see a physician.
- Skin Contact: Flush thoroughly from skin with water. If irritation persists, see a physician.
- Ingestion: Drink plenty of water and call a physician immediately. DO NOT INDUCE VOMITING UNLESS INSTRUCTED BY A PHYSICIAN.
- Inhalation of mist or vapor: Move to fresh air. If breathing is difficult, give oxygen and get medical attention.

REACTIVITY DATA:
- Stability: Stable
- Hazardous Polymerization: Will not occur.
- Incompatibility: Strong acids will neutralize product.
- Hazardous Decomposition Products: None
- Conditions to Avoid: None

SPILL OR LEAKAGE PROCEDURES:
- Steps to be taken if material is released or spilled:
  - Ventilate area well and extinguish all sources of ignition.
  - Small spill: Dilute with water and mop up, absorb on absorbent, or flush to sewer with plenty of water. Scrub floor well to remove residue to prevent slipperiness.
  - Large spill: Dilute with water and neutralize with dilute acid solution. Diluted, neutralized material may be mopped up, absorbed on an absorbent, or flushed to sewer with plenty of water. Scrub floor well to remove residue to prevent slipperiness.
- Waste disposal method: According to local, state, or federal ordinances.

SPECIAL PROTECTION INFORMATION:
- Ventilation: No special ventilation required in normal use.
- Respiration Protection: None required in normal use.
- Eye Protection: Safety goggles required when handling the concentrate.
- Protective Gloves: Impervious gloves required when handling the concentrate.
- Other Protective Equipment: None required.

SPECIAL PRECAUTIONS:
- Precautions to be taken in handling and storage: Store in closed container in cool place. Store away from sources of ignition or open flames. Wash thoroughly after handling.
- KEEP OUT OF REACH OF CHILDREN.
- Other precautions: None

HAZARD RATING:

Health:	1	0 = Minimal	3 = Serious
Fire:	2	1 = Slight	4 = Severe
Reactivity:	0	2 = Moderate	
Specific Hazard:	Combustible liquid		

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061
Emergency No. 1-800-535-5053 (INFOTRAC)

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: ZONK/NBC NON-BUTYL CONCENTRATED CLEANER/DEGREASER CLEANER
Date Issued: 06/01/95
Supercedes: 02/28/95
National Item#: 2107XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS #	%	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV
SODIUM HYDROXIDE (50%) SOLUTION	1310-73-2	2.0 - 2.5	2MG/M3	2MG/M3
*ETHOXYLATED NONYL PHENOL	9016-45-9	2 - 4	N/D	N/D
SODIUM SILICATE SOLN.	1344-09-8	2 - 3	2MG/M3	2MG/M3

N/D = NOT DETERMINED N/A = NOT APPLICABLE N/E = NOT ESTABLISHED
*THESE MATERIALS ARE SUBJECT TO THE REPORTING REQUIREMENTS UNDER SARA TITLE III, SECTION 313 AND 40 CFR PART 372.

SECTION 3. PHYSICAL DATA

Boiling Point (F): Approx. 212
Specific Gravity (Water=1): 1
Vapor Pressure (PSIG): N/E
Percent Volatile (By Volume): APPROX.91
Vapor Density (Air=1): N/E
Evaporation Rate (BuAce=1): N/A
Solubility in Water: MISCIBLE
pH Range: 12.5 - 13.5
Appearance & Odor: CLEAR BLUE LIQUID / SWEET SCENT

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): NONE
Flammability: NON-FLAMMABLE.
Auto-Ignition Temp.: N/A
Flammable Limits: LEL= N/A UEL = N/A
Extinguishing Media: CO2, DRY CHEMICAL, FOAM, WATER FOG

Special Fire Fighting Procedures: NORMAL FIRE FIGHTING PROCEDURES MAY BE USED. COOL WITH WATER SPRAY AND USE CAUTION WHEN APPROACHING OR HANDLING FIRE-EXPOSED CONTAINERS.

Unusual Fire & Explosion Hazards: PRODUCTS OF COMBUSTION ARE ARE NOT TOXIC. CONTAINERS MAY BURST IN HEAT.

Product Name: ZONK/NBC NON-BUTYL CONCENTRATED CLEANER/DEGREASER DEODORANT
Date Issued: 06/01/95
National Item#: 2107XX

SECTION 5. REACTIVITY DATA

Stability: STABLE
Conditions to Avoid: FREEZING; EXCESSIVE HEAT.
Hazardous Polymerization: WILL NOT OCCUR.
Material to Avoid: DO NOT MIX WITH OTHER CHEMICALS.
Hazardous Decomposition Products: MAY CONSIST OF CO, CO2, AND ORGANIC VAPORS OF UNKNOWN COMPOSITION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill Spills: (FOR LIQUID CONCENTRATE) DILUTE WITH WATER AND PICK UP WITH MOP AND PAIL OR WET PICK-UP VACUUM.
Large Spills: (FOR LIQUID CONCENTRATE) DIKE AREA TO CONTAIN SPILL. CLEAN UP USING ABSORBENT MATERIAL. PLACE ALL CONTAMINATED MATERIAL IN A CLOSED CONTAINER FOR DISPOSAL.
Disposal: UNDILUTED (LIQUID CONCENTRATE) PRODUCT RECOVERED FROM SPILLS MAY BE SENT TO LICENSED DISPOSAL FACILITY TO BE DISPOSED OF IN ACCORDANCE WITH FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.
Contain. Disp.: LIQUID BULK CONCENTRATE CONTAINERS SHOULD BE TRIPLE RINSED AND DISCARDED PER LOCAL, STATE AND FEDERAL REGULATIONS IF NOT RECYCLED. DO NOT FLUSH TO SEWER.

SECTION 7. HEALTH HAZARD DATA

Primary Route(s) of Entry: SKIN
Overexposure Symptoms:
Eye Contact: MILD EYE IRRITANT.
Skin Contact: IRRITATION CAN OCCUR FROM PROLONGED AND REPEATED CONTACT. MILD IRRITATION DUE TO DEFATTING OF SKIN.
Inhalation: NONE KNOWN TO NSS.
Ingestion: POSSIBLE CHEMICAL PNEUMONITIS IF ASPIRATED INTO LUNGS. MAY CAUSE STOMACH PAIN/CRAMPS, VOMITING AND NAUSEA.
Chronic Health Hazards: NONE KOWN TO NSS.

KMB00003748

Product Name: ZONK/NBC NON-BUTYL CONCENTRATED CLEANER/DEGREASER DEODORANT
Date Issued: 06/01/95
National Item#: 2107XX

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: IMMEDIATELY FLUSH THE EYE WITH LARGE QUANTITIES OF RUNNING WATER FOR A MINIMUM OF 15 MINUTES. HOLD THE EYELIDS APART DURING THE IRRIGATION TO ENSURE FLUSHING OF THE ENTIRE SURFACE OF THE EYE LID WITH WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
Skin Contact: RINSE WITH WARM WATER. REMOVE CONTAMINATED CLOTHES AND SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
Inhalation: MOVE PERSON TO FRESH AIR.
Ingestion: REQUIRES IMMEDIATE MEDICAL MANAGEMENT. DRINK MILK OR WATER AND GET MEDICAL ADVICE. VOMITING SHOULD BE INDUCED ONLY ON RECOMMENDATION OF MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION 9. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NONE REQUIRED WHEN USED AS DIRECTED.
Ventilation: NORMAL ROOM VENTILATION SHOULD BE ADEQUATE.
Protection Gloves: NEOPRENE (RUBBER) GLOVES RECOMMENDED WHEN HANDLING CONCENTRATE FOR PROLONGED PERIODS OR IF SKIN IS ESPECIALLY SENSITIVE.
Eye Protection: CHEMICAL GOGGLES/EYE PROTECTION WHEN HANDLING CONCENTRATE.
Other Measures: APPROPRIATE PROTECTIVE EQUIPMENT WHEN GROSS EYE/SKIN CONTACT MAY OCCUR. AVOID FOOD CONTAMINATION.

SECTION 10. ADDITIONAL INFORMATION AND PRECAUTIONS

Handling and Storage: STORE IN A COOL DRY PLACE.

SARA TITLE III H&P RATINGS: Acute, YES; Chronic, NO; Fire, NO;
Press. Release, NO; Reactive, NO;

HMIS RATINGS: HEALTH -1 FIRE -0 REACTIVITY -0 PROTECTION -A
NFPA RATINGS: HEALTH -1 FIRE -0 REACTIVITY -0 SPECIFIC -

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO THE PROPER USE AND HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS, IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION REGULATION.

MT. HOOD
CHEMICAL

PRODUCT INFORMATION

BIG O - CITRUS BASED DEGREASER/CLEANER

GENERAL DESCRIPTION:

BIG O is an organic, biodegradable degreaser. Contains no solvents or petroleum distillates. BIG O's natural citrus extracts solubilize grease, oils, dirt, and grime safely and effectively. Contains no corrosive alkalies or acids! Environmentally safe and easy on the hands. BIG O leaves a fresh orange scent in the work area.

Ideal for equipment cleaning and engine degreasing. BIG O penetrates and removes oil, tar, grease, asphalt, and cosmoline from equipment. BIG O should not be used on a hot vehicle. If a vehicle has been sitting in the sun, its surface temperature should be cooled with water before BIG O is applied. Care should be taken to avoid contact with plastic parts and lens assemblies.

BIG O's natural degreasers make it an ideal choice for declogging grease-stopped drains and grease traps. Safer to handle than caustic or sulfuric acid-based drain cleaners. BIG O is safe on all plumbing materials. Leaves drains smelling sweet and fresh.

PROPERTIES:

Form	Liquid
Color	Orange
Odor	Orange fragrance
pH	Neutral

USE DIRECTIONS:

Engine degreasing, parts cleaning:Spray or mop on BIG O. Allow to stand 1-2 minutes. Agitate if necessary for heavy grease or grime accumulation. Rinse well with either hot or cold water.

Tar, asphalt, and cosmoline removal from vehicles:Cool surface of vehicle with water if hot. Spray or mop on BIG O, avoiding contact with plastic parts and lens assemblies. Allow to stand 1-2 minutes. Rinse well with water.

Declogging drains or grease traps:Pour one cup BIG O directly into drain. Let stand for at least one hour. Flush drain with hot water. NOTE: BIG O will not dissolve hair or paper.

CAUTION:

Contains detergents. May cause temporary eye irritation. For contact with eyes, flush thoroughly with plenty of water for at least 15 minutes. Wash thoroughly after handling. DO NOT INGEST. Consult the Material Safety Data Sheet for additional precautions.

PACKAGING:

55 gal. drum
5 gal. pail
6x1 gal. case

11/95

4444 NW Yeon Avenue | Portland, Oregon 97210 | T (503) 227-3505 | F (503) 225-9143 | Toll Free (800) 547-2594

MT. HOOD CHEMICAL CORPORATION
4444 N.W. Yeon Avenue
Portland, Oregon 97210
Emergency Phone: 503-227-3505

N/A = NOT APPLICABLE
NA = NOT AVAILABLE

PRODUCT NAME: BIG O PREPARED BY: K. Woods DATE: August 31,1995

CHEMICAL FAMILY: Biodegradable Citrus Degreaser FORMULA: Proprietary

HAZARDOUS INGREDIENTS (CAS #):	%	EXPOSURE LIMITS, ppm: ACGIH TLV	OSHA-PEL
None	N/A	N/A	N/A

CARCINOGENIC INGREDIENTS: Contains no known or suspected carcinogens.
SARA TITLE III, SECTION 313 REPORTABLE INGREDIENTS: None

PHYSICAL PROPERTIES:
- Boiling Point: About 200°F
- Solubility in Water: 100%
- Specific Gravity - Liquid (H_2O = 1): 0.975-0.98
- Odor and Appearance: Orange, clear liquid; orange scent
- % Volatiles: NA
- % Volatile Organic Content (VOC): 0
- Vapor Pressure: NA
- Vapor Density (Air = 1): NA

FIRE AND EXPLOSION DATA:
- Flash Point: 160°F, TCC
- Extinguishing Media: Water, CO_2, foam, dry chemical
- Special Firefighting Procedures: None
- Unusual Hazards: None
- Flammability Limits: NA

HEALTH EFFECTS:
- Effects of overexposure: Contains detergents. May cause temporary minor eye irritation. Prolonged or repeated skin contact may cause minor irritation or dryness in some sensitive individuals. Ingestion may cause nausea and diarrhea..
- Chronic effects of overexposure: None known or expected.
- Medical conditions that may be aggravated by exposure: None known or expected.
- Primary routes of entry: Ingestion, skin contact

EMERGENCY AND FIRST AID PROCEDURES:
- Eye Contact: Flush thoroughly with plenty of water for several minutes. If irritation persists, see a physician.
- Skin Contact: Flush thoroughly from skin with water. If irritation persists, see a physician.
- Ingestion: Drink plenty of water and call a physician immediately.
- Inhalation of mist or vapor: Move to fresh air.

REACTIVITY DATA:
- Stability: Stable
- Incompatibility: Strong oxidizers
- Hazardous Decomposition Products: None
- Conditions to Avoid: Open flames, high heat
- Hazardous Polymerization: Will not occur

SPILL OR LEAKAGE PROCEDURES:
- Steps to be taken if material is released or spilled:
  Flush to sewer with plenty of water, mop up, or absorb on an absorbent.
  Scrub floor well to remove residue to prevent slipperiness.
- Waste disposal method: According to local, state, or federal ordinances.

SPECIAL PROTECTION INFORMATION:
- Ventilation: Not required in normal use.
- Respiration Protection: None required in normal use.
- Eye Protection: Safety glasses or goggles recommended if splashing is possible.
- Protective Gloves: Rubber or neoprene gloves for prolonged or repeated contact.
- Other Protective Equipment: None required

SPECIAL PRECAUTIONS:
- Precautions to be taken in handling and storage: Store in closed container in a dry place. Store away from open flame or sparks. Wash thoroughly after handling.
- KEEP OUT OF REACH OF CHILDREN.
- Other precautions: None

HAZARD RATING:

Health:	0	0 = Minimal	3 = Serious
Fire:	2	1 = Slight	4 = Severe
Reactivity:	0	2 = Moderate	

NATIONAL SANITARY SUPPLY COMPANY
255 EAST FIFTH STREET, SUITE 2900
CINCINNATI, OH 45202
24 HR. EMERGENCY NO. (800) 535-5053

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER
NATIONAL ITEM #: 2802XX
DATE ISSUED: 08/28/97
SUPERCEDES: 03/20/97

SECTION 1. IDENTIFICATION OF PRODUCT

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER

DATE ISSUED: 08/28/97
SUPERCEDES: 03/20/97
NATIONAL ITEM #: 2802XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV
* 2-BUTOXYETHANOL	111-76-2	4-5	25 PPM	25 PPM
AMMONIUM HYDROXIDE	1336-21-6	1-2	35 PPM	25 PPM

* THIS (THESE) MATERIAL(S) ARE SUBJECT TO THE REPORTING REQUIREMENTS UNDER SARA TITLE III, SECTION 313 AND 40 CFR PART 372.

N/D = NOT DETERMINED
N/E = NOT ESTABLISHED
N/A = NOT APPLICABLE
PROP. = PROPRIETARY

SECTION 3. PHYSICAL DATA

BOILING POINT (F): LT 212 F
SPECIFIC GRAVITY (CONCENTRATE)(WATER=1): 0.99-1.00
VAPOR PRESSURE (PSIG): (@70F - AEROSOL): N/D
VAPOR PRESSURE (NON-AEROSOLS; MM HG): N/D
VAPOR DENSITY (AIR=1): GT 1
EVAPORATION RATE (WATER=1): GT 1
SOLUBILITY IN WATER: COMPLETE
PERCENT SOLIDS (2HR. @ 110C)(BY VOLUME): 0.3-0.4
PH RANGE: 10-10.5
VISCOSITY (BROOKFIELD SPIN. # @ RPM): LT 25 CPS
MELTING POINT: N/A
FREEZING POINT: N/D
GALLON WEIGHT: 8.283 LBS./GAL.
WATER REACTIVE: NEGLIGIBLE
APPEARANCE/ODOR: BLUE LIQUID/FLORAL FRAGRANCE.

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER DATE ISSUED: 08/28/97
NATIONAL ITEM #: 2802XX SUPERCEDES: 03/20/97

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY: NON-FLAMMABLE
FLASH POINT (NON-AEROSOLS): 127 F (TCC)
AUTO-IGNITION TEMP.: N/D
FLAMMABLE LIMITS: LEL=N/D UEL=N/D

EXTINGUISHING MEDIA: CO2, DRY CHEMICAL, FOAM, WATER SPRAY/FOG. DO NOT USE DIRECT WATER STREAM.

SPECIAL FIRE FIGHTING PROCEDURES: DO NOT ENTER CONFINED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT INCLUDING NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS, SURROUNDING EQUIPMENT AND STRUCTURES WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZ.: NONE KNOWN.

SECTION 5. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: OPEN FLAME, HEAT, SPARKS. AVOID CONTAMINATION WITH STRONG OXIDIZERS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

MATERIALS TO AVOID: OXIDIZING MATERIALS; STRONG ACIDS AND BASES.

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON AND UNIDENTIFIED ORGANICS MAY BE FORMED DURING COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

SMALL SPILLS: DILUTE WITH WATER AND PICK UP WITH MOP AND PAIL OR WET PICK UP VACUUM.

LARGE SPILLS: DIKE AREA TO CONTAIN SPILL. CLEAN UP USING ABSORBENT MATERIAL. PLACE ALL CONTAMINATED MATERIAL IN A CLOSED CONTAINER FOR DISPOSAL.

DISPOSAL: DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.

CONTAIN. DISP.: EMPTY PRODUCT CONTAINERS MUST BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.

KMB00003752

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER DATE ISSUED: 08/28/97
NATIONAL ITEM #: 2802XX SUPERCEDES: 03/20/97

SECTION 7. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: EYES, SKIN

ACUTE EFFECTS: OVEREXPOSURE (INGESTION) MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS, CARDIOPULMONARY EFFECTS (METABOLIC ACIDOSIS), AND KIDNEY FAILURE.

OVEREXPOSURE SYMPTOMS:
EYE CONTACT: MAY CAUSE EYE IRRITATION.

SKIN CONTACT: MAY CAUSE SKIN IRRITATION.

INHALATION: NO HEALTH EFFECTS ARE KNOWN TO OCCUR FROM INHALATION OF THIS PRODUCT UNDER NORMAL USE IN A WELL VENTILATED AREA. HIGH AIRBORNE CONCENTRATIONS OF MISTS OR SPRAYS OF THIS PRODUCT MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT.

INGESTION: MAY RESULT IN VOMITING. SMALL AMOUNTS SWALLOWED INCIDENTAL TO NORMAL HANDLING OPERATIONS ARE NOT LIKELY TO CAUSE INJURY; HOWEVER, SWALLOWING AMOUNTS LARGER THAN THAT MAY CAUSE SERIOUS INJURY.

CHRONIC HEALTH HAZARDS: NONE KNOWN TO NSS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: PRE-EXISTING IRRITATION OF SKIN OR MUCOUS MEMBRANES.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: IMMEDIATELY FLUSH THE EYE WITH LARGE QUANTITIES OF FRESH, RUNNING WATER FOR A MINIMUM OF 15 MINUTES. HOLD THE EYELIDS APART DURING THE IRRIGATION TO ENSURE FLUSHING OF THE ENTIRE SURFACE OF THE EYELID WITH WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

SKIN CONTACT: WASH AFFECTED AREA WITH SOAP AND WARM WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

INHALATION: MOVE PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT GET MEDICAL ATTENTION.

INGESTION: REQUIRES IMMEDIATE MEDICAL MANAGEMENT. DO NOT INDUCE VOMITING. DRINK 3 TO 4 GLASSES OF WATER. VOMITING SHOULD BE INDUCED ONLY ON RECOMMENDATION OF MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIANS: NONE AVAILABLE OR KNOWN TO NSS.

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER DATE ISSUED: 08/28/97
NATIONAL ITEM #: 2802XX SUPERCEDES: 03/20/97

SECTION 9. SPECIAL PROTECTION INFORMATION

EYE PROTECTION: CHEMICAL GOGGLES/EYE PROTECTION RECOMMENDED. AVOID CONTACT WITH EYES.

RESPIRATORY PROTECTION: NORMAL ROOM VENTILATION SHOULD BE ADEQUATE.

SKIN PROTECTION: AS REQUIRED TO MINIMIZE SKIN CONTACT. WHEN PROLONGED OR FREQUENTLY REPEATED CONTACT COULD OCCUR, USE PROTECTIVE CLOTHING IMPERVIOUS TO THIS MATERIAL.

VENTILATION: IF NECESSARY, EXPLOSION PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

OTHER MEASURES: AVOID FOOD CONTAMINATION. EYEWASH ACCESSIBILITY RECOMMENDED.

HYGIENIC WORK PRACTICES: DO NOT EAT, DRINK OR SMOKE IN WORK AREA. WASH HANDS AFTER HANDLING.

SECTION 10. ADDITIONAL PRECAUTIONS

HANDLING AND STORAGE: PRACTICE REASONABLE CARE AND CLEANLINESS. AVOID BREATHING SPRAY MISTS. STORE IN ORIGINAL SHIPPING CONTAINERS AWAY FROM HEAT, OPEN FLAMES, STRONG ACIDS AND BASES AND OXIDIZING MATERIALS. DO NOT STORE NEAR FOOD, FOODSTUFFS, DRUGS OR POTABLE WATER SUPPLIES. KEEP CLOSED WHEN NOT IN USE. SHELF LIFE 1 YEAR.

OTHER SPECIAL HAZARDS: KEEP OUT OF REACH OF CHILDREN. READ AND FOLLOW LABEL DIRECTIONS.

TSCA INVENTORY STATUS: ALL COMPONENTS ARE INCLUDED IN TSCA INVENTORY.

SARA TITLE III RATINGS:
ACUTE: YES
CHRONIC: NO
FIRE: NO
PRESSURE RELEASE: NO
REACTIVITY: NO

HMIS RATINGS:	HEALTH-1	FIRE-1	REACTIVITY-0	PROTECTION-A
NFPA RATINGS:	HEALTH-1	FIRE-1	REACTIVITY-0	SPECIAL-

PRODUCT NAME: BLUE-X INSTITUTIONAL STRENGTH CLEANER DATE ISSUED: 08/28/97
NATIONAL ITEM #: 2802XX SUPERCEDES: 03/20/97

SECTION 11. REGULATORY (OPTIONAL)

HM-181 PROPER SHIPPING NAME (DOT): NOT DOT HAZARDOUS
PROPER SHIPPING NAME CODE:
UN/NA NUMBER:
PG#:

CARCINOGEN LISTING: NONE OF THE COMPONENTS PRESENT IN THIS MATERIAL AT CONCENTRATIONS EQUAL TO OR GREATER THAN 0.1% ARE LISTED BY IARC, NTP, OSHA OR ACGIH AS A CARCINOGEN.

VOC CONTENT:
THEORETICAL = 2.75% ( ) LB/GAL.
TYPICAL ANALYTICAL = % ( ) LBS./GAL.
PHOSPHOROUS: % CONCENTRATE = NONE
DILUTION RANGE: N/A - N/A GMS./GAL.

THE INFORMATION ON THIS MATERIAL SAFETY DATA SHEET REPRESENTS THE LATEST DATA AND BEST OPINION AS TO PROPER USE/HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS. ANY USE OF THIS PRODUCT OR METHOD OF APPLICATION WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET AND THE PRODUCT LABEL DIRECTIONS IS THE RESPONSIBILITY OF THE USER. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH OSHA HAZARD COMMUNICATION REGULATIONS.

DATE PRINTED: 08/28/97

UNISOURCE WORLDWIDE, INC.
1100 CASSATT ROAD
BERYWN, PA 19312-0935
Call nearest Sales Office for MSDS Information 1-800-864-7687

EMERGENCY NO. 1-888-660-6737 (INFOTRAC)

SECTION 1. IDENTIFICATION OF PRODUCT

Product Name: BLUE-X
Date Issued: 03/05/99
Supersedes: 08/28/97
Unisource Item #: U17956, U17957, U17958

SECTION 2. INGREDIENTS

INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV
* 2-BUTOXYETHANOL	111-76-2	4-5	25 PPM	25 PPM
AMMONIUM HYDROXIDE	1336-21-6	1-2	35 PPM	25 PPM

* THIS (THESE) MATERIAL(S) ARE SUBJECT TO THE REPORTING REQUIREMENTS UNDER SARA TITLE III, SECTION 313 AND 40 CFR PART 372.
N/D = NOT DETERMINED N/E = NOT ESTABLISHED N/A = NOT APPLICABLE
PROP. = PROPRIETARY

SECTION 3. PHYSICAL DATA

BOILING POINT (F): LT 212 F
SPECIFIC GRAVITY (CONCENTRATE)(WATER=1): 0.99-1.00
VAPOR PRESSURE (PSIG): (@70F - AEROSOL): N/D
VAPOR PRESSURE (NON-AEROSOLS; MM HG): N/D
VAPOR DENSITY (AIR=1): GT 1
EVAPORATION RATE (WATER=1): GT 1
SOLUBILITY IN WATER: COMPLETE
PERCENT SOLIDS (2HR. @ 110C)(BY VOLUME): 0.3-0.4
PH RANGE: 10-10.5
VISCOSITY (BROOKFIELD SPIN. # @ RPM): LT 25 CPS
MELTING POINT: N/A
FREEZING POINT: N/D
GALLON WEIGHT: 8.283 LBS./GAL.
WATER REACTIVE: NEGLIGIBLE
APPEARANCE/ODOR: BLUE LIQUID/FLORAL FRAGRANCE.

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY: NON-FLAMMABLE
FLASH POINT (NON-AEROSOLS): 127 F (TCC)
AUTO-IGNITION TEMP.: N/D FLAMMABLE LIMITS: LEL=N/D UEL=N/D
EXTINGUISHING MEDIA: CO2, DRY CHEMICAL, FOAM, WATER SPRAY/FOG. DO NOT USE DIRECT WATER STREAM.
SPECIAL FIRE FIGHTING PROCEDURES: DO NOT ENTER CONFINED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT INCLUDING NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS, SURROUNDING EQUIPMENT AND STRUCTURES WITH WATER.
UNUSUAL FIRE AND EXPLOSION HAZARD: NONE KNOWN.

Product Name: BLUE-X
Date Issued: 03/05/99
Supersedes: 08/28/97
Unisource Item #: U17956, U17957, U17958

SECTION 5. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: OPEN FLAME, HEAT, SPARKS. AVOID CONTAMINATION WITH STRONG OXIDIZERS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

MATERIALS TO AVOID: OXIDIZING MATERIALS; STRONG ACIDS AND BASES.

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON AND UNIDENTIFIED ORGANICS MAY BE FORMED DURING COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

SMALL SPILLS: DILUTE WITH WATER AND PICK UP WITH MOP AND PAIL OR WET PICK UP VACUUM.

LARGE SPILLS: DIKE AREA TO CONTAIN SPILL. CLEAN UP USING ABSORBENT MATERIAL. PLACE ALL CONTAMINATED MATERIAL IN A CLOSED CONTAINER FOR DISPOSAL.

DISPOSAL: DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.

CONTAIN. DISP.: EMPTY PRODUCT CONTAINERS MUST BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES.

SECTION 7. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: EYES, SKIN
ACUTE EFFECTS: OVEREXPOSURE (INGESTION) MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS, CARDIOPULMONARY EFFECTS (METABOLIC ACIDOSIS), AND KIDNEY FAILURE.
OVEREXPOSURE SYMPTOMS:
EYE CONTACT: MAY CAUSE EYE IRRITATION.
SKIN CONTACT: MAY CAUSE SKIN IRRITATION.
INHALATION: NO HEALTH EFFECTS ARE KNOWN TO OCCUR FROM INHALATION OF THIS PRODUCT UNDER NORMAL USE IN A WELL VENTILATED AREA. HIGH AIRBORNE CONCENTRATIONS OF MISTS OR SPRAYS OF THIS PRODUCT MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT.
INGESTION: MAY RESULT IN VOMITING. SMALL AMOUNTS SWALLOWED INCIDENTAL TO NORMAL HANDLING OPERATIONS ARE NOT LIKELY TO CAUSE INJURY; HOWEVER, SWALLOWING AMOUNTS LARGER THAN THAT MAY CAUSE SERIOUS INJURY.
CHRONIC HEALTH HAZARDS: NONE KNOWN TO UNISOURCE.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: PRE-EXISTING IRRITATION OF SKIN OR MUCOUS MEMBRANES.

KINDER MORGAN TERMINAL 4
11040 N LOMBARD STREET
PORTLAND OR 97203

Attn:

MSDS Distribution Type: SS Send with Shipment

Ship to Customer Nbr. 167221

Item Number	Item Description	MSDS Sheet Number
280204	4X1GAL BLUE-X GLASS CLEANER	M2002270

** END OF REPORT **

This MSDS should be attached or kept with the respective product with which it is associated.

##########

OLIN MATERIAL SAFETY DATA

OCEAN NETWORK EMERGENCY PHONE 1-800-OLIN-911

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD. (REFER TO THE OSHA CLASSIFICATION IN SEC.I.). THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE. THE EXPOSURE TO THE COMMUNITY, IF ANY, IS QUITE DIFFERENT.

I. PRODUCT IDENTIFICATION

REVISION NO: 4
REVISION DATE: 8/17/93
PRODUCT CODE: DPE000093
FILE NUMBER: DPE00838.0001
PRODUCT NAME: CARTRIDGE FOR POWER DEVICE

SYNONYMS: CENTERFIRE POWERTOOL LOADED ROUND, RIMFIRE CARTRIDGE FOR POWER DEVICE, 22,25,27,32,38 CALIBER POWERTOOL ROUND, POWER LOAD, BLANK POWER LOAD AND/OR BOOSTER, POWER LOAD
CHEMICAL FAMILY: NOT APPLICABLE
FORMULA: NOT APPLICABLE
USE DESCRIPTION: CENTERFIRE POWERTOOL LOADED ROUND CONTAINS A PAPER WAD WHICH IS NON-HAZARDOUS.
OSHA HAZARD CLASSIFICATION: EXPLOSIVE.

II. COMPONENT DATA

PRODUCT COMPOSITION:
CONSISTS OF THE FOLLOWING FOUR COMPONENTS:

COMPONENT	PERCENT	PRODUCT	PRODUCT CODE NUMBER
A) SHELLCASE	75-85%	BRASS 2XXX SERIES	BPE.020000
B) PROPELLANT	7-13%	SMOKELESS POWDER	DPE.090000
C) PRIMING MIX/PRIMER	4-7%		
D) PAPER WAD	.5-2%		

ADDITIONAL INFORMATION MAY BE OBTAINED FROM OLIN FOR ANY COMPONENT OF INTEREST. QUOTE THE RELEVANT PRODUCT CODE NUMBER IF APPLICABLE.

ALL PERCENT COMPOSITIONS SPECIFIED BELOW ARE BASED ON THE ENTIRE PRODUCT.

A) SHELLCASE
CAS OR CHEMICAL NAME: COPPER
CAS NUMBER: 7440-50-8
PERCENTAGE RANGE: 50-65%
HAZARDOUS PER 29 CFR 1910.1200: YES (AS DUST OR FUME)
EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		1		1
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: LEAD STYPHNATE
CAS NUMBER: 15245-44-0
PERCENTAGE RANGE: 0-1%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARDS: AS LEAD (SEE 29 CFR 1910.1025)

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.05		0.15
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: BARIUM NITRATE
CAS NUMBER: 10022-31-8
PERCENTAGE RANGE: 0-1%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.5		0.5
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

D) PAPER WAD
NON-HAZARDOUS PRODUCT

III. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.
STORAGE CONDITIONS:
STORE IN A COOL, DRY, WELL VENTILATED PLACE, AWAY FROM ALL SOURCES OF IGNIT
DO NOT STORE AT TEMPERATURES ABOVE: NOT APPLICABLE
DO NOT SUBJECT TO MECHANICAL SHOCK.
PRODUCT STABILITY AND COMPATIBILITY:
SHELF LIFE LIMITATIONS: 25-30 YEARS
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: ACIDS, CLASS A & B EXPLOS AND OXIDIZERS.

IV. PHYSICAL DATA

APPEARANCE: CYLINDRICAL, BRASS CARTRIDGE
FREEZING POINT: NOT APPLICABLE
BOILING POINT: NOT APPLICABLE
DECOMPOSITION TEMPERATURE: NOT APPLICABLE
SPECIFIC GRAVITY: NOT APPLICABLE
BULK DENSITY: NOT APPLICABLE
PH @ 25 DEG C: NOT APPLICABLE
VAPOR PRESSURE @ 25 DEG. C: NOT APPLICABLE
SOLUBILITY IN WATER: NOT APPLICABLE
VOLATILES, PERCENT BY VOLUME: NOT APPLICABLE
EVAPORATION RATE: NOT APPLICABLE
VAPOR DENSITY: NOT APPLICABLE
MOLECULAR WEIGHT: NOT APPLICABLE
ODOR: NONE
COEFFICIENT OF OIL/WATER DISTRIBUTION: NOT APPLICABLE

CAS OR CHEMICAL NAME: ZINC

CAS NUMBER: 7440-66-6

PERCENTAGE RANGE: 15-30%

HAZARDOUS PER 29 CFR 1910.1200: YES (AS DUST OR FUME)

EXPOSURE STANDARDS: AS ZINC OXIDE

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		5 (RESPIRABLE)		10
		10 (TOTAL DUST)		
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

B) PROPELLANT

CAS OR CHEMICAL NAME: NITROCELLULOSE

CAS NUMBER: 9004-70-0

PERCENTAGE RANGE: 7-13%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS: NONE ESTABLISHED

CAS OR CHEMICAL NAME: NITROGLYCERIN

CAS NUMBER: 55-63-0

PERCENTAGE RANGE: .5-2%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.1 (SKIN)		0.05 (SKIN)
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: DIBUTYL PHTHALATE

CAS NUMBER: 84-74-2

PERCENTAGE RANGE: .5-2%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		5		5
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

C) PRIMING MIX/PRIMER

CAS OR CHEMICAL NAME: COPPER (SEE ABOVE)

CAS NUMBER: 7440-50-8

PERCENTAGE RANGE: 0-5%

CAS OR CHEMICAL NAME: ZINC (SEE ABOVE)

CAS NUMBER: 7440-66-6

PERCENTAGE RANGE: 0-2%

V. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: NONE REQUIRED FOR NORMAL HANDLING.

VENTILATION: NONE BEYOND NORMAL VENTILATION.

SKIN AND EYE PROTECTIVE EQUIPMENT: USE SAFETY GLASSES.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NONE NORMALLY REQUIRED

PROTECTIVE CLOTHING TYPE (THIS INCLUDES: GLOVES, BOOTS, APRON, PROTECTIVE SUIT): NONE NORMALLY REQUIRED

VI. FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:

EXPLOSIVE: YES

FLAMMABLE: NOT APPLICABLE

COMBUSTIBLE: NOT APPLICABLE

PYROPHORIC: NO

FLASH POINT: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NO DATA

FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VO IN AIR): LEL - NOT APPLICABLE UEL - NOT APPLICABLE

NFPA RATINGS: NOT ESTABLISHED

HMIS RATINGS:

HEALTH: 0

FLAMMABILITY: 2

REACTIVITY: 4

EXTINGUISHING MEDIA:

WATER SPRAY NOTE: DO NOT FIGHT FIRE IF FIRE REACHES CARGO. USE WATER FROM UNMANNED STATION.

FIRE FIGHTING TECHNIQUES AND COMMENTS:

SEE SECTION XI FOR PROTECTIVE EQUIPMENT FOR FIRE FIGHTING.

OTHER: EVACUATE ALL PERSONS INCLUDING EMERGENCY RESPONSE PERSONNEL FROM TH AREA FOR 1500 FEET (1/2 MILE) IN ALL DIRECTIONS IF FIRE REACHES CARGO.

VII. REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:

TEMPERATURES ABOVE: NO DATA

MECHANICAL SHOCK OR IMPACT: YES - BASED ON PRIMER

ELECTRICAL (STATIC) DISCHARGE: YES - BASED ON PRIMER

OTHER: CARTRIDGE MAY DETONATE IF CASE IS PUNCTURED OR SEVERELY DAMAGED

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

INCOMPATIBLE MATERIALS: ACIDS AND CAUSTICS

HAZARDOUS DECOMPOSITION PRODUCTS: NITROGEN OXIDES, CARBON MONOXIDE, CARBON DIOXIDE, LEAD OXIDES, LEAD DUST/FUME

OTHER CONDITIONS TO AVOID: CARTRIDGES PLACED IN A HIGH RADIO FREQUENCY ENE FIELD (RADAR STATIONS)

SUMMARY OF REACTIVITY:

EXPLOSIVE: YES OXIDIZER: NO PYROPHORIC: NO ORGANIC PEROXIDE: NO

WATER REACTIVE: NO

VIII. FIRST AID

EYES: NOT A LIKELY ROUTE OF EXPOSURE.

SKIN: NOT A LIKELY ROUTE OF EXPOSURE.

INGESTION: NOT A LIKELY ROUTE OF EXPOSURE.

INHALATION: NOT A LIKELY ROUTE OF EXPOSURE.

IX. TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION: THE PHYSICAL NATURE OF THIS PRODUCT MAKES ABSORPTION FROM ANY ROUTE UNLIKELY. A SMALL AMOUNT OF INHALABLE PARTICLES MAY BE CREATED WHEN CARTRIDGE IS FIRED.

WARNING STATEMENTS AND WARNING PROPERTIES:
PARTICLES FROM FIRING MAY BE HARMFUL IF INHALED.

HUMAN THRESHOLD RESPONSE DATA:
ODOR THRESHOLD: NO DATA
IRRITATION THRESHOLD: NO DATA
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: THE IDLH CONCENTRATION HAS NOT BEEN ESTABLISHED FOR THIS PRODUCT.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:
INHALATION:
ACUTE: INHALATION OF THE PROPELLANT IS IRRITATING TO THE NOSE, MOUTH, THROAT AND LUNGS. DILATION OF BLOOD VESSELS WITH DROP IN BLOOD PRESSURE AND HEADACHE, CYANOSIS AND MENTAL CONFUSION MAY RESULT FROM THE NITROGLYCERIN. THE HEADACHE MAY BE SEVERE AND CAN REMAIN FOR A FEW HOURS TO SEVERAL DAYS. IT TYPICALLY STARTS AT THE FOREHEAD PRECEDED BY A SENSATION OF WARMTH AND FULLNESS IN THE HEAD AND MAY EXTEND TO THE BACK OF THE NECK. NAUSEA, VOMITING, AND ABDOMINAL PAIN MAY ALSO OCCUR.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

THIS PRODUCT IS COMPOSED OF A FINISHED CARTRIDGE, AND THE PROPELLANT IS COMPLETELY SEALED. IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT AND ITS USE WOULD PRECLUDE INHALATION OF A SUFFICIENT AMOUNT OF PROPELLANT AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

SKIN:
ACUTE: DERMAL EXPOSURE TO THE PROPELLANT MAY CAUSE IRRITATION WHICH COULD SUBSIDE RAPIDLY UPON REMOVAL OF MATERIAL WITHOUT PERMANENT DAMAGE. ADDITIONAL EFFECTS WOULD BE SIMILAR TO THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

THIS PRODUCT IS COMPOSED OF A FINISHED CARTRIDGE, AND THE PROPELLANT IS COMPLETELY SEALED. IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT, AND ITS USE WOULD PRECLUDE SKIN ABSORPTION OF A SUFFICIENT AMOUNT OF PROPELLANT AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

AQUATIC TOXICITY:
FISH ARE UNAFFECTED BY NITROCELLULOSE AT CONCENTRATIONS OF 1000 MG/L.

THE LC 50 OF LEAD (48 HRS.) TO BLUEGILL (LEPOMIS MACROCHIRUS) IS REPORTED TO BE 2-5 MG/L.

X. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101: SMALL A AMMUNITION

REPORTABLE QUANTITY: NOT APPLICABLE (PER 49 CFR 172.101, APPENDIX)

THE MATERIAL DESCRIBED ABOVE IS SUBJECT TO THE U.S. DOT HAZARDOUS MATERIALS REGULATIONS VIA THE MODES AND PACKAGING QUANTITIES INDICATED BELOW WITH THE LETTER "X":

	MODE	PACKAGING QUANTITIES		
X	RAIL	BULK	X	NON-BULK
X	MOTOR	BULK	X	NON-BULK
X	WATER	BULK	X	NON-BULK
X	AIR	BULK	X	NON-BULK

THE APPLICABLE PACKAGING SECTIONS IN 49 CFR ARE 173.101 AND 173.1201.

SPECIAL COMMENTS: CLASS C EXPLOSIVE, NO LABEL REQUIRED.

OTHER: MAY BE RECLASSED AS AN ORM-D, PACKAGE MAY NOT EXCEED 65 LBS. GROSS.

XI. SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY:
(PER 40 CFR 302.4) - AS NITROGLYCERIN 10#, DIBUTYL PHTHALATE 10#

SPILL MITIGATION PROCEDURES:
THIS PRODUCT DOES REPRESENT AN EXPLOSION HAZARD WHEN INVOLVED IN A FIRE OR EXPOSED TO HEAT, FRICTION, SHOCK, ETC. REMOVE ALL SOURCES OF IGNITION.

AIR RELEASE: NOT APPLICABLE

WATER RELEASE: NOT APPLICABLE

LAND SPILL: SHUT OFF ALL IGNITION SOURCES, NO FLARES, SMOKING, OR FLAMES I HAZARD AREA. PLACE IN PROPER DOT CONTAINER FOR LATER DISPOSITION.

SPILL RESIDUES: DISPOSE OF PER GUIDELINES UNDER SECTION XII, WASTE DISPOSA

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
NO EXTRA PROTECTION REQUIRED BEYOND THAT LISTED IN SECTION V (IN CASE OF FI USE NORMAL FIRE FIGHTING EQUIPMENT).

PROTECTION CONCERNS MUST ALSO ADDRESS THE POTENTIAL OF THE PHYSICAL CHARACTERISTIC OF THIS PRODUCT AS EXPLOSIVE.

EYE:

IRRITATION MAY OCCUR WITH INFLAMMATION OF THE CONJUNCTIVA. ANY EFFECT WOULD NOT RESULT IN PERMANENT IMPAIRMENT OF VISION.

IT IS JUDGED THAT THIS EFFECT WOULD NOT OCCUR BECAUSE OF THE PHYSICAL NATURE OF THE PRODUCT, AND LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT AND ITS USE.

INGESTION:

ACUTE: IRRITATION TO THE GASTROINTESTINAL TRACT. ADDITIONAL EFFECTS WOULD BE SIMILAR TO THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT, AND ITS USE WOULD PRECLUDE INGESTION AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

NONE KNOWN OR REPORTED.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:

NONE KNOWN OR REPORTED.

ANIMAL TOXICITY:

ACUTE TOXICITY:

INHALATION LC 50: NO DATA

DERMAL LD 50: NO DATA

ORAL LD 50: NO DATA

IRRITATION: NOT AN IRRITANT TO SKIN OR EYES.

ACUTE TARGET ORGAN TOXICITY:

NITROGLYCERIN WILL PRODUCE DILATION OF BLOOD VESSELS AND DROP IN BLOOD PRESSURE WHICH MAY AFFECT THE HEART. IT HAS ALSO BEEN SHOWN TO CAUSE METHEMOGLOBINEMIA (CYANOSIS). IT IS JUDGED THAT THE LOW CONCENTRATION OF NITROGLYCERIN AND THE PHYSICAL NATURE OF THE PRODUCT WOULD PRECLUDE THE OCCURRENCE OF THESE SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

CHRONIC TARGET ORGAN TOXICITY:

THERE ARE NO KNOWN OR REPORTED EFFECTS FROM REPEATED EXPOSURE TO THIS PRODUCT.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

THERE ARE NO KNOWN OR REPORTED EFFECTS ON REPRODUCTIVE FUNCTION OR FETAL DEVELOPMENT.

CARCINOGENICITY:

THIS PRODUCT IS NOT KNOWN OR REPORTED TO BE CARCINOGENIC BY ANY REFERENCE SOURCE INCLUDING IARC, OSHA, NTP, OR EPA. LEAD IS CLASSIFIED AS A CARCINOGEN BY IARC. BASED ON THE PHYSICAL NATURE OF THE PRODUCT AND ITS USE, IT IS JUDGED THAT THE RISK OF CANCER IS NOT SIGNIFICANT FROM EXPOSURE TO THE PRODUCT.

MUTAGENICITY:

THIS PRODUCT IS NOT KNOWN OR REPORTED TO BE MUTAGENIC.

XII. WASTE DISPOSAL

IF THIS PRODUCT BECOMES A WASTE, IT MEETS THE CRITERIA OF A HAZARDOUS WASTE AS DEFINED UNDER 40 CFR 261 AND WOULD HAVE THE FOLLOWING EPA HAZARDOUS WASTE NUMBER: D003.

IF THIS PRODUCT BECOMES A WASTE, IT WILL BE A HAZARDOUS WASTE WHICH IS SUBJ TO THE LAND DISPOSAL RESTRICTIONS UNDER 40 CFR 268 AND MUST BE MANAGED ACCORDINGLY.

OTHER: DEACTIVATION.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF T MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII. ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TOXIC SUBSTANCE CONTROL AC INVENTORY.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III:

HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH: NONE

PHYSICAL: SUDDEN RELEASE OF PRESSURE

EXTREMELY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY: NONE ESTABLIS

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45: NONE ESTABLISHED

XIV. ADDITIONAL INFORMATION

MSDS REVISION STATUS: MINOR REVISIONS TO SECTION IX (TOXICOLOGY).

XV. MAJOR REFERENCES

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2. ANSI Z88.2. RECOMMENDED PRACTICE FOR RESPIRATORY PROTECTION. AMERICAN NATIONAL STANDARDS INSTITUTE, NEW YORK, NY.

3. BAKER, C.J., THE FIRE FIGHTER'S HANDBOOK OF HAZARDOUS MATERIALS, 4TH ED INDIANA: MALTESE ENTERPRISES, INC., 1984.

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6. CERIS (CHEMICAL EMERGENCY RESPONSE INFORMATION SYSTEM) ON LINE DATABASE ASSOCIATION OF AMERICAN RAILROADS.

7. CHEMICAL DEGRADATION AND PERMEATION DATABASE AND SELECTION GUIDE FOR RESISTANT PROTECTIVE MATERIALS. AUSTIN, TX.

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11. FIRE PROTECTION GUIDE ON HAZARDOUS MATERIALS, 9TH ED., NATIONAL FIRE PROTECTION ASSOCIATION, BATTERYMARCH PARK, QUINCY, MA, 1986.

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13. GRANT, W. MORTON, M.D., TOXICOLOGY OF THE EYE, 2ND ED., SPRINGFIELD, IL: CHARLES C. THOMAS, 1974.

14. HAZARDLINE, OCCUPATIONAL HEALTH SERVICES INC., NEW YORK, NY.

15. IARC MONOGRAM ON THE EVALUATION OF CARCINOGENIC RISK OF CHEMICALS TO MAN., GENEVA: WORLD HEALTH ORGANIZATION, INTERNATIONAL AGENCY FOR RESEARCH ON CANCER.

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17. LEWIS, R. AND D. SWEET, EDS., REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, 1985-1986, WASHINGTON, DC: U.S. GOVERNMENT PRINTING OFFICE, 1987.

18. MEDLINE, U.S. NATIONAL LIBRARY OF MEDICINE, BETHESDA, MD.

19. MCKEE, JACK E. AND HAROLD W. WOLF, EDS., WATER QUALITY CRITERIA, NTIS PB REPORT; (PB-82-188244), 2ND ED., SPRINGFIELD, VA: NATIONAL TECHNICAL INFORMATION SERVICES, 1963.

20. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS. WASHINGTON, DC: U.S. GOVERNMENT PRINTING OFFICE, 1985.

21. OLIN RESPIRATORY PROTECTION MANUAL.

22. SAX, N. IRVING, DANGEROUS PROPERTIES OF HAZARDOUS MATERIALS 6TH ED., NEW YORK: VAN NOSTRAND REINHOLD COMPANY, 1984.

23. THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES FOR 1989-90. CINCINNATI, OH: AMERICAN CONFERENCE OF GOVERNMENT INDUSTRIAL HYGIENISTS, 1989.

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25. LEE, CHENG-CHUN, ET AL., MAMMALIAN TOXICITY OF MUNITION COMPOUNDS: PHASE I. ACUTE ORAL TOXICITY, PRIMARY SKIN AND EYE IRRITATION, DERMAL SENSITIZATION, AND DISPOSITION AND METABOLISM. NTIS REPORT (ADB011150), NATIONAL TECHNICAL INFORMATION SERVICES, SPRINGFIELD, VA. REPORT NO. 1, JULY 22, 1975.

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO MAKE CERTAIN THAT THIS SHEET IS CURRENT.

OLIN MSDS CONTROL GROUP; OLIN CORPORATION; 120 LONG RIDGE ROAD; STAMFORD, CT 06904; PHONE NUMBER: (203)356-3449

OLIN CORPORATION SUBSIDIARIES AND AFFILIATED ENTITIES: ASAHI-OLIN LTD., BRIDGEPORT BRASS CORPORATION, INDY ELECTRONICS, INC., OLIN CHLORATE CORPORATION, OLIN FABRICATED METAL PRODUCTS INC., OLIN HUNT SPECIALTY PRODUCTS INC., OLIN ELECTRONICS TECHNOLOGY, OLIN MESA CORP., OLIN SPECIALTY METALS CORPORATION, PACIFIC ELECTRO DYNAMICS, INC., PHYSICS INTERNATIONAL COMPANY, ROCKET RESEARCH COMPANY, OCG MICROELECTRONIC MATERIALS, INC.

0027880888 HAZARDOUS MATERIAL WARNING (HAZMAT) 3JR16

When shipment is complete, retain for daily Hazmat audit.

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GRAINGER SHIPPING INFORMATION

STOCK # : 3JR16

MSDS # : 7SD81

FREIGHT CODE : 0810

DOT PROPER SHIP NAME : CONSUMER COMMODITY, ORM-D

UPS RESTRICTIONS : 20 LB. & UNDER REQUIRES 200 LB. BSC/32 ECT,
21 LB. & OVER REQUIRES 275 LB. BSC/44 ECT.

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL : ORM-D

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 :

SHIPPING PAPERS : AUTOMATED BILL OF LADING REQUIRED FOR TRUCK SHIPMENTS.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

This MSDS should be attached or kept with the respective product with which it is associated.

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OLIN MATERIAL SAFETY DATA

OCEAN NETWORK EMERGENCY PHONE 1-800-OLIN-911

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD. (REFER TO THE OSHA CLASSIFICATION IN SEC.I.). THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE. THE EXPOSURE TO THE COMMUNITY, IF ANY, IS QUITE DIFFERENT.

I. PRODUCT IDENTIFICATION

REVISION NO: 4
REVISION DATE: 8/17/93
PRODUCT CODE: DPE000093
FILE NUMBER: DPE00838.0001
PRODUCT NAME: CARTRIDGE FOR POWER DEVICE

SYNONYMS: CENTERFIRE POWERTOOL LOADED ROUND, RIMFIRE CARTRIDGE FOR POWER DEVICE, 22,25,27,32,38 CALIBER POWERTOOL ROUND, POWER LOAD, BLANK POWER LOAD AND/OR BOOSTER, POWER LOAD
CHEMICAL FAMILY: NOT APPLICABLE
FORMULA: NOT APPLICABLE
USE DESCRIPTION: CENTERFIRE POWERTOOL LOADED ROUND CONTAINS A PAPER WAD WHICH IS NON-HAZARDOUS.
OSHA HAZARD CLASSIFICATION: EXPLOSIVE.

II. COMPONENT DATA

PRODUCT COMPOSITION:
CONSISTS OF THE FOLLOWING FOUR COMPONENTS:

COMPONENT	PERCENT	PRODUCT	PRODUCT CODE NUMBER
A) SHELLCASE	75-85%	BRASS 2XXX SERIES	BPE.020000
B) PROPELLANT	7-13%	SMOKELESS POWDER	DPE.090000
C) PRIMING MIX/PRIMER	4-7%		
D) PAPER WAD	.5-2%		

ADDITIONAL INFORMATION MAY BE OBTAINED FROM OLIN FOR ANY COMPONENT OF INTEREST. QUOTE THE RELEVANT PRODUCT CODE NUMBER IF APPLICABLE.

ALL PERCENT COMPOSITIONS SPECIFIED BELOW ARE BASED ON THE ENTIRE PRODUCT.

A) SHELLCASE
CAS OR CHEMICAL NAME: COPPER
CAS NUMBER: 7440-50-8
PERCENTAGE RANGE: 50-65%
HAZARDOUS PER 29 CFR 1910.1200: YES (AS DUST OR FUME)
EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		1		1
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: LEAD STYPHNATE
CAS NUMBER: 15245-44-0
PERCENTAGE RANGE: 0-1%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARDS: AS LEAD (SEE 29 CFR 1910.1025)

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.05		0.15
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: BARIUM NITRATE
CAS NUMBER: 10022-31-8
PERCENTAGE RANGE: 0-1%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.5		0.5
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

D) PAPER WAD
NON-HAZARDOUS PRODUCT

III. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.
STORAGE CONDITIONS:
STORE IN A COOL, DRY, WELL VENTILATED PLACE, AWAY FROM ALL SOURCES OF IGNIT
DO NOT STORE AT TEMPERATURES ABOVE: NOT APPLICABLE
DO NOT SUBJECT TO MECHANICAL SHOCK.
PRODUCT STABILITY AND COMPATIBILITY:
SHELF LIFE LIMITATIONS: 25-30 YEARS
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: ACIDS, CLASS A & B EXPLOS AND OXIDIZERS.

IV. PHYSICAL DATA

APPEARANCE: CYLINDRICAL, BRASS CARTRIDGE
FREEZING POINT: NOT APPLICABLE
BOILING POINT: NOT APPLICABLE
DECOMPOSITION TEMPERATURE: NOT APPLICABLE
SPECIFIC GRAVITY: NOT APPLICABLE
BULK DENSITY: NOT APPLICABLE
PH @ 25 DEG C: NOT APPLICABLE
VAPOR PRESSURE @ 25 DEG. C: NOT APPLICABLE
SOLUBILITY IN WATER: NOT APPLICABLE
VOLATILES, PERCENT BY VOLUME: NOT APPLICABLE
EVAPORATION RATE: NOT APPLICABLE
VAPOR DENSITY: NOT APPLICABLE
MOLECULAR WEIGHT: NOT APPLICABLE
ODOR: NONE
COEFFICIENT OF OIL/WATER DISTRIBUTION: NOT APPLICABLE

CAS OR CHEMICAL NAME: ZINC

CAS NUMBER: 7440-66-6

PERCENTAGE RANGE: 15-30%

HAZARDOUS PER 29 CFR 1910.1200: YES (AS DUST OR FUME)

EXPOSURE STANDARDS: AS ZINC OXIDE

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		5 (RESPIRABLE)		10
		10 (TOTAL DUST)		
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

B) PROPELLANT

CAS OR CHEMICAL NAME: NITROCELLULOSE

CAS NUMBER: 9004-70-0

PERCENTAGE RANGE: 7-13%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS: NONE ESTABLISHED

CAS OR CHEMICAL NAME: NITROGLYCERIN

CAS NUMBER: 55-63-0

PERCENTAGE RANGE: .5-2%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		0.1 (SKIN)		0.05 (SKIN)
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

CAS OR CHEMICAL NAME: DIBUTYL PHTHALATE

CAS NUMBER: 84-74-2

PERCENTAGE RANGE: .5-2%

HAZARDOUS PER 29 CFR 1910.1200: YES

EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	PPM	MG/CUBIC-METER	PPM	MG/CUBIC-METER
TWA:		5		5
CEILING:	NONE		NONE	
STEL:	NONE		NONE	

C) PRIMING MIX/PRIMER

CAS OR CHEMICAL NAME: COPPER (SEE ABOVE)

CAS NUMBER: 7440-50-8

PERCENTAGE RANGE: 0-5%

CAS OR CHEMICAL NAME: ZINC (SEE ABOVE)

CAS NUMBER: 7440-66-6

PERCENTAGE RANGE: 0-2%

V. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: NONE REQUIRED FOR NORMAL HANDLING.

VENTILATION: NONE BEYOND NORMAL VENTILATION.

SKIN AND EYE PROTECTIVE EQUIPMENT: USE SAFETY GLASSES.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NONE NORMALLY REQUIRED

PROTECTIVE CLOTHING TYPE (THIS INCLUDES: GLOVES, BOOTS, APRON, PROTECTIVE SUIT): NONE NORMALLY REQUIRED

VI. FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:

EXPLOSIVE: YES

FLAMMABLE: NOT APPLICABLE

COMBUSTIBLE: NOT APPLICABLE

PYROPHORIC: NO

FLASH POINT: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NO DATA

FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VO IN AIR): LEL - NOT APPLICABLE UEL - NOT APPLICABLE

NFPA RATINGS: NOT ESTABLISHED

HMIS RATINGS:

HEALTH: 0

FLAMMABILITY: 2

REACTIVITY: 4

EXTINGUISHING MEDIA:

WATER SPRAY NOTE: DO NOT FIGHT FIRE IF FIRE REACHES CARGO. USE WATER FROM UNMANNED STATION.

FIRE FIGHTING TECHNIQUES AND COMMENTS:

SEE SECTION XI FOR PROTECTIVE EQUIPMENT FOR FIRE FIGHTING.

OTHER: EVACUATE ALL PERSONS INCLUDING EMERGENCY RESPONSE PERSONNEL FROM TH AREA FOR 1500 FEET (1/2 MILE) IN ALL DIRECTIONS IF FIRE REACHES CARGO.

VII. REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:

TEMPERATURES ABOVE: NO DATA

MECHANICAL SHOCK OR IMPACT: YES - BASED ON PRIMER

ELECTRICAL (STATIC) DISCHARGE: YES - BASED ON PRIMER

OTHER: CARTRIDGE MAY DETONATE IF CASE IS PUNCTURED OR SEVERELY DAMAGED

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

INCOMPATIBLE MATERIALS: ACIDS AND CAUSTICS

HAZARDOUS DECOMPOSITION PRODUCTS: NITROGEN OXIDES, CARBON MONOXIDE, CARBON DIOXIDE, LEAD OXIDES, LEAD DUST/FUME

OTHER CONDITIONS TO AVOID: CARTRIDGES PLACED IN A HIGH RADIO FREQUENCY ENE FIELD (RADAR STATIONS)

SUMMARY OF REACTIVITY:

EXPLOSIVE: YES OXIDIZER: NO PYROPHORIC: NO ORGANIC PEROXIDE: NO WATER REACTIVE: NO

VIII. FIRST AID

EYES: NOT A LIKELY ROUTE OF EXPOSURE.

SKIN: NOT A LIKELY ROUTE OF EXPOSURE.

INGESTION: NOT A LIKELY ROUTE OF EXPOSURE.

INHALATION: NOT A LIKELY ROUTE OF EXPOSURE.

IX. TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION: THE PHYSICAL NATURE OF THIS PRODUCT MAKES ABSORPTION FROM ANY ROUTE UNLIKELY. A SMALL AMOUNT OF INHALABLE PARTICLES MAY BE CREATED WHEN CARTRIDGE IS FIRED.

WARNING STATEMENTS AND WARNING PROPERTIES:
PARTICLES FROM FIRING MAY BE HARMFUL IF INHALED.

HUMAN THRESHOLD RESPONSE DATA:
ODOR THRESHOLD: NO DATA
IRRITATION THRESHOLD: NO DATA
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: THE IDLH CONCENTRATION HAS NOT BEEN ESTABLISHED FOR THIS PRODUCT.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:
INHALATION:
ACUTE: INHALATION OF THE PROPELLANT IS IRRITATING TO THE NOSE, MOUTH, THROAT AND LUNGS. DILATION OF BLOOD VESSELS WITH DROP IN BLOOD PRESSURE AND HEADACHE, CYANOSIS AND MENTAL CONFUSION MAY RESULT FROM THE NITROGLYCERIN. THE HEADACHE MAY BE SEVERE AND CAN REMAIN FOR A FEW HOURS TO SEVERAL DAYS. IT TYPICALLY STARTS AT THE FOREHEAD PRECEDED BY A SENSATION OF WARMTH AND FULLNESS IN THE HEAD AND MAY EXTEND TO THE BACK OF THE NECK. NAUSEA, VOMITING, AND ABDOMINAL PAIN MAY ALSO OCCUR.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

THIS PRODUCT IS COMPOSED OF A FINISHED CARTRIDGE, AND THE PROPELLANT IS COMPLETELY SEALED. IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT AND ITS USE WOULD PRECLUDE INHALATION OF A SUFFICIENT AMOUNT OF PROPELLANT AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

SKIN:
ACUTE: DERMAL EXPOSURE TO THE PROPELLANT MAY CAUSE IRRITATION WHICH COULD SUBSIDE RAPIDLY UPON REMOVAL OF MATERIAL WITHOUT PERMANENT DAMAGE. ADDITIONAL EFFECTS WOULD BE SIMILAR TO THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

THIS PRODUCT IS COMPOSED OF A FINISHED CARTRIDGE, AND THE PROPELLANT IS COMPLETELY SEALED. IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT, AND ITS USE WOULD PRECLUDE SKIN ABSORPTION OF A SUFFICIENT AMOUNT OF PROPELLANT AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

AQUATIC TOXICITY:
FISH ARE UNAFFECTED BY NITROCELLULOSE AT CONCENTRATIONS OF 1000 MG/L.

THE LC 50 OF LEAD (48 HRS.) TO BLUEGILL (LEPOMIS MACROCHIRUS) IS REPORTED TO BE 2-5 MG/L.

X. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101: SMALL A AMMUNITION

REPORTABLE QUANTITY: NOT APPLICABLE (PER 49 CFR 172.101, APPENDIX)

THE MATERIAL DESCRIBED ABOVE IS SUBJECT TO THE U.S. DOT HAZARDOUS MATERIALS REGULATIONS VIA THE MODES AND PACKAGING QUANTITIES INDICATED BELOW WITH THE LETTER "X":

	MODE	PACKAGING QUANTITIES		
X	RAIL	BULK	X	NON-BULK
X	MOTOR	BULK	X	NON-BULK
X	WATER	BULK	X	NON-BULK
X	AIR	BULK	X	NON-BULK

THE APPLICABLE PACKAGING SECTIONS IN 49 CFR ARE 173.101 AND 173.1201.

SPECIAL COMMENTS: CLASS C EXPLOSIVE, NO LABEL REQUIRED.

OTHER: MAY BE RECLASSED AS AN ORM-D, PACKAGE MAY NOT EXCEED 65 LBS. GROSS.

XI. SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY:
(PER 40 CFR 302.4) - AS NITROGLYCERIN 10#, DIBUTYL PHTHALATE 10#

SPILL MITIGATION PROCEDURES:
THIS PRODUCT DOES REPRESENT AN EXPLOSION HAZARD WHEN INVOLVED IN A FIRE OR EXPOSED TO HEAT, FRICTION, SHOCK, ETC. REMOVE ALL SOURCES OF IGNITION.

AIR RELEASE: NOT APPLICABLE

WATER RELEASE: NOT APPLICABLE

LAND SPILL: SHUT OFF ALL IGNITION SOURCES, NO FLARES, SMOKING, OR FLAMES I HAZARD AREA. PLACE IN PROPER DOT CONTAINER FOR LATER DISPOSITION.

SPILL RESIDUES: DISPOSE OF PER GUIDELINES UNDER SECTION XII, WASTE DISPOSA

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
NO EXTRA PROTECTION REQUIRED BEYOND THAT LISTED IN SECTION V (IN CASE OF FI USE NORMAL FIRE FIGHTING EQUIPMENT).

PROTECTION CONCERNS MUST ALSO ADDRESS THE POTENTIAL OF THE PHYSICAL CHARACTERISTIC OF THIS PRODUCT AS EXPLOSIVE.

EYE:

IRRITATION MAY OCCUR WITH INFLAMMATION OF THE CONJUNCTIVA. ANY EFFECT WOULD NOT RESULT IN PERMANENT IMPAIRMENT OF VISION.

IT IS JUDGED THAT THIS EFFECT WOULD NOT OCCUR BECAUSE OF THE PHYSICAL NATURE OF THE PRODUCT, AND LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT AND ITS USE.

INGESTION:

ACUTE: IRRITATION TO THE GASTROINTESTINAL TRACT. ADDITIONAL EFFECTS WOULD BE SIMILAR TO THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

CHRONIC: NO ADDITIONAL EFFECTS ARE KNOWN OR HAVE BEEN REPORTED EXCEPT FOR THOSE DESCRIBED FOR ACUTE INHALATION EXPOSURE.

IT IS JUDGED THAT THE PHYSICAL NATURE OF THE PRODUCT, THE LOW PERCENTAGE OF PROPELLANT IN THE PRODUCT, AND ITS USE WOULD PRECLUDE INGESTION AND THE DEVELOPMENT OF THESE ACUTE AND/OR CHRONIC SYMPTOMS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

NONE KNOWN OR REPORTED.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:

NONE KNOWN OR REPORTED.

ANIMAL TOXICITY:

ACUTE TOXICITY:

INHALATION LC 50: NO DATA

DERMAL LD 50: NO DATA

ORAL LD 50: NO DATA

IRRITATION: NOT AN IRRITANT TO SKIN OR EYES.

ACUTE TARGET ORGAN TOXICITY:

NITROGLYCERIN WILL PRODUCE DILATION OF BLOOD VESSELS AND DROP IN BLOOD PRESSURE WHICH MAY AFFECT THE HEART. IT HAS ALSO BEEN SHOWN TO CAUSE METHEMOGLOBINEMIA (CYANOSIS). IT IS JUDGED THAT THE LOW CONCENTRATION OF NITROGLYCERIN AND THE PHYSICAL NATURE OF THE PRODUCT WOULD PRECLUDE THE OCCURRENCE OF THESE SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

CHRONIC TARGET ORGAN TOXICITY:

THERE ARE NO KNOWN OR REPORTED EFFECTS FROM REPEATED EXPOSURE TO THIS PRODUCT.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

THERE ARE NO KNOWN OR REPORTED EFFECTS ON REPRODUCTIVE FUNCTION OR FETAL DEVELOPMENT.

CARCINOGENICITY:

THIS PRODUCT IS NOT KNOWN OR REPORTED TO BE CARCINOGENIC BY ANY REFERENCE SOURCE INCLUDING IARC, OSHA, NTP, OR EPA. LEAD IS CLASSIFIED AS A CARCINOGEN BY IARC. BASED ON THE PHYSICAL NATURE OF THE PRODUCT AND ITS USE, IT IS JUDGED THAT THE RISK OF CANCER IS NOT SIGNIFICANT FROM EXPOSURE TO THE PRODUCT.

MUTAGENICITY:

THIS PRODUCT IS NOT KNOWN OR REPORTED TO BE MUTAGENIC.

XII. WASTE DISPOSAL

IF THIS PRODUCT BECOMES A WASTE, IT MEETS THE CRITERIA OF A HAZARDOUS WASTE AS DEFINED UNDER 40 CFR 261 AND WOULD HAVE THE FOLLOWING EPA HAZARDOUS WASTE NUMBER: D003.

IF THIS PRODUCT BECOMES A WASTE, IT WILL BE A HAZARDOUS WASTE WHICH IS SUBJ TO THE LAND DISPOSAL RESTRICTIONS UNDER 40 CFR 268 AND MUST BE MANAGED ACCORDINGLY.

OTHER: DEACTIVATION.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF T MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII. ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TOXIC SUBSTANCE CONTROL AC INVENTORY.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III:

HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH: NONE

PHYSICAL: SUDDEN RELEASE OF PRESSURE

EXTREMELY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY: NONE ESTABLIS

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45: NONE ESTABLISHED

XIV. ADDITIONAL INFORMATION

MSDS REVISION STATUS: MINOR REVISIONS TO SECTION IX (TOXICOLOGY).

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20. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS. WASHINGTON, DC: U.S. GOVERNMENT PRINTING OFFICE, 1985.

21. OLIN RESPIRATORY PROTECTION MANUAL.

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THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO MAKE CERTAIN THAT THIS SHEET IS CURRENT.

OLIN MSDS CONTROL GROUP; OLIN CORPORATION; 120 LONG RIDGE ROAD; STAMFORD, CT 06904; PHONE NUMBER: (203)356-3449

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Spartan Chemical Company, Inc.
Material Safety Data Sheet

SECTION I: PRODUCT INFORMATION

Product Name or Number (as it appears on label):
F-6 FLYING INSECT KILLER (AEROSOL)
Product Number: 6919

Product Division:
Janitorial

Manufacturers Name:	**Spartan Chemical Company, Inc.**
Emergency Phone No:	**(800)537-8990**
Address:	**1110 Spartan Drive**
City:	**Maumee** State: **OH**
Zip Code:	**43537**
Product/Technical Information:	**1-(800)-537-8990**
Medical Emergency:	**1-(888)-314-6171 (24 hours)**
Chemical Leak/Spill Emergency:	**CHEMTREC 1-(800) 424-9300 (24 hours)**
Shipping Description:	*ORM-D, Consumer commodity, insecticides, aerosol, n.o.s.*

NFPA Ratings:	HMIS Ratings:
Health: 1- Slight	**Health:** 1- Slight
Fire: 0 - Minimal	**Fire:** 0 - Minimal
Reactivity: 1- Slight	**Reactivity:** 1- Slight
	Pers. Prot. Equip.: A - Safety Glasses

SECTION II: HAZARDOUS INGREDIENTS

All component chemicals are listed or exempted from listing on the "TSCA Inventory" of chemical substances maintained by the U.S. Environmental Protection Agency.

Chemical Name(s)	%W	CAS Registry No.	Table Z-1-A TWA mg/m³	STEL mg/m³	CEILING mg/m³	Carcinogen
Odorless mineral spirits	05-10	8032-32-4	1350	1800	Not Established	No
Isobutane	15-20	75-28-5	1900 (NIOSH)	Not Established	Not Established	No
Propane	05-10	74-98-6	1800	Not Established	Not Established	No

SECTION III: PHYSICAL DATA

Boiling Point:	N/A	Vapor Pressure:	N/A
Vapor Density (AIR = 1):	>1	Solubility in Water:	Forms an emulsion
pH:	9.2	Specific Gravity (H_2O=1):	0.97
Evaporation Rate (but.ace.=1):	<1	Percent Solid by Weight:	Trace
Physical State:	Liquid		
Appearance & Odor:	Milky jet stream spray, mild solvent odor		

SECTION IV: FIRE & EXPLOSIVE HAZARD DATA

Flash Point:	<0°F	Method Used:	ASTM-D3065
Flammable Limits:	N/A	Flame Extension:	0"
Extinguishing Media:	Water fog		
Special Fire Fighting Procedures:	Keep container cool. Use equipment or shielding required to protect personnel from bursting, rupturing or venting containers.		
Unusual Fire & Explosive Hazards:	At elevated temperatures (over 54°C/130°F) containers may vent, rupture or burst.		

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value:	Not Established	Primary Routes of Entry:	Inhalation, Skin Contact, Eyes
Effects of Overexposure-Conditions to Avoid:	May affect central nervous system and cause respiratory irritation. Avoid contact with eyes and skin. Avoid breathing vapor or mist.		
Conditions Aggravated by Use:	Unknown		

Emergency & First Aid Procedures:

Eyes:	In case of contact; immediately flush eyes with water for at least 15 minutes. Remove contact lenses. If irritation persists; call a physician.
Skin:	Wash contaminated clothing and affected areas with plenty of soap and water. If irritation persists; call a physician.
Ingestion:	If swallowed; call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Repeat until vomit fluid is clear. Never give anything by mouth to an unconscious person.
Inhalation:	If inhaled; removed person to fresh air. Apply artificial respiration if necessary.

SECTION VI: REACTIVITY DATA

Stability:	Stable	Incompatible Materials:	None known
Hazardous Decomposition Products:	None known	Hazardous Polymerization:	Will Not Occur

SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:	Avoid breathing vapors, remove ignition sources, pick up with scoop or absorbent material.
Waste Disposal Method:	Do not incinerate or puncture aerosol container. Dispose of in accordance with state, local or Federal regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection:	Recommended
Ventilation:	Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.
Protective Gloves(Specify Type):	Not required
Eye Protection(Specify Type):	Goggles
Other Protective Equipment:	None required

SECTION IX: SPECIAL PRECAUTIONS

Precautions; Handling & Storing:	Contents under pressure. Do not use near fire, sparks or flame. Do not store where temperatures could exceed 130°F)
Other Precautions:	None

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F-6 FLYING INSECT KILLER (AEROSOL)
Ref: 29 CRF 1910.1200 (OSHA)

Name: Ronald T. Cook
Effective Date: 09/23/1999
Changes: Address and Format

Title: Manager, Regulatory Affairs
Supercedes: 02/06/1998

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Spartan Chemical Company, Inc.
Material Safety Data Sheet

SECTION I: PRODUCT INFORMATION

Product Name or Number (as it appears on label):
GLASS CLEANER (BULK)
Product Number: 3030; 3261

Product Division:
Janitorial

Manufacturers Name:	**Spartan Chemical Company, Inc.**
Emergency Phone No:	**(800)537-8990**
Address:	**1110 Spartan Drive**
City:	**Maumee** State: **OH**
Zip Code:	**43537**
Product/Technical Information:	**1-(800)-537-8990**
Medical Emergency:	**1-(888)-314-6171 (24 hours)**
Chemical Leak/Spill Emergency:	**CHEMTREC 1-(800) 424-9300 (24 hours)**
Shipping Description:	Cleaning compounds, liquid, n.o.s.

NFPA Ratings:	HMIS Ratings:
Health: 1- Slight	**Health:** 1- Slight
Fire: 2 - Moderate	**Fire:** 2 - Moderate
Reactivity: 0 - Minimal	**Reactivity:** 0 - Minimal
	Pers. Prot. Equip.: B - Safety Glasses; gloves

SECTION II: HAZARDOUS INGREDIENTS

All component chemicals are listed or exempted from listing on the "TSCA Inventory" of chemical substances maintained by the U.S. Environmental Protection Agency.

Chemical Name(s)	%W	CAS Registry No.	Table Z-1-A TWA mg/m³	Table Z-1-A STEL mg/m³	Table Z-1-A CEILING mg/m³	Carcinogen
*2-Butoxyethanol	2.5	111-76-2	120 [skin]	Not Established	Not Established	No
Isopropanol	05-10	67-63-0	980	1225	Not Established	No

Comment: *This substance is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (SARA) and of 40 CFR 372.

SECTION III: PHYSICAL DATA

Boiling Point:	200 °F	Vapor Pressure:	Unknown
Vapor Density (AIR = 1):	Unknown	Solubility in Water:	Complete
pH:	10.0-11.0	Specific Gravity (H_2O=1):	0.99
Evaporation Rate (but.ace.=1):	<1	Percent Solid by Weight:	1-5
Physical State:	Liquid		
Appearance & Odor:	Clear, light blue, ammoniacal odor		

SECTION IV: FIRE & EXPLOSIVE HAZARD DATA

Flash Point:	111°F	Method Used:	ASTM-D56
Flammable Limits:	Not Established	Flame Extension:	N/A
Extinguishing Media:	Water		
Special Fire Fighting Procedures:	None		
Unusual Fire & Explosive Hazards:	None known		

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value:	Not Established	Primary Routes of Entry:	Inhalation, Skin Contact, Eyes

Effects of Overexposure-Conditions to Avoid: May cause skin and eye irritation. Harmful if swallowed. Avoid eye and skin contact. Avoid inhalation of vapors or mist. Do not swallow. 2-Butoxyethanol is absorbed through the skin which may affect the liver, kidneys, lymph and blood systems; inhalation may irritate throat and respiratory system.

Conditions Aggravated by Use: None known

Emergency & First Aid Procedures:

Eyes: In case of contact; immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses. If irritation persists; seek medical attention.

Skin: For skin contact; immediately flush with water for 15 minutes. If irritation persists; seek medical attention.

Ingestion: If swallowed; drink large quantities of water or fruit juice. Call a physician immediately

Inhalation: In case of respiratory irritation; move person to fresh air.

SECTION VI: REACTIVITY DATA

Stability:	Stable	Incompatible Materials:	None known
Hazardous Decomposition Products:	None	Hazardous Polymerization:	Will Not Occur

SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Flush with copious amounts of water into sanitary sewer system.

Waste Disposal Method: Same as above

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection: None required

Ventilation: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

Protective Gloves(Specify Type): Rubber

Eye Protection(Specify Type): Goggles

Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

Precautions; Handling & Storing: Keep away from heat and flame.

Other Precautions: None

© SCC 11/12/1999

GLASS CLEANER (BULK)
Ref: 29 CRF 1910.1200 (OSHA)

Name: Ronald T. Cook
Effective Date: 11/12/1999
Changes: Update Section II

Title: Manager, Regulatory Affairs
Supercedes: 09/23/1999

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Clorox Profressional Products Company
A Subsidiary of The Clorox Company
1221 Broadway
Oakland, California 94612
Tel. (510) 271-7000

Material Safety Data Sheet

I Product: CLOROX® GERMICIDAL BLEACH

Description: CLEAR, LIGHT YELLOW LIQUID WITH CHLORINE ODOR

Other Designations	Distributor	Emergency Telephone No.
	Clorox Profressional Products Company 1221 Broadway Oakland, CA 94612	For Medical Emergencies Call: Rocky Mountain Poison Center (800) 446-1014 For Transportation Emergencies Chemtrec (800) 424-9300

II Health Hazard Data

WARNING: Eye irritant. Avoid eye contact. Causes substantial but temporary eye injury. May irritate skin. May cause nausea and vomiting if ingested. Exposure to vapor or mist may irritate nose, throat and lungs. The following medical conditions may be aggravated by exposure to high concentrations of vapor or mist; heart conditions or chronic respiratory problems such as asthma, chronic bronchitis or obstructive lung disease. Under normal consumer use conditions the likelihood of any adverse health effects are low. Occasional clinical reports suggest a low potential for sensitization upon exaggerated exposure to sodium hypochlorite if skin damage (e.g. irritation) occurs during exposure. Routine clinical tests conducted on intact skin with Clorox Liquid Bleach found no sensitization in the test subjects.

FIRST AID: EYE CONTACT: Immediately flush eyes with plenty of water. If irritation persists, see a doctor. SKIN CONTACT: Remove contaminated clothing. Wash area with water. INGESTION: Drink a glassful of water and call a physician. INHALATION: If breathing problems develop remove to fresh air.

HMIS/NFPA: H=2, F=0, R=1

HMIS Hazard Scale: 1=slight 2=moderate 3=serious 4=severe

III Hazardous Ingredients

Ingredients	Concentration	Worker Exposure Limit
Sodium hypochlorite CAS # 7681-52-9	5.25%	not established

None of the ingredients in this product are on the IARC, NTP or OSHA carcinogen list.

IV Special Protection and Precautions

Hygienic Practices: **Non-dilute:** Wear eye protection such as safety glasses in situations where splashing may occur. Discontinue use or wear gloves if product use irritates your skin. **Dispensing System:** Eye protection is not required when used with a Clorox approved closed dispensing system. **Diluted to 200 ppm Available Chlorine:** Eye protection is not required. Discontinue use or wear gloves if solution irritates your skin. Engineering Controls: Use general ventilation to minimize exposure to vapor or mist.

Work Practices: Avoid eye and skin contact and inhalation of vapor or mist. KEEP OUT OF THE REACH OF CHILDREN.

V Transportation and Regulatory Data

U.S. DOT Hazard Class: Not restricted
U.S. DOT Proper Shipping Name: Hypochlorite solution with not more than 7% available chlorine. Not Restricted per 49CFR172.101(c)(12)(iv).
EPA - SARA Title III/CERCLA: Bottled product is not reportable under Sections 311/312; contains no chemicals regulated under Section 313; and contains a chemical (sodium hypochlorite $\leq$ 5.25%) which is regulated under Section 304/CERLA.
TSCA/DSL: All chemicals in this product are listed on the TSCA inventory and the Canadian Domestic Substances List.

VI Spill or Leak Procedures

Spill Procedures: Absorb, containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material. For spills of multiple products, responders should evaluate the MSDS's of the products for incompatibility with sodium hypochlorite. Breathing protection should be worn in enclosed, and/or poorly ventilated areas until hazard assessment is complete. Waste disposal: Dispose of in accordance with all applicable federal, state and local regulations.

VII Reactivity Data

Stable under normal use and storage conditions. Strong oxidizing agent. Reacts with other household chemicals such as toilet bowl cleaners, rust removers, vinegar, acids or ammonia containing products to produce hazardous gases, such as chlorine and other chlorinated species. Prolonged contact with metal may cause pitting or discoloration.

VIII Fire and Explosion Data

Not flammable or explosive. In a fire, cool containers to prevent rupture and release of sodium chlorate.

IX Physical Data

Boiling point	212°F/100°C decomposes)
Specific Gravity (H_2O=1)	1.085
Solubility in Water	complete
pH	11.4

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DATE PREPARED 2/98

DATA FURNISHED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH

Clorox Profressional Products Company
Una subsidiaria de The Clorox Company
1221 Broadway
Oakland, California 94612
Tel. (510) 271-7000

Hoja de Especificación para el Uso Salvo de los Materiales

Material Safety Data Sheet = MSDS)

I. Producto: LEJIA GERMICIDA CLOROX®

Descripción: LIQUIDO LIMPIDO AMARILLO CLARO Y OLOR A CLORO

Otros nombres	Distribuidor	Nos. telefónicos de emergencia
	Clorox Profressional Products Company 1221 Broadway Oakland, CA 94612	Para las emergencias médicas: Rocky Mountain Poison Center (800) 446-1014 Para las emergencias involucrando el transporte: (800) 424-9300

II. Datos sobre los peligros a la salud

CUIDADO: Irritante ocular. Evitar el contacto con los ojos. Causa lesiones importantes pero temporales a los ojos. Puede irritar la piel. Puede causar náuseas y vómito por ingestión. La exposición a los vapores o la niebla puede irritar la nariz, la garganta y los pulmones. Las siguientes condiciones médicas pueden agravarse por exposición a altas concentraciones de vapor on niebla: enfermedades cardíacas o problemas respiratorios crónicos tales como el asma, la bronquitis crónica o los estados causados por obstrucciones pulmonares. En condiciones normales de uso por el consumidor la probabilidad de efectos adversos a la salud es baja. Ocasionalmente los informes clinicos sugieren un bajo potencial de sensibilización como consecuencia de una exposición exagerada al hipoclorito de sodio si ocurren lesiones cutáneas (p.ej. irritación. Pruebas clínicas de rutina efectuadas con piel intacta con la Lejía Líquida Clorox no resultaron en sensibilizaciones en las personas sometidas a la prueba.

PRIMEROS AUXILIOS: CONTACTO CON LOS OJOS: Enjuagar los ojos inmediatamente con agua en abundancia. Obtener asistencia médica si persiste la irritación. CONTACTO CON LA PIEL: Quitarse las prendas contaminadas. Lavar el área afectada con agua. INGESTION: Beber un vaso de agua y llamar al médico. INHALACION: De presentarse problemas respiratorios, sacar a la victima al aire fresco.

HMIS/NFPTA: H=2, F=0, R=1

Escala de peligros HMIS: 1=Leve 2=Moderado 3=Serio 4=Severo

III. Ingredientes peligrosos

Ingredientes	Concentración	Límite de exposición para el trabajador
Hipoclorito de sodio CAS No. 7681-52-9	5.25%	no ha sido establecido

Ninguno de los ingredientes en este producto se encuentran en las listas de carcinógenos de IARC, NTP u OSHA.

IV. Protección y precauciones especiales

Prácticas de higiéne: Usar protección ocular tal como gafas de seguridad en situaciones el las que puedan ocurrir salpicaduras. Interrumpir el uso o llevar guantes si la solución resulta irritante de la piel.

Sistema dispensador: No se necesita protección ocular al usarlo con un sistema dispensador cerrado aprobado por Clorox. **En dilución a 200 ppm de cloro aprovechable:** No se requiere protección ocular. Interrumpir el uso o llevar guantes si la solución resultara irritante de la piel.

Controles de ingeniería: Uilizar ventalación general para reducir al minimo la exposición al vapor o la niebla.

Prácticas de trabajo: Evitar el contacto con los ojos o la piel y la inhalación de los vapores o la niebla.

MANTENER EL PRODUCTO FUERA DEL ALCANCE DE LOS NIÑOS.

V. Datos de transporte y reglamentación oficial

Tipo de peligro según el Depto. de Transportes de E.E.U.U. (DOT):
Sin restricciones.

Nombre correcto para el transporte de acuerdo al DOT:
Solución hipoclorítica con un máximo del 7% de cloro aprovechable.
Sin restricciones bajo 49CFR172 101(c)(12)(vi).

EPA-SARA Titulo III-CERCLA: El producto embotellado está exento de los requisitos de notificación bajo las Secciones 311/312; no contiene productos químicos reglamentados bajo la Sección 313; y contiene un producto químico (hipoclorito de sodio □ 5.25%) que se encuentra reglamentado bajo la Sección 304 de CERCLA.

TSCA/DSL: Todas las sustancias químicas en este producto se encuentran en el Registro de TSCA y en la Lista de Sustancias Domésticas del Canadá.

VI. Procedimientos en caso de derrames o escapes

Derrames Absorber y poner en recipientes. Enjuagar el residuo a los desagües sanitarios. Comunicarse con las instalaciones de tratamiento sanitario por adelantado para asegurarse de la capacidad de procesar el material asi desechado. Para los derrames de productos múltiples se deben evaluar las MSDS de todos los productos para verificar su compatibilidad con el hipoclorito de sodio. Debe llevarse protección respiratoria en áreas cerradas *y/o mal ventiladas hasta que se haya completado la evaluación del peligro.*

Disposición de los desechos: Disponer de ellos de acuerdo con todas las reglamentaciones federales, estatales y locales del caso.

VII. Datos de reactividad

Estable en condiciones normales de uso y almacenamiento. Fuerte agente oxidante. Reacciona con otros productos químicos de hogar, tales como los limpiadores de inodoros, removedores de herrumbre, el vinagre, ácidos o productos que contengan amoníacos produciendo gases peligrosos tales como el cloro y otras especies de gases que contienen cloro. El contacto prolongado con los metales puede causar marcas o descoloramiento.

VIII. Datos acerca de la inflamabilidad y explosividad

No es inflamable ni explosivo. En caso de incendio, enfriar los recipientes par evitar roturas y la liberación de clorato de sodio.

IX. Datos físicos

Punto de ebullición	212°F/100°C (descomposición)
Peso especifico (H_2O=1)	1.085
Solubilidad en agua	Completa
pH	11.4

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FECHA DE PREPARACION 11/92 (Inglés) 10/94 (Español)

ESTOS DATOS SE SUMINISTRAN SOLAMENTE PARA EL USO EN CONEXIÓN CON LA SALUD Y LA SEGURIDAD OCUPACIONALES

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29CFR. 1200. Standard must be consulted for specific requirements.

Urn cleaner - (Urnex Urn Cleaner)

QUICK IDENTIFIER COMMON NAME: (used on label & list)

SECTION 1 -

MANUFACTURER'S NAME	Royal Urn Bag Co., INC.
ADDRESS	170 Ludlow Street
CITY, STATE & ZIP	Yonkers, New York 10705
EMERGENCY TELEPHONE NO.	914-963-2042
SIGNATURE OF PERSON RESPONSIBLE FOR PREPARATION (OPTIONAL)	
OTHER INFORMATION CALLS	same
DATE PREPARED	4/25/90

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS NO.

**Materials in this blend are non-hazardous as defined by OSHA

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	N/A*	Specific Gravity (H20=1)	Bulk Density-55 Cu. ft	Vapor Pressure (mm Hg)	N/A
	Vapor Density(Air = 1)	N/A			
Solubility in Water	soluble			Reactivity in Water	non-reactive: Ph.(as1% sol)-12.0
Appearance and Odor	White crystalline mix		Melting Point	decomposes	

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point	Non-flammable	Method		Flammable Limits In Air % by Volume	LEL Lower	N/A	UEL Upper N/A
Auto-Ignition Temperature	N/A		Extinguisher Media	Water spray, carbon dioxide or foam			
Special Fire Fighting Procedure	none						
Unusual Fire and Explosion Hazards	none						

*N/A- not applicable

URN CLEANER (CONT'D)

CTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)

ability ☐ Unstable ☒ Stable — Conditions to Avoid

ompatability aterials to avoid) — Avoid strong acidic material and aluminum

zardous composition Products — In presence of aluminum may liberate flammable hydrogen gas

zardous lymerization ☐ May Occur ☐ Will Not Occur — Conditions to Avoid

CTION 6 - HEALTH HAZARDS

Acute: e irritant, slight skin irritant

2. chronic: will cause digestive irritation

ins and nptoms of posure — If digested

dical Conditions Generally gravated by Exposure — skin abrasions, or digestive problems such as ulcers if ingested.

emical listed as rcinogen or Potential rcinogen — National Toxicology Program ☐ Yes ☒ No; I.A.R.C. Monographs ☐ Yes ☒ No; OSHA ☐ Yes ☒ No

ergency and First l Procedures — Get immediate medical attention for all conditions listed below if irritation persists.

)UTES :
ITRY

1. Inhalation — Move to fresh air.
2. Eyes — Wash wih cold water for 15 minutes.
3. Skin — Wash with cold water until smarting ceases.
4. Ingestion — Give large quantity of cold water, do not induce vomiting.

CTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

cautions to be taken Handling and Storage — store in cool dry area as material is slightly hydroscopic.

ner cautions — Keep out of reach of children, keep containers tightly closed when not in use.

ps to be taken in Case terial is Spilled or Released — Scoop up spilled material, place in closed metal container, wash residue down drain with warm water.

ste Disposal (Consult federal, state, and local regulations) — Dispose of waste material in compliance w/ local state and federal regs.

CTION 8 - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

spiratory Protection (Specify type) — Use NIOSH/MSHA approved mask in areas of heavy dusting of material.

ntilation	Local Exhaust	Mechanical (general)	Special	Other
d gen. room ntilation		x	x	x

otective oves — plastic or rubber; Eye Protection — safety goggles

her Protective othing or Equipment — Normal work clothing. Remove contaminated clothes, rewash before reuse.

rk/Hygienic Practices — Eye wash station, ie: deep sink, and safety shower is advised for large exposure to non-covered skin.

PORTANT: Do not leave any blank spaces. If required information is unavailable, unknown or does not apply, so indicate.

KMB00003776

Date: 15 October 2007
Supercedes: 15 November 2004

MATERIAL SAFETY DATA SHEET

IN CASE OF EMERGENCY CALL CHEMTREC AT 1-800-424-9300

1. PRODUCT IDENTIFICATION AND COMPANY IDENTIFICATION:

Product Name: **PURELL® INSTANT HAND SANITIZER**

Company Name & Address: GOJO Industries, Inc.
One GOJO Plaza, Suite 500
Akron, OH 44311

Emergency Phone: **1-800-424-9300 CHEMTREC**
Non-Emergency Phone: (330) 255-6000
MSDS Request Phone: (330) 255-6000 x8804

2. INFORMATION ON INGREDIENTS:

HAZARDOUS INGREDIENTS	CAS NUMBER	OSHA PEL	ACGIH TLV	% RANGE
Ethyl Alcohol	64-17-5	1000 ppm	1000 ppm	62
Isopropanol	67-63-0	400 ppm	400 ppm	<5

Other ingredient(s) with notification requirements:	CAS NUMBER	List
Ethyl Alcohol	64-17-5	MA 1; NJ 1S; PA 1; CN 2
Isopropanol	67-63-0	MA 1; NJ 1S; CN 1

3. HAZARDS IDENTIFICATION:

EMERGENCY OVERVIEW

When used according to instructions, the product applicable to this MSDS is safe and presents no immediate or long-term health hazard. However, abnormal entry routes, such as gross ingestion, may require immediate medical attention.

Potential Health Effects:

HMIS: Health 1 Flammability 3 Reactivity 0 Personal Protection None

Eye Contact: May cause eye irritation.
Skin Contact: No irritation or reaction expected.
Inhalation: Not applicable.
Ingestion: May cause upset stomach, nausea (Abnormal entry route).
Carcinogenicity: Not listed as a carcinogen by NTP, IARC, OSHA or ACGIH.

4. FIRST AID MEASURES:

Eye Contact: Do not rub eyes. Flush eyes thoroughly with water for 15 minutes. If condition worsens or irritation persists, contact physician.
Skin Contact: Not applicable.
Inhalation: Not applicable.
Ingestion: Do not induce vomiting. Contact a physician or Poison Control Center.

Purell is a trademark of Warner-Lambert Company LLC

5. FIRE FIGHTING MEASURES:

NFPA:	Health 0 Fire 3 Reactivity 0
Flashpoint °F/°C (PMCC method):	86.36°F/30.2°C
Unusual Fire and Explosion Hazards:	Product is flammable due to alcohol content.
Special Fire Fighting Procedures:	None known.
Extinguishing Media:	X Water Fog X Alcohol Foam X CO_2 X Dry Chemical ___ Other

6. ACCIDENTAL RELEASE MEASURES:

Avoid contact with ignition sources since product is flammable. Absorb onto inert material and dispose in appropriate manner. Water clean up and rinse. CAUTION – WILL CAUSE SLIPPERY SURFACES.

7. HANDLING AND STORAGE:

Keep away from fire or flame. Store at normal room temperature away from reach of small children. Keep containers sealed. Use older containers first. Avoid freezing conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

Eye Protection:	None required under normal conditions.
Skin Protection:	None required under normal conditions.
Respiratory Protection:	None required under normal conditions.
Ventilation:	None required under normal conditions.
Protective Equipment or Clothing:	None required under normal conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance and Odor	Clear liquid, citrus fragrance
pH (undiluted):	4.5 – 9.5
VOC , %:	65

10. STABILITY AND REACTIVITY:

Stable/Non reactive product. Avoid ignition sources.

11. TOXICOLOGICAL INFORMATION:

No acute or chronic toxic effects expected when used according to directions.

12. ECOLOGICAL CONSIDERATIONS:

No ecological or special considerations when used according to directions. Not considered environmentally harmful from normal dilution, expected usage and typical drainage to sewers, septic systems and treatment plants.

13. DISPOSAL CONSIDERATIONS:

Characteristic hazardous waste-flammable liquid. Dispose according to local, state and Federal regulations.

14. TRANSPORT INFORMATION:

Hazardous by transport regulations. When transported by Ground and Rail, this product typically is shipped as Consumer Commodity ORM-D. When transported by air, this product is typically shipped as Consumer Commodity or Alcohols N.O.S. depending on package size. When transported by ocean, this product is typically shipped as Limited Quantities. Refer to current regulations for exact requirements.

15. REGULATORY AND OTHER INFORMATION:

TSCA: All ingredients are listed or exempt per reference 15 USC 2602 (2)(B)(iv).

Complies with current FDA regulations for cosmetic and/or over-the-counter drug products.

Notice: The information herein is based on data considered to be accurate as of the date of preparation of this material safety data sheet. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the foregoing data and safety information. The user assumes all liability for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

Section 1: PRODUCT & COMPANY IDENTIFICATION

Product Name: All-Purpose Simple Green® Cleaner (READY-TO-USE)

Company: Sunshine Makers, Inc.
15922 Pacific Coast Highway
Huntington Harbour, CA 92649 USA

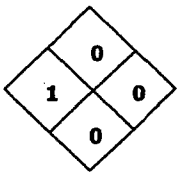
Telephone: 800-228-0709 • 562-795-6000 Fax: 562-592-3830

Emergency Phone: Chem-Tel 24-Hour Emergency Service: 800-255-3924

Use of Product: All-Purpose Simple Green® Cleaner is a **ready-to-use** cleaning product and can be used undiluted on any water-safe surface.

Section 2: HAZARDS IDENTIFICATION

Emergency Overview: CAUTION. Mild eye irritant.
All-Purpose Simple Green® is a green liquid with a sassafras fragrance



HMIS Rating:
Health = 1 = slight
Fire = 0
Reactivity, and Special = 0 = minimal

Eye Contact: Mild Eye Irritant.

Skin Contact: No adverse effects expected under typical use conditions. Prolonged exposure may cause dryness. Under this condition, use of gloves or skin moisturizer after washing may be indicated.

Ingestion: May cause stomach or intestinal upset if swallowed (due to detersive properties.)

Inhalation: No adverse effects expected under typical use conditions. Adequate ventilation should be present when using over a prolonged period of time. Open windows or ventilate via fan or other air-moving equipment if necessary.

Carcinogens: No ingredients are listed by OSHA, IARC, or NTP as known or suspected carcinogens.

Medical Conditions: No medical conditions are known to be aggravated by exposure to All-Purpose Simple Green® Cleaner. Dermal-sensitive users may experience mild but reversible reactions.

UN Number: Not Required **Dangerous Goods Class:** Non-hazardous

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

The only ingredient of All-Purpose Simple Green® Cleaner with established exposure limits is undiluted 2-butoxyethanol (<1%) (Butyl Cellosolve; CAS No. 111-76-2): the ACGIH TLV-TWA is 20 ppm (97 mg/m^3). Based upon chemical analysis, Simple Green® Multi-Purpose Cleaner & Wipes contain no known EPA priority pollutants, heavy metals or chemicals listed under RCRA, CERCLA, or CWA. Analysis by TCLP (Toxicity Characteristic Leaching Procedure) according to RCRA revealed no toxic organic or inorganic constituents.

All components of All-Purpose Simple Green® Cleaner are listed on the TSCA Chemical Substance Inventory.

Section 4: FIRST AID MEASURES

Eye Contact: Reddening may develop. Immediately rinse the eye with large quantities of cool water; continue 10-15 minutes or until the material has been removed; be sure to remove contact lenses, if present, and to lift upper and lower lids during rinsing. Get medical attention if irritation persists.

Skin Contact: Minimal effects, if any; rinse skin with water, rinse shoes and launder clothing before reuse. Reversible reddening may occur in some dermal-sensitive users; thoroughly rinse area and get medical attention if reaction persists.

Swallowing; Essentially non-toxic. Give several glasses of water to dilute; do not induce vomiting. If stomach upset occurs, consult physician

Inhalation: Non-toxic. Exposure to concentrate may cause mild irritation of nasal passages or throat; remove to fresh air. Get medical attention if irritation persists.

Section 5: FIRE FIGHTING MEASURES

All-Purpose Simple Green® Cleaner is stable, not flammable, and will not burn.

Flash Point/Auto-Ignition:	Not flammable.
Flammability Limits:	Not flammable.
Extinguishing Media:	Not flammable/non-explosive. No special procedures required.
Special Fire Fighting Procedures:	None required.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid contact with eyes. Do not rub eyes with hands during cleanup. No special precautions for dermal contact are needed. Wash hands thoroughly after cleaning up spill or leak.

Method for cleaning up: Recover usable material by convenient method, residual may be removed by wipe or wet mop. If necessary, unrecoverable material may be washed to drain with large quantities of water.

Section 7: HANDLING AND STORAGE

No Special precautions are required. **This product is non-hazardous for storage and transport according to the U.S. Department of Transportation Regulations.** All-Purpose Simple Green® Cleaner requires no special labeling or placarding to meet U.S. Department of Transportation requirements.

UN Number: Not Required **Dangerous Goods Class:** Nonhazardous

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: All-Purpose Simple Green® Cleaner formulation presents no health hazards to the user when used according to label directions for its intended purposes. Mild skin and eye irritation is possible (please see Eye contact and Skin contact in section IV.) No special precautionary measures required under normal use conditions.

Ventilation: No special ventilation, precautions or respiratory protection is required during normal use. Large-scale use indoors should provide an increased rate of air exchange. Mucous membranes may become irritated.

Human Health Effects or Risks From Exposure: Adverse effects on human health are not expected from All-Purpose Simple Green® Cleaner, based on 20 years of use of Simple Green® without reported adverse health incidence in diverse population groups, including extensive use by inmates of U.S. Federal prisons in cleaning operations.

Eye protection: All-Purpose Simple Green® Cleaner is a mild eye irritant. Eye protection not generally required. Wash hands after using wipes.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION – continued –

Skin protection: All-Purpose Simple Green® Cleaner is not likely to irritate the skin in the majority of users. Repeated daily application to the skin without rinsing, or continuous contact on the skin may lead to temporary, but reversible, irritation. Rinse completely from skin after contact.

General hygiene conditions: There are no known hazards associated with this material when used as recommended. The following general hygiene considerations are recognized as common good industrial hygiene practices:

- Avoid breathing vapor or mist.
- Avoid contact with eyes.
- Wash thoroughly after handling and before eating, drinking, or smoking.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: All-Purpose Simple Green® Cleaner is a green liquid with a sassafras scent.			
Specific Gravity:	1.0257	**Vapor Pressure:**	17 mm Hg @ 20°C; 22 mmHg @26°C
Evaporation:	>1 (butyl acetate = 1)	**Vapor Density:**	1.3 (air = 1)
Water Solubility:	100%	**Density:**	8.5 lbs/gallon
Boiling Point:	110°C (231°F)	**pH:**	8.8
Ash Content:	At 600°F: 1.86% by weight	**Nutrient Content:**	
Freezing Point: Approx -9 °C (16 °F) *If product freezes, it will reconstitute without loss of efficacy when brought back to room temperature and agitated.*		Phosphorus: 0.3% by formula Nitrogen <1.0% by weight (fusion and qualitative test for ammonia) Sulfur: 0.6% by weight (barium chloride precipitation method)	
VOC Composite Partial Pressure: 0.006 mmHg @ 20°C			
Volatile Organic Compounds (VOCs):			
CARB Method 310	<1.2%	Cleaner meets CARB, BAAQMD & SCAQMD regulations.	

Section 10: STABILITY AND REACTIVITY

Stability: Stable Hazardous Decomposition Products: None expected
Materials to Avoid: None known

Section 11: TOXICOLOGICAL INFORMATION

Toxicology information is based on chemical profile of ingredients and extrapolation of data from similar formulas. No animal testing has been conducted on this product.

Acute Toxicity:
Oral LD_{50} (rat) >5 g/kg body weight*
Dermal LD_{50} (rabbit) >2 g/kg body weight

**Calculation from OECD series on testing and assessment number 33, Chapter 3.2*

Eye Irritation: Moderate / Mild reversible eye irritation may occur based on relevant laboratory studies. This potential is reduced by immediate rinsing of eyes in case of eye contact.

Dermal Irritation: Mild, reversible skin irritation may occur based on relevant laboratory studies. A 6-hour exposure to human skin under a patch did not produce irritation.

Repeat Exposure Via Skin Contact: Based on relevant laboratory studies, no toxic effects are expected to be associated with daily skin exposures (with up to 2 g/kg/day tested for 13 weeks on rabbits). Skin irritation may, however, occur with repeated or prolonged exposures.

Reproductive Effects Assessment: Based on Relevant laboratory studies (CD-1 mouse 18-week fertility assessment continuous breeding), no adverse effects on reproduction, fertility, or health of offspring are expected.

Section 12: ECOLOGICAL INFORMATION

Hazard to wild animals & aquatic organisms: Low, based on toxicological profile.

Biodegradability: Readily biodegradable based on biodegradation profile.

Section 13: DISPOSAL CONSIDERATIONS

All-Purpose Simple Green® Cleaner is fully water soluble and biodegradable and will not harm sewage-treatment microorganisms if disposal by sewer or drain is necessary. Dispose of in accordance with all applicable local, state and federal laws.

Dispose of used or unused product, and empty containers in accordance with the local, State, Provincial, and Federal regulations for your location. Never dispose of used degreasing rinsates into lakes, streams, and open bodies of water or storm drains.

Section 14: TRANSPORT INFORMATION

This product is non-hazardous for transport according to the U.S. Department of Transportation Services

UN Number:	Not required	Dangerous Goods Class:	Non-hazardous

Section 15: REGULATORY INFORMATION

*Reportable components:

SARA:	This material contains 2-Butoxyethanol, <1%, (CAS# 111-76-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 49 CFR Part 373.
All components are listed on:	EINECS and TSCA Inventory
No components listed under:	Clean Air Act Section 112

RCRA Status:	Not a hazardous waste.	CERCLA Status:	No components listed
TSCA TRI Reporting:	Not required / Not listed	CA PROP. 65 Status:	No components listed

Section 16: OTHER INFORMATION

Questions about the information found on this MSDS should be directed to:
SUNSHINE MAKERS, INC. – TECHNICAL DEPARTMENT
15922 Pacific Coast Hwy. Huntington Harbour, CA 92649

Phone: 800/228-0709 [8am-5pm Pacific time, Mon-Fri] *Fax:* 562/592-3830 *Email:* infoweb@simplegreen.com

DISCLAIMER: The information provided with this MSDS is furnished in good faith and without warranty of any kind. Personnel handling this material must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of this material and the safety and health of employees and customers. Sunshine Makers, Inc. assumes no additional liability or responsibility resulting from the use of, or reliance on this information.

Spartan Chemical Company, Inc.
Material Safety Data Sheet

SECTION I: PRODUCT INFORMATION

Product Name or Number (as it appears on label):
GOLDEN GLO
Product Number: 2999; 3000

Product Division:
Janitorial

Spartan Chemical Company, Inc.
1110 Spartan Drive
Maumee OH 43537

Product/Technical Information: **1-(800)-537-8990**
Medical Emergency: **1-(888)-314-6171 (24 hours)**
Chemical Leak/Spill Emergency: **CHEMTREC 1-(800) 424-9300 (24 hours)**

Shipping Description:	Cleaning compounds, liquid, n.o.s.

NFPA Ratings:		**HMIS Ratings:**	
Health:	1- Slight	**Health:**	1- Slight
Fire:	0 - Minimal	**Fire:**	0 - Minimal
Reactivity:	0 - Minimal	**Reactivity:**	0 - Minimal
		Pers. Prot. Equip.:	See Section VIII

SECTION II: HAZARDOUS INGREDIENTS

(Listed when present at 1% or greater, carcinogens at 0.1% or greater) All component chemicals are listed or exempted from listing on the "TSCA Inventory" of chemical substances maintained by the U.S. Environmental Protection Agency.

Chemical Name(s)	% W	CAS Registry No.	Table Z- 1 - A			NTP, IARC or OSHA Carcinogen
			TWA mg/m^3	STEL mg/m^3	CELING mg/m^3	
Sodium dodecyl benzene sulfonate	20-25	25155-30-0	Not Established	Not Established	Not Established	No
Sodium lauryl ether sulfate	1-5	9004-82-4	Not Established	Not Established	Not Established	No

SECTION III: PHYSICAL DATA

Boiling Point:	210-215 °F	Vapor Pressure:	Unknown
Vapor Density (AIR = 1):	Unknown	Solubility in Water:	Complete
pH:	7.0-8.0	Specific Gravity (H_2O=1):	1.04
Evaporation Rate (but.ace.=1):	<1	Percent Solid by Weight:	24-26
Physical State:	Liquid		
Appearance & Odor:	Pink, moderately viscous liquid, fresh fragrance		

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SECTION IV: FIRE & EXPLOSIVE HAZARD DATA

Flash Point:	> 212°F	Method Used:	ASTM-D56
Flammable Limits:	Not Established	Flame Extension:	N/A

Extinguishing Media:	Product does not support combustion. Use extinguishing media appropriate for surrounding fire.
Special Fire Fighting Procedures:	Wear NIOSH approved self-contained breathing apparatus and protective clothing. Cool fire-exposed containers with water spray.
Unusual Fire & Explosive Hazards:	Combustion products are toxic.

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value:	Not Established	Primary Routes of Entry:	Inhalation, Skin Contact, Eyes & Oral

Effects of Overexposure-Conditions to Avoid:	Causes eye irritation. Symptoms may include pain, redness and swelling. May cause mild skin irritation. Symptoms may include pain, redness and swelling. May be harmful if swallowed. Symptoms may include abdominal pain and diarrhea. Inhalation of product mist may cause respiratory irritation. **Avoid contact with eyes. Avoid prolonged or repeated skin contact with undiluted product. Do not swallow. Avoid breathing product mists.**
Conditions Aggravated by Use:	Use of this product may aggravate preexisting skin; eye and respiratory disorders including asthma and dermatitis.

Emergency & First Aid Procedures:

Eyes:	Flush eyes with plenty of water for at least 15 minutes. Remove contact lenses. Get medical attention.
Skin:	Wash thoroughly with soap and water. Get medical attention if irritation persists. Wash contaminated clothing before reuse.
Ingestion:	Do not induce vomiting. Drink one or two glasses of water to dilute product. Get medical attention. Do not give anything by mouth to an unconscious person.
Inhalation:	Move person to fresh air. Get medical attention if irritation persists.

SECTION VI: REACTIVITY DATA

Stability:	Stable	Incompatible Materials:	Strong acids and oxidizing agents
Hazardous Decomposition Products:	Not established	Hazardous Polymerization:	Will Not Occur

SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:	Small spills of one gallon or less may be flushed with plenty of water to sanitary sewer system (If permitted by local sewer regulations). Dike and contain large spills with inert material and transfer liquid to containers for disposal. Keep spill out of storm sewers and waterways.
Waste Disposal Method:	Dispose of in compliance with all federal, state and local laws and regulations.

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SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection:	Not normally required when good general ventilation is provided.
Ventilation:	Provide good general ventilation. Local exhaust ventilation may be necessary for some operations.
Protective Gloves(Specify Type):	Not required. Rubber or other impervious gloves may be worn if desired.
Eye Protection(Specify Type):	Not required. Splash goggles may be worn if desired.
Other Protective Equipment:	See 29 CFR 1910.132-138 for further guidance.

SECTION IX: SPECIAL PRECAUTIONS

Precautions; Handling & Storing:	Do not freeze. Do not store above 120°F. Do not mix with other chemicals.
Other Precautions:	Keep out of reach of children

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GOLDEN GLO

Name:	Ronald T. Cook	Title:	Manager, Regulatory Affairs
Effective Date:	09/22/2008	Supercedes:	07/07/2005
Changes:	Review		

Ref: 29 CFR 1910.1200 (OSHA)

This document has been prepared using data from sources considered technically reliable. It does not constitute a warranty, express or implied, as to the accuracy of the information contained herein. Actual conditions of use and handling are beyond sellers control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State and Local laws and regulations.

Spartan Chemical Company, Inc.
Material Safety Data Sheet

SECTION I: PRODUCT INFORMATION

Product Name or Number (as it appears on label):
ORANGE TOUGH 40
Product Number: 2240

Product Division:
Janitorial

Spartan Chemical Company, Inc.
1110 Spartan Drive
Maumee OH 43537

Product/Technical Information: **1-(800)-537-8990**
Medical Emergency: **1-(888)-314-6171 (24 hours)**
Chemical Leak/Spill Emergency: **CHEMTREC 1-(800) 424-9300 (24 hours)**

Shipping Description:	Cleaning compounds, liquid, n.o.s.

NFPA Ratings:		**HMIS Ratings:**	
Health:	2 - Moderate	**Health:**	2 - Moderate
Fire:	2 - Moderate	**Fire:**	2 - Moderate
Reactivity:	0 - Minimal	**Reactivity:**	0 - Minimal
		Pers. Prot. Equip.:	See Section VIII

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SECTION II: HAZARDOUS INGREDIENTS

(Listed when present at 1% or greater, carcinogens at 0.1% or greater) All component chemicals are listed or exempted from listing on the "TSCA Inventory" of chemical substances maintained by the U.S. Environmental Protection Agency.

Chemical Name(s)	% W	CAS Registry No.	Table Z- 1 - A			NTP, IARC or OSHA Carcinogen
			TWA mg/m^3	STEL mg/m^3	CELING mg/m^3	
d-limonene	35-40	5989-27-5	Not Established	Not Established	Not Established	No
Nonyl phenol ethoxylate	10-15	127087-87-0	Not Established	Not Established	Not Established	No
Triethanolamine dodecylbenzenesulfonate	05-10	27323-41-7	Not Established	Not Established	Not Established	No
Triethanolamine	05-10	102-71-6	5 (ACGIH)	Not Established	Not Established	No
Hexylene glycol	01-05	107-41-5	Not Established	Not Established	121 (NIOSH)	No
Dicarboxylic fatty acid, dipotassium salt	01-05	66375-37-9	Not Established	Not Established	Not Established	No
Tetrasodium ethylene diaminetetraacetate	01-05	64-02-8	Not Established	Not Established	Not Established	No

SECTION III: PHYSICAL DATA

Boiling Point:	>212 °F	Vapor Pressure:	Unknown
Vapor Density (AIR = 1):	Unknown	Solubility in Water:	Emulsifiable
pH:	9.0	Specific Gravity (H_2O=1):	0.96
Evaporation Rate (but.ace.=1):	<1	Percent Solid by Weight:	20-25
Physical State:	Liquid		
Appearance & Odor:	Clear, orange liquid. Orange citrus fragrance.		

SECTION IV: FIRE & EXPLOSIVE HAZARD DATA

Flash Point:	124°F	Method Used:	ASTM-D56
Flammable Limits:	Unknown	Flame Extension:	N/A
Extinguishing Media:	Foam, dry chemical, carbon dioxide, water fog or spray		
Special Fire Fighting Procedures:	Wear NIOSH approved self-contained breathing apparatus and protective clothing. Cool fire-exposed containers with water spray.		
Unusual Fire & Explosive Hazards:	Combustible liquid and vapor. Keep away from heat, sparks or flame. Combustion products are toxic.		

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value:	Not Established	Primary Routes of Entry:	Inhalation, Skin Contact, Eyes and Oral
Effects of Overexposure-Conditions to Avoid:	**Causes eye irritation:** Symptoms may include pain, redness and swelling of the conjunctiva. **Causes skin irritation:** Symptoms may include redness, pain and swelling. **Harmful if swallowed:** Symptoms may include pain, nausea, vomiting and diarrhea. **Breathing product vapors or mist may cause respiratory irritation:** Symptoms may include nasal discomfort and coughing. Contains d-limonene, hexylene glycol and triethanolamine which may cause skin sensitization with repeated contact. Repeated overexposure to triethanolamine may cause liver and kidney damage. **Avoid contact with eyes, skin and clothing. Avoid breathing product vapors or mists. Do not swallow. Use with adequate ventilation. Wash thoroughly after handling.**		
Conditions Aggravated by Use:	Use of this product may aggravate preexisting skin; eye and respiratory disorders including asthma and dermatitis.		

Emergency & First Aid Procedures:

Eyes:	Flush eyes with water for at least 15 minutes. Remove contact lenses. Get medical attention.
Skin:	Remove contaminated clothing. Flush skin with water for at least 15 minutes. Get medical attention if irritation persists. Wash contaminated clothing before reuse.
Ingestion:	Do not induce vomiting. Drink one or two glasses of water to dilute product. Get medical attention. Do not give anything by mouth to an unconscious person.
Inhalation:	Move person to fresh air. Get medical attention if irritation persists.

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SECTION VI: REACTIVITY DATA

Stability:	Stable	Incompatible Materials:	Strong oxidants
Hazardous Decomposition Products:	CO, CO_2	Hazardous Polymerization:	Will Not Occur

SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:	Dike and contain spill with inert material (sand, earth, commercial absorbent, etc.) and transfer to containers for disposal. Keep spill out of storm sewers and waterways.
Waste Disposal Method:	Dispose of in compliance with all federal, state and local laws and regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection:	Not normally required when good general ventilation is provided. However if exposure limits are exceeded (see Section II) or if respiratory irritation occurs, the use of a NIOSH approved respirator suitable for the use-conditions and chemicals listed in Section II should be considered.
Ventilation:	Provide good general ventilation. Local exhaust ventilation may be necessary for some operations.
Protective Gloves(Specify Type):	Rubber or other impervious gloves.
Eye Protection(Specify Type):	Splash goggles are recommended to prevent eye contact.
Other Protective Equipment:	See 29 CFR 1910.132-138 for further guidance.

SECTION IX: SPECIAL PRECAUTIONS

Precautions; Handling & Storing:	Combustible liquid and vapors. Flash Point 124°F. Keep away from heat, sparks, or open flame. Keep container tightly closed. Store in a cool, dry area. Do not store above 120°F.
Other Precautions:	Keep out of reach of children.

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ORANGE TOUGH 40

Name:	Ronald T. Cook	Title:	Manager, Regulatory Affairs
Effective Date:	09/22/2008	Supercedes:	06/30/2005
Changes:	Review		

Ref: 29 CFR 1910.1200 (OSHA)

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SC Johnson
A FAMILY COMPANY

DRANO® PROFESSIONAL STRENGTH KITCHEN CRYSTALS CLOG REMOVER

Version *1.*
Print Date 07/22/2008
Revision Date 07/21/2008
MSDS Number 350000004279

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Trade name	:	DRANO® PROFESSIONAL STRENGTH KITCHEN CRYSTALS CLOG REMOVER
Use of the Substance/Preparation	:	Drain Cleaner
Company	:	S.C. Johnson and Son, Limited 1 Webster Street Brantford ON N3T 5R1
Emergency telephone	:	24 Hour Transport & Medical Emergency Phone (866) 231-5406 24 Hour International Emergency Phone (952) 852-4647 24 Hour Canadian Transport Emergency Phone (CANUTEC) (613) 996-6666

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance / Odor	:	white / Crystals / characteristic
Immediate Concerns	:	DANGER Corrosive CAUSES EYE AND SKIN BURNS HARMFUL OR FATAL IF SWALLOWED. Avoid contact with skin, eyes and clothing.

Potential Health Effects

Routes of exposure	:	Eye, Skin, Inhalation, Ingestion.
Eyes	:	Corrosive - causes irreversible eye damage. May cause blindness.
Skin	:	Corrosive to skin Causes skin burns.
Inhalation	:	None known.
Ingestion	:	Harmful or fatal if swallowed. Causes severe digestive tract burns.
Aggravated Medical Condition	:	None known.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Weight %
Sodium hydroxide	1310-73-2	30.00 - 60.00
Sodium nitrate	7631-99-4	15.00 - 40.00
Sodium chloride	7647-14-5	7.00 - 13.00
Aluminum	7429-90-5	1.00 - 5.00

4. FIRST AID MEASURES

Eye contact : Rinse immediately with plenty of water, also under the eyelids.
Remove contact lenses.
Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin contact : Remove contaminated clothing and shoes.
Flush immediately with plenty of water for at least 15 to 20 minutes.
Get medical attention immediately.

Inhalation : No special requirements

Ingestion : Rinse mouth.
Drink 1 or 2 glasses of water.
Do NOT induce vomiting.
Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide (CO_2)
Dry chemical

Extinguishing media which shall not be used for safety reasons : Water

Further information : Wear full protective clothing and positive pressure self-contained breathing apparatus.
Fight fire from maximum distance or protected area.

Flash point : Note: not applicable

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Lower explosion limit	:	Note: no data available
Upper explosion limit	:	Note: no data available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Use personal protective equipment.
Methods for cleaning up	:	Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Handling

Advice on safe handling	:	Product residue may remain in/on empty containers. All precautions taken in handling the product must be used in handling the empty container and residue. Avoid contact with skin, eyes and clothing. KEEP OUT OF REACH OF CHILDREN AND PETS. Use only as directed.

Storage

Requirements for storage areas and containers	:	Keep in a dry, cool and well-ventilated place.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Components	CAS-No	mg/m3	ppm	Basis
Sodium hydroxide	1310-73-2	2 mg/m3		ACGIH_CEIL
		2 mg/m3		CA-AB_CEIL
		2 mg/m3		CA-BC_CEIL
		2 mg/m3		CA-MB_CEIL
		2 mg/m3		CA-NB_CEIL
		2 mg/m3		CA-NS_CEIL
		2 mg/m3		CA-NT_CEIL
		2 mg/m3		CA-NU_CEIL
		2 mg/m3		CA-ON_CEVS
		2 mg/m3		CA-QC_CEIL
		2 mg/m3		CA-SK_CEIL
		2 mg/m3		CA-YK_CEIL
		2 mg/m3		NIOSH_CEIL
		10 mg/m3		NIOSH_IDLH

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection : not required under normal use
In case of full contact:
Wear suitable gloves.

Eye protection : No special requirements.

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Hygiene measures	:	Use only with adequate ventilation. Wash thoroughly after handling. Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	Crystals
Color	:	white
Odor	:	characteristic
pH	:	> 12.5
Melting point	:	no data available
Boiling point	:	no data available
Flash point	:	not applicable
Evaporation rate	:	no data available
Autoignition temperature	:	not applicable
Lower explosion limit	:	no data available
Upper explosion limit	:	no data available
Vapour pressure	:	no data available
Water solubility	:	completely soluble

10. STABILITY AND REACTIVITY

Conditions to avoid	:	None known.
Materials to avoid	:	Strong acids Rust remover. Ammonia
Hazardous decomposition products	:	When exposed to fire, produces normal products of combustion.
Hazardous reactions	:	Stable

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11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	Harmful if swallowed. Causes severe digestive tract burns.
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available

Chronic effects

Carcinogenicity	:	no data available
Mutagenicity	:	no data available
Reproductive effects	:	no data available
Teratogenicity	:	no data available
Sensitisation	:	Not known to be a sensitizer.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Not Available

13. DISPOSAL CONSIDERATIONS

Product	:	Observe all applicable Federal, Provincial and State regulations and Local/Municipal ordinances regarding disposal.

14. TRANSPORT INFORMATION

Land transport

- **U.S. DOT and Canadian TDG Surface Transportation:**

UN-Number	1759
Proper shipping name	Corrosive Solid, N.O.S.
Class:	8
Packaging group:	III

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Note: SC Johnson ships this product as Consumer Commodity ORM-D (non-bulk packages)

Sea transport

- *IMDG:*

Class:	8
Packaging group:	III
Proper shipping name	Corrosive Solid, N.O.S.
UN-Number:	1759
ADR/RID-Labels:	None.

Note: SC Johnson ships this product as "Limited Quantity" when the container quantity value is 5 Kilograms or less.

Air transport

- *ICAO/IATA:*

Class:	8
Packaging group:	III
Proper shipping name	Corrosive Solid, N.O.S.
UN/ID No.:	UN 1759
ADR/RID-Labels:	None.
Note:	SC Johnson typically does not ship products via air, therefore it has not been determined if the product container meets current IATA/ICAO package criteria. Refer to IATA/ICAO Dangerous Goods Regulations for detailed instructions when shipping this item by air.

15. REGULATORY INFORMATION

Global Chemical Inventories

Notification status : All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

: All ingredients of this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).

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California Prop. 65	:	This product is not subject to the reporting requirements under California's Proposition 65.
WHMIS Classification	:	E.:
	:	This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

HMIS Ratings

Health	3
Flammability	0
Reactivity	1

NFPA Ratings

Health	3
Fire	0
Reactivity	1
Special	

Further information

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Prepared by:	SC Johnson Global Safety Assessment & Regulatory Affairs (GSARA)

KMB00003797

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200

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A FAMILY COMPANY

DRANO® PROFESSIONAL STRENGTH KITCHEN CRYSTALS CLOG REMOVER

Version *1.*

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Revision Date 07/21/2008

MSDS Number 350000004279

MATERIAL SAFETY DATA SHEET

Misty Insect Spray

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Misty Insect Spray
Product Number:	A00413
Product Use:	Insecticide.
Manufacturer/Supplier:	Amrep, Inc. 990 Industrial Park Drive Marietta, GA 30062
Phone Number:	(770) 422-2071 (Mon - Fri / 8am - 5pm ET)
D.O.T. Emergency Phone:	CHEM TEL (800) 255-3924 INTERNATIONAL: +01-813-248-0584
Date of Preparation:	January 27, 2008 **Revision #:** 1.0

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW **HMIS:** See Section 15

WARNING

TOXIC BY INHALATION. MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. CONTENTS UNDER PRESSURE. CONTAINER MAY EXPLODE IF HEATED.

Potential Health Effects: See Section 11 for more information.

Likely Routes of Exposure: Skin contact, eye contact, inhalation, and ingestion.

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Not a normal route of exposure. Harmful: may cause lung damage if swallowed.

Inhalation: Toxic by inhalation. May cause respiratory tract irritation. May cause asphyxiation. This product may be aspirated into the lungs and cause chemical pneumonitis.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation.

Signs and Symptoms: Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Handling can cause dry skin. Vapours may cause drowsiness and dizziness.

Medical Conditions Aggravated By Exposure: Asthma. Allergies.

Target Organs: Skin, eyes, gastrointestinal tract, respiratory system.

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Environmental Effects: May cause long-term adverse effects in the aquatic environment. See Section 12 for more information.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS #	Wt. %
Isobutane	75-28-5	5 - 10
Distillates (petroleum), hydrotreated light	64742-47-8	5 - 10
Propane	74-98-6	3 - 7
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	113-48-4	0.1 - 1

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Section 4: FIRST AID MEASURES

Eye Contact: In case of contact, immediately flush eyes with plenty of water. If easy to do, remove contact lenses, if worn.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE FIGHTING MEASURES

Flammability: Not flammable by OSHA criteria.

Means of Extinction:

Suitable Extinguishing Media: Powder, water spray, foam, carbon dioxide.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: May include, and are not limited to: oxides of carbon.

Explosion Data:

Sensitivity to Mechanical Impact: Not available.

Sensitivity to Static Discharge: Not available.

Protection of Firefighters: Containers may explode when heated. Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition. Ruptured cylinders may rocket.

Environmental Precautions: Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). This material is a water pollutant. Keep out of drains, sewers, ditches, and waterways. Minimize use of water to prevent environmental contamination.

Methods for Containment: Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for Clean-Up: Vacuum or sweep material and place in a disposal container. Allow gas to dissipate harmlessly into the atmosphere.

Other Information: Not available.

Section 7: HANDLING AND STORAGE

Handling:
Keep away from sources of ignition. - No smoking. Avoid contact with skin and eyes. Do not swallow. Do not breathe gas/fumes/vapor/spray. Use only in well-ventilated areas. Handle and open container with care. When using, do not eat or drink. Wash hands before eating, drinking, or smoking.

Storage:
Keep out of the reach of children. Keep container in a well-ventilated place. Do not store at temperatures above 49°C / 120°F.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

	Exposure Limits	
Ingredient	**OSHA-PEL**	**ACGIH-TLV**
Isobutane	Not available.	Not available.
Distillates (petroleum), hydrotreated light	100 ppm	200 mg/m³
Propane	1000 ppm	1000 ppm
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	Not available.	Not available.

Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

Personal Protective Equipment: **HMIS:** See Section 15

Eye/Face Protection: Wear eye/face protection.

Hand Protection: Wear suitable gloves.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Opaque.
Color:	White.
Odour:	Aromatic.
Odour Threshold:	Not available.
Physical State:	Gas/Pressurized Liquid.
pH:	9
Viscosity:	Not available.
Freezing Point:	Not available.
Boiling Point:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.

Lower Flammability Limit:	Not available.
Upper Flammability Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Specific Gravity:	0.960 (Liquid Concentrate)
Solubility in Water:	Partial.
Coefficient of Water/Oil Distribution:	Not available.
Auto-ignition Temperature:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	15.0% (US federal/CARB/OTC/LADCO)

Section 10: STABILITY AND REACTIVITY

Stability: Stable under normal storage conditions. Contents under pressure. Container may explode if heated. Do not puncture. Do not burn. Keep in a cool place.

Conditions of Reactivity: Heat. Incompatible materials.

Incompatible Materials: Oxidizers. Alkaline media. Heavy metals.

Hazardous Decomposition Products: May include, and are not limited to: oxides of carbon.

Possibility of Hazardous Reactions: No dangerous reaction known under conditions of normal use.

Section 11: TOXICOLOGY INFORMATION

EFFECTS OF ACUTE EXPOSURE

Component Anaylsis

Ingredient	LD_{50} (oral)	LC_{50}
Isobutane	Not available.	Not available.
Distillates (petroleum), hydrotreated light	> 5000 mg/kg, rat	Not available.
Propane	Not available.	Not available.
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	2800 mg/kg, rat	Not available.

Eye: May cause eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Skin: May cause skin irritation. Handling can cause dry skin.

Ingestion: Not a normal route of exposure. Harmful: may cause lung damage if swallowed.

Inhalation: Toxic by inhalation. May cause respiratory tract irritation. May cause asphyxiation. This product may be aspirated into the lungs and cause chemical pneumonitis. Vapours may cause drowsiness and dizziness.

EFFECTS OF CHRONIC EXPOSURE

Target Organs: Not available.

Chronic Effects: Not hazardous by OSHA criteria.

Carcinogenicity: Not hazardous by OSHA criteria.

Ingredient	Chemical Listed as Carcinogen or Potential Carcinogen *
Isobutane	Not listed.
Distillates (petroleum), hydrotreated light	I -3, G-A3
Propane	Not listed.
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	Not listed.

* See Section 15 for more information.

Mutagenicity: Not hazardous by OSHA criteria.

Reproductive Effects: Not hazardous by OSHA criteria.

Developmental Effects:

Teratogenicity: Not hazardous by OSHA criteria.

Embryotoxicity: Not hazardous by OSHA criteria.

Respiratory Sensitization: Not hazardous by OSHA criteria.

Skin Sensitization: Not hazardous by OSHA criteria.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: May cause long-term adverse effects in the aquatic environment

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions:
This material must be disposed of in accordance with all local, state, provincial, and federal regulations.

Section 14: TRANSPORTATION INFORMATION

DOT Classification
ORM-D

TDG Classification
Limited Quantity

Section 15: REGULATORY INFORMATION

Federal Regulations

Canadian: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

US: MSDS prepared pursuant to the Hazard Communication Standard (29 CFR 1910.1200).

KMB00003803

SARA Title III

Ingredient	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313
Isobutane	Not listed.	Not listed.	Not listed.	Not listed.
Distillates (petroleum), hydrotreated light	Not listed.	Not listed.	Not listed.	Not listed.
Propane	Not listed.	Not listed.	Not listed.	Not listed.
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	Not listed.	Not listed.	Not listed.	Not listed.

State Regulations

California Proposition 65:
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Global Inventories

Ingredient	Canada DSL/NDSL	USA TSCA
Isobutane	DSL	Yes.
Distillates (petroleum), hydrotreated light	DSL	Yes.
Propane	DSL	Yes.
N-(2-ethylhexyl)-8,9,10-trinorborn-5-ene-2,3-dicarboximide	DSL	Yes.

HMIS - Hazardous Materials Identification System

Health - 1 **Flammability** - 2 **Physical Hazard** - 0 **PPE** – B

NFPA - National Fire Protection Association:

Health - 1 **Fire** - 2 **Reactivity** - 0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

WHMIS Classification(s):
Exempt under WHMIS.

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

OSHA (O) Occupational Safety and Health Administration.

ACGIH (G) American Conference of Governmental Industrial Hygienists.
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.

IARC (I) International Agency for Research on Cancer.
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP (N) National Toxicology Program.
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Disclaimer:
We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

Expiry Date: January 27, 2011

Prepared by: Nexreg Compliance Inc.
Prepared for: Amrep, Inc.
Phone: (770) 422-2071 (Mon - Fri / 8am - 5pm ET)

MATERIAL SAFETY DATA SHEET

Misty Dry Deodorizers Seasonal Spring Rain (Hand Held)

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Misty Dry Deodorizers Seasonal Spring Rain (Hand Held)
Product Number:	A00239SR
Product Use:	Air Freshener.
Manufacturer/Supplier:	Amrep, Inc. 990 Industrial Park Drive Marietta, GA 30062
Phone Number:	(770) 422-2071 (Mon - Fri / 8am - 5pm ET)
D.O.T. Emergency Phone:	CHEM TEL (800) 255-3924 INTERNATIONAL: +01-813-248-0584
Date of Preparation:	December 3, 2007 **Revision #:** 1.0

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW **HMIS:** See Section 15

DANGER

EXTREMELY FLAMMABLE. HARMFUL BY INHALATION. MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. CONTENTS UNDER PRESSURE. CONTAINER MAY EXPLODE IF HEATED.

Potential Health Effects: See Section 11 for more information.

Likely Routes of Exposure: Skin contact, eye contact, inhalation, and ingestion.

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Not a normal route of exposure. Harmful: may cause lung damage if swallowed.

Inhalation: Harmful by inhalation. May cause respiratory tract irritation. This product may be aspirated into the lungs and cause chemical pneumonitis.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation.

Signs and Symptoms: Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Handling can cause dry skin.

Medical Conditions Aggravated By Exposure: Asthma. Allergies.

Target Organs: Skin, eyes, gastrointestinal tract, respiratory system.

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Environmental Effects: May cause long-term adverse effects in the aquatic environment. See Section 12 for more information.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS #	Wt. %
Acetone	67-64-1	60 - 100
Isobutane	75-28-5	10 - 30
Propane	74-98-6	7 - 13

Section 4: FIRST AID MEASURES

Eye Contact: In case of contact, immediately flush eyes with plenty of water. If easy to do, remove contact lenses, if worn.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE FIGHTING MEASURES

Flammability: Flammable by WHMIS/OSHA criteria.

Means of Extinction:

Suitable Extinguishing Media: Powder, foam, carbon dioxide.

Unsuitable Extinguishing Media: Water.

Products of Combustion: May include, and are not limited to: oxides of carbon.

Explosion Data:

Sensitivity to Mechanical Impact: Not available.

Sensitivity to Static Discharge: Not available.

Protection of Firefighters: Containers may explode when heated. Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition. Ruptured cylinders may rocket.

Environmental Precautions: Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). This material is a water pollutant. Keep out of drains, sewers, ditches, and waterways. Minimize use of water to prevent environmental contamination.

Methods for Containment: Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for Clean-Up: Vacuum or sweep material and place in a disposal container. Allow gas to dissipate harmlessly into the atmosphere.

Other Information: Not available.

Section 7: HANDLING AND STORAGE

Handling:
Keep away from sources of ignition. - No smoking. Avoid contact with skin and eyes. Do not swallow. Do not breathe gas/fumes/vapor/spray. Use only in well-ventilated areas. Handle and open container with care. When using, do not eat or drink. Wash hands before eating, drinking, or smoking.

Storage:
Keep out of the reach of children. Do not store at temperatures above 49 °C / 120 °F. Keep away from food, drink and animal feedingstuffs.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

	Exposure Limits	
Ingredient	**OSHA-PEL**	**ACGIH-TLV**
Acetone	1000 ppm	500 ppm
Isobutane	Not available.	Not available.
Propane	1000 ppm	1000 ppm

Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

Personal Protective Equipment: **HMIS:** See Section 15

Eye/Face Protection: Wear eye/face protection.

Hand Protection: Wear suitable gloves.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear.
Color:	Colorless to light yellow.
Odour:	Acetone/Characteristic.
Odour Threshold:	Not available.
Physical State:	Gas/Pressurized Liquid.
pH:	Not applicable.
Viscosity:	Not available.
Freezing Point:	Not available.
Boiling Point:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.
Lower Flammability Limit:	Not available.

Upper Flammability Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Specific Gravity:	0.795 (Concentrate only)
Solubility in Water:	Complete.
Coefficient of Water/Oil Distribution:	Not available.
Auto-ignition Temperature:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	29.5% (US federal/CARB/OTC/LADCO)

Section 10: STABILITY AND REACTIVITY

Stability: Stable under normal storage conditions. Contents under pressure. Container may explode if heated. Do not puncture. Do not burn. Keep in a cool place.

Conditions of Reactivity: Heat. Incompatible materials.

Incompatible Materials: Oxidizers. Bases. Amines.

Hazardous Decomposition Products: May include, and are not limited to: oxides of carbon.

Possibility of Hazardous Reactions: No dangerous reaction known under conditions of normal use.

Section 11: TOXICOLOGY INFORMATION

EFFECTS OF ACUTE EXPOSURE

Component Anaylsis

Ingredient	LD_{50} (oral)	LC_{50}
Acetone	5800 mg/kg, rat	Not available.
Isobutane	Not available.	Not available.
Propane	Not available.	Not available.

Eye: May cause eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Skin: May cause skin irritation. Handling can cause dry skin.

Ingestion: Not a normal route of exposure. Harmful: may cause lung damage if swallowed.

Inhalation: Harmful by inhalation. May cause respiratory tract irritation. This product may be aspirated into the lungs and cause chemical pneumonitis.

EFFECTS OF CHRONIC EXPOSURE

Target Organs: Not available.

Chronic Effects: Not hazardous by WHMIS/OSHA criteria.

Carcinogenicity: Not hazardous by WHMIS/OSHA criteria.

Ingredient	Chemical Listed as Carcinogen or Potential Carcinogen *
Acetone	Not listed.
Isobutane	Not listed.
Propane	Not listed.

* See Section 15 for more information.

Mutagenicity: Not hazardous by WHMIS/OSHA criteria.

Reproductive Effects: Not hazardous by WHMIS/OSHA criteria.

Developmental Effects:

Teratogenicity: Not hazardous by WHMIS/OSHA criteria.

Embryotoxicity: Not hazardous by WHMIS/OSHA criteria.

Respiratory Sensitization: Not hazardous by WHMIS/OSHA criteria.

Skin Sensitization: Not hazardous by WHMIS/OSHA criteria.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: May cause long-term adverse effects in the aquatic environment

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions:
This material must be disposed of in accordance with all local, state, provincial, and federal regulations.

Section 14: TRANSPORTATION INFORMATION

DOT Classification
ORM-D

TDG Classification
Limited Quantity

Section 15: REGULATORY INFORMATION

Federal Regulations

Canadian: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

US: MSDS prepared pursuant to the Hazard Communication Standard (29 CFR 1910.1200).

SARA Title III

Ingredient	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313
Acetone	Not listed.	Not listed.	5,000	Not listed.
Isobutane	Not listed.	Not listed.	Not listed.	Not listed.
Propane	Not listed.	Not listed.	Not listed.	Not listed.

State Regulations

California Proposition 65:
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Global Inventories

Ingredient	Canada DSL/NDSL	USA TSCA
Acetone	DSL	Yes.
Isobutane	DSL	Yes.
Propane	DSL	Yes.

HMIS - Hazardous Materials Identification System

Health - 1 **Flammability** - 3 **Physical Hazard** - 0 **PPE** – B

NFPA - National Fire Protection Association:

Health - 1 **Fire** - 3 **Reactivity** - 0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

WHMIS Classification(s):
Class A - Compressed Gas
Class B5 - Flammable Aerosol
Class D2B - Skin/Eye Irritant

WHMIS Hazard Symbols:

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

OSHA (O) Occupational Safety and Health Administration.

ACGIH (G) American Conference of Governmental Industrial Hygienists.
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.

IARC (I) International Agency for Research on Cancer.
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP (N) National Toxicology Program.
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Disclaimer:
We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

Expiry Date: December 3, 2010

Prepared by: Nexreg Compliance Inc.
Prepared for: Amrep, Inc.
Phone: (770) 422-2071 (Mon - Fri / 8am - 5pm ET)

RECKITT BENCKISER

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name	**LYSOL® BRAND II DISINFECTANT SPRAY, ALL SCENTS (AEROSOL)**
Product Description	Aerosol disinfectant spray.
Manufacturer	Reckitt Benckiser Inc. 1655 Valley Road Wayne, N.J. 07474
Product Identifier	EPA Registration No. 777-72; Original Scent, Fresh Scent, Country Scent®, Mountain Air® Scent, Crisp Linen® Scent, Spring Waterfall™, Pine Breeze™, Summer Breeze™ and Soft Powder™.
Item Number	359979
Formula Number	432-124A (F/F 359979) Original Scent, 73-087 (F/F 356593) Fresh Scent, 147-082 (F/F 356595) Country Scent, 147-083 (F/F 356596) Mountain Air ® Scent, 677-059E (F/F 373282) Crisp Linen® Scent, 550-095 (F/F 367851) Spring Waterfall™, 677-077A (F/F 375476) Pine Breeze™ Scent, 629-183C (F/F 372171) Summer Breeze™ Scent and 677-059F (F/F 373285) Soft Powder®.
UPC Number	19200-02107 [6 oz.], -02291 [12 oz.], -02121[18 oz.] Original Scent; 19200-02836 [6 oz.], -02845 [12 oz.], -02881 [18 oz.] Fresh Scent; 19200-02014 [6 oz.], -02032 [12 oz.], -02048 [18 oz.] Country Scent; 19200-02906 [6 oz.], -02922 [12 oz.], -02938 [18 oz.] Mountain Air®; 19200-74185 [6 oz.], -74186 & -76239 [12 oz.], -74568 [18 oz.] Crisp Linen®; 19200-02845 [12 oz.], -02881 [18 oz.] Spring Waterfall™; 19200-76151 [12 oz.], -76150 [18 oz.] Pine Breeze™ Scent; 19200-02922 [12 oz.], -02938 [18 oz.] Summer Breeze™ Scent; 19200-74998 [12 oz.], -74999 [18 oz.] Soft Powder®.

MSDS#	Not available.
Validation Date	**8/19/2002**
Print Date	8/23/2002

In case of Emergency:	Telephone: 800-228-4722
Transportation Emergencies:	Chemtrec: 800-424-9300 (U.S. & Canada)

Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits : TLV/PEL
1) CARBON DIOXIDE	124-38-9	4.0	TWA: 9000 (mg/m^3) from ACGIH (TLV) TWA: 5000 (ppm) from ACGIH (TLV) TWA: 9000 STEL: 54 (mg/m^3) from OSHA TWA: 5000 (ppm) from OSHA
2) ETHANOL	64-17-5	79	TWA: 1880 (mg/m^3) from ACGIH (TLV) TWA: 1000 (ppm) from ACGIH (TLV) TWA: 1900 (mg/m^3) from OSHA TWA: 1000 (ppm) from OSHA

Section 3. Hazards Identification

Emergency Overview	WARNING: KEEP OUT OF REACH OF CHILDREN. Causes eye irritation. Do not spray in eyes, on skin or on clothing. Flammable. Contents under pressure. Keep away from heat, sparks and open flame. Do not puncture or incinerate container. Exposure to temperature above 130° F (55° C) may cause bursting.

Section 4. First Aid Measures

Eye Contact	In case of eye contact, immediately flush eyes thoroughly with water, remove any contact lenses, and continue to flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.
Skin Contact	In keeping with good hygienic practices, wash exposed areas thoroughly with soap and water.
Inhalation	If required, remove to fresh air.
Ingestion	Rinse mouth with water. Contact a physician or poison control center if symptoms develop. NEVER give an unconscious person anything to ingest.

Continued on Next Page

Section 5. Fire and Explosion Data

Flammability	Flammable. See Section 14 for any Shipping Classifications.
Flash Point	Not applicable. Aerosol flame extension greater than 18 inches or 45 cm.
Explosive Limits in Air	LOWER: 3.3% UPPER: 19%
Products of Combustion	Products of thermal decomposition may include carbon oxides and nitrogen oxides.
Fire and Explosion Hazards	CONTENTS UNDER PRESSURE. Do not use or store near hear or open flame. Do not puncture or incinerate. Exposure to temperatures above 130° F (55° C) may cause bursting.
Fire Fighting Media and Instructions	Water spray, foam, dry chemical or carbon dioxide. Use media suitable for surrounding fire. Use water spray to cool fire exposed containers.
Special Fire Fighting Instructions	Wear self-contained breathing apparatus and protective equipment appropriate for fighting a typical chemical fire. Move containers away from fire if possible and safe to do so. Use water spray to cool fire exposed containers. Provide shielding for venting, rupturing or bursting containers.

Section 6. Accidental Release Measures

Accidental Spill	For large spills due to ruptured containers, eliminate all sources of ignition and ventilate the area with equipment rated for use in flammable environments. Collect liquid and store in metal containers for disposal.

Section 7. Handling and Storage

Handling and Storage	WARNING: Causes eye irritation. Do not spray in eyes, on skin or on clothing. Flammable. Contents under pressure. Keep away from heat, sparks, and open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F (55° C) may cause bursting. Store in original container in areas inaccessible to small children. KEEP OUT OF REACH OF CHILDREN. It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Section 8. Exposure Controls/Personal Protection

Ventilation Requirements	None required under normal use conditions. For occupational situations, use sufficient ventilation to keep hazardous ingredients below their Threshold Limit Values (see Section #2).
Eye Protection	When handling in large quantities or responding to emergency situations, the use of appropriate eye protection is recommended. Emergency responders should wear full eye and face protection.
Skin Protection	None required under normal use conditions.
Respiratory Protection	None required for normal recommended use, avoid prolonged breathing of vapors. A self contained breathing apparatus (SCBA) should be used by emergency responders to avoid inhalation of the vapors which may be generated by this product during spill clean-up or fire situations.
Other Protection	None required.
Work/Hygienic Practices	Washing with soap and water after use is recommended as good hygienic practice to prevent possible eye irritation from hand contact.

Section 9. Physical and Chemical Properties

Description	Aerosol spray. Clear, water thin.
pH	10 [Basic.]
Boiling/Condensation Point	Not available.
Specific Gravity	0.835 @ 25°C (conc)

Odor	Various scents. See Section 1.
Color	Clear. Yellow.

Continued on Next Page

Vapor Pressure	95 - 105 psig.
Vapor Density	>1.0
Viscosity	Not available.
Solubility	Complete.
Physical Chemical Comments	Not available.

Section 10. Stability and Reactivity Data

Chemical Stability	The product is stable.
Conditions of Instability	Keep away from heat, sparks, and open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F (55° C) may cause bursting.
Incompatibility with Various Substances	Strong oxidizing agents.
Hazardous Decomposition Products	Carbon dioxide, carbon monoxide, and unidentified organic compounds may be formed during thermal decomposition.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

Exposure effects

Eye Contact	Causes eye irritation. Do not spray in eyes.
Skin Contact	None expected.
Inhalation	None expected.
Ingestion	None expected.
Carcinogenicity	Not listed as carcinogenic by OSHA, NTP or IARC.

Section 12. Ecological Information

Ecotoxicity	Not available.

Section 13. Disposal Considerations

Waste Disposal	Dispose of in accordance with local, state and federal regulations. Container disposal: Do not puncture or incinerate. Do not reuse empty container. Discard in trash. Encourage your local authorities to establish a program to recycle empty aerosol containers.

Section 14. Transport Information

DOT Classification	ORM-D
Proper Shipping Name	Consumer Commodity.
DOT Identification Number	Not applicable
Packing Group	Not applicable

Continued on Next Page

Maritime Transportation	Not applicable.
Hazardous Substances Reportable Quantity	Not applicable.
Special Provisions for Transport	Not applicable.
TDG Classification	Consumer Commodity - Transborder Consignment.
ADR Classification	Not applicable.
IMDG Classification	Aerosols, class 2.1 UN1950 - Limited Quantity.
IATA Classification	For 19200-02906, -02107, -02291, -01313, -02014, -02032, -02836, -02845, -74185, -74186, -76239, -02922, -74998 ONLY: (6 oz. and 12 oz. sizes) Consumer Commodity, 9 ID8000. For UPC 19200-02121, -02048, -02881, -74588, -02938, -74999 ONLY: (All 18 oz. size). Aerosols, flammable 2.1, UN1950 - Limited Quantity.

Section 15. Regulatory Information

Federal and State Regulations

SARA Title III, Section 313 Toxic Chemical Notification & Release Reporting:

None

California Proposition 65: This product contains the following ingredients which require a warning under the Safe Drinking Water & Toxic Enforcement Act:

None

Other Classifications

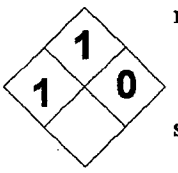
WHMIS (Canada) Not a WHMIS controlled product.

Section 16. Other Information

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	3
Reactivity	0
Personal Protection	B

National Fire Protection Association (U.S.A.)



NFPA Aerosol Level 1, per NFPA 30B

Validated by Product Safety on 8/19/2002.

Printed 8/23/2002.

Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

Product Name: A-700-717, A719, A720 Dry Breeze™ - All Fragrances

Product Use: Deodorizer

WHMIS Class: Class D - Division 2B
Class B - Division 5: Flammable Aerosol
Class A - Compressed Gas

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0
PERSONAL PROTECTION	

DOT/TDG Classification: Consumer commodity ORM-D/Consumer commodity

Manufacturer/Supplier: ITW Dymon

Address: 805 E Old 56 Highway
Olathe, Kansas, 66061

Telephone: 1-800-289-3966

Emergency Phone: 1-800-535-5053

SECTION II – HAZARDOUS INGREDIENTS

Ingredients	CAS#	Wt%	OSHA-PEL	ACGIH-TLV	LC_{50}	LD_{50}
Acetone	67-64-1	40 - 70	1000 ppm TWA	500 ppm TWA	71000 mg/m^3 4 h, rat	5800 mg/kg oral, rat
Propane	74-98-6	5 - 10	1000 ppm TWA	2500 ppm TWA	280000 ppm 4 h, rat	Not available
Isobutane	75-28-5	10 - 30	Not available	800 ppm TWA	Not available	Not available

SECTION III - PHYSICAL DATA

Boiling Point of Concentrate (°C): 56
Pressure (can, kPa @ 21.1 °C): 377
Vapour Density (Air = 1): >1
Solubility in Water: Complete
Physical State: Aerosol
Appearance; Odour: Clear colourless; various
Specific Gravity of Concentrate (H_2O = 1): 0.794
% Volatile (Wt %): Not available
Evaporation Rate (Ether = 1): Not available
pH (100%): Not available
Viscosity: Not available
Odour Threshold (ppm): Not available

SECTION IV - FIRE AND EXPLOSION DATA

Flammability: Flammable aerosol by flame projection test.
Flash Point of Concentrate (°C, TCC): Not available **LEL:** Not available **UEL:** Not available
Hazardous Combustion Products: May include and are not limited to oxides of carbon.
Autoignition Temperature (°C): Not available
Means of Extinction: Dry chemical, foam, carbon dioxide.
Special Fire Hazards: Contents under pressure. Container may explode with heat. Cool containers with water spray and remove source of ignition if safe. Fire fighters should wear self-contained breathing apparatus.

SECTION V - REACTIVITY DATA

Conditions for Chemical Instability: Stable.
Incompatible Materials: Caustics, acids, oxidizers.
Reactivity, and Under What Conditions: Aerosol containers are unstable at temperatures above 49°C.
Hazardous Decomposition Products: May include and are not limited to oxides of carbon when heated to decomposition.

SECTION VI - TOXICOLOGICAL PROPERTIES

Route of Entry: Eye, Skin contact, Inhalation, Ingestion.

EFFECTS OF ACUTE EXPOSURE:

Eye: Causes irritation.
Skin: May cause irritation.
Inhalation: Excessive intentional inhalation may cause respiratory tract irritation and central nervous system effects (headache, dizziness).
Ingestion: May cause stomach distress, nausea or vomiting.

EFFECTS OF CHRONIC EXPOSURE:

Skin: Prolonged or repeated exposure can cause drying, defatting and dermatitis.
Irritancy: Hazardous.
Respiratory Tract Sensitization: No data available.
Carcinogenicity: Non-hazardous.
Teratogenicity, Mutagenicity, Reproductive Effects: No data available.
Synergistic Materials: Not available.

SECTION VII- PREVENTATIVE MEASURES

Gloves: Not normally required.
Eye Protection: Not normally required.
Respiratory Protection: Not normally required if good ventilation is maintained.
Other Protective Equipment: As required by employer code.
Engineering Controls: General ventilation normally adequate.
Leak and Spill Procedure: Before attempting clean up, refer to hazard data given above. Remove sources of ignition. Although the chance of a significant spill or leak is unlikely in aerosol containers, in the event of such an occurrence, absorb spilled material with a non-flammable absorbent such as sand or vermiculite.
Waste Disposal: Review federal, provincial, and local government requirements prior to disposal. Do not puncture or incinerate container.
Storage and Handling Requirements: Keep out of reach of children. Store in a closed container away from incompatible materials. Avoid heat, open flame, and other sources of ignition in the use and storage of this product. Do not store at temperatures above 49 degrees C.

SECTION VIII - FIRST AID

Eye: Flush with cool water. Remove contact lenses, if applicable, and continue flushing. Obtain medical attention if irritation persists.
Skin: Flush with cool water. Wash with soap and water. Obtain medical attention if irritation persists.
Inhalation: If symptoms develop, move victim to fresh air. If symptoms persist, obtain medical attention. If breathing has stopped, trained personnel should administer CPR immediately.
Ingestion: Do not induce vomiting. Rinse mouth with water then drink one or two glasses of water. Obtain medical attention. Never give anything by mouth if victim is unconscious, or is convulsing.

SECTION IX - PREPARATION INFORMATION

Date: 2001/03/15 **MSDS Prepared by:** Dell Tech Laboratories
Telephone: (519) 858-5021

Disclaimer

Information for this material safety data sheet was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the mandatory requirements of WHMIS. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this form. If user requires independent information on ingredients in this or any other material, we recommend contact with the Canadian Centre for Occupational Health and Safety (CCOHS) in Hamilton, Ontario (1-800-263-8466) or CSST in Montreal, Quebec (514-873-3990).

FICHE SIGNALÉTIQUE

SECTION I – IDENTIFICATEUR DE LA MATIÈRE

Identificateur de la matière: A-700-717, A719, A720 Dry Breeze™ – Tous les parfums

Usage du produit: Désodorisant

Classification du SIMDUT: Catégorie D - Division 2B
Catégorie B - Division 5: Aérosol inflammable
Catégorie A - Gaz comprimés

SANTÉ	2
INFLAMM.	3
RÉACTIVITÉ	0
PROTECTION PERSONNELLE	

Appellation réglementaire en vertu du DOT/TMD:
Bien de consommation ORM-D/Bien de consommation

Fabricant/Fournisseur: ITW Dymon
Adresse: 805 E Old 56 Highway
Olathe, Kansas, 66061
No. de téléphone: 1-800-289-3966

Numéro de téléphone d'urgence: 1-800-535-5053

SECTION II – INGRÉDIENTS DANGEREUX

Ingrédients	CAS#	Pd%	OSHA-PEL	ACGIH-TLV	CL_{50}	DL_{50}
Acétone	67-64-1	40 - 70	1000 ppm MPT	500 ppm MPT	71000 mg/m^3 4 h, rat	5800 mg/kg orale, rat
Propane	74-98-6	5 - 10	1000 ppm MPT	2500 ppm MPT	280000 ppm 4 h, rat	Pas disponible
Isobutane	75-28-5	10 - 30	Pas disponible	800 ppm MPT	Pas disponible	Pas disponible

SECTION III – DONNÉES PHYSIQUES

Point d'ébullition du concentre (°C): 56
Pression (canette, kPa @ 21.1 °C): 377
Densité de vapeur (Air = 1): >1
Solubilité dans l'eau: Complète
État physique: Aérosol
Seuil de l'odeur (ppm): Pas disponible
Apparence; odeur: Incolore transparente; plusieurs parfums
Densité spécifique du concentre (H_2O = 1): 0.794
% Volatil (Pd %): Pas disponible
Vitesse d'évaporation (Éther = 1): Pas disponible
pH (100%): Pas disponible
Viscosité: Pas disponible

SECTION IV – DANGERS D'EXPLOSION ET D'INCENDIE

Inflammabilité: Aérosol inflammable par détermination de la projection de la flamme.
Point d'éclair du concentre (TCC, °C): Pas disponible **LIE:** Pas disponible **LSE:** Pas disponible
Produits de combustion dangereux: Ils peuvent comprendre et ne sont pas limités aux oxydes de carbone.
Température d'auto-inflammation (°C): Pas disponible
Produits extincteurs: Poudre chimique, mousse, dioxyde de carbone.
Dangers d'incendie particuliers: Contenu sous pression. Le contenant peut exploser sous l'effet de la chaleur. Pulvériser de l'eau sur les contenants pour les refroidir et retirer la source d'ignition si sans danger. Les pompiers doivent porter un appareil respiratoire autonome.

SECTION V – DONNÉES SUR LA RÉACTIVITÉ CHIMIQUE

Conditions d'instabilité chimique: Stable.
Incompatibilité: Caustiques, acides, oxydants.
Conditions de réactivité: Les contenants de type aérosol devient instable à températures dépassant 49°C.
Produits de décomposition dangereux: Ils peuvent comprendre et ne sont pas limités aux oxydes de carbone quand chauffé jusqu'à décomposition.

SECTION VI – PROPRIÉTÉS TOXICOLOGIQUES

Voie d'exposition: Yeux, contact avec la peau, inhalation, ingestion.
EFFETS D'UNE EXPOSITION AIGUË:
Yeux: Cause une irritation.
Peau: Peut causer une irritation.
Inhalation: L'inhalation excessive intentionnelle peut causer l'irritation des voies respiratoires et des effets sur le système nerveux central (maux de tête, vertiges).
Ingestion: Peut causer un malaise gastro-intestinal, des nausées ou des vomissements.
EFFETS D'UNE EXPOSITION CHRONIQUE:
Peau: L'exposition prolongée ou répétée peut causer l'assèchement, la délipidation et des dermatites.
Irritation: Dangereux.
Sensibilisation des voies respiratoires: Pas de données disponibles.
Cancérogénicité: Non dangereux.
Tératogénicité, mutagénicité, effets sur la reproduction: Pas de données disponibles.
Matières synergiques: Pas disponible.

SECTION VII- MESURES DE PRÉVENTION

Gants: Normalement non nécessaire.
Protection des yeux: Normalement non nécessaire.
Protection des voies respiratoires: Normalement non nécessaire s'il y a une bonne ventilation.
Autre équipement de protection: Conformément aux directives de votre employeur.
Ventilation: Ventilation générale adéquate.
Mesures en cas de fuite ou de déversement: Avant de procéder au nettoyage, consulter les renseignements de danger ci-dessus. Retirer les sources d'ignition. Bien que les risques de déversement ou de fuite d'importance soient peu probables avec un aérosol, si cela arrive, absorber le liquide répandu au moyen d'une substance absorbante ininflammable telle que sable, vermiculite.
Élimination des déchets: Consulter les règlements fédéraux, provinciaux et municipaux avant d'éliminer. Ne pas percer ni incinérer le contenant.
Conditions d'entreposage et de manutention: Garder hors de la portée des enfants. Entreposer dans un contenant fermé à l'abri des matières incompatibles. Entreposer et utiliser ce produit à l'abri de la chaleur, de flammes nues et d'autres sources d'ignition. Ne pas conserver à des températures dépassant 49 degrés C.

SECTION VIII – PREMIERS SOINS

Yeux: Rincer à grande eau froide. Enlever les verres de contact, le cas échéant, et continuer à rincer. Obtenir de l'attention médicale si l'irritation persiste.
Peau: Rincer à grande eau froide. Laver à l'eau et au savon. Obtenir de l'attention médicale si l'irritation persiste.
Inhalation: En cas de symptômes, placer la victime à l'air frais. Si les symptômes persistent, obtenir de l'attention médicale. Si la victime ne respire pas du personnel qualifié devrait immédiatement commencer la réanimation cardio-pulmonaire.
Ingestion: Ne pas tenter de faire vomir. Rincer la bouche à grande eau, puis boire un ou deux verres d'eau. Obtenir de l'attention médicale. Ne jamais rien faire boire ou avaler à une victime inconsciente, en train de perdre rapidement connaissance ou si la victime a des convulsions.

SECTION IX – RENSEIGNEMENTS SUR LA PRÉPARATION

Date: 2001/03/15 **FS préparée par:** Dell Tech Laboratories
No. de téléphone: (519) 858-5021

Clause d'exonération de responsabilité
Les renseignements fournis dans la présente fiche signalétique ont été préparés à partir de différentes sources que nous croyons exactes et fiables du point de vue technique. Nous avons tout mis en oeuvre pour divulguer tous les renseignements sur les dangers. Cependant, dans certains cas, les renseignements ne sont pas disponibles et nous l'avons indiqué. Les conditions d'utilisation du produit étant hors du contrôle du fournisseur, nous assumons que l'utilisateur de la présente matière a reçu la formation obligatoire voulue conformément aux règlements du SIMDUT. Aucune garantie expresse ou implicite n'est émise et le fournisseur ne sera pas responsable en cas de pertes, blessures ou dommages indirects résultant de l'utilisation des présents renseignements. Si l'utilisateur de la présente matière ou d'autres matières souhaite obtenir d'autres renseignements sur les ingrédients, nous lui recommandons de communiquer avec la Commission de la Santé et de la Sécurité du Travail, à Montréal en Québec (514-873-3990) ou le Centre Canadien d'Hygiène et de Sécurité au Travail, à Hamilton (1-800-263-8466).

FICHA DESCRIPTIVA DEL PRODUCTO

SECCIÓN I - IDENTIFICACIÓN DEL PRODUCTO

Nombre del producto: A-700-717, A719, A720 Dry Breeze™ – Todos los perfumes

Uso del producto: Desodorante

Clase WHMIS: Clase D - División 2B
Clase B - División 5: Aerosol Inflamable
Clase A - Gas Comprimido

Clasificación DOT/TDG: Bien de consumo ORM-D/Bien de consumo

SALUD	2
INFLAMABILIDAD	3
REACTIVIDAD	0
PROTECCIÓN PERSONAL	

Fabricante/Proveedor: ITW Dymon
Dirección: 805 E Old 56 Highway
Olathe, Kansas, 66061
Teléfono: 1-800-289-3966

Teléfono para emergencias: 1-800-535-5053

SECCIÓN II – PELIGROSOS INGREDIENTES

Ingredientes	#CAS	Peso%	OSHA-PEL	ACGIH-TLV	CL_{50}	DL_{50}
Acetona	67-64-1	40 - 70	1000 ppm PPT	500 ppm PPT	71000 mg/m^3 4 h, rata	5800 mg/kg oral, rata
Propano	74-98-6	5 - 10	1000 ppm PPT	2500 ppm PPT	280000 ppm 4 h, rata	No disponible
Isobutano	75-28-5	10 - 30	No disponible	800 ppm PPT	No disponible	No disponible

SECCIÓN III - PROPIEDADES FÍSICAS

Punto de ebullición del concentrado (°C): 56
Presión de vapor (Cilindro, kPa @ 21.1°C): 377
Densidad de vapor (Aire = 1): >1
Solubilidad en agua: Completa
Estado físico: Aerosol
Aspecto; olor: Incoloro transparente; varios perfumes
Peso específico del concentrado (H_2O = 1): 0.794
% Volátil (Peso%): No disponible
Tasa de evaporación (Éter = 1): No disponible
pH (100%): No disponible
Viscosidad: No disponible
Umbral de olor (ppm): No disponible

SECCIÓN IV - MEDIDAS DE LUCHA CONTRA INCENDIO

Inflamabilidad: Aerosol inflamable según el ensayo de proyección de la llama.
Punto de inflamabilidad del concentrado (°C, Vaso cerrado Tag): No disponible **LIE:** No disponible **LSE:** No disponible
Productos de combustión peligrosos: Pueden incluir y no están limitados a óxidos de carbono.
Temperatura de autoignición (°C): No disponible
Forma de extinción: Polvo químico, espuma, dióxido de carbono.
Riesgos de incendio especiales: Contenido bajo presión. El recipiente puede explotar bajo el efecto del calor. Enfriar el recipiente con un rocío de agua y retirar la fuente de ignición si no es peligroso. Los bomberos deben usar aparatos de respiración autónomos.

SECCIÓN V - REACTIVIDAD

Condiciones para la inestabilidad química: Estable.
Materiales incompatibles: Materiales cáusticos, ácidos, oxidantes.
Condiciones de reactividad: Los recipientes de tipo aerosol son inestables a temperaturas por arriba de 49°C.
Productos de descomposición peligrosos: Pueden incluir y no están limitados a óxidos de carbono cuando se calienta hasta la descomposición.

SECCIÓN VI - PROPIEDADES TOXICOLÓGICAS

Vías de entrada: Ojos, contacto con la piel, inhalación, ingestión.
Efectos debidos a una exposición aguda:
Ojos: Causa una irritación.
Piel: Puede causar una irritación.
Inhalación: La inhalación intencional y excesiva puede causar la irritación del sistema respiratorio y efectos sobre el sistema nerviosos central (dolores de cabeza, mareos).
Ingestión: Puede causar problemas digestivos, náuseas o vómitos.
Efectos debidos a una exposición crónica:
Piel: La exposición repetida o prolongada puede causar deshidratación, sequedad y dermatitis.
Irritación: Es peligroso.
Sensibilización del aparato respiratorio: No hay datos disponibles.
Carcinogenesis: No es peligroso.
Teratogenesis, mutagenesis, efectos sobre la reproducción: No hay datos disponibles.
Materiales sinergísticos: No disponible.

SECCIÓN VII - MEDIDAS DE PREVENCIÓN

Guantes: Normalmente no se requiere.
Protección de ojos: Normalmente no se requiere.
Protección del aparato respiratorio: Normalmente no se requiere si se mantiene una buena ventilación.
Otros equipos de protección: Como sea requerido por las normas del empleador.
Controles de ingeniería: La ventilación general es normalmente suficiente.
Procedimientos para escapes y derrames: Antes de proceder a limpiar, referirse a los datos sobre riesgos dados más arriba. Retirar las fuentes de ignición. Si bien los riesgos de derrames o pérdidas importantes son poco probables en el caso de aerosoles, en el caso que ocurran pueden absorberse con un material absorbente ininflamable como arena o vermiculite
Eliminación de residuos: Consultar los requerimientos de los gobiernos federales, provinciales y municipales antes de la eliminación. No perforar ni incinerar el recipiente.
Requerimientos de almacenaje y manipulación: Mantener fuera del alcance de niños. Almacenar en recipientes cerrados lejos de materiales incompatibles. Usar y almacenar este producto lejos del calor, de llamas y de otras fuentes de ignición. No almacenar a temperaturas por arriba de 49°C.

SECCIÓN VIII - PRIMEROS AUXILIOS

Ojos: Enjuagar con agua fría. Sacarse los lentes de contacto, si es el caso, y continuar enjuagando. Obtener asistencia médica si la irritación persiste.
Piel: Enjuagar con abundante agua fría. Lavar con agua y jabón. Obtener asistencia médica si la irritación persiste.
Inhalación: En caso de síntomas, mover a la víctima a un lugar con aire fresco. Si los síntomas persisten, obtener asistencia médica. Si la víctima no respira, personal capacitado debe comenzar inmediatamente la reanimación
cardio-pulmonar.
Ingestión: No inducir el vómito. Enjuagar la boca con agua y después tomar uno o dos vasos de agua. Obtener asistencia médica. No dar nada por boca si la víctima está inconsciente, o si tiene convulsiones.

SECCIÓN IX - INFORMACIÓN SOBRE LA PREPARACIÓN

Fecha: 2001/03/15 **Ficha preparada por:** Dell Tech Laboratories
Teléfono: (519) 858-5021

Cláusula de limitación de responsabilidad
La información para esta ficha descriptiva fue obtenida de fuentes consideradas técnicamente precisas y confiables. Si bien se ha hecho lo posible para divulgar todos los riesgos del producto, en algunos casos no se dispone de datos y así está indicado. Dado que las condiciones del uso actual del producto están fuera del control del proveedor, se asume que los usuarios de este producto están totalmente entrenados de acuerdo a los requerimientos obligatorios de WHMIS. No se da ninguna garantía expresa, o implícita, y el proveedor no es responsable por ninguna pérdida, heridas o daños indirectos causados como resultado del uso de la información contenida en esta ficha. Si el usuario requiere información independiente sobre los ingredientes de este u otro producto, recomendamos contactar al Centro Canadiense de Seguridad y Salud en el Trabajo (Canadian Centre for Occupational Health and Safety/CCOHS) en Hamilton, Ontario (1-800-263-8466) o a la Comisión de la Salud y de la Seguridad en el Trabajo (Commission de la Santé et de la Sécurité du Travail/CSST) en Montreal, Quebec (514-873-3990).

A-700-717, A719, A720 Dry Breeze™

Eye and skin irritant. Flammable aerosol. Compressed gas.

Avoid contact with eyes and skin. Keep out of reach of children. Keep away from sources of ignition. No smoking. Do not puncture or incinerate container. Do not store at temperatures above 49°C.

Eye: Flush with cool water. Remove contact lenses, if applicable, and continue flushing. Obtain medical attention if irritation persists.

Skin: Flush with cool water. Wash with soap and water. Obtain medical attention if irritation persists.

Inhalation: If symptoms develop, move victim to fresh air. If symptoms persist, obtain medical attention. If breathing has stopped, trained personnel should administer CPR immediately.

Ingestion: Do not induce vomiting. Rinse mouth with water then drink one or two glasses of water. Obtain medical attention. Never give anything by mouth if victim is unconscious, or is convulsing.

READ MATERIAL SAFETY DATA SHEET BEFORE USING PRODUCT

==========

Irritant pour les yeux et la peau. Aérosol inflammable. Gaz comprimés. Éviter le contact avec les yeux et la peau. Garder hors de la portée des enfants. Conserver à l'écart de toutes sources d'ignition. Ne pas fumer. Ne pas percer le contenant ni le jeter au feu. Ne pas entreposer à températures dépassant 49°C.

Yeux: Rincer à grande eau froide. Enlever les verres de contact, le cas échéant, et continuer à rincer. Obtenir de l'attention médicale si l'irritation persiste.

Peau: Rincer à grande eau froide. Laver à l'eau et au savon. Obtenir de l'attention médicale si l'irritation persiste.

Inhalation: En cas de symptômes, placer la victime à l'air frais. Si les symptômes persistent, obtenir de l'attention médicale. Si la victime ne respire pas du personnel qualifié devrait immédiatement commencer la réanimation cardio-pulmonaire.

Ingestion: Ne pas tenter de faire vomir. Rincer la bouche à grande eau, puis boire un ou deux verres d'eau. Obtenir de l'attention médicale. Ne jamais rien faire boire ou avaler à une victime inconsciente, en train de perdre rapidement connaissance ou si la victime a des convulsions.

LIRE LA FICHE SIGNALÉTIQUE AVANT D'UTILISER CE PRODUIT

==========

Irritante para los ojos y la piel. Aerosol inflamable. Gas comprimido. Evitar el contacto con los ojos y la piel. Mantener fuera del alcance de niños. Mantener alejado de fuentes de ignición. No fumar. No perforar ni incinerar el recipiente. No almacenar a temperaturas por arriba de 49°C.

Ojos: Enjuagar con agua fría. Sacarse los lentes de contacto, si es el caso, y continuar enjuagando. Obtener asistencia médica si la irritación persiste.

Piel: Enjuagar con abundante agua fría. Lavar con agua y jabón. Obtener asistencia médica si la irritación persiste.

Inhalación: En caso de síntomas, mover a la víctima a un lugar con aire fresco. Si los síntomas persisten, obtener asistencia médica. Si la víctima no respira, personal capacitado debe comenzar inmediatamente la reanimación cardio-pulmonar.

Ingestión: No inducir el vómito. Enjuagar la boca con agua y después tomar uno o dos vasos de agua. Obtener asistencia médica. No dar nada por boca si la víctima está inconsciente, o si tiene convulsiones.

LEER LA FICHA DESCRIPTIVA ANTES DE UTILISAR EL PRODUCTO

ITW Dymon

WALTER

J. WALTER INC.
141 Locust St., Hartford. CT 06114-1504
EMERGENCY NUMBER: INFOTRAC 1-800-535-5053

NFPA Hazard Identification
FLAMMABILITY: 1
HEALTH: 1 REACTIVITY: 0
0: 0
0= Minimum
1= Light
2= Moderate
3= Serious
4= Extremely

MATERIAL SAFETY DATA SHEET

M.S.D.S. No.: L-10E

SECTION 1 & 2 - Product & Preparation Information

TRADE NAME(S)	Spatter Block	PRODUCT NAME(S)	Spatter Block, weld Spatter Release
		ORDER NO.	53-F 002
PREPARED BY	Product Manager, Chemical Tools	WHMIS CLASSIFICATION	B5
TELEPHONE #	(860) 724-0321 DATE January 15, 2001	THIS IS A CONTROLLED PRODUCT UNDER WHMIS	No ☐ Yes X ☐

SECTION 3 - Hazardous Ingredients

CHEMICAL IDENTITY	% BY WEIGHT	C.A.S. Number	LD_{50}RAT	LC_{50}RAT
Dimethylether (propellant)	30-60	115-10-6	N/E	N/E

SECTION 4 - Physical Data

PHYSICAL STATE	Aerosol	ODOUR & APPEARANCE	Odourless, green	ODOUR THRESHOLD	N/E
pH	8	BOILING POINT (°C)	N/A	FREEZING POINT (°C)	N/A
SPECIFIC GRAVITY	0.84 g/ml @ 20°C	VAPOUR PRESSURE (@20°C)	5500 hPa	VAPOUR DENSITY	N/E
EVAPORATION RATE	N/E			SOLUBILITY IN WATER	Soluble

SECTION 5 - Fire or Explosion Hazards

FLAMMABILITY	No ☐ Yes ☒ Conditions Avoid accumulation of fumes	HAZARDOUS COMBUSTION PRODUCTS	Normal combustion products
EXTINGUISHING MEDIA	CO_2, dry powder, foam	SENSITIVITY TO MECH. IMPACT OR STATIC DISCHARGE	No
FLASHPOINT (°C,Method)	-41 c.c. (propellant)	AUTO IGNITION TEMPERATURE (°C)	350 (propellant)
FLAMMABLE LIMITS (%) (propellant)	UPPER32	LOWER1.4	

SECTION 6 - Toxicological Data

ROUTE OF ENTRY: ☒ Skin Contact ☐ Skin Absorption ☒ Eye Contact ☒ Inhalation ☒ Ingestion

ACUTE EXPOSURE EFFECTS	Inhalation may cause drowsiness.			EXPOSURE LIMITS (MAK)
CHRONIC EXPOSURE EFFECTS	Prolonged contact may cause skin and eye irritation.			1000 ppm (propellant)
CARCINOGENICITY No ☒ Yes ☐	MUTAGENICITY No ☒ Yes ☐	REPRODUCTIVE TOXICITY No ☒ Yes ☐	TERATOGENICITY No ☒ Yes ☐	SYNERGISTIC EFFECTS No ☒ Yes ☐

IF YES TO ANY ABOVE, SPECIFY: No

SECTION 7 - Reactivity Data

CHEMICAL STABILITY	No ☐ Yes ☒ Conditions None	REACTIVITY CONDITIONS	None
INCOMPATIBLE SUBSTANCES	None	HAZARDOUS DECOMPOSITION PRODUCTS	None

SECTION 8 - Preventive Measures

PROTECTIVE EQUIPMENT	Eyewear ☒ Clothing ☐ Gloves ☒ Other ☐	ENGINEERING CONTROLS	Provide adequate ventilation.
HANDLING PROCEDURES	Follow package instructions.	HANDLING EQUIPMENT	None
WASTE DISPOSAL METHODS	According to government regulations.	LEAK/SPILL PROCEDURES	Wipe up with an absorbent material.
STORAGE REQUIREMENTS	Store at temperatures below 50°C.	SPECIAL SHIPPING INFORMATION	U.N.1950, Class 2.1.

SECTION 9 - First Aid Measures

SKIN CONTACT	Rinse thoroughly with plenty of water.
EYE CONTACT	Rinse thoroughly with plenty of water.
INHALATION	Remove victim to fresh air. Seek medical advice if needed.
INGESTION	Do not induce vomiting. Seek medical advice if needed.
OTHER	N/A

N/A - Not Applicable

N/E - Not Established

Coverall of Oregon Cleaning Supplies

Procter & Gamble
CPG TN 6
2 Procter & Gamble Plaza
Cincinnati, OH 45202

MATERIAL SAFETY DATA SHEET

MSDS #:
Supersedes: N/A

Issue Date: 4/2004 (updated)
Issue Date: 2/00

SECTION I - CHEMICAL PRODUCT

Identity: **Liquid Disinfecting Bathroom Cleaner**

Brands: **COMET Disinfecting Bathroom Cleaner (Professional Line)**

Hazard Rating: 1

Health: 1
Flammability: 0
Reactivity: 0

4=EXTREME
3=HIGH
2= MODERATE
1=SLIGHT

Emergency Telephone Number: 1-800-332-7787 or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (dipropylene glycol butyl ether, citric acid), quality control agents, perfume, and water.

This mixture, when tested as a whole, is considered an eye irritant within the meaning of the OSHA Hazard Communication Standard

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
None					

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Ingestion: Mild mucous membrane irritant. May result in gastrointestinal irritation with nausea, vomiting and diarrhea.

Eye Contact: Mild eye irritant.

Inhalation: Mild respiratory irritant.

Skin: Mild skin irritant. Use on irritated or extremely dry skin may aggravate the existing condition.

SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Ingestion:	If swallowed, drink 1-2 glasses of water and call a doctor or poison control center (product contains an alcohol ethoxylate). Do not induce vomiting unless told to do so by a poison control center or doctor.
Eye Contact:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye.
Skin:	Thoroughly wash exposed area with soap and water and discontinue use. Remove contaminated clothing. If irritation persists, consult a physician.
Inhalation:	Remove to fresh air.

Other: Product package front label has a caution statement: KEEP OUT OF REACH OF CHILDREN. CAUTION: MAY BE HARMFUL IF SWALLOWED. SEE BACK PANEL FOR OTHER PRECAUTIONS.

Back label states the following: CAUTION: Causes eye irritation. Avoid contact with eyes. May be harmful if swallowed. Do not mix with bleach or mildew stain removers as irritating fumes may result.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): over 200° F (cc) **Explosive Limits**: *LEL*: N/A *UEL*: N/A

Extinguishing Media: CO_2, water, dry chemical or "alcohol" foam.

Special Fire Fighting Procedures: Use water to keep fire exposed container cool.

Unusual Fire Hazards: None known.

Stability *Unstable*: *Conditions to Avoid*: None known

Stable: X

Incompatibility (Materials to Avoid): None known

Hazardous Decomposition/By Products: None known

Hazardous Polymerization: *May Occur*: *Conditions to Avoid*: None known

Will Not Occur: X

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Do not landfill. Small (household) quantities may be disposed of via sewer with large quantities of water. Incineration is preferred where permitted.

Steps To Be Taken in Case Material is Released or Spilled: Use water spray to dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak. Absorb spilled product onto absorbent material.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing: Store in a well ventilated, cool, and dry location.

Other Precautions: None known.

KMB00003826

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Respiratory Protection (Specify Type): None required with normal use.
Ventilation *Local Exhaust*: None required with normal consumer use. *Special*: None
Mechanical (General): Acceptable. *Other*: None
Eye Protection: None required with normal consumer use.
Industrial Setting: For splash protection, use chemical goggles. Eye wash fountain is desirable.
Protective Gloves: None required with normal use.
Other Protective Equipment: None required with normal use.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point °F: N/A	**Specific Gravity (H_2O=1)**: 1.030-1.045
Vapor Pressure (mm Hg): N/A	**Percent Volatile by Volume (%)**: N/A
Vapor Density (Air=1): N/A	**Evaporation Rate (nBuOAc=1)**: N/A
Odor Threshold: N/A	**Freezing Point:** N/A
Coefficient of Water/Oil Distribution: N/A	**pH (neat):** 3.0
Scooped Density: N/A	**Solubility in Water**: Completely
Appearance and Odor: Clear liquid; product is perfumed.	**Reserve Alkalinity:** N/A

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): >5 ml/kg
ED50: 2ml/kg

SECTION XII - ECOLOGICAL INFORMATION

No concerns at relevant environmental concentrations.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Do not landfill. Small (household) quantities may be disposed of via sewer with large quantities of water. Incineration is preferred where permitted. DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

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SECTION XIV. TRANSPORT INFORMATION

DOT Classification: The product, as sold, is not DOT hazardous. Bulk product shipments are classified as a Class 9 Hazardous Substance with a shipping name of Environmentally Hazardous Substance, Liquid n.o.s.

SECTION XV. ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

This product is an EPA registered pesticide EPA Reg. No. 3573-54.

No components of Comet Disinfecting Bathroom Cleaner are subject to California Proposition 65.

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified with Hazard Criteria of the Canadian Control Products Regulation (CPR) and this MSDS contains all information required by the Canadian Products Regulation.

SECTION XVI. OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

KMB00003828

The Procter & Gamble Company
P&G Household Care
Fabric & Home Care Innovation Center
5299 Spring Grove Avenue
Cincinnati, OH 45217-1087

MATERIAL SAFETY DATA SHEET

MSDS #: RQ0701772
Supersedes: N/A

Issue Date: October, 2007
Issue Date: N/A

SECTION I - CHEMICAL PRODUCT

Identity: **Liquid Surface Sanitizing Cleaner** **Concentrate**

Brands: **Comet Disinfecting Bathroom Cleaner (Professional Line)**

P&G Telephone Number: 1-800-332-7787or call Local Poison Control Center or your physician.

Emergency (24 hour) Telephone Number: CHEMTREC 1-800-424-9300

SECTION II - HAZARDS IDENTIFICATION

Potential Health Hazards (Acute and Chronic): (See Section 11 for more information)

Ingestions: Mild mucous membrane irritant. May result in gastrointestinal irritation with nausea, vomiting and diarrhea.

Eye Contact: Mild eye irritant.

Inhalation: Mild respiratory irritant.

Skin: Mild skin irritant. Use on irritated or extremely dry skin may aggravate the existing condition.

Signs and Symptoms of Exposure:

Ingestion: May cause transient gastrointestinal irriation including nausea, vomiting and diarrea. When diluted according to label directions, these signs and symptoms may still be present but to a lesser extent.

Eye Contact: May cause stinging, tearing, burning, swelling and/or redness. When diluted according to label directions, these signs and symptoms may still be present but to a lesser extent.

Skin Contact: Prolonged contact may be drying or transiently irritating to skin. When diluted according to label directions, these signs and symptoms may still be present but to a lesser extent.

Inhalation: N/A

Medical Conditions Generally Known to be Aggravated by Exposure: N/K

Potential Environmental Effects: (See Section 12 for more information)

SECTION III - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (dipropylene glycol butyl ether, citric acid), quality control agents, perfume and water. Daily Sanitizing Restroom Cleaner contains no phosphorus.

The concentrated mixture, when tested as a whole, is considered an eye irritant within the meaning of the OSHA Hazard Communication Standard.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200. and/or WHMIS under the HPA:

Chemical Name	Common Name	CAS No.	Composition Range	LD50/LC50
None				

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SECTION IV - FIRST AID INFORMATION

First Aid Procedures:

Ingestion: Immediately drink 1-2 glasses of water and call a doctor or Poison Control Center (product contains an alcohol ethoxylate). Do not induce vomiting unless told to do so by a Poison Control Center or doctor. Have the product container or label with you when calling or going for treatment.

Eye Contact: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a Poison Control Center or doctor for treatment advice.

Skin: Thoroughly wash exposed area with soap and water and discontinue use. Remove contaminated clothing.

Inhalation:

Note to Physician: (if applicable)

Other: Product package has a precautionary statement: CAUTION: KEEP OUT OF REACH OF CHILDREN. Causes eye irritation. Avoid contact with eyes. May be harmful if swallowed. Do not mix with bleach or mildew stain removers as irritating fumes may result.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): >200°F CC (>93.33c)

Flammable Properties: N/A

Upper Flammable Limit: N/A

Lower Flammable Limit: N/A

Explosive Limits: UEL: N/A LEL: N/A

Auto-ignition Temperature: N/A

Hazardous Combustion Products: N/K

Explosion Data (Sensitivity to Mechanical Impact): N/A

Explosion Data (Sensitivity to Static Discharge): N/A

Extinguishing Media:

Suitable: Use CO_2, water, dry chemical or 'alcohol' foam.

Unsuitable: None known

Protection of Firefighters:

Specific Hazards Arising from the Material: None known

Protective Equipment and Precautions for Firefighters: Normal firefighting gear. Use water to keep fire exposed container cool.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Do not landfill. Small quantities may be disposed of via sewer.

Methods for Containment: Prevent spills from reaching waterways.

Methods for Cleanup: Use water spray to dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak.

Other Information: (if applicable)

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling: Handling and storage must be well ventilated, cool and dry. Materials must be isolated from potential sources of ignition. Fire fighting equipment must be available at all times

Precautions To B e Taken in Storage: Store in a cool place. Keep away from heat/sparks and open flame. Discard empty bottle in trash.

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SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Guidelines: N/A

Engineering Controls: N/A

Personal Protective Equipment (PPE):

Eye/Face Protection: None required with normal use.

Manufacturing: For splash protection, use chemical goggles. Eye wash fountain is desirable.

Skin Protection: None required with normal use.

Respiratory Protection: None required with normal use.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (color, physical form, shape): clear liquid	**Flash Point (Method Used):** >200F CC (>93.33c)
Odor: Perfumed	**Reserve Alkalinity:** N/A
Odor Threshold: N/A	**Solubility in Water:** Completely
Physical State: Liquid	**Decomposition Temperature:** N/A
Vapor Pressure (mm Hg): N/A	**Evaporation Rate (nBuOAc=1):** N/A
Vapor Density (Air=1): N/A	**Specific Gravity/Density:** 1.030-1.045
Boiling Point: N/A	**Melting/Freezing Point:** ~30°F
Partition Coefficient (n-octanol/water): N/A	**pH (neat solution):** 2.99-3.01

Volatile Organic Compound (VOC): Product complies with State and Federal regulations for VOC content.

SECTION X - STABILITY AND REACTIVITY

Chemical Stability: Stable

Conditions to Avoid: *None*

Incompatible Materials: Do not mix with bleach or mildew stain removers as irritating fumes may result.

Hazardous Decomposition Products: None known

Possibility of Hazardous Reactions: None known

SECTION XI - TOXICOLOGICAL INFORMATION

Chronic Effects: No chronic health effects reported.

Target Organs: No target organs reported.

Carcinogenicity: NTP: No

IARC: No

SECTION XII - ECOLOGICAL INFORMATION

Based on ecotoxicity and fate data for the individual ingredients in this specific formulation this product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment at relevant environmental concentrations. The surfactant(s) used in the formulation biodegrade rapidly and do not accumulate in the environment. This product is intended for dispersive use and should not be disposed of directly into the environment.

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SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS. DO NOT LANDFILL. Prevent spills from reaching waterways.

Non-Household Setting (US Federal): Industrial disposal of product in finished, consumer-ready packaging must be disposed of as an organic pesticide. Records must be kept of the disposal that documents the method of disposal, the date of disposal, the location of the disposal site, the type of pesticide disposed of (organic pesticide), and the amount of pesticide disposed of. Disposal records must be retained for 20 years. Incineration is preferred where permitted. Product removed from finished, consumer-ready packaging may be disposed of as non-pesticidal, liquid waste which is non-hazardous waste according to Federal RCRA regulations (40 CFR 261).

Non-Household Setting (California): Hazardous, in accordance with 22 CCR 66261.20 through 22 CCR 66261.24

SECTION XIV - TRANSPORT INFORMATION

Products covered by this MSDS, in their original form, are regulated for transportation.

Ground Transport (US DOT): Consumer Commodity ORM-D

Air Transport (IATA): DO NOT SHIP. Finished product packaging does not meet air transport requirements.

Marine/Water Transport (IMDG): UN3266, Corrosive liquid, basic, inorganic, n.o.s. 8, PG III, Ltd Qty.

SECTION XV - REGULATORY INFORMATION

United States

All intentionally-added components of this product are listed on the US TSCA Inventory.

EPA Registration Number: 3573-54

SARA 313/302/304/311/312 chemicals: None

California: This product has been evaluated and does not require warning labeling under California Proposition 65.

California Registration Number: 3573- 54-ZG

State Right-to-Know and CERCLA:

The following ingredients present in the finished product are listed on state right-to-know lists or state worker exposure lists

Ingredient	CAS #	Level	CERCLA RQ	State
Citric Acid	77-92-9	3-7%	N/A	TX

Canada

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and this MSDS contains all information required by the Controlled Products Regulations.

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SECTION XVI - OTHER INFORMATION

Perfumes contained within the products covered by this MSDS comply with appropriate IFRA guidance.

P&G Hazard Rating:	Health:	1	4=EXTREME
	Flammability:	0	3=HIGH
	Reactivity:	0	2=MODERATE
			1=SLIGHT
			0=NOT SIGNIFICANT

*N/A. - Not Applicable *N/K. - Not Known

Data supplied is for use only in connection with occupational safety and health.

DISCLAIMER: This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumes no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

KMB00003833

Procter & Gamble
CPG TN 6
2 Procter & Gamble Plaza
Cincinnati, OH 45202

MATERIAL SAFETY DATA SHEET

Supersedes: N/A

Issue Date: 8/05
Issue Date: 3/05

SECTION I - CHEMICAL PRODUCT

Identity: **Disinfecting Liquid Hard Surface Cleaner**

Brands: **SPIC and SPAN 10X Concentrate Disinfecting All-Purpose Spray and Glass Cleaner (Professional)**

Hazard Rating: 3

Health: 3	4=EXTREME
Flammability: 3	3=HIGH
Reactivity: 0	2= MODERATE
	1=SLIGHT
	0=NONE

Emergency Telephone Number: CHEMTREC (24 hr operator)	1-800-424-9300 U.S. and Canada
	1-703-527-3887 for calls originating elsewhere
U.S. Emergency or Customer Service:	1-800-332-7787 (P&G operator)
	or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (ethanol, butoxypropanol), quaternary, water, colorant and perfume

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
Ethyl alcohol	Ethanol	64-17-5	ACGIH TLV: 1000 mg/m^3	12-25%	
2-aminoethanol	Monoethanol-amine	141-43-5	ACGIH TLV: 3 ppm OSHA PEL: 3 mg/m^3 OSHA PEL: 6 ppm (15 min)	1-5%	

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Eye Contact: Concentrate causes eye damage. Use dilution may cause mild irritation

Skin: Concentrate may cause skin burns. Use dilution may cause mild skin irritation.

Ingestion: Mucous membrane irritant. may result in mild gastrointestinal irritation with nausea, vomiting and/or diarrhea. Large ingestions may cause temporary dizziness, uncoordination and headache.

Inhalation: Mucous membrane irritant

SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Eye contact: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.

Skin irritation: *Wash with plenty of soap and water. Get medical attention.*

Oral ingestion: Promptly drink a large quantity of milk, egg whites or gelatin. If these are not available, drink large quantities of water. Call a doctor or get medical attention. Do not induce vomiting.

Inhalation: If a large amount of product is inhaled, get fresh air.

**NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

Other: Product package has a caution statement: DANGER: KEEP OUT OF REACH OF CHILDREN. Corrosive. Causes irreversible eye damage. Causes skin burns. Do not get in eyes, on skin or on clothing. Wear goggles or face shield, protective clothing and rubber gloves when handling concentrate. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): 97°F (cc) **Explosive Limits**: *LEL:* N/A *UEL*: N/A

Extinguishing Media: CO_2, water, or dry chemical

Special Fire Fighting Procedures: Use water to keep fire exposed container cool.

Unusual Fire Hazards: Although this product has a flash below 140°F this product will not support sustained combustion when in contact with open flame above the indicated flash point.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: N/A

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Small quantities may be slowly flushed down sewer with excess water or dispose as liquid scrap. Discard empty container in trash.

Steps To Be Taken in Case Large Amounts Material are Released or Spilled: Use water spray to dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak. Absorb spilled product onto absorbant material.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing:. Handling and storage must be well ventilated, cool and dry. Store away from potential sources of ignition. Fire fighting equipment must be available at all times.

Other Precautions: Keep away from heat/sparks and open flame.

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Respiratory Protection (Specify Type): None required with normal use.

Ventilation: General

Eye Protection: Goggles or face shield required when handling concentrate. None required at use dilution.

Protective Gloves: Rubber gloves are required when handling concentrate. None required at use dilution.

Other Protective Equipment: None required with normal use. Easily accessible water source is needed.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point °F: 175°F
Specific Gravity (H_2O=1): 0.94
Vapor Pressure (mm Hg): N/A
Percent Volatile by Volume (%): ca. 95
Vapor Density (Air=1): N/A
Evaporation Rate (nBuOAc=1): N/K
Odor Threshold: N/A
Freezing Point: N/A
Coefficient of Water/Oil Distribution: N/A
pH (100% solution): 10.8
Scooped Density: N/A
Solubility in Water: Completely
Appearance and Odor: Dark blue liquid
Reserve Alkalinity: N/A
Product is perfumed.

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions/By Products: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

Stability: Stable

Hazardous Polymerization: Will not occur.

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): >20 g/kg

SECTION XII - ECOLOGICAL INFORMATION

No concerns.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Small quantities may be disposed of via sewer. DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. Discard empty container in trash.

SECTION XIV - TRANSPORT INFORMATION

DOT Classification: This material is regulated by the US Department of Transportation.

For finished packaged product transported by ground: **ORM-D Consumer commodity**.

For finished packaged product transported by sea: **Disinfectants, liquid, corrosive, n.o.s., (monoethanolamine), 8, UN1903, PGIII**

For finished packaged product transported by air: **DO NOT SHIP. Finished product packaging does not meet air transport requirements.**

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

No components of Spic & Span Disinfecting 10X Concentrate All-Purpose Spray and Glass Cleaner are subject to California Proposition 65.

EPA Reg. No. 6836-244-3573

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

Procter & Gamble
Fabric and Home Care Division
Sharon Woods Technical Center
11530 Reed Hartman Highway
Cincinnati, OH 45241-2422

MATERIAL SAFETY DATA SHEET

MSDS #: H98002M
Supersedes: N/A

Issue Date: 11/1/99
Issue Date: N/A

SECTION I - CHEMICAL PRODUCT

Identity: **Liquid Cleaner**

Brands: **MR. CLEAN (All Variations)**

Hazard Rating: 1

Health: 1	4=EXTREME
Flammability: 0	3=HIGH
Reactivity: 0	2= MODERATE
	1=SLIGHT

Emergency Telephone Number: 24hr P&G Operator - 1-800-8-MR CLEAN (1-800-867-2532) or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (nonionic and anionic surfactants), quality control agents, perfume, colorant and water.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
Alcohol ethoxylates	Nonionic Surfactants	Confidential	N/A	0.1-1%	

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Ingestion: Harmful if swallowed.
Eye Contact: Mild eye irritant.
Inhalation: N/A
Skin: Mild skin irritant.

Signs and Symptoms of Exposure:

Ingestion: Oral ingestion may result in transient nervous system effects (ataxia and muscle weakness) and/or gastrointestinal irritation with nausea, vomiting, or diarrhea. This product contains alcohol ethoxylates. Large ingestions (>2 ml/kg) may also cause symptoms of alcohol-like intoxication, incoordination, drowsiness, inarticulateness or ataxia. Alcohol ethoxylates may contribute to central nervous system symptoms.

Eye Contact: Instillation into the eye may result in transient superficial effects similar to those produced by mild toilet soaps and detergents.

Skin: Use on irritated or extremely dry skin may aggravate the existing condition.

Inhalation: N/A

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SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Ingestion:	Dilute with fluids and call a physician.
Eye Contact:	Flush thoroughly with water.
Skin:	Wash exposed area with soap and water and discontinue use. Remove contaminated clothing.
Inhalation:	Remove to fresh air.

Other: Consumer product package has a caution statement: WARNING: KEEP OUT OF REACH OF CHILDREN. HARMFUL IF SWALLOWED. EYE IRRITANT. If swallowed, drink a glassful of water and call a physician. In case of contact with eyes, rinse thoroughly with water.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): over 200 °F (cc) **Explosive Limits**: *LEL*: N/A *UEL*: N/A

Extinguishing Media: Use water, CO_2, dry chemical or "alcohol" foam.

Special Fire Fighting Procedures: Use water to keep fire exposed container cool.

Unusual Fire Hazards: None known.

Stability *Unstable*: *Conditions to Avoid*: None known

Stable: X

Incompatibility (Materials to Avoid): Ammonia and acids. Do not mix with toilet bowl cleaners, rust removers or household ammonia.

Hazardous Decomposition/By Products: None known

Hazardous Polymerization: *May Occur*: *Conditions to Avoid*: None known

Will Not Occur: X

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Do not landfill. Small (household) quantities may be disposed of via sewer with large quantities of water. Incineration is preferred where permitted.

Steps To Be Taken in Case Material is Released or Spilled: Use water spray to dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak. Absorb spilled product onto absorbent material.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing: Store in cool, dry, well ventilated area.

Other Precautions: None Known

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SECTION VIII - EXPOSURE CONTROLS; PERSONAL PROTECTION

Respiratory Protection (Specify Type): None required with normal use.
Ventilation *Local Exhaust*: None required with normal consumer use. *Special*: None
Mechanical (General): Acceptable. *Other*: None
Eye Protection: None required with normal consumer use.
Industrial Setting: For splash protection, use chemical goggles. Eye Wash fountain is desirable.
Protective Gloves: None required with normal use.
Other Protective Equipment: None required with normal use.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point °F: 200° F
Vapor Pressure (mm Hg): N/A
Vapor Density (Air=1): N/A
Odor Threshold: N/A
Coefficient of Water/Oil Distribution: N/A
Scooped Density: N/A
Appearance and Odor: Mr. Clean Springtime Fresh, Mr. Clean Springtime Fresh Antibacterial, and Mr. Clean Mountain Falls are blue liquids. Mr. Clean Lemon Fresh is a clear yellow liquid. All products are perfumed.
Specific Gravity (H_2O=1): 1.007-1.019 q/cc
Percent Volatile by Volume (%): N/A
Evaporation Rate (nBuOAc=1): Unknown
Freezing Point: N/A
pH (1% solution): 10.0
Solubility in Water: Completely
Reserve Alkalinity: N/A

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): > 5 ml/kg

SECTION XII - ECOLOGICAL INFORMATION

No concerns at relevant environmental concentrations.

KMB00003840

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Do not landfill. Small (household) quantities may be disposed of via sewer with large quantities of water. Incineration is preferred where permitted.
Industrial Setting: **Mr. Clean with Bleach** - EPA hazardous waste code D002.
DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

SECTION XIV - TRANSPORT INFORMATION

DOT Classification: Mr. Clean Liquid Cleaner is not DOT hazardous and is not regulated under the DOT Hazardous Materials Regulations, (49 CFR, parts 171-180), which govern the sale and transport of hazardous materials.

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

No components of Mr. Clean are subject to California Proposition 65.

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified with Hazard Criteria of the Canadian Control Products Regulation (CPR) and this MSDS contains all information required by the Canadian Products Regulation.

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

KMB00003841

Procter & Gamble
CPG TN 6
2 Procter & Gamble Plaza
Cincinnati, OH 45202

MATERIAL SAFETY DATA SHEET

Issue Date: 3/02
Supersedes: N/A Issue Date: N/A

SECTION I - CHEMICAL PRODUCT

Identity: **Liquid Disinfecting Bathroom Cleaner**

Brands: **Mr. CLEAN Toilet Bowl Cleaner/Restroom Disinfectant (Professional Line)**

Hazard Rating: 1

Health: 1	4=EXTREME
Flammability: 0	3=HIGH
Reactivity: 0	2= MODERATE
	1=SLIGHT

Emergency Telephone Number: - 1-800-332-7787 or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (dipropylene glycol butyl ether, citric acid), quality control agents, perfume, and water.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
None					

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Ingestion:	Mild mucous membrane irritant.
Eye Contact:	Mild eye irritant.
Inhalation:	Mild respiratory irritant.
Skin:	Mild skin irritant.

Signs and Symptoms of Exposure:

Ingestion:	Oral ingestion may result in gastrointestinal irritation with nausea, vomiting or diarrhea.
Eye Contact:	Instillation into the eye may result in transient mild to moderate irritation.
Skin:	Use on irritated or extremely dry skin may aggravate the existing condition
Inhalation:	May cause mild irritation

SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Ingestion:	Immediately drink two large glasses of water and treat symptomatically. If large amounts are ingested, call a physician. Product contains an alcohol ethoxylate.
Eye Contact:	Immediately flush with water large amounts of water for at least 5 minutes, lifting upper and lower lids occasionally.
Skin:	Thoroughly wash exposed area with soap and water and discontinue use. Remove contaminated clothing.
Inhalation:	Move to open area with plenty of flesh air.

Other: Product package has a caution statement: KEEP OUT OF REACH OF CHILDREN CAUTION: Causes eye irritation. May be harmful if swallowed. Do not mix with bleach or mildew stain removers, as irritating fumes may result.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): over 200°F (cc) **Explosive Limits**: *LEL*: N/A *UEL*: N/A

Extinguishing Media: CO_2, water, dry chemical or "alcohol" foam

Special Fire Fighting Procedures: Use water to keep fire exposed container cool.

Unusual Fire Hazards: None known.

Stability *Unstable*: *Conditions to Avoid*: None known

Stable: X

Incompatibility (Materials to Avoid): None.

Hazardous Decomposition/By Products: None.

Hazardous Polymerization: *May Occur*: *Conditions to Avoid*: None known

Will Not Occur: X

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Do not landfill. Small quantities may be disposed of via sewer.

Steps To Be Taken in Case Material is Released or Spilled: Use water spray to dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing: Handing and storage must be well ventilated, cool and dry. Materials must be isolated from potential sources of ignition. Fire fighting equipment must be available at all times.

Other Precautions: Keep away from heat/sparks and open flame.

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SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Respiratory Protection (Specify Type): None required with normal use.

Ventilation *Local Exhaust*: None required with normal use. *Special*: None

Mechanical (General): Acceptable. *Other*: None

Eye Protection: None required with normal use.

Industrial Setting: For splash protection, use chemical goggles. Eye wash fountain is desirable.

Protective Gloves: None required with normal use.

Other Protective Equipment: None required with normal use.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point °F: N/A	**Specific Gravity (H_2O=1)**: 1.038
Vapor Pressure (mm Hg): N/A	**Percent Volatile by Volume (%)**: N/A
Vapor Density (Air=1): N/A	**Evaporation Rate (nBuOAc=1)**: N/A
Odor Threshold: N/A	**Freezing Point:** N/A
Coefficient of Water/Oil Distribution: N/A	**pH (100 %):** ~3
Scooped Density: N/A	**Solubility in Water**: Completely
Appearance and Odor: Clear thick liquid. Lemon scented odor	**Reserve Alkalinity**: N/A

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): >= 5 ml/kg
ED50: 2 ml/kg

SECTION XII - ECOLOGICAL INFORMATION

None

KMB00003844

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: *Do not landfill. Small quantities may be disposed of via sewer.* DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

SECTION XIV - TRANSPORT INFORMATION

DOT Classification: The product, as sold, is classified as non-hazardous. Bulk product shipments are classified as a Class 9 Hazardous Substance with a shipping name of Environmentally hazardous substance, liquid n.o.s.

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory.

This product is an EPA registered pesticide EPA Reg. # 3573-53.

No components of Comet are subject to California Proposition 65.

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified with Hazard Criteria of the Canadian Control Products Regulation (CPR) and this MSDS contains all information required by the Canadian Products Regulation.

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

KMB00003845

Procter & Gamble
CPG TN 6
2 Procter & Gamble Plaza
Cincinnati, OH 45202

MATERIAL SAFETY DATA SHEET

Issue Date: 8/01
Supersedes: 3/00 Issue Date: N/A

SECTION I - CHEMICAL PRODUCT

Identity: **Disinfecting Liquid Hard Surface Cleaner**

Brands: **SPIC & SPAN Disinfecting All-Purpose Spray & Glass Cleaner Ready to Use (Professional Line)**

Hazard Rating: 2

Health: 1	4=EXTREME
Flammability: 2	3=HIGH
Reactivity: 0	2= MODERATE
	1=SLIGHT

Emergency Telephone Number - 1-800-332-7787 or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning agents (ethanol, butoxypropanol), quaternary, water, colorant and perfume.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
Ethyl alcohol	Ethanol	64-17-5	ACGIH TLV: 1000 mg/m^3	1-4%	
2-aminoethanol	Monoethanol-amine	141-43-5	ACGIH TLV: 3 ppm OSHA PEL: 3 mg/m^3 OSHA PEL: 6 ppm (15 min)	0.1-1%	

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Ingestion: May cause mucous membrane irritation. Possible mild gastrointestinal irritation with nausea, vomiting and/or diarrhea. Large ingestions may cause temporary dizziness, uncoordination and headache.

Eye Contact: May cause eye irritation. May result in transient, superficial effects similar to those produced by mild toilet soaps.

Skin: May cause skin irritation. Use on irritated or extremely dry skin may aggravate the existing condition.

Inhalation: May cause mucous membrane irritation.

SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Ingestion: Dilute with fluids and treat symptomatically. For large ingestions, call a physician.

Eye contact: Flush thoroughly with water for 15 minutes. Get medical attention if irritation persists.

Skin: Rinse exposed area with soap and water and discontinue use.

Inhalation: Get fresh air.

Other: Product package has a caution statement: KEEP OUT OF REACH OF CHILDREN. CAUTION: Causes eye irritation. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): 136°F (cc) **Explosive Limits**: *LEL:* N/A *UEL:* N/A

Extinguishing Media: CO_2, dry chemical, water, or "alcohol" foam.

Special Fire Fighting Procedures: Use water to keep fire exposed containers cool.

Unusual Fire Hazards: Combustible liquid. Product will produce a brief flash but will not support sustained combustion when in contact with open flame above the indicated flashpoint.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: N/A

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Small quantities may be slowly flushed down sewer with excess water or dispose as liquid scrap. Discard empty container in trash.

Steps To Be Taken in Case Material is Released or Spilled: Use water spray or dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing:. Handling and storage must be well ventilated, cool and dry. Materials must be isolated from potential sources of ignition. Fire fighting equipment must be available at all times.

Other Precautions: Keep away from sparks and open flame.

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Respiratory Protection (Specify Type): None required with normal use.
Ventilation General

Eye Protection: None required with normal use.
Industrial Setting: If splash of solution is likely, chemical goggles may be needed.
Protective Gloves: None required with normal use.
Industrial Setting: Minimize skin contact with protective gloves (rubber, neoprene).
Other Protective Equipment: None required with normal use.
Industrial Setting: Use ventilation to minimize exposure to vapor or mist (ethanol).

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point °F: 200°F	**Specific Gravity (H_2O=1)**: 0.99
Vapor Pressure (mm Hg): N/A	**Percent Volatile by Volume (%)**: ca. 95
Vapor Density (Air=1): N/A	**Evaporation Rate (nBuOAc=1)**: N/K
Odor Threshold: N/A	**Freezing Point:** N/A
Coefficient of Water/Oil Distribution: N/A	**pH (100% solution):** 10.7
Scooped Density: N/A	**Solubility in Water**: Completely
Appearance and Odor: Light blue liquid, solvent odor	**Reserve Alkalinity:** N/A

KMB00003847

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions/By Products: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

Stability Stable

Hazardous Polymerization: Will not occur

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): >20 g/kg

SECTION XII - ECOLOGICAL INFORMATION

No concerns at relevant environmental concentrations.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Slowly flush down sewer with excess water or dispose as liquid scrap. . DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. Discard empty container in trash.

SECTION XIV - TRANSPORT INFORMATION

DOT Classification: Combustible liquid not regulated in packaging of less than 119 gallons. When shipped in bulk, classified as compounds, cleaning liquid Class 3 (NA 1993)

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

No components of Spic & Span Disinfecting All-Purpose Spray & Glass Cleaner RTU are subject to California Proposition 65.

EPA Reg. No. 6836-245-3573

KMB00003848

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

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KMB00003849

The Procter & Gamble Company
P&G Household Care
Fabric & Home Care Innovation Center
5299 Spring Grove Avenue
Cincinnati, OH 45217-1087

MATERIAL SAFETY DATA SHEET

MSDS #: N/A
Supersedes: N/A

Issue Date: 3/20/06
Issue Date: 6/01

SECTION I - CHEMICAL PRODUCT

Identity: **Disinfectant Powder Cleanser** **Finished Product**

Brands: **COMET Disinfectant Cleanser with Chlorinol (Professional Line)**

P&G Telephone Number: 1-800-332-7787or call Local Poison Control Center or your physician.

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Bleach, cleaning agents (calcium carbonate, sodium carbonate, anionic surfactants), quality control agents, perfume, color. Comet Disinfectant Cleanser with Chlorinol contains no phosphorus.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200. and/or WHMIS under the HPA:

Chemical Name	Common Name	CAS No.	Composition Range	LD50/LC50
Calcium carbonate	Limestone	1317-65-3	60-88%	NA/NA

SECTION III - HAZARDS IDENTIFICATION

Potential Health Hazards (Acute and Chronic): (See Section 11 for more information)

Ingestion: Mild mucous membrane irritant. May result in gastrointestinal irritation with nausea, vomiting and diarrhea.

Eye Contact: Mild eye irritant. Direct contact with eye may result in superficial, temporary irritation similar to those produced by other household detergents.

Skin: Mild skin irritant. Prolonged skin contact or direct contact with eye may result in superficial, temporary irritation similar to those produced by other household detergents.

Inhalation: Mild respiratory irritant. Unusually high exposures may cause coughing or irritation of nose and throat.

Signs and Symptoms of Exposure:

Ingestion: Ingestion of larger amounts leads to emesis.

Eye Contact: Stinging and burning of eyes can occur unless flushed immediately with water.

Skin Contact: Mild irritation is possible with prolonged contact.

Inhalation: Dust irritation is possible.

Medical Conditions Generally Known to be Aggravated by Exposure: None known.

Potential Environmental Effects: (See Section 12 for more information)

SECTION IV - FIRST AID INFORMATION

First Aid Procedures:

Ingestion: Dilute with fluids and treat symptomatically.
Eye Contact: For accidental eye contact, flush thoroughly with water for 15 minutes.
Skin: Wash with soap and water and discontinue use.

Inhalation: For accidental, high level inhalation, remove to fresh air. Get medical attention if coughing persists.

Note to Physician: (if applicable)

Other: Product package has a caution statement: CAUTION: KEEP OUT OF REACH OF CHILDREN. May cause eye irritation. In case of eye contact, flush thoroughly with water. If irritation persists, see a physician. If swallowed, drink a glass of water to dilute. Do not mix with other products especially toilet bowl cleansers and products that contain ammonia.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): N/A

Flammable Properties:

Upper Flammable Limit:

Lower Flammable Limit:

Explosive Limits: UEL: N/A LEL: N/A

Auto-ignition Temperature:

Hazardous Combustion Products:

Explosion Data (Sensitivity to Mechanical Impact):

Explosion Data (Sensitivity to Static Discharge):

Extinguishing Media:

Suitable: Use CO_2, water, or dry chemical.

Unsuitable: None known.

Protection of Firefighters:

Specific Hazards Arising from the Material: None known.

Protective Equipment and Precautions for Firefighters: Normal firefighting gear.

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SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: Recommendation is to wear gloves for handling/cleanup, and dust masks if considerable dust is airborne.

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Product contains biodegradable surfactant. If permitted, flush small quantities down sewer drain with large excess of water or dispose of at landfill.

Methods for Containment:

Methods for Cleanup: Vacuum to remove spill and place in trash container for disposal or flush with water. Do not dry sweep.

Other Information: (if applicable)

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling: Keep product dry.

Precautions To B e Taken in Storage: Avoid moisture when storing to prevent loss of bleaching action and to prevent caking.

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Guidelines: N/A

Engineering Controls: N/A

Personal Protective Equipment (PPE):

Eye/Face Protection: None required with normal use. For splash protection, use chemical goggles.

Skin Protection: Protective gloves (rubber, neoprene) should be used for prolonged direct contact.

Respiratory Protection: None required with normal use. For bulk handling or other dusty conditions, use respiratory protection approved by NIOSH for dust.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (color, physical form, shape): Green powder.	**Flash Point (Method Used):** N/A
Odor: Cedar pine scent.	**Reserve Alkalinity:** N/A
Odor Threshold:	**Solubility in Water:** Moderately
Physical State: Powder	**Decomposition Temperature:** N/A
Vapor Pressure (mm Hg): N/A	**Evaporation Rate (nBuOAc=1):** N/A
Vapor Density (Air=1): N/A	**Specific Gravity/Density:** ca. 1
Boiling Point: N/A	**Melting/Freezing Point:** N/A
Partition Coefficient (n-octanol/water): N/A	**pH (specify % solution):** N/A

SECTION X - STABILITY AND REACTIVITY

Chemical Stability: Stable

Conditions to Avoid: None known.

Incompatible Materials: Ammonia and acids

Hazardous Decomposition Products: Chlorine gas

Possibility of Hazardous Reactions: None known.

KMB00003852

SECTION XI - TOXICOLOGICAL INFORMATION

Calcium carbonate, an ingredient of this product, contains small amounts of crystalline silica (quartz) as a naturally occurring impurity. Prolonged, excessively high exposures to respirable crystalline silica may result in reduced lung function in some individuals. IARC has found sufficient evidence to classify crystalline silica as a carcinogen in animals, but there is limited evidence in humans.

LD50 (rats oral): 9 g/kg
ED50: 0.23 g/kg
Product as a whole:
CARCINOGENICITY: None known
SENSITIZATION EFFECTS: None known
REPRODUCTIVE EFFECTS: None known
SYNERGISTIC EFFECTS: None known

SECTION XII - ECOLOGICAL INFORMATION

No concerns at relevant environmental levels.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS. Product contains biodegradable surfactant. If permitted, flush small quantities down sewer drain with large excess of water or dispose of at landfill.
Household Use: Household quantities may be disposed of via sewer.
Industrial Setting: Dry product can be lanfilled if local restrictions allow.

SECTION XIV - TRANSPORT INFORMATION

Ground Transport (DOT): The finished packaged product is non hazardous under DOT.
Air Transport (IATA): The finished packaged product is not regulated for IATA.
Marine/Water Transport (IMDG): The finished packaged product is not regulated for IMDG.

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All intentionally-added components of this product are listed on the US TSCA Inventory.

This product is not subject to warning labeling under California Proposition 65.

All ingredients are CEPA approved for import to Canada by Procter & Gamble.

This product has been classified in accordance with the hazard criteria of the Canadian *Controlled Products Regulations* and the MSDS contains all information required by the *Controlled Products Regulations.*

KMB00003853

SECTION XVI - OTHER INFORMATION

P&G Hazard Rating:	Health: 1	4=EXTREME
	Flammability: 0	3=HIGH
	Reactivity: 0	2=MODERATE
		1=SLIGHT
		0=NOT SIGNIFICANT

*N/A. - Not Applicable *N/K. - Not Known

Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

KMB00003854

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1- PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-3; Flammability-0; Reactivity-1; Special-0	HMIS Rating: Health-3; Flammability-0; Reactivity- 1; Personal Protection- 0
Manufactured By: MISSION LABORATORIES Address: 2433 BIRKDALE STREET LOS ANGELES, CA 90031	DOT Hazard Classification: CORROSIVE 8, 6.1, UN2817, PG II Identity (trade name as used on label): **AMAZING TRR NON-ACID TOILET RING REMOVER**
Date Prepared: 07/10/07 Prepared By: DS	MSDS Number: F1456 Revision-
Information Calls: (323) 223-1405 EMERGENCY RESPONSE NUMBER: (800) 636-6053	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
AMMONIUM HYDROGEN FLUORIDE	1341-49-7	N/E	2.5 mg/m3	N/E	N/E
NONYLPHENOL ETHOXYLATE	9016-45-9	N/E	N/E	N/E	N/E
ISOPROPYL ALCOHOL	63-67-0	N/E	400 PPM	400 PPM	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212 F	Specific Gravity : 1.128
Vapor Pressure: N/E Max.	pH of product: 4.0 +/- 0.5
Vapor Density >1.00	Evaporation Rate <1.00
Solubility in Water: Soluble	VOLATILE ORGANIC CONTENT (VOC's): <1 by weight
Appearance and Odor: CLEAR THIN LIQUID WITH A SLIGHT ALCOHOL SMELL	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST NON FLAMMABLE	Auto Ignition Temperature N/E	Flammability Limits in Air by % in Volume: N/A
FLASH POINT AND METHOD USED (non-aerosols): >200 F (TCC) SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus.	EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.	
Unusual Fire & Explosion Hazards: This product emits Toxic Fumes.		

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE	HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): VERY STRONG OXIDIZING AGENTS	Conditions to Avoid: KEEP AWAY FROM HEAT OR OPEN FLAME.
Hazardous Decomposition Products: Decomposition of this product will emit Toxic Fumes.	

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS : None Known.

Inhalation: Prolonged exposure to vapors may cause signs & symptoms of Central Nervous System Depression such as Headache, Dizziness, Weakness and Loss of Coordination. Vapor/Mist may result in irritation to the entire Respiratory Tract.

Eye Contact: Contact with eyes may result in severe eye irritation and possible damage of the Corneal. Redness and Tearing.	Skin Contact: Prolonged or Repeated skin contact may result in skin irritation leading to Dermatitis. Defatting of skin may also occur.

Ingestion: Ingestion of this product may result in Gastrointestinal Irritation, Headache, Nausea, Vomiting and Diarrhea.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7- EMERGENCY FIRST AID PROCEDURES

Eye Contact: Remove contact lenses immediately. Flush eyes with plenty of water for at least 15 minutes. Get immediately medical attention.

Skin Contact: Wash skin with plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if needed.

Inhalation: Remove to Fresh Air. Give Oxygen or CPR. Get immediately medical attention.

Ingestion: Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Get immediately medical attention.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): NONE NEEDED WITH GOOD VENTILATION.

Protective Gloves: Neoprene or Rubber Gloves.	Eye Protection: SAFETY GLASSES OR MONOGOGGLES.

Ventilation Requirements: GOOD VENTILATION SHOULD BE MAINTAINED.

Other Protective Clothing & Equipment: None if used as directed.

Hygienic Work Practices: Do not mix this product with other chemicals.

SECTION 9 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken if Material is Spilled Or Released: KEEP UNNECESSARY PEOPLE AWAY. SPILLS ARE SLIPPERY. DIKE & CONTAIN WITH INERT ABSORBENT MATERIAL. COLLECT FOR DISPOSAL.

Waste Disposal Methods: CONSULT LOCAL AUTHORITY FOR ALTERNATE METHODS. OBSERVE ALL LOCAL, STATE & FEDERAL REGULATIONS.

Precautions To Be Taken in Handling & Storage: STORE IN A COOL WELL VENTILATED AREA AWAY FROM SPARK, HEAT AND OPEN FLAME.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1- PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-2; Flammability-0; Reactivity-0; Special-0	HMIS Rating: Health-2; Flammability-0; Reactivity-0; Personal Protection- 0
MANUFACTURED BY : MISSION LABORATORIES Address: 2433 BIRKDALE STREET LOS ANGELES, CA 90031	DOT Hazard Classification: NON HAZARDOUS Identity (trade name as used on label): NEUTRAL SANISOL CLEANER / DISINFECTANT/VIRUCIDE EPA REG. NO. 1839-168-6269
Date Prepared: 07/10/07 Prepared By: DS	MSDS Number: F3201 Revision-
Information Calls: (323) 223-1405 EMERGENCY RESPONSE NUMBER: (800) 535-5053	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	SARA III-LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
N-ALKYL (C14-50%, C12-40%,C16-10%) DIMETHYL BENZYL AMMONIUM CHLORIDE	1.00-5.00	139-08-2	N/E	N/E	N/E	N/E
OCTYL DECYL DIMETHYL AMMONIUM CHLORIDE	1.00-5.00	N/A	N/E	N/E	N/E	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212 F	Specific Gravity : 0.998
Vapor Pressure: N/A Max.	pH of Product : 7.0 +/- 0.5
Vapor Density N/A	Evaporation Rate: N/A
Solubility in Water: Soluble	Volatile Organic Content (VOC's) : 2 % BY WEIGHT
Appearance and Odor: CLEAR YELLOW LIQUID WITH A LEMON FRAGRANCE	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST NON FLAMMABLE	Auto Ignition Temperature N/E	Flammability Limits in Air by % in Volume: NA
FLASH POINT AND METHOD USED (non-aerosols): N/E SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus.	EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.	
Unusual Fire & Explosion Hazards: TOXIC FUMES MAY BE EMITTED IF MATERIAL IS EXPOSED TO EXTREME TEMPERATURES.		

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE	HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): VERY STRONG OXIDIZING AGENTS	Conditions to Avoid: KEEP AWAY FROM HEAT OR OPEN FLAME.
Hazardous Decomposition Products: Smoke, Carbon Monoxide, Carbon Dioxide and other Toxic Fumes.	

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS : None Known.

Inhalation: Prolonged exposure to vapors may cause signs & symptoms of Central Nervous System Depression such as Headache, Dizziness, Weakness and Loss of Coordination. Vapor/Mist may result in irritation to the entire Respiratory Tract.

Eye Contact: Contact with eyes may result in severe eye irritation and possible damage of the Corneal. Redness and Tearing.	Skin Contact: Prolonged or Repeated skin contact may result in skin irritation leading to Dermatitis. Defatting of skin may also occur.

Ingestion: Ingestion of this product may result in Gastrointestinal Irritation, Headache, Nausea, Vomiting and Diarrhea.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7- EMERGENCY FIRST AID PROCEDURES

Eye Contact: Remove contact lenses immediately. Flush eyes with plenty of water for at least 15 minutes. Get immediately medical attention.

Skin Contact: Wash skin with plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if needed.

Inhalation: Remove to Fresh Air. Give Oxygen or CPR. Get immediately medical attention.

Ingestion:. Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Get immediately medical attention.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): None needed if used as directed.

Protective Gloves: Neoprene or Rubber Gloves.	Eye Protection: SAFETY GLASSES OR MONOGOGGLES.

Ventilation Requirements: GOOD VENTILATION SHOULD BE MAINTAINED.

Other Protective Clothing & Equipment: NONE

Hygienic Work Practices: Do not mix this product with other chemicals. Toxic Fumes may be emitted.

SECTION 9 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken If Material Is Spilled Or Released: KEEP UNNECESSARY PEOPLE AWAY. SPILLS ARE SLIPPERY. DIKE & CONTAIN WITH INERT ABSORBENT MATERIAL. COLLECT FOR DISPOSAL.

Waste Disposal Methods: CONSULT LOCAL AUTHORITY FOR ALTERNATE METHODS. OBSERVE ALL LOCAL, STATE & FEDERAL REGULATIONS.

Precautions To Be Taken in Handling & Storage: STORE IN A COOL WELL VENTILATED AREA AWAY FROM SPARK, HEAT AND OPEN FLAME.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1- PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-2; Flammability-1; Reactivity-0; Special-0	HMIS Rating: Health- 2; Flammability-1; Reactivity-0; Personal Protection- 0
MANUFACTURED BY: MISSION LABORATORIES Address: 2433 BIRKDALE STREET LOS ANGELES, CA 90031	DOT Hazard Classification: NON HAZARDOUS Identity (trade name as used on label): SUNSHINE 5O:1 NON-AMMONIATED GLASS CLEANER CONCENTRATE
Date Prepared: 07/10/07 Prepared By: DS	MSDS Number: F1911 Revision-
Information Calls: (323) 223-1405 EMERGENCY RESPONSE NUMBER: (800) 535-5053	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
2-BUTOXYETHANOL	20 - 30	111-76-2	313	25	25	N/E
ISOPROPANOL	10 - 25	67-63-0	N/E	400	400	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212	Specific Gravity : 0.848
Vapor Pressure: N/E Max.	pH of Product : 11-11.4
Vapor Density >1	Evaporation Rate: <1
Solubility in Water: Soluble	V.O.C. : 500 g/L or 47% by weight
Appearance and Odor: CLEAR THIN DARK BLUE LIQUID W/ A PLEASANT SMELL	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST NON FLAMMABLE	Auto Ignition Temperature N/E	Flammability Limits in Air by % in Volume: LOWER : 2.0 UPPER : 12.7
FLASH POINT AND METHOD USED (non-aerosols): 120°F (TCC) SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus.	EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.	
Unusual Fire & Explosion Hazards: TOXIC FUMES MAY BE EMITTED IF MATERIAL IS EXPOSED TO EXTREME TEMPERATURES.		

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE	HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): VERY STRONG OXIDIZING AGENTS	Conditions to Avoid: KEEP AWAY FROM HEAT OR OPEN FLAME.
Hazardous Decomposition Products: Smoke, Carbon Monoxide, Carbon Dioxide and other Toxic Fumes.	

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS : None Known.

Inhalation: Prolonged exposure to vapors may cause signs & symptoms of Central Nervous System Depression such as Headache, Dizziness, Weakness and Loss of Coordination. Vapor/Mist may result in irritation to the entire Respiratory Tract.

Eye Contact: Contact with eyes may result in eye irritation. Redness and Tearing.	Skin Contact: Prolonged or Repeated skin contact may result in skin irritation

Ingestion: Ingestion of this product may result in Gastrointestinal Irritation, Headache, Nausea, Vomiting and Diarrhea.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7- EMERGENCY FIRST AID PROCEDURES

Eye Contact: Remove contact lenses immediately. Flush eyes with plenty of water for at least 15 minutes. Get medical attention if needed.

Skin Contact: Wash skin with plenty of water. Remove contaminated clothing and wash before reuse.

Inhalation: Remove to Fresh Air. Give Oxygen or CPR. Get immediate medical attention.

Ingestion:. Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Get immediate medical attention.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): None Needed.

Protective Gloves: Neoprene or Rubber Gloves.	Eye Protection: None Needed.

Ventilation Requirements: GOOD VENTILATION SHOULD BE MAINTAINED.

Other Protective Clothing & Equipment: NONE

Hygienic Work Practices: Do not mix this product with other chemicals. Toxic Fumes may be emitted.

SECTION 8 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken If Material Is Spilled Or Released: KEEP UNNECESSARY PEOPLE AWAY. SPILLS ARE SLIPPERY. DIKE & CONTAIN WITH INERT ABSORBENT MATERIAL. COLLECT FOR DISPOSAL.

Waste Disposal Methods: CONSULT LOCAL AUTHORITY FOR ALTERNATE METHODS. OBSERVE ALL LOCAL, STATE & FEDERAL REGULATIONS.

Precautions To Be Taken In Handling & Storage: STORE IN A COOL WELL VENTILATED AREA AWAY FROM SPARK, HEAT AND OPEN FLAME.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1 – PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-2; Flammability-0; Reactivity-0; Special-0

HMIS Rating: Health-2; Flammability-0; Reactivity-0; Personal Protection- 0

MANUFACTURED BY: **MISSION LABORATORIES**
Address: 2433 BIRKDALE STREET
LOS ANGELES, CA 90031

DOT Hazard Classification: NON-HAZARDOUS
IDENTITY (trade name as used on label):
SANISOL CLEANER DISINFECTANT ODOR NEUTRALIZER (EPA REG. NO. 6269-6)

Date Prepared: 07/12/07 Prepared By: DS

MSDS Number: F3200 Revision-

Information Calls: (323) 223-1405
EMERGENCY RESPONSE NUMBER: (800) 535-5053

NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
N-ALKYL (C14-50%, C12-40%,C16-10%) DIMETHYL BENZYL AMMONIUM CHLORIDE	1 – 3 %	139-08-2	N/E	N/E	N/E	N/E
OCTYL DECYL DIMETHYL AMMONIUM CHLORIDE	1 – 3 %	N/A	N/E	N/E	N/E	N/E
SODIUM METASILICATE	<5.00	6834-92-0	N/E	N/E	N/E	N/E
DIOCTYL DIMETHYL AMMONIUM CHLORIDE	<5.00	N/A	N/E	N/E	N/E	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212 F
Specific Gravity : 0.998
Vapor Pressure: N/A Max.
pH of Product : 12.5 +/- 0.5
Vapor Density N/A
Evaporation Rate: N/A
Solubility in Water: Soluble
VOLATILE ORGANIC CONTENT (VOC's): 0
Appearance and Odor: CLEAR YELLOW LIQUID W/ LEMON FRAGRANCE

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST: NON FLAMMABLE
Auto Ignition Temperature: N/E
Flammability Limits in Air by % in Volume: LOWER : 0.00 UPPER : 0.00

FLASH POINT AND METHOD USED (non-aerosols): N/A
SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus.
EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.

Unusual Fire & Explosion Hazards: TOXIC FUMES MAY BE EMITTED IF MATERIAL IS EXPOSED TO EXTREME TEMPERATURES.

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE
HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR

Incompatibility (Mat. to avoid): VERY STRONG OXIDIZING AGENTS
Conditions to Avoid: KEEP AWAY FROM HEAT OR OPEN FLAME.

Hazardous Decomposition Products: Smoke, Carbon Monoxide, Carbon Dioxide and other Toxic Fumes.

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS : None Known.

Inhalation: Prolonged exposure to vapors may cause signs & symptoms of Central Nervous System Depression such as Headache, Dizziness, Weakness and Loss of Coordination. Vapor/Mist may result in irritation to the entire Respiratory Tract.

Eye Contact: Contact with eyes may result in severe eye irritation and possible damage of the Corneal. Redness and Tearing.

Skin Contact: Prolonged or Repeated skin contact may result in skin irritation leading to Dermatitis. Defatting of skin may also occur.

Ingestion: Ingestion of this product may result in Gastrointestinal Irritation, Headache, Nausea, Vomiting and Diarrhea.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Remove contact lenses immediately. Flush eyes with plenty of water for at least 15 minutes. Get immediately medical attention.

Skin Contact: Wash skin with plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if needed.

Inhalation: Remove to Fresh Air. Give Oxygen or CPR. Get immediately medical attention.

Ingestion:. Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Get immediately medical attention.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): NONE NEEDED IF USED AS DIRECTED.

Protective Gloves: Neoprene or Rubber Gloves.

Eye Protection: SAFETY GLASSES OR MONOGOGGLES.

Ventilation Requirements: GOOD VENTILATION SHOULD BE MAINTAINED.

Other Protective Clothing & Equipment: NONE

Hygienic Work Practices: Do not mix this product with other chemicals. Toxic Fumes may be emitted.

SECTION 9 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken If Material Is Spilled Or Released: KEEP UNNECESSARY PEOPLE AWAY. SPILLS ARE SLIPPERY. DIKE & CONTAIN WITH INERT ABSORBENT MATERIAL. COLLECT FOR DISPOSAL.

Waste Disposal Methods: CONSULT LOCAL AUTHORITY FOR ALTERNATE METHODS. OBSERVE ALL LOCAL, STATE & FEDERAL REGULATIONS.

Precautions To Be Taken In Handling & Storage: STORE IN A COOL WELL VENTILATED AREA AWAY FROM SPARK, HEAT AND OPEN FLAME.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1- PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1 ; Flammability-0 ; Reactivity-0 ; Special-0	HMIS Rating: Health-1 Flammability-0 ; Reactivity-0 ; Personal Protection-0
MANUFACTURED BY: Mission Laboratories Address: 2433 Birkdale Street Los Angeles, CA 90031	DOT Hazard Classification: NON HAZARDOUS Identity (trade name as used on label): **RINSE FREE** **FLOOR CLEANER & BRIGHTENER**
Date Prepared: 07/06/07 Prepared By: DS	MSDS Number: F2130 Revision-
Information Calls: (323) 223-1405 EMERGENCY RESPONSE NUMBER: (800) 535-5053	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
ISOPROPYL ALCOHOL	1.00-500	67-63-0	312,311	400	500	N/E
NONYLPHENOL ETHOXYLATE	1.00-5.00	9016-45-9	N/E	N/E	N/E	N/E
FRAGRANCE	< 1.00	N/E	N/E	N/E	N/E	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212'F	Specific Gravity: 1.0012
Vapor Pressure: N/E Max.	pH : 7.0 +/- 0.5
Vapor Density N/E	Evaporation Rate: < 1
Solubility in Water: Soluble	VOLATILE ORGANIC CONTENT (VOC's) : 2.4% by weight
Appearance and Odor: Clear Thin Yellow Liquid with Lemon Fragrance.	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY	Auto Ignition Temperature	Flammability Limits in Air by % in Volume:
NON FLAMMABLE	N/E	N/E
FLASH POINT AND METHOD USED (non-aerosols): >200 F (TCC) SPECIAL FIRE FIGHTING PROCEDURES: Wear self contained breathing apparatus.	EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.	
Unusual Fire & Explosion Hazards: Toxic Fumes of Carbon Oxide may evolve with high temperature.		

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE	HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): Contamination by other chemicals	Conditions to Avoid: Excessive Heat.
Hazardous Decomposition Products: Carbon Monoxide, Nitrogen Oxide and Sulfur Oxides.	

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

Inhalation: Excessive inhalation of vapors/mist can cause headache, nausea and irritation of the nose, throat and lungs.

ACUTE EFFECTS

Eye Contact: May cause stinging, pain and irritation.	Skin Contact: Prolonged or repeated skin contact may cause skin irritation.

Ingestion: May cause abdominal discomfort or pain, dizziness malaise and central nervous system depression, possible kidney injury if swallowed large quantities of this product.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7- EMERGENCY FIRST AID PROCEDURES

Eye Contact: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN IMMEDIATELY. CONTACT LENS MUST BE REMOVED.

Skin Contact: WASH THOROUGHLY WITH PLENTY OF SOAP & WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE.

Inhalation: IF BREATHING BECOMES DIFFICULT, REMOVE TO FRESH AIR. GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion: Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Give two glasses of water. Call a physician immediately.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): None required.

Protective Gloves: Rubber or Neoprene.	Eye Protection: Safety goggles.

Ventilation Requirements: Mechanical ventilation recommended for area being applied.

Other Protective Clothing & Equipment: None if used as directed.

Hygienic Work Practices: Prepare surface properly before use. Do not mix with any other chemicals.

SECTION 9 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken If Material Is Spilled Or Released: Spills are very slippery. Dike and contain with Absorbent Material. Collect for disposal.

Waste Disposal Methods: Incinerate at approved waste facility in accordance with The Federal, State and Local Regulations.

Precautions To Be Taken In Handling & Storage: Store in a cool, dry, well ventilated area away from Heating or Freezing.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

SECTION 1- PRODUCT AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-2; Flammability-1; Reactivity-0; Special-0	HMIS Rating: Health-2; Flammability-1; Reactivity- 0 Personal Protection- 0
Manufactured By : MISSION LABORATORIES Address 2433 BIRKDALE STREET LOS ANGELES, CA 90031	DOT Hazard Classification: NON HAZARDOUS Identity (trade name as used on label): KLEENOL 30
Date Prepared: 07/09/07 Prepared By: DS	MSDS Number: F1180 Revision-
Information Calls: (323) 223-1405 EMERGENCY RESPONSE NUMBER: (800) 535-5053	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 2 – HAZARDOUS MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
NONYL PHENOL ETHOXYLATE	1.0 – 5	9016-45-9	N/E	N/E	N/E	N/E
DODECYL BENZENE SULFONIC ACID	1.0 – 5	5155-30-0	N/E	N/E	N/E	N/E
SILICIC ACID, DISODIUM SALT	1.0 - 5	6834-92-0	N/E	2MG/M3	2MG/M3	N/E
2-BUTOXYETHANOL	10.0 - 15	111-76-2	313	25 SKIN	20 SKIN	N/E

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >212 F	Specific Gravity : 1.005
Vapor Pressure: N/E Mm.	pH of Product : 12.5 +/- 0.5
Vapor Density >1.00	Evaporation Rate <1.00
Solubility in Water: complete	Volatile Organic Content (VOC) : 12.6% by weight
Appearance and Odor: THIN YELLOW LIQUID WITH SLIGHT SOLVENT ODOR	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST NON FLAMMABLE	Auto Ignition Temperature N/E	Flammability Limits in Air by % in Volume: N/A
FLASH POINT AND METHOD USED (non-aerosols): > 150 F SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus.	EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide, water.	
Unusual Fire & Explosion Hazards: TOXIC FUMES MAY BE EMITTED IF MATERIAL IS EXPOSED TO EXTREME TEMPERATURES.		

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ] UNSTABLE	HAZARDOUS POLYMERIZATION [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): VERY STRONG OXIDIZING AGENTS	Conditions to Avoid: KEEP AWAY FROM HEAT OR OPEN FLAME.,
Hazardous Decomposition Products: Smoke, Carbon Monoxide, Carbon Dioxide and other Toxic Fumes.	

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS: None Known.

Inhalation: Prolonged exposure to vapors may cause signs & symptoms of Central Nervous System Depression such as Headache, Dizziness, Weakness and Loss of Coordination. Vapor/Mist may result in Irritation to the entire Respiratory Tract.

Eye Contact: Contact with eyes may result in severe eye irritation and possible damage of the Corneal. Redness and Tearing.	Skin Contact: Prolonged or Repeated skin contact may result in skin irritation leading to Dermatitis. Defatting of skin may also occur. (THERE IS A POTENTIAL DERMAL ABSORPTION OF THE MATERIAL.)

Ingestion: Ingestion of this product may result in Gastrointestinal Irritation, Headache, Nausea, Vomiting and Diarrhea.

CHRONIC EFFECTS: None Known.

Medical Conditions Generally Aggravated by Exposure: None Known.

SECTION 7- EMERGENCY FIRST AID PROCEDURES

Eye Contact: Remove contact lenses immediately. Flush eyes with plenty of water for at least 15 minutes. Get immediately medical attention.

Skin Contact: Wash skin with plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if needed.

Inhalation: Remove to Fresh Air. Give Oxygen or CPR. Get immediately medical attention.

Ingestion: Do not give anything by mouth to an unconscious or convulsing person. Do not induce vomiting. Get immediately medical attention.

SECTION 8 – PERSONAL PROTECTION

Respiratory Protection (specify type): none needed if used as directed.

Protective Gloves: Neoprene or Rubber Gloves.	Eye Protection: SAFETY GLASSES OR MONOGOGGLES.

Ventilation Requirements: GOOD VENTILATION SHOULD BE MAINTAINED.

Other Protective Clothing & Equipment: NONE

Hygienic Work Practices: Do not mix this product with other chemicals. Toxic Fumes may be emitted.

SECTION 9 – ACCIDENTAL RELEASE PROCEDURES

Steps To Be Taken If Material is Spilled Or Released: KEEP UNNECESSARY PEOPLE AWAY. SPILLS ARE SLIPPERY. DIKE & CONTAIN WITH INERT ABSORBENT MATERIAL. COLLECT FOR DISPOSAL.

Waste Disposal Methods: CONSULT LOCAL AUTHORITY FOR ALTERNATE METHODS. OBSERVE ALL LOCAL, STATE & FEDERAL REGULATIONS.

Precautions To Be Taken in Handling & Storage: STORE IN A COOL, WELL VENTILATED AREA AWAY FROM SPARK, HEAT AND OPEN FLAME.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

*Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

Ellis, Gene

From: Kinder Morgan Event Notification [STARSAdministrator@kindermorgan.com]
Sent: Tuesday, April 22, 2008 11:50 AM
To: Seaman, Brian; Pitta, Michael; Harker, Justin; STARS Administrator; Ellis, Gene; McMullin, Brent
Cc: STARS Administrator
Subject: New Regulatory Agency Inspection Event # 200804223709

A New Regulatory Agency Inspection Event has been added as follows:

Occurrence #: 200804223706
Event #: 200804223709
Event Date: 4/21/2008
Incident Location: PBT56427
Near Miss:
Description of Incident: Annual stormwater inspection at PBT-5

Created By: BRENT MCMULLIN
http://lkwincident/STARSWEB/EnhancedLogin.asp?ClientID=PROD

Do not reply to this e-mail.

Ellis, Gene

From: Kinder Morgan Event Notification [STARSAdministrator@kindermorgan.com]
Sent: Tuesday, April 22, 2008 8:05 AM
To: Walker, Bill; Seaman, Brian; Pitta, Michael; Harker, Justin; STARS Administrator; Ellis, Gene; McMullin, Brent
Cc: STARS Administrator
Subject: New Occurrence # 200804223692

A New Occurrence has been added as follows:

Occurrence #: 200804223692
Event Date: 4/17/2008
Incident Location: PBT56427
Near Miss: N
Description of Incident: Laborer was sitting on a catwalk with his legs extended over the torboard while restringing 3/4

Created By: BRENT MCMULLIN
http://lkwincident/STARSWEB/EnhancedLogin.asp?ClientID=PROD

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Ellis, Gene

From: Kinder Morgan Event Notification [STARSAdministrator@kindermorgan.com]
Sent: Tuesday, April 22, 2008 8:18 AM
To: Koch, Tia; Woods, Brenda; Cavitt, Ann; Franco, Christina; Seaman, Brian; Pitta, Michael; Harker, Justin; Ries, Mindy; STARS Administrator; Ellis, Gene; McMullin, Brent
Cc: STARS Administrator
Subject: New Injury/Illness - Kinder Morgan Laborer Event # 200804223693

A New Injury/Illness - Kinder Morgan Laborer Event has been added as follows:

Occurrence #: 200804223692
Event #: 200804223693
Event Date: 4/17/2008
Incident Location: PBT56427
Near Miss: N
Description of Incident: Laborer was sitting on a catwalk with his legs extended over the torboard while restringing 3/4
Name: Rutherford, Dale

Created By: BRENT MCMULLIN
http://lkwincident/STARSWEB/EnhancedLogin.asp?ClientID=PROD

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0001202

Reference 4

EPA910/R-98-006

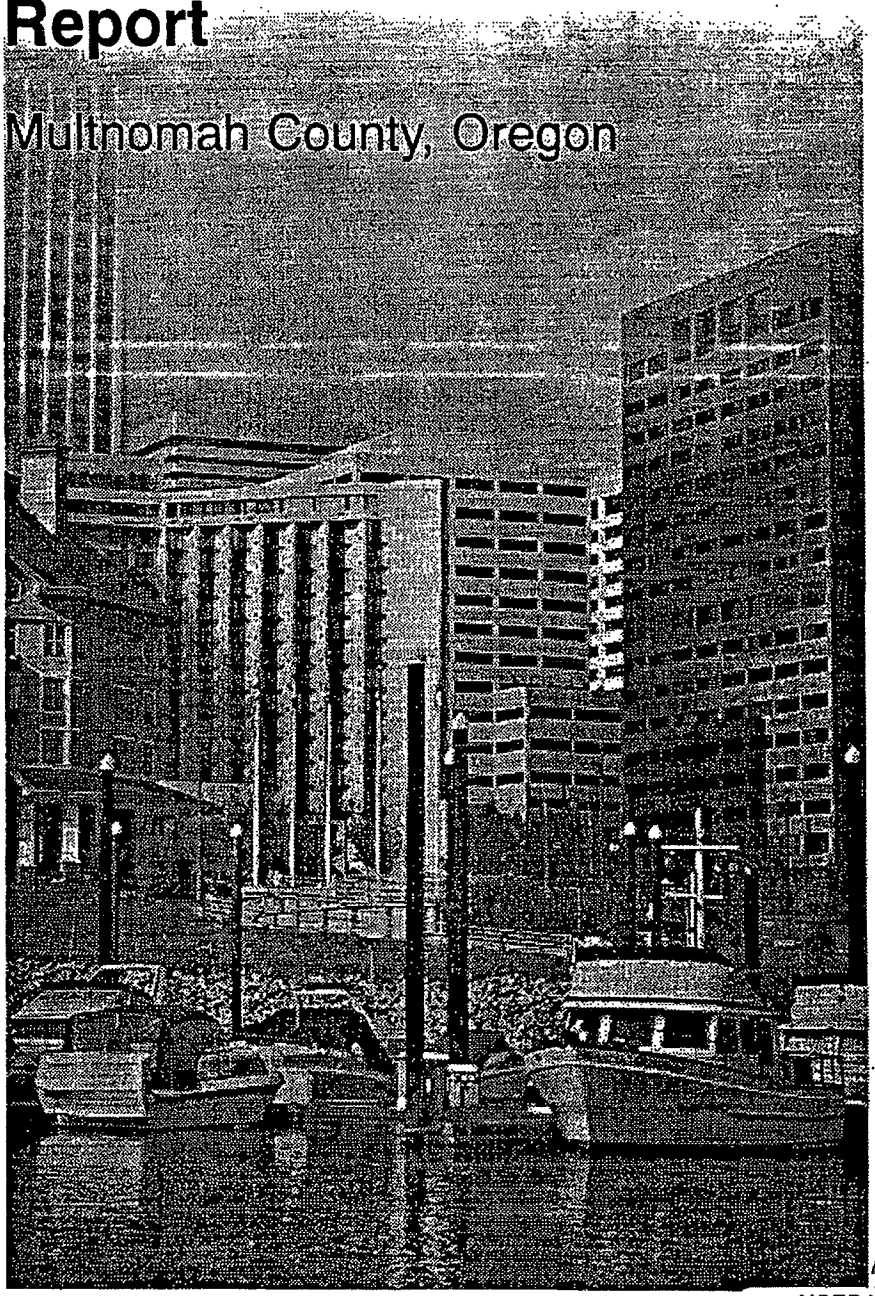
United States Environmental Protection Agency | Region 10 1200 Sixth Avenue Seattle WA 98101 | Alaska Idaho Oregon Washington

Office of Environmental Cleanup | May 1998

EPA

Portland Harbor Sediment Investigation Report

Multnomah County, Oregon



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WESTON MANAGERS ENGINEERS CONSULTANTS

Contract No. 68-W9-0046
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Work Order No. 04000-019-036-4100
Document Control No. 04000-019-036-AACE

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PORTLAND HARBOR SEDIMENT INVESTIGATION REPORT
MULTNOMAH COUNTY, OREGON

Prepared for
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Contract No. 68-W9-0046
Work Assignment No. 46-23-0JZZ
Work Order No. 04000-019-036-4100
Document Control No. 04000-019-036-AACE

May 1998

Prepared by
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Seattle, WA 98104-5057

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ARCS QUALITY ASSURANCE CONCURRENCE

Project Name:	Portland Harbor Sediment Investigation Multnomah County, Oregon
Contract Number:	68-W9-0046
Work Assignment Number:	46-23-0JZZ
Responsible Organization:	Roy F. Weston, Inc. 700 Fifth Avenue, Suite 5700 Seattle, Washington 98104

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SECTION 1

INTRODUCTION

Pursuant to United States Environmental Protection Agency (EPA) Contract No. 68-W9-0046, Multiple Site Inspections, and Work Plan Addendum (WPA; WESTON 1997c) to the Work Plan: Site Inspections—Multiple Sites (WESTON, 1993), Roy F. Weston, Inc. (WESTON®) conducted a Site Inspection (SI) of a six-mile reach of the Willamette River in Portland, Oregon (see Figure 1-1).

The EPA SI process is intended to evaluate actual or potential environmental hazards at a particular site relative to other sites across the nation for purposes of identifying remedial action priorities. The SI, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), is intended to collect sufficient data to enable evaluation of the site's potential for inclusion on the National Priorities List (NPL) and, for those sites determined to be NPL candidates, establish priorities for additional action. The decision as to whether the site is placed on the NPL list is made based on the EPA's revised Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat to human health and the environment associated with the actual or potential releases of hazardous substances at a site.

In addition, this SI was performed at the request of the Oregon Department of Environmental Quality (ODEQ) in an effort to aid their site assessment program.

This document presents a summary of the objectives, sampling activities, and results of the Willamette River SI. Included are site background information (Section 2), project description (Section 3), sampling and analytical results (Section 4), and references.

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SECTION 2

BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The Willamette River originates in the Cascade Mountain Range and flows approximately 187 miles north before discharging into the Columbia River. From this location, the Columbia River flows an additional 100 miles westward to the Pacific Ocean. The point of confluence of the Willamette and Columbia rivers denotes river mile 0 (RM 0). Most development along the Willamette River has occurred within the project area, referred to as the Portland Harbor. Portland Harbor has been dredged to provide a shipping channel generally 300 feet wide and 40 feet deep from the mouth of the Willamette River upriver to the Broadway Bridge (RM 11.8) (Caldwell and Doyle 1995). Channel depths currently range from 10 to 140 feet, with an average depth of 45 feet. In this reach, the river is deep, slow moving, and tidally influenced. During periods of medium and low flows, tidal effects are evident to RM 26.5 (Willamette Falls); reverse flow has been measured as far upstream as Ross Island (RM 15) during low flow periods.

Habitat in the Willamette River near Portland has been altered to accommodate urban development and a growing shipping industry. Shoreline features include steeply sloped banks covered with riprap or constructed bulkheads, with manmade structures such as piers and wharves extending out over the water. Because of dredging, many portions of the riverbed are steeply sloped and maintain substrates composed mainly of silts and sands (Farr and Ward 1991).

2.2 INDUSTRIAL OPERATIONS IN THE PROJECT AREA

Much of the upland areas adjacent to the Willamette River within Portland Harbor is heavily industrialized, and marine traffic within the river is considered to be intensive. Within the 6-mile project area, a number of industrial operations have been identified as potential sources of contamination to sediment in the Willamette River. Historical or current industrial operations include hazardous waste storage; marine construction; bulk petroleum product storage and handling; oil fire fighting training activities; oil gasification plant operations; wood-treating; agricultural chemical production; battery processing; liquid natural gas plant operations; chlorine production; ship loading and unloading; ship maintenance and repair (i.e., sandblasting, scaling, repair, painting, refueling); and rail car manufacturing.

2.3 INVESTIGATIVE AND REGULATORY HISTORY

Numerous past investigations within the Portland Harbor area have been conducted at varying levels of scope. A portion of the studies focused on specific properties, while the remaining

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studies were river-wide and incorporated sediment sampling as one component of the entire study. A summary of existing sediment chemical data is provided in the Executive Summary of Historical Sediment Data (WESTON 1997a). Past sediment studies have demonstrated the presence of polycyclic aromatic hydrocarbons (PAHs), pesticides, polychlorinatedbiphenyls (PCBs), dioxins, total inorganics, organotins, pentachlorophenol, and solvents in sediment. These contaminants may have entered the river via spillage during product shipping and handling, direct disposal or discharge, accidental spills, contaminated groundwater discharge, surface water runoff, stormwater discharge, or contaminated soil erosion. Of particular note, a recent sediment investigation conducted by the U.S. Army Corps of Engineers (COE 1998), which includes portions of the Willamette River within our study area, was released subsequent to the implementation of this study. Please refer to this document for further background information regarding sediment conditions associated with the Willamette River.

2.4 REGIONAL GEOLOGY

The following discussion of the regional geologic setting is summarized from several published reports on the geology of the area: Beeson et al. 1991, Madin 1990, Tolan and Beeson 1984, Allen 1975, and Waitt 1985.

The geology of the Portland area is characterized generally by a broad structural depression or basin bordered by the Cascade mountains on the east and the Coast Range mountains on the west. Geologic formations in the basin are also folded and dissected by a number of northwest-trending faults. The Tualatin mountains form a northwest-trending anticlinal ridge that is faulted along its eastern flank by the Portland Hills fault. The Willamette River flows along the base of the eastern side of the Tualatin Mountains. A number of additional faults are located approximately parallel or perpendicular to the Portland Hills fault and are mapped along or near the Tualatin mountains. An inferred graben is identified immediately southeast of the site (Beeson et al. 1991).

A description of the geologic formations of regional significance that may be present at or near the site is presented below (from oldest to youngest):

- **Columbia River Basalt Group**—The Portland basin is underlain by the Columbia River Basalt Group, which consists of flood basalt that erupted 17 to 6 million years ago. These Miocene-age flood basalts are characterized by a thick sequence of dense basalt flows that are separated by permeable interflow zones. These interflow zones are generally highly productive aquifers. This unit has been folded and faulted and forms the Tualatin Mountain uplands southwest of the site. The Columbia River Basalt Group dips steeply to the northeast near this area and is estimated to extend to a depth of 300 to 450 feet below (Madin 1990), with a thickness of more than 650 feet. Fluvial sediments of the Sandy River Mudstone and the Troutdale Formation overlie the Columbia River basalt flows.

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- **Sandy River Mudstone**—These deposits of Miocene to Pliocene age are friable to moderately indurated siltstone, sandstone, and claystone derived from an ancestral Columbia River that flowed into the Portland basin from the east. The deposits are found at thicknesses of up to 900 feet near Troutdale. However, outcrops of Sandy River Mudstone are not found near the Tualatin Mountains; the unit may pinch out or may have been scoured out in this part of the basin. The Sandy River Mudstone is overlain by the Troutdale Formation.

- **Troutdale Formation**—The Troutdale Formation is of Miocene to Pliocene age and, in this area, consists of interbedded conglomerates and finer-grained deposits (Beeson et al. 1991). The Troutdale Formation is characterized by pebbly to cobbly conglomerates consisting primarily of Columbia River basalt clasts with foreign clasts of volcanic, platonic, and metamorphic rocks, and interbeds of micaceous arkosic and vitric sandstone (Tolan and Beeson 1984; Beeson et al. 1991). East of the Willamette River, outcrops of the Troutdale Formation are composed of locally derived pebbly to cobbly vitric sandstone with basalt clasts from Boring and Cascade lavas (Tolan and Beeson 1984). Major regional aquifers are established in the Troutdale Formation in much of the east Portland area. The thickness of the Troutdale Formation ranges from 900 feet near Troutdale to 200 to 300 feet in the western parts of the basin near the Tualatin Mountains (Beeson et al. 1991).

- **Boring Formation**—During Pliocene-Pleistocene time, volcanic lavas were erupted from approximately 90 vents throughout the Portland and Vancouver area. Where present, these volcanic deposits overlie the Troutdale Formation (Allen 1975). Boring lava thicknesses are greatest near source vents; however, thicknesses rapidly decrease and pinch out away from source vent areas.

- **Catastrophic Flood Deposits**—During the Pleistocene time, thick deposits of boulders, gravels, sands, and silts accumulated throughout the Portland basin, as a result of the repeated failures of glacial ice dams that impounded glacial Lake Missoula (Waitt 1985). These catastrophic flood deposits form the terrace surfaces in the eastern Portland area and are composed of three different facies. Coarse-grained pebble to boulder gravels and sand make up the core of these terraces, with fine-grained sand and silt deposits mantling the coarser-grained facies. A finer-grained, interlayers silt, sand, and gravel facies is found adjacent to the Columbia and Willamette River channels. The coarse-grained facies reach maximum thicknesses of 100 to 130 feet. The channel facies typically range in thickness from 15 to 45 feet (Beeson et al. 1991).

- **Recent Alluvium**—Recent alluvium consists of Quaternary deposits or river sands, silts, and gravels deposited by the Willamette and Columbia rivers. These deposits are generally limited to the channel bottoms and floodplains of these rivers, and reach maximum thicknesses of about 150 feet (Beeson et al. 1991).

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In addition to these geologic formations, imported sand fill is common along many of the floodplain terraces adjacent to the Willamette and Columbia rivers. The source of this fill is primarily dredged material from the shipping channels in these two waterways.

2.5 AQUATIC RESOURCES AND CRITICAL HABITATS

Recent studies have identified 39 species of fish in the Willamette River within the project area. The lower Willamette River upstream to the Willamette Falls provides a significant migratory corridor, nursery habitat, and adult forage area for two runs of chinook, two runs of steelhead, and individual runs of coho and sockeye salmon (Melcher 1998; Farr and Ward 1991). In general, chinook and steelhead populations are the largest and most widespread of the salmonids found in the Willamette River basin (Melcher 1998). Pursuant to 50 CFR 17.11 & 17.12, steelhead salmon utilizing the Willamette River within the study area are currently classified as threatened per the Endangered Species Act of 1973. A threatened species is qualified as a species that is likely to become endangered within the foreseeable future. Pacific lamprey are also present in the river and are currently classified as a species of special concern by the U.S. Fish and Wildlife Service (USF&WS). The USF&WS defines species of special concern as those organisms whose conservation status is of concern to the USF&WS, but for which further information is needed. Pacific Lamprey are also classified by the Oregon Fish and Wildlife Commission as a sensitive specifies (OAR 635-100-040). The state of Oregon defines sensitive species as naturally reproducing native vertebrates that are likely to become threatened or endangered throughout all or a significant portion of their range in Oregon. The Sensitive Species List is for the express purpose of encouraging actions that will prevent further decline in species' populations and/or habitats and thus avoid the need for listing.

Commercial fishing in the Willamette River within the project area is limited to a small Pacific lamprey fishery (Melcher 1998). In contrast, recreational fishing is extremely popular throughout the lower Willamette basin. Resident species such as largemouth bass, black crappie, white crappie, and walleye support a significant year-round recreational fishery. Significant angling pressure is also directed toward spring chinook, steelhead, coho, American shad, and white sturgeon (Melcher 1998; Farr and Ward 1991).

Numerous piscivorous birds, migratory waterfowl, and raptors utilize the lower Willamette River during various times of the year. Great blue heron, cormorant, osprey, merganser, kingfisher, and bald eagle routinely forage within the study area. Both great blue heron and osprey nest sites are located in the vicinity of the study area and represent significant potential receptors.

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2.6 POTENTIAL CONTAMINANT TRANSPORT PATHWAYS AND RECEPTORS

2.6.1 Sediment

Sediment located in areas of direct deposition of waste materials or receiving contaminated surface water drainages may act as a receptor, and, in turn, also act as a source, because the sediment can retain contaminants. In addition, sediment can be transported by currents and wave action and as a result can function as a source of contamination at locations distal from the original source materials.

Within the 6-mile study area, the sediments represent a receptor as well as a source, as some of the types of contaminants present in the historically collected sediment samples (e.g., PAHs, total inorganics, pesticides, PCBs, etc.) tend to strongly sorb to particulate matter, may accumulate over time, and may be re-released to the water column via disturbance or dissolution during transport. The hydraulic characteristics of the area further suggest that transport of contaminated sediments to areas up- and downriver, may occur. Aquatic organisms represent additional receptors that may be impacted by sediment-bound contaminants due to exposure via dermal contact, respiration, or direct ingestion. Exposed lower trophic-order organisms also provide a pathway for exposure of higher trophic-order organisms via ingestion of contaminated prey.

The potential for sediments to act as a receptor and a source at locations both adjacent to and distal from the site was evaluated through the collection and chemical analysis of surface and subsurface sediment and sediment porewater from areas within the 6-mile study area (see Section 3.2).

2.6.2 Surface Water

Surface water runoff associated with upland areas adjacent to the Willamette River is dependent upon climatic influences and varies according to season. No sources of drinking water are derived from surface water associated with the 6-mile study area. The primary ecological receptors include anadromous and resident populations of fish occurring in the Willamette River. Secondary ecological receptors include numerous piscivorous birds, migratory waterfowl, and raptors, which utilize the lower Willamette River during various times of the year.

Potential groundwater pathways leading to downgradient surface water are another potential pathway, and were addressed through the sediment pathways.

2.6.3 Soil

Although this media may represent a source of contamination or an exposure mechanism to terrestrial receptors, soil conditions associated with adjacent upland areas were not evaluated as part of this investigation. However, soil that may have been transported to nearshore sediment was evaluated as part of the sediment pathway.

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2.6.4 Groundwater

The groundwater pathway was not directly evaluated for this site, but the sediment pathway may capture areas of significant groundwater contamination that has impacted sediment quality.

2.6.5 Air

Particulate migration from the upland properties to the Willamette River was considered a potential pathway of contaminant transport and was evaluated as part of the sediment pathway investigation described above.

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SECTION 3

PROJECT DESCRIPTION

3.1 SAMPLING OBJECTIVES

The EPA process is intended to evaluate actual or potential environmental hazards at a particular site relative to other sites across the nation for purposes of identifying remedial action priorities. This SI was intended to collect sufficient data to support a HRS evaluation for a 6-mile section of the Willamette River. The data collection efforts in this project area are also intended to support ODEQ's ongoing investigations for potential remedial actions associated with possible upland sources adjacent to the Willamette River.

The purpose of this investigation is to provide a screening level evaluation of sediment contamination in the Portland Harbor reach of the Willamette River. Accordingly, the following sampling objectives were defined for this investigation:

- Characterize the nature and magnitude of contamination in surface and shallow subsurface sediments
- Obtain sediment porewater samples to evaluate the potential bioavailability of organotins and total inorganics to aquatic receptors.

Based on historical data (WESTON 1997a), contaminants of potential concern in sediment include total inorganics, base-neutral acid extractables (BNAs) (primarily PAHs), PCBs, pesticides, and organotins. Because organotins were of potential concern, this investigation also focused on evaluating the potential bioavailability of organotins to aquatic receptors through the collection and analysis of sediment porewater.

3.2 SAMPLE TYPES, NUMBERS, LOCATIONS, AND RATIONALE

In total, 227 samples were collected during the SI field effort, as follows:

- 150 surface (0 to 10 cm) sediment samples, plus 8 field duplicates.
- 28 sediment porewater samples, plus 2 field duplicates.
- 37 subsurface (1.8 to 4.55 feet) sediment samples (sediment cores), plus 2 field duplicates.

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Surface and subsurface sediment sampling locations are depicted in Figures 3-1 through 3-5. Porewater stations and surface sediment stations are provided in Table 3-1.

Split samples were provided to three interested parties owning properties adjacent to the study area. Information detailing interested parties and split sampling locations are provided in Table 3-2.

3.3 SAMPLING METHODS, ANALYTICAL REQUIREMENTS, AND STATION LOCATIONS

3.3.1 Sampling Methods

Surface Sediment Sampling

Subtidal surface sediment samples were collected using a stainless-steel modified 0.1 m^2 van Veen grab sampler, in accordance with the procedures outlined in the sampling and analysis plan (SAP; WESTON 1997b). On average, between 1 and 4 grabs were required at each station, depending on sediment volume requirements associated with bulk chemical and porewater analyses. Penetration depths for acceptable grabs ranged from 6 to 17 cm.

Accepted samples were placed in stainless-steel bowls or soup pots for homogenization. Samples submitted for bulk chemical analysis were placed in labeled pre-cleaned sample jars, while samples submitted for porewater analysis were placed in decontaminated high-density polyethylene (HDPE) buckets. All sample containers were subsequently packed in coolers with ice for shipment. Observations of sediment composition were made for each sample and recorded on the appropriate field sample record forms (see Appendix A.1).

Subsurface Sediment Sampling

In accordance with the SAP (WESTON 1997b), all subsurface sediment sampling was conducted using a 3-inch-diameter gravity corer, configured with a 5-foot core barrel and a 700-pound weight stand. Core recovery lengths varied throughout the study area. Core recovery ranged from 1.8 to 4.55 feet, and averaged 3.2 feet. A summary of the recovery lengths is provided in Table 3-3. On average, between three to six casts of the gravity corer were required to acquire an acceptable core. A minor deviation from the SAP entailed the rate of descent of the gravity corer. Due to hard substrates encountered immediately below the mudline, the rate of descent increased from the proposed 1 foot/second to approximately 6 feet/second (free fall) to maximize the impact of the corer and increased core penetration. Core collection observations were recorded on appropriate field record forms (see Appendix A.2).

Core processing was conducted at an onshore location. Sediment from each core was extruded onto a decontaminated 5-foot stainless-steel tray by elevating the tube at an angle. When

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necessary, the core was tapped with a rubber mallet to loosen the sediment from the liner. Care was taken to ensure that samples were extruded as slowly as possible to maintain the cylindrical form of the core. Once the core sediment was extruded onto the tray, observations of sediment composition were made and recorded on the appropriate field sample record forms (see Appendix A.3). Samples were placed in stainless-steel bowls for homogenization. Samples submitted for bulk chemical analysis were placed in labeled pre-cleaned sample jars. All sample containers were subsequently packed in coolers with ice for shipment.

Latitude and longitude data are provided in Appendix A.4.

3.3.2 Analytical Requirements

In general, all samples were analyzed in accordance with the methods and procedures specified in the SAP (WESTON 1997a). A few minor deviations from the proposed sample analytical requirements occurred, as follows:

- A chlorinated herbicide analysis was not originally proposed for surface sediment sampling location WR-SD-SD092-0000; however, during the field sampling effort, a strong pesticide odor was detected at this location. Based on these observations and in consultation with EPA, chlorinated herbicide analysis was subsequently added to the analytical requirements for this location.

- Organotin (i.e., tributyltin) analysis was originally proposed at surface sediment sampling location WR-SD-SD064-0000; however, during the field sampling effort, this station was inadvertently omitted from the laboratory analysis request form. As a result, no organotin sediment data are available for this sampling location.

Chemical analyses conducted at each surface sediment sampling location (including those stations evaluating porewater quality) are presented in Table 3-1. Chemical analyses conducted at each subsurface sediment sampling location are presented in Table 3-4.

Duplicate sediment and porewater samples were collected at a frequency of 5 percent or greater per matrix, with eight surface sediment, two subsurface sediment, and two porewater duplicate samples collected for analysis. Temperature blanks were included in all sample coolers shipped to the contracted laboratories.

3.3.3 Station Locations

3.3.3.1 Surface Sediment Stations

Considerable effort was made to collect surface sediment within close proximity of the sampling locations detailed in Figures 3-2 through 3-6 of the SAP (WESTON 1997a). In several instances, sampling locations were moved due to physical obstructions present at the time of sediment

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collection (e.g., overhead lines, moored vessels, shallow water, etc.). In addition to these factors, substrate material at WR-SD-SD054 was predominantly composed of submerged wood debris, so adequate recovery of surface sediment was not possible at this location. Under this circumstance, multiple attempts were made before this station was abandoned. Sufficient sediment volumes for porewater extraction and analysis could also not be obtained from stations WR-SD-SD051 and WR-SD-SD055 because of insufficient grab sampler penetration due to the presence of hard substrates and abundant wood debris; sediment from these locations were submitted for bulk chemistry only.

3.3.3.2 Subsurface Sediment Stations

Considerable effort was made to co-locate subsurface sediment sampling locations to within 2-meters of the previously occupied surface sediment sampling locations. In several instances, subsurface sediment conditions failed to allow adequate recovery of subsurface sediment. When these conditions were encountered, multiple attempts were made before the coring location was abandoned or moved to an area of more favorable subsurface sediment conditions. All subsurface sediment station-positioning modifications are detailed in Table 3-5.

3.4 SAMPLE HANDLING, PACKAGING, AND SHIPPING

Samples were generally handled, packaged, and shipped in accordance with the procedures specified in the SAP (WESTON 1997b). Minor deviations from the SAP included the following:

- EPA sample tags were not placed on each sample container, as Contract Laboratory Program (CLP) analytical services, which require these tags, were not used.
- Vermiculite was not included in all coolers in which the plastic, 2-gallon buckets containing sediment for porewater extraction were placed, as container breakage was not anticipated to occur due to the container type (plastic) and tight fit of the containers in the coolers.

3.5 DOCUMENTATION

All field documentation, sample designation and labeling, and chain of custody procedures were followed in accordance with the procedures specified in the SAP (WESTON 1997b).

3.6 EQUIPMENT DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

Procedures specified in the SAP (WESTON 1997b) for decontaminating equipment and disposing of investigation-derived wastes (IDW) were followed during field activities.

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SECTION 4

SAMPLING RESULTS

The following sections present analytical data generated during this SI. A log summarizing individuals and affiliated agencies contacted during the course of this SI is provided in Appendix B. Chain-of-custody forms and data validation reports can be provided upon request (Appendix C).

4.1 DATA PRESENTATION

Analytical data tables for surface sediment, subsurface sediment, and sediment porewater are presented in Appendix D. Analytical data are reported as follows:

- Sediment inorganics are expressed in units of milligram per kilogram (mg/kg) dry-weight
- Sediment organics are expressed in units of microgram per kilogram (µg/kg) dry-weight; sediment nonionic/nonpolar organics are also expressed in units of µg/kg-organic carbon (i.e., the dry-weight concentration was normalized to the organic carbon content of the sample by dividing the chemical concentration by the sample-specific decimal fraction of organic carbon)
- Sediment porewater inorganics (including organotins) and organics are expressed in units of microgram per liter (µg/L)
- Sediment organotins are expressed in units of µg/kg-dry weight
- Sediment total organic carbon (TOC) and grain size are expressed as percentages

4.2 DATA EVALUATION

4.2.1 Effects-Based Screening Values/Guidelines

No background samples were designated for this investigation. However, numerous effects-based screening values/guidelines are available to assist in the interpretation of potential risks associated with exposures to media associated with this investigation. Several guidelines commonly used in the region include:

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4.2.1.1 Sediment Screening Guidelines

- Washington State Sediment Management Standards (SMS) Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) criteria (WAC 173-204).
- Effects range-low (ER-L) and effects range-median (ER-M) values (Long and Morgan 1990 with 1995 updates).
- Washington State Freshwater Sediment Quality Values (Cubbage et al. 1997).

The SMS include TOC-normalized (i.e., TOCN) criteria for nonionic/nonpolar organic compounds. However, these criteria are generally only effective at predicting adverse effects in sediments with TOC content greater than 0.5 percent (Michelson 1997). Also, in cases where high TOC (greater than 3 to 4 percent) may be due to some anthropogenic contribution (e.g., oils or wood debris), TOC normalization may not be appropriate. To determine the appropriateness of normalizing the organic data for comparisons with these standards, TOC content was reviewed on a sample-by-sample basis and was performed only on those samples with a TOC content between 0.5 and 4 percent. Of note, TOC-normalized data should only be compared to SMS criteria to aid the reader. Both TOC-normalized, where appropriate, and non-normalized data for nonionic/nonpolar organic compounds are provided in Appendix D.

4.2.1.2 Porewater Screening Guidelines

- Federal marine acute and chronic Ambient Water Quality Criteria (AWQC; EPA 1995)
- Oregon State freshwater acute and chronic AWQC (OAR 340-41)
- EPA proposed freshwater acute and chronic AWQC for TBT (EPA 1997)

Summaries of the above screening guidelines, as well as other potentially applicable effects-based screening values, are provided in Appendix E.

4.3 ANALYTICAL RESULTS

4.3.1 Surface Sediment

4.3.1.1 Total Inorganics

Total inorganics (i.e., metals) were analyzed at all surface sediment sampling stations. Analytical results indicated that total inorganics were detected at all stations. Please refer to the table in Appendix D.1-1 for a statistical summary of the data or consult the table in Appendix D.1-2 for a complete listing of the data. Figures 4-1 through 4-7 provide a graphical representation of the inorganic results from this study.

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4.3.1.2 Base-Neutral Acid Extractables (BNAs)/Semivolatile Organic Compounds(SVOCs)

BNAs were analyzed at all surface sediment sampling stations and were detected in nearly all surface sediment samples collected in the study. PAHs were most common. High-molecular weight PAHs (HPAHs) were detected in all samples and ranged from 49 to 677,000 µg/kg. The highest HPAH concentration was measured at SD032. Low-molecular weight PAHs (LPAHs) were also widespread and were detected in about 95 percent of the surface sediment stations. LPAHs ranged from 21 to 402,400 µg/kg, with the highest measured concentration occurring at station SD064. A statistical summary of the SVOC data is presented, as dry-weight concentrations, in the table in Appendix D.1-3. A complete data listing of the SVOC data is presented, as dry-weight concentrations, in the table in Appendix D.1-4. The SVOCs data were also normalized to total organic carbon (see Section 4.2.1.1). A statistical summary of the SVOC TOC-normalized data is presented in the table in Appendix D.1-5. A complete data listing of the SVOC TOC-normalized data is presented in the table in Appendix D.1-6. Figures 4-8 and 4-9 provide a graphical representation of HPAH and LPAH results, respectively.

4.3.1.3 Pesticides

Pesticides were analyzed at 39 of the surface sediment sampling stations. Pesticides were infrequently detected with exception to dichloro-diphenyl-trichloroethene (4,4'-DDT) and its associated metabolites (i.e., 4,4'-DDD and 4,4'-DDE). 4,4'-DDT was detected in about 85 percent of those samples analyzed for this analyte and ranged from 1.0 to 3,100 µg/kg. The highest concentrations of pesticides were detected at stations SD092 and SD097. Please refer to the table in Appendix D.1-7 for a statistical summary of pesticide data or consult the table in Appendix D.1-8 for a complete listing of the data. Figure 4-10 provides a graphical representation of DDT results.

4.3.1.4 Polychlorinated Biphenyls (PCBs)

PCBs were analyzed at 45 of the surface sediment sampling stations. The only detected PCB congeners included Aroclor-1254 and Aroclor-1260. Aroclor-1254 was detected in 20 percent of the analyzed samples, while Aroclor-1260 was detected in only one of the 45 samples. Aroclor-1254 ranged from 26 to 580 µg/kg, with the highest concentration measured at station SD133. Please refer to the table in Appendix D.1-7 for a statistical summary of PCB data or consult the table in Appendix D.1-8 for a complete listing of the data. Figure 4-11 provides a graphical representation of total PCB results.

4.3.1.5 Organotins (Reported as Organotin Chloride)

Organotins were analyzed at 61 of the surface sediment sampling stations. The most commonly detected organotin constituent was tributyltin (TBT), occurring in about 90 percent of the samples analyzed for this analyte. TBT ranged from 6.23 to 41,830 µg/kg, with the highest concentration measured at station SD012. Please refer to the table in Appendix D.1-9 for a

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statistical summary of organotin data or consult the table in Appendix D.1-10 for a complete listing of the data. Figure 4-12 provides a graphical representation of sediment TBT results.

4.3.1.6 Dioxins/Furans

Analyses for dioxins/furans were conducted at three surface sediment sampling locations. Analytical results indicated that dioxins/furans were detected at all three stations. Please refer to the table in Appendix D.1-11 for a statistical summary of these data or consult the table in Appendix D.1-12 for a complete data listing.

4.3.1.7 Chlorinated Herbicides

Analyses for chlorinated herbicides were conducted at seven sampling locations. Detections in herbicides were limited to 2,4-D, 2,4-DB, and pentachlorophenol. The highest detections of all three of these herbicides were at station SD080. Please refer to the table in Appendix D.1-13 for a statistical summary of herbicide data or consult the table in Appendix D.1-14 for a complete data listing. Figure 4-13 provides a graphical representation of 2,4-D results.

4.3.1.8 Total Organic Carbon (TOC)

TOC analysis was performed at all surface sediment sampling stations. Analytical results indicated that TOC averaged about 1.5-percent. Please refer to the table in Appendix D.1-15 for a statistical summary of TOC data or consult the table in Appendix D.1-16 for a complete listing of the data.

4.3.1.9 Grain Size

Grain size analysis was performed at all surface sediment sampling stations. Please refer to the table in Appendix D.1-15 for a statistical summary and to the table in Appendix D.1-16 for a complete listing of the grain size data.

4.3.2 Subsurface Sediment

4.3.2.1 Total Inorganics

Total inorganics were analyzed at all subsurface sediment sampling stations. Analytical results indicated that total inorganics were detected at all stations. Please refer to the table in Appendix D.2-1 for a statistical summary of these data or consult the table in Appendix D.2-2 for a complete listing of the data. Figure 4-1 through 4-7 provide a graphical representation of inorganics results.

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4.3.2.2 BNAs/SVOCs

BNAs were analyzed at all subsurface sediment sampling stations and were detected in nearly all analyzed subsurface sediment samples collected in the study. Similar to the surface sediment results, PAH constituents were most common. HPAHs were detected in all but one core and ranged from 135 to 152,700 µg/kg. The highest HPAH concentration was measured at SD035. LPAHs were detected in all cores and ranged from 34 to 69,410 µg/kg, with the highest measured concentration occurring at station SD055. These data indicated that PAHs were, in general, more elevated in surface sediment samples.

A statistical summary of the SVOC data is presented, as dry-weight concentrations, in the table in Appendix D.2-3. A complete data listing of the SVOC data is presented, as dry-weight concentrations, in the table in Appendix D.2-4. The SVOC data were also normalized to total organic carbon. A statistical summary of the SVOC normalized data is presented in the table in Appendix D.2-5. A complete data listing of the SVOC normalized data is presented in the table in Appendix D.2-6. Figures 4-8 and 4-9 provide a graphical representation of HPAH and LPAH results, respectively.

4.3.2.3 Pesticides

Pesticides were analyzed at 20 of the subsurface sediment sampling stations. Pesticides were infrequently detected with exception to 4,4'-DDT and its associated metabolites (i.e., 4,4'-DDD and 4,4'-DDE). 4,4'-DDT was detected in about 65 percent of those samples analyzed for this analyte and ranged from 4.4 to 22,000 µg/kg. 4,4'-DDD was also detected with a high frequency (80-percent) and ranged from 2.2 to 29,000 µg/kg. Highest concentrations of both 4,4'-DDT and 4,4'-DDD were measured at station SD092.

Please refer to the table in Appendix D.2-7 for a statistical summary of pesticide data or consult the table in Appendix D.2-8 for a complete pesticide data listing. Figure 4-10 provides a graphical representation of DDT results.

4.3.2.4 PCBs

PCBs were analyzed at 23 of the subsurface sediment sampling stations. PCB congeners most frequently detected included Aroclor-1254 and Aroclor-1260. Aroclor-1254 was detected in about 61 percent of the analyzed samples, while Aroclor-1260 was detected in about 39 percent of the samples. Aroclor-1242 was detected in one sample. Aroclor-1254 ranged from 15 to 1,500 µg/kg, while Aroclor-1260 ranged from 24 to 810 µg/kg. Highest PCB concentrations were measured at station SD133. These data indicated that PCBs were, in general, more elevated in subsurface sediment samples.

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Please refer to the table in Appendix D.2-7 for a statistical summary of PCB data of subsurface samples or consult the table in Appendix D.2-8 for a complete listing of the data. Figure 4-11 provides a graphical representation of total PCB results.

4.3.2.5 Organotins

Organotins were analyzed at 25 of the subsurface sediment sampling stations. The most commonly detected organotin constituent was TBT, occurring in nearly 70 percent of the samples analyzed for this analyte. TBT ranged from 25 to 13,350 µg/kg, with the highest concentration measured at station SD133. Please refer to the table in Appendix D.2-9 for a statistical summary of organotin data in subsurface sediment or consult the table in Appendix D.2-10 for a complete listing of the data. Figure 4-12 provides a graphical representation of sediment TBT results.

4.3.2.6 Dioxins/Furans

Analyses for dioxins/furans were conducted at three subsurface sediment sampling locations. Analytical results indicated that dioxins/furans were detected at all three stations. Please refer to the table in Appendix D.2-11 for a statistical summary of these data or consult the table in Appendix D.2-12 for a complete data listing.

4.3.2.7 TOC

TOC analysis was performed at all surface sediment sampling stations. Analytical results indicated that TOC averaged about 1.8 percent. Please refer to the table in Appendix D.2-13 for a statistical summary of TOC data or consult the table in Appendix D.2-14 for a complete listing of the data.

4.3.2.8 Grain Size

Grain size analysis was performed at all subsurface sediment sampling stations. Please refer to the table in Appendix D.2-13 for statistical information and the table in Appendix D.2-14 for a complete listing of the grain size data.

4.3.3 Sediment Porewater Analysis

4.3.3.1 Total Inorganics

Total inorganics were analyzed at all 28 sediment porewater sampling stations. Analytical results indicated that total inorganics were detected at all stations. Please refer to the table in Appendix D.3-1 for a statistical summary of these data or consult the table in Appendix D.3-2 for a complete listing of the data.

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4.3.3.2 Organotins

Organotins were analyzed at all 28 sediment porewater sampling stations. The most commonly detected organotin constituent included tributyltin (TBT); occurring in 25 percent of the samples analyzed for this analyte. Detected TBT ranged from 0.03 to 0.45 µg/L, with the highest concentration measured at station SD128. Please refer to the table in Appendix D.3-3 for a statistical summary of organotin data in porewater or consult the table in Appendix D.3-4 for a complete listing of the data. Figure 4-14 provides a graphical representation of TBT porewater results.

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SECTION 5

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FIGURES

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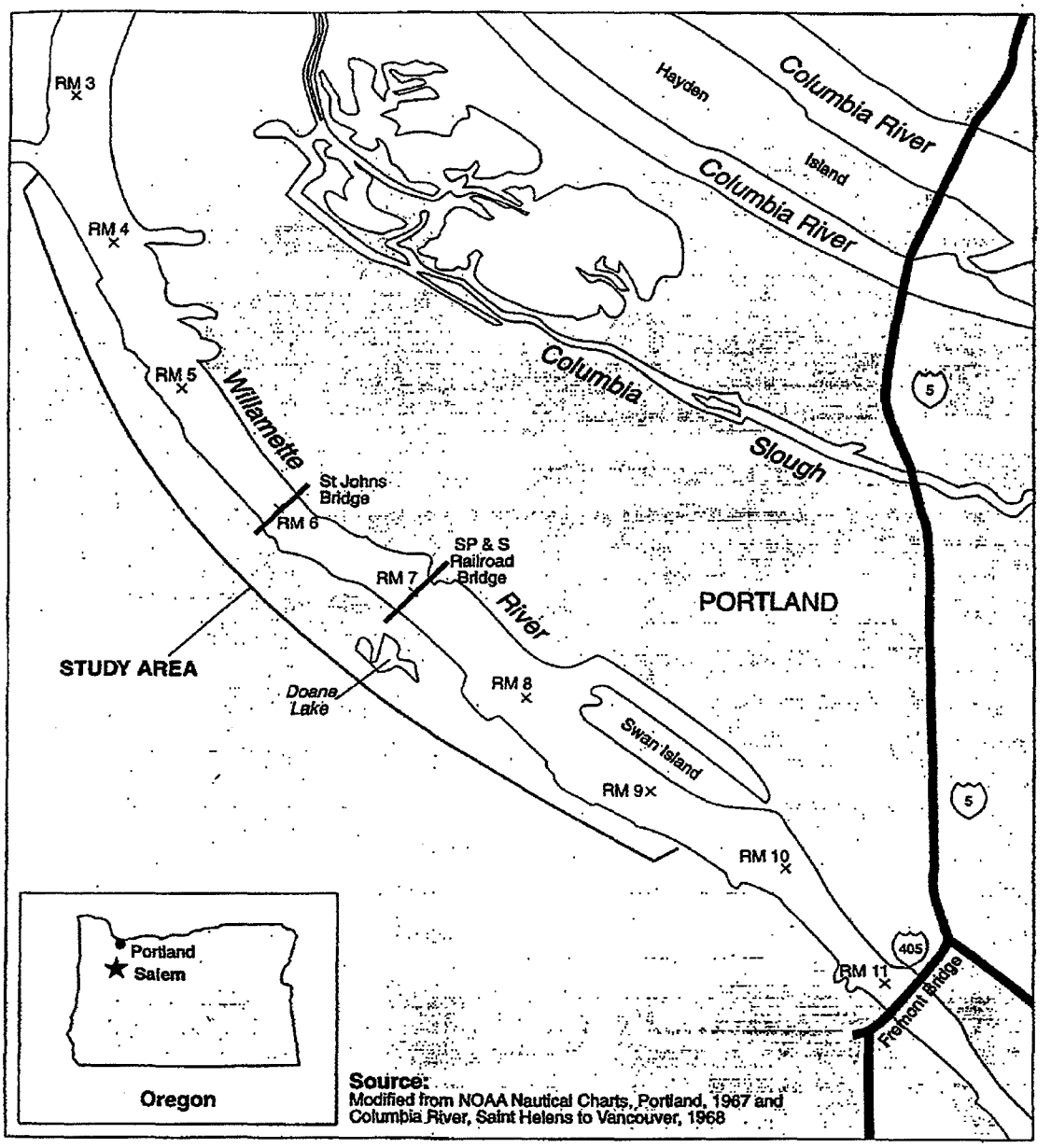

EXPLANATION

RM 1 River Mile Marker with Identification

0 1/2 1

Scale in Miles

Portland Harbor Sediment Investigation
Portland, OR
Study Area

FIGURE
1-1

98-0232 Fig1-1.fh7

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Map Source: METRO (City of Portland), 1997

Portland Harbor Sediment Investigation Portland, Oregon

Surface and Subsurface Sediment Sampling Locations Between RM 5.0 and RM 6.0

EXPLANATION:

Stations

▲ Surface and subsurface sediments sampling location
Surface sediment sampling location

-C Indicates core sample could not be co-located with surface sediment sampling location due to subsurface obstruction and/or insufficient recovery.

Note: SD-054 was not collected due to insufficient recovery.

N

500 0 500 1000 Feet

WESTON

Figure 3-2

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0030

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Portland Harbor
Sediment Investigation
Portland, Oregon

Surface and Subsurface Sediment Sampling Locations Between RM 7.0 and RM 8.0

EXPLANATION:

Stations

- ▲ Surface and subsurface sediment sampling location
- Surface sediment sampling location
- -C Indicates core sample could not be co-located with surface sediment sampling location due to subsurface obstruction and/or insufficient recovery.

500 0 500 1000 Feet

WESTON

Figure 3-4

98-0067.APR

0032

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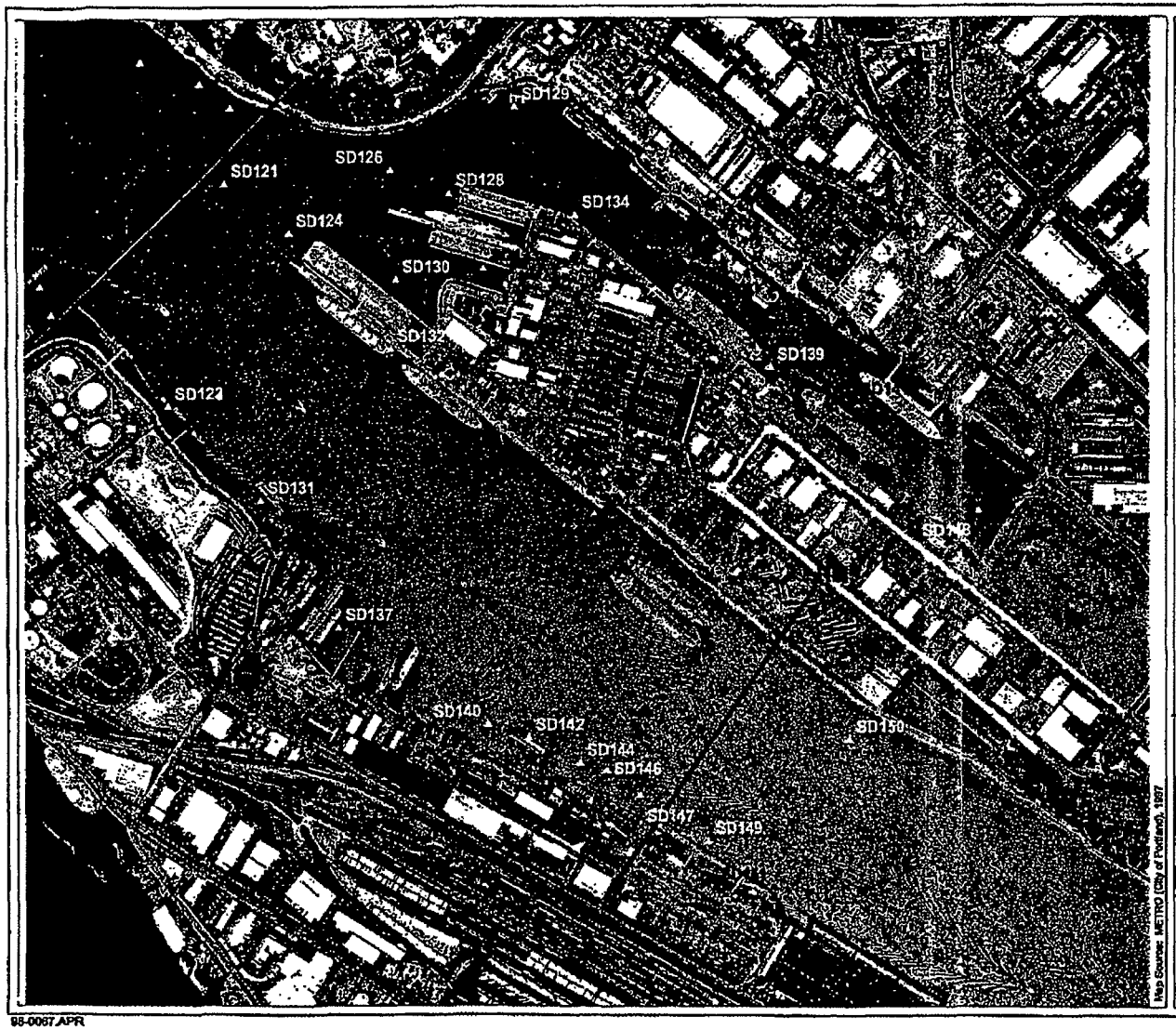

Portland Harbor Sediment Investigation Portland, Oregon

Surface and Subsurface Sediment Sampling Locations Between RM 8.0 - RM 9.5

EXPLANATION:

Stations

▲ Surface and subsurface sediment sampling location
Surface sediment sampling location

N

500 0 500 1000 Feet

WESTON

Figure 3-5

98-0067.APR

0033

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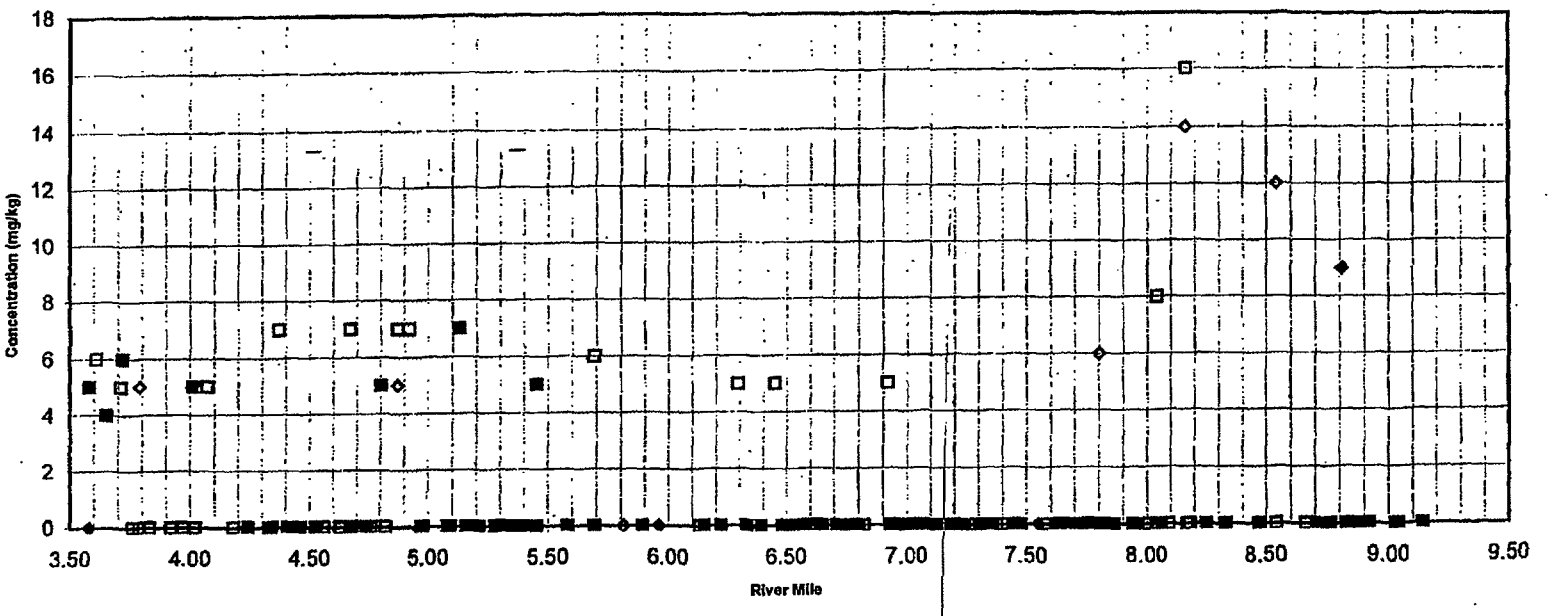

◇ Subsurface sediment sample, North Portland side Willamette River
□ Surface sediment sample, North Portland side of Willamette River
◆ Subsurface sediment sample, Northwest Portland side of Willamette River
■ Surface sediment sample, Northwest side of Willamette River

WESTON

Willamette River
Arsenic Concentrations per River Mile

Figure
4-1

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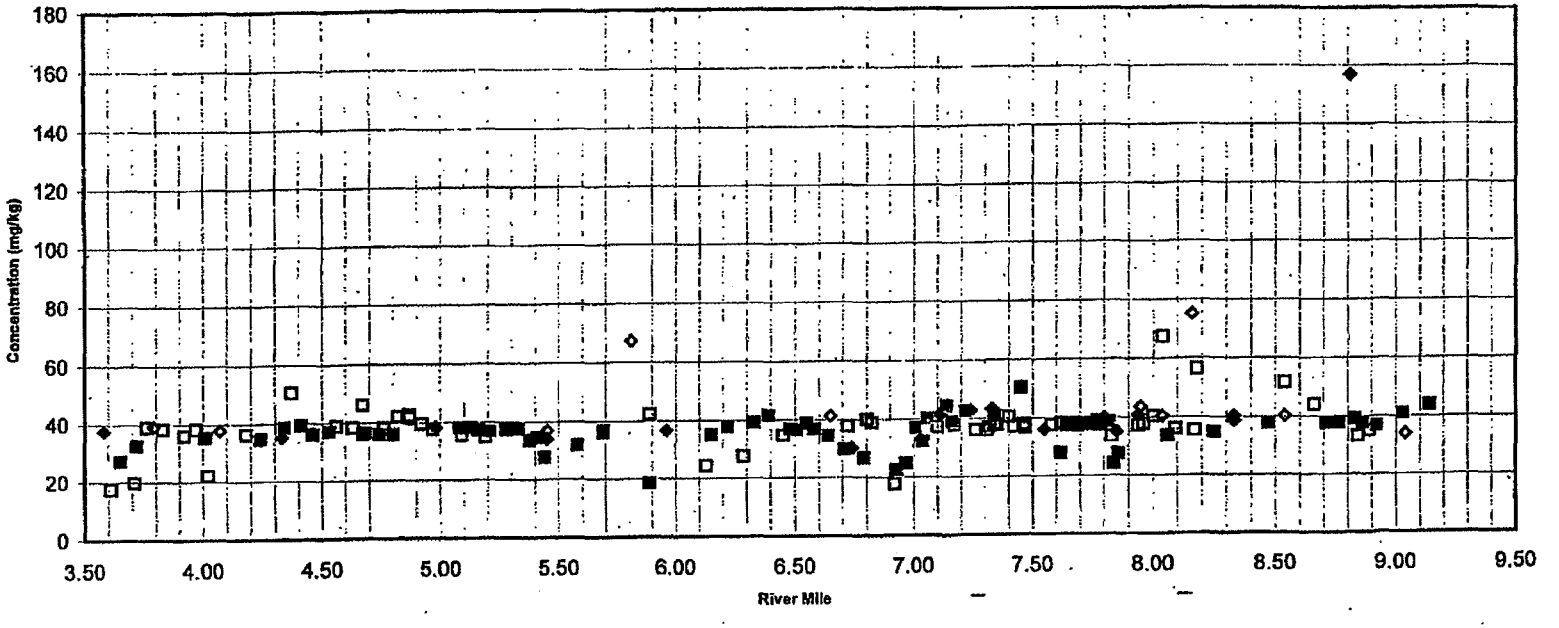

WESTON

- Subsurface sediment sample, North Portland side Willamette River
- Surface sediment sample, North Portland side of Willamette River
- Subsurface sediment sample, Northwest Portland side of Willamette River
- Surface sediment sample, Northwest side of Willamette River

Willamette River
Chromium Concentrations per River Mile

Figure
4-3

98-0282.fig

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0037

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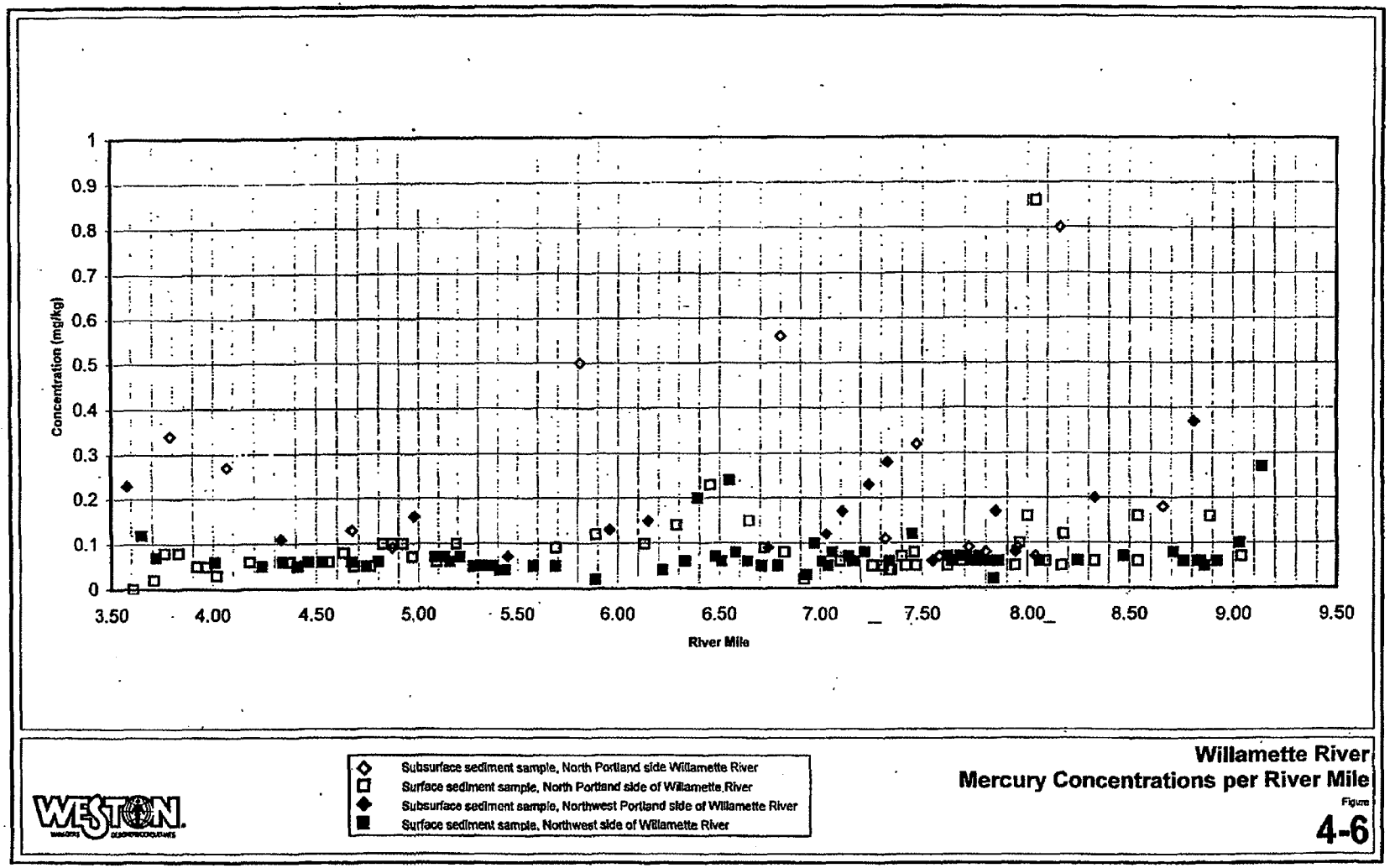

WESTON

Willamette River
Mercury Concentrations per River Mile

Figure
4-6

96-0288.fig

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0040

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KMB00003905

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0044

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0945

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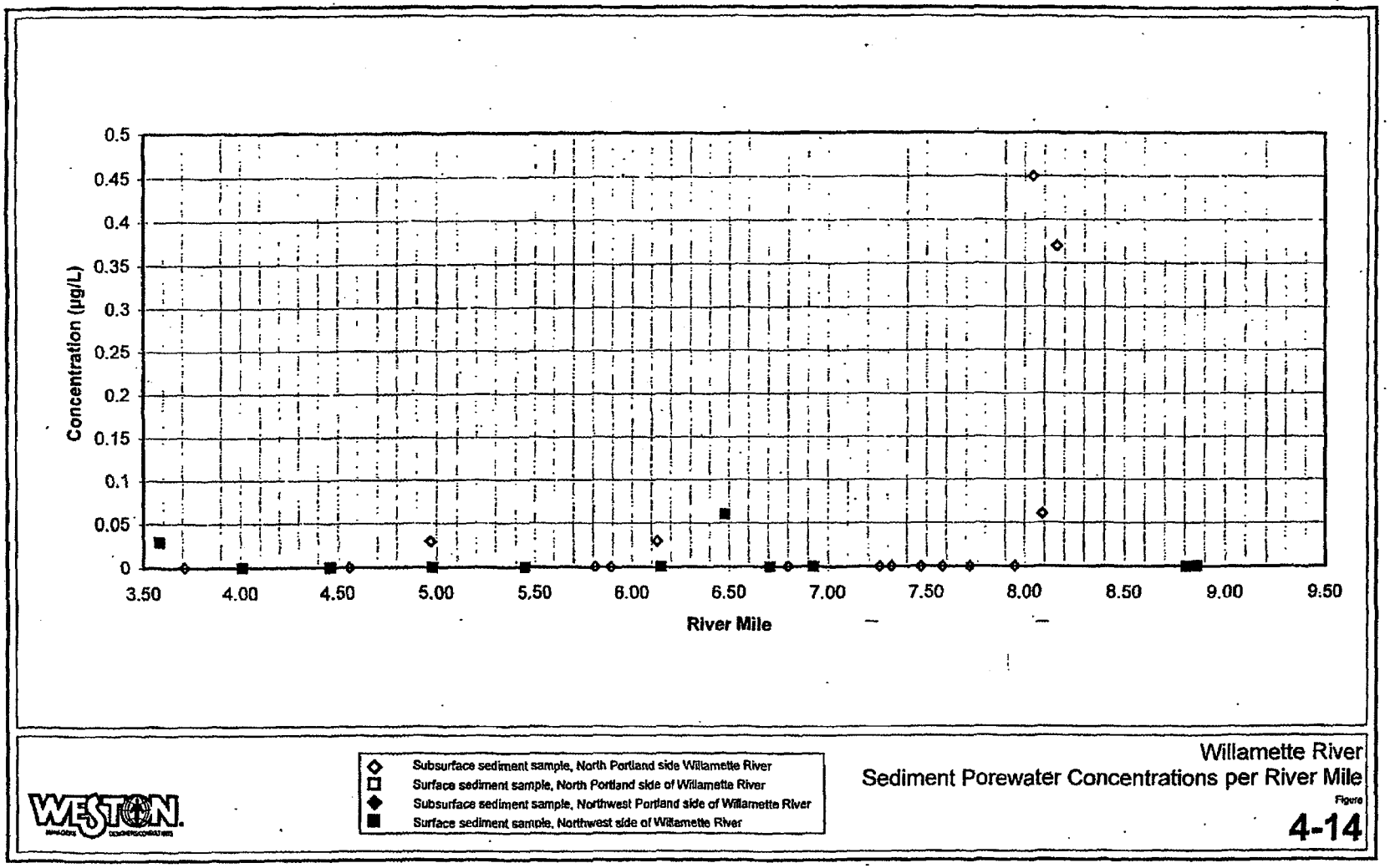

WESTON

Willamette River
Sediment Porewater Concentrations per River Mile

Figure
4-14

91-0288.Fig

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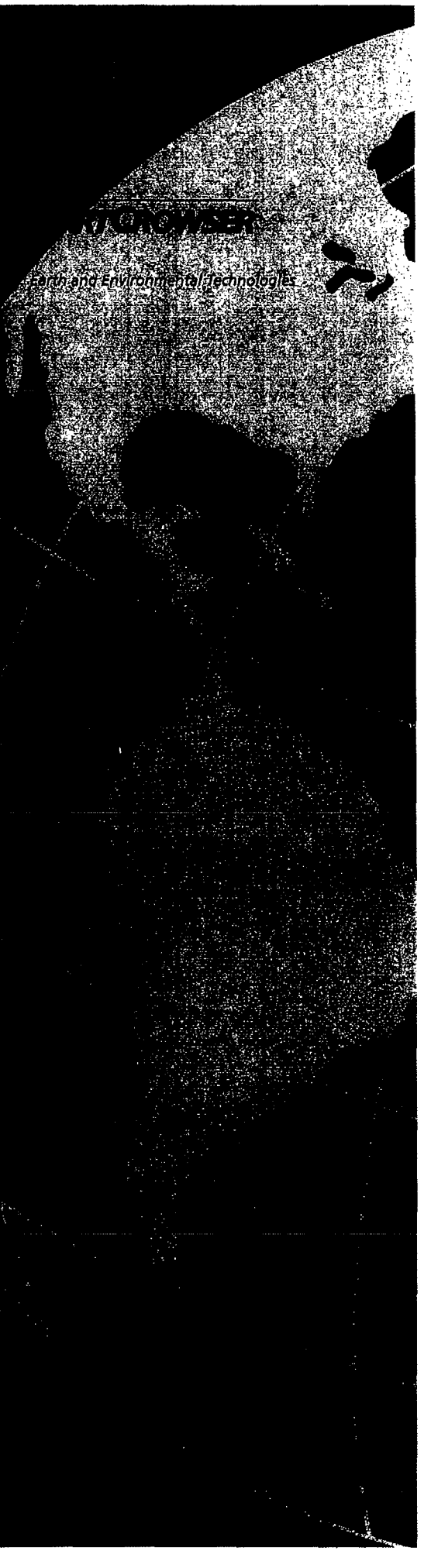
HARTCROWSER



Sediment Characterization Study
River Terminal 4, Slip 3
Willamette River
Portland, Oregon

Prepared for
Port of Portland

Purchase Order No. 51615
Project No. 52051
Task No. 900

August 29, 1997
J-5628-01

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ACRONYMS

Corps	Army Corps of Engineers - Portland District
CRD	Columbia River Datum
DMMU	Dredge Material Management Unit
ML	Maximum Level
PAHs	Polycyclic Aromatic Hydrocarbons
PSDDA	Puget Sound Dredge Disposal Analysis
SAP	Sampling and Analysis Plan
SL	Screening Level
TBT	Tributyltin
TOC	Total Organic Carbon

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SEDIMENT CHARACTERIZATION STUDY
RIVER TERMINAL 4, SLIP 3
WILLAMETTE RIVER
PORTLAND, OREGON

1.0 INTRODUCTION

1.1 Project Background

The Port of Portland proposes to conduct maintenance dredging at Marine Terminal 4, Slip 3, located on the Willamette River (see vicinity and location maps, Figures 1 and 2) to remove sediment that has accumulated over the past several years. At Terminal 4, Slip 3, maintenance dredging is proposed along Berths 410 and 411, to a distance 800 feet from the end of the finger pier, to maintain berth elevation of -40 feet below Columbia River Datum (CRD). It is estimated that this operation will remove approximately 12,000 cubic yards of material from the mooring area including one foot of overdredge. This work was conducted for the Port of Portland under Purchase Order No. S1615, Project No. 52051, Task No. 900.

1.2 Site Description and History

Terminal 4 is a ship loading and unloading facility located on the Willamette River in Portland, Oregon (Fig. 1). The west side of the terminal has several berths that are parallel and perpendicular to the Willamette River. The area east of the terminal is used for industrial and commercial activities. The areas north and south of the terminal are occupied by marine, industrial, and commercial operations.

Terminal 4 has facilities for the handling of autos, containers, logs, lumber, grain, dry and liquid bulks, steel products, and breakbulk cargo. Soda ash, talc, pencil pitch (coal tar pitch), and bentonite clay are examples of cargo loaded and unloaded at the bulk facility.

There are three berths that have been used for bulk loading operations at Terminal 4, Slip 3. Berth 410 is an in-load area and removes materials from the ship holds by use of a clam shell device (Dravo) and transfers the material, primarily soda ash, to rail cars and trucks. Berth 411 is used for the unloading of vessels carrying bulk loads of pencil pitch. Operations at Berth 412 were terminated in January 1989.

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Historical activities at Terminal 4, Slip 3, resulted in non-permitted discharges of pencil pitch to the slip. Based on the history of such non-permitted discharges at Berth 411, the EPA brought legal action against the Port. The legal action resulted in a Federal Consent Order, issued May 7, 1993, stipulating that the Port cease all non-permitted discharges and remediate the contamination resulting from past discharges of pencil pitch.

The Consent Order stipulated that any concentrations of pencil pitch over 0.5% dry weight were to be remediated. Slip 3 was dredged in December 1994. The dredge material was transported to the Ross Island disposal site and capped with a minimum of one foot of clean material. Post-dredge sediment sampling and analysis confirmed that the remediation requirements of the Consent Order were achieved.

In a letter dated April 24, 1995, the EPA was notified by the Port that the dredging and remediation efforts had been completed. The EPA's response to the Port was received on June 23, 1995. The letter stated that "according to our records, all requirements of the Consent Order have been completed." As of June 1995, the Port had fulfilled its obligations as set forth in the federal consent order.

1.3 Previous Sediment Sampling

Sediment sampling was conducted in 1988, 1993, and 1994 to delineate the horizontal and vertical extent of pencil pitch contamination (Port, 1994). In November 1988, the Port undertook studies of the horizontal and vertical distribution of pencil pitch in sediments at Terminal 4, Slip 3. Twenty-eight surface sediment samples (10 cm) and six sediment core samples were collected and it was determined that the concentrations of pencil pitch exhibited a definite pattern within Slip 3 with the most elevated values occurring near Berth 411 and extending toward the southeast corner of Berth 412.

Additional sediment cores were collected in 1993 and 1994 to survey present sediment conditions and delineate more fully the areas requiring remediation. In addition to pencil pitch, trace concentrations of pesticides and PCBs were found in the surface sediment at or below method detection limits. Elevated concentrations of several trace metals were also detected in the sediments; however, the majority of these additional constituents were located in surficial material and were removed in the remedial action in 1994.

In December 1994, a remedial action was undertaken by the Port in compliance with the federal Consent Order. Sediments from Slip 3 containing concentrations of pencil pitch exceeding the mandated regulatory limit of 0.5 %

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dry weight were removed. Dredging removed sediments ranging in depth from a minimum of 12 inches to a maximum of 72 inches; however, in most areas of Slip 3 about 36 inches of sediment were removed. Approximately 35,000 cubic yards of dredge material from Slip 3 were transported to Ross Island for disposal. Once in place, the sediments were covered with a minimum of one foot clean capping material as stipulated in the federal Consent Order.

Post-dredging sediment samples included surface samples from twenty-four locations and seven sediment cores in Slip 3 to document compliance with the Consent Order (Hartman, 1995). Concentrations of pencil pitch were reduced to below 0.5% dry weight in all areas of the project.

1.4 Permitting

A permit for routine maintenance dredging of Marine River Terminals along the Willamette River has been provided by the Corps to the Port of Portland. This permit (Permit Number 8760) expires on February 1, 2001. Additionally, the Port of Portland has received from the Corps a permit for disposal, at Morgan Bar, of material found suitable for unconfined open water disposal.

1.5 Report Organization

The main body of the report discusses the results of the sediment characterization study and the dredge material disposal options based upon comparison with current and proposed Puget Sound Dredge Disposal Analysis (PSDDA) screening guidelines. Supporting discussions within the text include a description of sediment sampling locations and any modifications to the agency-approved Sampling and Analysis Plan (Hart Crowser, April 4, 1997). The attached appendices present supporting information including chemical testing data (Appendix A) and sediment core logs (Appendix B). Additional procedural details are presented in the Sampling and Analysis Plan (Hart Crowser, April 4, 1997) that guided this work.

2.0 SEDIMENT SAMPLING AND CHEMICAL ANALYSIS

Sediment sampling and handling activities were performed in accordance with the agency-approved Sampling and Analysis Plan (Hart Crowser, April 4, 1997). These procedures included methods for locating the sediment sampling locations, coring of the sediments, and compositing the material for analysis. Modifications to the Sampling and Analysis Plan are detailed below in Section 2.1.

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2.1 Sampling Locations, Methods, and Chemical Analysis

Six sediment cores were collected and composited according to the protocol presented in the Sampling and Analysis Plan (Hart Crowser April 4, 1997). There were three slight modifications to the sampling plan:

- The location of Sediment Samples HC-VC-01 and HC-VC-02 were moved closer to the face of the pier (see Figure 2) according to Corps recommendations (Mark Siipola, Portland District Corps, pers. comm.);

- The method of positioning was changed from DGPS to a horizontal triangulation method because of the proximity of all sampling locations to the face of the pier. The horizontal locations of the sampling locations were marked on the face of the pier by measuring the distance from the end of the pier with a tape measure. The sampling vessel was then tied to pilings at this location and samples collected at the required distance away from the face of the pier. The coordinates for the sampling locations were derived from a CAD Site Map provided by the Port of Portland; and

- At the request of the Corps, archived sediment samples collected from below the proposed dredge prism (corresponding to a core depth of between 3 to 5 feet below the dredge prism) were submitted to North Creek Analytical Laboratories on July 8, 1997, for the analyses of polycyclic aromatic hydrocarbons (PAHs), Total Organic Carbon (TOC), cadmium, lead, and zinc. These bottom sediment samples were composited in the same manner as the previous sediment cores (Table 1).

Specific information on the core depths, coordinates of sampling locations, compositing scheme, and DMMU identification, are provided in Table 1.

2.2 Data Quality Review

A standard data quality review was performed by Hart Crowser on the analytical data package submitted by North Creek Analytical Laboratories for both the initial sediment samples and the subsequent analysis of archived bottom sediment samples. The results of our review and copies of the laboratory certificates are included in Appendix A of this report. The data quality review concluded that the chemistry data for the initial sediment samples are acceptable for evaluation of sediment disposal options. For the bottom sediment samples, the holding times for the PAHs and TOC were greatly exceeded. These data would normally be rejected; however, because of the request from the Corps to analyze the samples for informational use, detected results were qualified as estimated (J-flagged).

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3.0 COMPARISON OF SEDIMENT CORE CHEMISTRY RESULTS WITH PSDDA SEDIMENT GUIDELINES

3.1 Comparison to Current PSDDA Guidelines

Chemistry results for the proposed dredging prisms at Terminal 4, Slip 3 are compared to the current sediment screening levels set forth in the Puget Sound Dredged Disposal Analysis (PSDDA) program for evaluation of suitability for open-water disposal. Two PSDDA screening levels are provided for comparison with site sediment analytical data. First, a lower Screening Level (SL) has been defined for each chemical to identify chemical concentrations below which sediments are acceptable for open-water disposal. Second, a higher Maximum Level (ML) has been defined for each chemical which corresponds to concentrations above which sediments would be unacceptable for unconfined, open-water disposal. Concentrations of chemicals between the SL and ML values are considered to have the potential for causing adverse biological effects during an open-water discharge, and will require additional bioassay testing to determine suitability for unconfined, open-water disposal. As per recent PSDDA guidance (PSDDA Issue Paper 10/96), the SL for Tributyltin (TBT) is based on a pore water concentration rather than the concentration of TBT in bulk sediment. Sediment chemistry results and screening level comparisons are presented in Table 2 and are summarized below.

Sample HC-T4-01. This sample is a composite of two sediment cores collected at locations HC-VC-01 and HC-VC-02 (Figure 2). The results of metal analysis detected the presence of cadmium at a concentration slightly above the PSDDA SL. The concentrations of various PAHs were found to be above the PSDDA SL but below the corresponding ML for each chemical. The concentrations of all pesticides and PCBs in sediment were below their corresponding PSDDA SLs. The concentration of TBT in pore water was below the recently established screening level of 0.15 ug/L.

Sample HC-T4-02. This sample is a composite of two sediment cores collected at locations HC-VC-03 and HC-VC-04 (Figure 2). The results of metal analysis detected the presence of cadmium at a concentration slightly above the PSDDA SL. The pesticide DDT was reported at a concentration slightly above the PSDDA SL, but this pesticide was not detected in the laboratory duplicate of this sample. As this pesticide was not detected in any other sample nor in the laboratory duplicate, this detection is suspect. The concentrations of various PAHs were found to be above the PSDDA SL but below the corresponding ML for each chemical. The concentrations of PCBs in sediment were below their

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corresponding PSDDA SLs. The concentration of TBT in pore water was below the recently established screening level of 0.15 ug/L.

Sample HC-T4-03. This sample is a composite of two sediment cores collected at locations HC-VC-05 and HC-VC-06 (Figure 2). The results of metal analysis detected the presence of cadmium, lead, and zinc at concentrations above the PSDDA SL. The concentrations of various PAHs were found to be above the PSDDA SL but below the corresponding ML for each chemical. The concentrations of all pesticides and PCBs in sediment were below their corresponding PSDDA SLs. The concentration of TBT in pore water was below the recently established screening level of 0.15 ug/L.

3.2 Comparison to Proposed (Draft) 1997 PSDDA Guidelines

The PSDDA agencies are currently in the process of revising the PSDDA sediment quality guidelines, and new draft guidelines (revised SLs and MLs) were proposed at the 1997 Sediment Management Annual Review Meeting. The revised guidelines are generally thought to incorporate a better scientific basis. The revisions are proposed for several reasons: (1) to incorporate the latest information in the biological effects database for Puget Sound; (2) to replace arbitrary SL values, originally defined as one-tenth the ML value for some chemicals, with biological effects-based SLs; and (3) to express sediment quality guidelines for many organic contaminants on a carbon-normalized basis, similar to the Washington State Sediment Management Standards. Expressing sediment quality guidelines on a carbon-normalized basis derives from the relationship between the biological availability of many organic contaminants and the amount of organic carbon present in the sediment—the higher the organic carbon content, the more tightly bound are the contaminants and less available for uptake by organisms. Dividing sediment chemical concentrations by the fraction of organic carbon accounts for some of the variability in sediment toxicity that is attributed to site-specific texture and composition of the sediments. Sediment chemistry results and screening level comparisons are presented in Table 3 and are summarized in the sections below.

Sample HC-T4-01. No chemicals of concern were detected in this sample above the corresponding revised PSDDA SL or ML.

Sample HC-T4-02. The concentrations of two PAHs (indeno (1,2,3-c,d)pyrene and benzo(g,h,i)perylene) were detected in this sample above their corresponding revised PSDDA SL. The detected concentrations of these PAHs were only slightly above the revised PSDDA SLs (with an enrichment ratio of less than 1.5 times the SL) and were well below the corresponding revised PSDDA MLs.

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Sample HC-T4-03. The concentrations of various PAHs were detected above the PSDDA SL but below the corresponding ML with the exception of benzo(g,h,i)perylene. The majority of the PAHs were detected at concentrations moderately above the SLs (with an enrichment ratio generally less than two times the SL). Indeno(1,2,3-c,d)pyrene was detected at a concentration approximately three times its corresponding PSDDA SL. The PAH, benzo(g,h,i)perylene, was detected at a concentration (112 mg/kg oc) slightly above the PSDDA ML (100 mg/kg oc).

Summary. The comparison of chemistry results of the sediment cores collected at Terminal 4, Slip 3 with current PSDDA guidelines indicate a moderate level of contamination for all three Dredge Material Management Units (DMMU). Based on exceedences of current PSDDA SLs, this material would not be approved for open water disposal without further biological testing of the dredge material. However, comparison of the sediment analytical data to the proposed 1997 PSDDA guidelines reveals that two of the three DMMUs could potentially be classified as suitable for open water disposal based on no exceedences of 1997 PSDDA SLs for sample HC-T4-01 and only two slight exceedences of SLs for sample HC-T4-02. However, biological testing of dredge material represented by sample HC-T4-03 would still be required based on a number of PAH exceedences of the 1997 PSDDA SLs.

As previously discussed, the suitability of open-water disposal could be further assessed with biological testing for these DMMUs which exceed PSDDA SLs (existing or proposed). However, the decision to pursue further testing should be weighed against the needs of the proposed dredging schedule and the relatively small volume of the proposed dredge material.

4.0 RESULTS OF BOTTOM SEDIMENT CHEMISTRY ANALYSIS

The analytical results for the archived bottom sediment samples (collected below the proposed dredge prism) are presented in both dry weight basis and normalized to organic carbon (Table 4). The concentrations detected in the bottom sediments are similar to those reported for the material being proposed to be dredged. As this material is not being considered for dredging, comparisons with PSDDA guidelines are not appropriate.

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5.0 LIMITATIONS

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of the Port of Portland in its submittal to the Corps of Engineers and the Oregon Department of Environmental Quality for specific applications to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made. Any questions regarding our work and this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

Sincerely,

HART CROWSER, INC.

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Senior Project Toxicologist

TODD THORNBURG, PH.D.
Associate Oceanographer

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Tables

Table 1 - Sediment Sampling Locations, Depths, and Identification

Subsurface Core Location	Easting Coordinate	Northing Coordinate	Core Sample Bottom Elev. in Feet (CRD)	1997 Bathymetry in Feet (CRD)	Core Depth in Feet	DMMU Identification	Sample Identification	Approx. DMMU Volume in Cubic Yards
TERMINAL 4								
HC-VC-01	7619331	713563	-41	-37	4	T4/1	HC-T4-01	4,000
HC-VC-02	7619424	713548	-41	-37	4	T4/1		
HC-VC-03	7619517	713534	-41	-36	5	T4/2	HC-T4-02	4,000
HC-VC-04	7619617	713519	-41	-36	5	T4/2		
HC-VC-05	7619722	713503	-41	-36	5	T4/3	HC-T4-03	4,000
HC-VC-06	7619818	713488	-41	-36	5	T4/3		

562801/Terminal4.xls - Table 1

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Table 2 - Analytical Results for Sediment Samples Compared to Current PSDDA Guidelines

	PSDDA SL	PSDDA ML	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
Grain Size in Percent						
Gravel			0	0	0	N/A
Sand			32	43	54	N/A
Silt			62	52	41	N/A
Clay			6	5	5	N/A
Conventionals in mg/kg						
Ammonia as Nitrogen			85.3 J	46.4	43.5	72.7
Sulfide, Total			8.21 J	60.9	37.9	24.8
Conventionals in percent						
Total Organic Carbon			2.05	2.34	1.77	2.90
Total Solids			50.4	51.3	56.9	53.4
Total Volatile Solids			3.2	3.07	3.43	3.17
Metals in mg/kg						
Arsenic	57	700	4.76	4.78	7.2	4.87
Cadmium	0.96	9.6	1.12	1.23	1.65	0.5 U
Copper	81	810	31.9	33.7	38.4	34.1
Lead	66	660	35.5	41.7	167	29.3
Mercury	0.21	2.1	0.05 U	0.05 U	0.05 U	0.05 U
Nickel	140		18.1	20.3	18	21.4
Silver	1.2	6.1	0.50 U	0.05 U	0.5 U	0.5 U
Zinc	160	1600	119.0	130	236	101
Butyltins in µg/L (pore water)						
Tributyltin	0.15		0.025 U	0.025 U	0.048	0.025 U
Pesticide/PCBs in µg/kg						
Alpha-BHC			5 U	5 U	5 U	5 U
Beta-BHC			5 U	5 U	5 U	5 U
Gamma-BHC(Lindane)	10		5 U	5 U	5 U	5 U
Delta-BHC			5 U	5 U	5 U	5 U
Heptachlor	10		5 U	5 U	5 U	5 U
Aldrin	10		5 U	5 U	5 U	5 U
Heptachlor Epoxide			5 U	5 U	5 U	5 U

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Table 2 - Analytical Results for Sediment Samples Compared to Current PSDDA Guidelines

	PSDDA SL	PSDDA ML	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
Pesticide/PCBs in µg/kg (cont.)						
Endosulfan I			5 U	5 U	5 U	5 U
Dieldrin	10		5 U	5 U	5 U	5 U
Endrin			5 U	5 U	5 U	5 U
Endosulfan II			5 U	5 U	5 U	5 U
Endrin Aldehyde			5 U	5 U	5 U	5 U
Endosulfan Sulfate			5 U	5 U	5 U	5 U
4,4'-DDE			5 U	5 U	5 U	5 U
4,4'-DDD			5 U	5 U	5 U	5 U
4,4'-DDT			5 U	10.6	5 U	5 U
Total DDT	6.9	69	5 U	10.6	5 U	5 U
Methoxychlor			5 U	5 U	5 U	5 U
Toxaphene			150 U	150 U	150 U	150 U
Chlordane	10		5 U	5 U	5 U	5 U
Aroclor 1016			50 U	50 U	50 U	50 U
Aroclor 1221			100 U	100 U	100 U	100 U
Aroclor 1232			50 U	50 U	50 U	50 U
Aroclor 1242			50 U	50 U	50 U	50 U
Aroclor 1248			50 U	50 U	50 U	50 U
Aroclor 1254			39.5	50 U	98.4	50 U
Aroclor 1260			50 U	50 U	50 U	50 U
Total PCBs	130	2500	39.5	50 U	98.4	50 U
PAHs in µg/kg						
Total LPAHs	610	6100	974.2	1622.8	3083.5	1699.2
Naphthalene	210	2100	37.4	42.8	65.1	41.8
Acenaphthylene	64	640	13.4 U	13.4 U	13.4 U	13.4 U
Acenaphthene	63	630	138	266	372	269
Fluorene	64	640	76.6	116	177	121
Phenanthrene	320	3200	546	883	1980	927
Anthracene	130	1300	135	273	429	293
2-Methylnaphthalene	67	670	27.8	28.6	47	34

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Table 2 - Analytical Results for Sediment Samples Compared to Current PSDDA Guidelines

	PSDDA SL	PSDDA ML	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
PAHs in µg/kg (cont.)						
Total HPAHs	1800	51000	6465	13966	24293	13979
Fluoranthene	630	6300	1320	3030	5230	3050
Pyrene	430	7300	653	1450	2440	1520
Benzo(a)anthracene	450	4500	710	1560	2600	1630
Chrysene	670	6700	714	1500	2520	1550
Total Benzofluoranthenes	800	8000	1179	2281	4370	2291
Benzo(a)pyrene	680	6800	747	1630	2810	1490
Indeno(1,2,3-c,d)pyrene	69	5200	470	1030	1760	1040
Dibenz(a,h)anthracene	120	1200	161	395	583	398
Benzo(g,h,i)perylene	540	5400	511	1090	1980	1010
Phenols in µg/kg						
Phenol	120	1200	40 U	40 U	40 U	40 U
2-Methylphenol	20	72	40 U	40 U	40 U	40 U
3/4-Methylphenol	120	1200	40 U	40 U	40 U	40 U
2,4-Dimethylphenol	29	50	40 U	40 U	40 U	40 U
Pentachlorophenol	100	690	40 U	40 U	40 U	40 U

J - Estimated concentration
U - Not detected at indicated detection limit.
☐ - Concentration above PSDDA Screening Level (SL)
Note: No concentrations exceeded the PSDDA Maximum Level (ML)

562801/Terminal4.xls - Table 2

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Table 3 - Analytical Results for Sediment Samples Compared to Proposed 1997 PSDDA Guidelines

	PSDDA SL 1997	PSDDA ML 1997	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
Grain Size in Percent						
Gravel			0	0	0	N/A
Sand			32	43	54	N/A
Silt			62	52	41	N/A
Clay			6	5	5	N/A
Conventionals in mg/kg						
Ammonia as Nitrogen			85.3 J	46.4	43.5	72.7
Sulfide, Total			8.21 J	60.9	37.9	24.8
Conventionals in percent						
Total Organic Carbon			2.05	2.34	1.77	2.90
Total Solids			50.4	51.3	56.9	53.4
Total Volatile Solids			3.2	3.07	3.43	3.17
Metals in mg/kg						
Arsenic	57	700	4.76	4.78	7.2	4.87
Cadmium	5.1	14	1.12	1.23	1.65	0.5 U
Copper	390	1300	31.9	33.7	38.4	34.1
Lead	450	1200	35.5	41.7	167	29.3
Mercury	0.41	2.3	0.05 U	0.05 U	0.05 U	0.05 U
Nickel	140	370	18.1	20.3	18	21.4
Silver	6.1	8.4	0.50 U	0.05 U	0.5 U	0.5 U
Zinc	410	3800	119	130	236	101
Butyltins in µg/L (pore water)						
Tributyltin	0.15		0.025 U	0.025 U	0.048	0.025 U
Pesticide/PCBs in mg/kg (oc)						
Alpha-BHC			0.24 U	0.21 U	0.28 U	0.17 U
Beta-BHC			0.24 U	0.21 U	0.28 U	0.17 U
Gamma-BHC(Lindane)			0.24 U	0.21 U	0.28 U	0.17 U
Delta-BHC			0.24 U	0.21 U	0.28 U	0.17 U
Heptachlor	0.11	0.4	0.24 U	0.21 U	0.28 U	0.17 U
Aldrin	0.56	0.56	0.24 U	0.21 U	0.28 U	0.17 U
Heptachlor Epoxide			0.24 U	0.21 U	0.28 U	0.17 U

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Table 3 - Analytical Results for Sediment Samples Compared to Proposed 1997 PSDDA Guidelines

	PSDDA SL 1997	PSDDA ML 1997	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
Pesticide/PCBs in mg/kg (oc) (cont.)						
Endosulfan I			0.24 U	0.21 U	0.28 U	0.17 U
Dieldrin	0.13	0.28	0.24 U	0.21 U	0.28 U	0.17 U
Endrin			0.24 U	0.21 U	0.28 U	0.17 U
Endosulfan II			0.24 U	0.21 U	0.28 U	0.17 U
Endrin Aldehyde			0.24 U	0.21 U	0.28 U	0.17 U
Endosulfan Sulfate			0.24 U	0.21 U	0.28 U	0.17 U
4,4'-DDE			0.24 U	0.21 U	0.28 U	0.17 U
4,4'-DDD			0.24 U	0.21 U	0.28 U	0.17 U
4,4'-DDT			0.24 U	0.45	0.28 U	0.17 U
Total DDT	1.4	8.8	0.24 U	0.45	0.28 U	0.17 U
Methoxychlor			0.24 U	0.21 U	0.28 U	0.17 U
Toxaphene			7.32 U	6.41 U	8.47 U	5.17 U
Chlordane	0.16	0.26	0.24 U	0.21 U	0.28 U	0.17 U
Aroclor 1016			2.44 U	2.14 U	2.82 U	1.72 U
Aroclor 1221			4.88 U	4.27 U	5.65 U	3.45 U
Aroclor 1232			2.44 U	2.14 U	2.82 U	1.72 U
Aroclor 1242			2.44 U	2.14 U	2.82 U	1.72 U
Aroclor 1248			2.44 U	2.14 U	2.82 U	1.72 U
Aroclor 1254			1.93	2.14 U	5.56	1.72 U
Aroclor 1260			2.44 U	2.14 U	2.82 U	1.72 U
Total PCBs	12	190	1.93	2.14 U	5.56	1.72 U
PAHs in mg/kg (oc)						
Total LPAHs	370	2200	47.52	69.35	174.21	58.59
Naphthalene	99	220	1.82	1.83	3.68	1.44
Acenaphthylene	66	66	0.65 U	0.57 U	0.76 U	0.46 U
Acenaphthene	16	200	6.73	11.37	21.02	9.28
Fluorene	23	360	3.74	4.96	10.00	4.17
Phenanthrene	120	840	26.63	37.74	111.86	31.97
Anthracene	220	1200	6.59	11.67	24.24	10.10
2-Methylnaphthalene	64	120	1.36	1.22	2.66	1.17

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Table 3 - Analytical Results for Sediment Samples Compared to Proposed 1997 PSDDA Guidelines

	PSDDA SL 1997	PSDDA ML 1997	Terminal 4 Slip 3 HC-T4-01	HC-T4-02	HC-T4-03	HC-T4-02(dup)
PAHs in mg/kg (oc) (cont.)						
Total HPAHs	960	7600	315.37	596.84	1372.49	482.03
Fluoranthene	160	3000	64.39	129.49	295.48	105.17
Pyrene	1000	1400	31.85	61.97	137.85	52.41
Benzo(a)anthracene	110	650	34.63	66.67	146.89	56.21
Chrysene	110	850	34.83	64.10	142.37	53.45
Total Benzofluoranthenes	230	1500	57.51	97.48	246.89	79.00
Benzo(a)pyrene	99	210	36.44	69.66	158.76	51.38
Indeno(1,2,3-c,d)pyrene	33	900	22.93	44.02	99.44	35.86
Dibenz(a,h)anthracene	33	120	7.85	16.88	32.94	13.72
Benzo(g,h,i)perylene	31	100	24.93	46.58	111.86	34.83
Phenols in µg/kg						
Phenol	420	440	40 U	40 U	40 U	40 U
2-Methylphenol	63	77	40 U	40 U	40 U	40 U
3/4-Methylphenol	670	3600	40 U	40 U	40 U	40 U
2,4-Dimethylphenol	29	210	40 U	40 U	40 U	40 U
Pentachlorophenol	140	66	40 U	40 U	40 U	40 U

J - Estimated concentration
U - Not detected at indicated detection limit.
[ ] - Concentration above PSDDA Screening Level (SL)
[ ] - Concentration above PSDDA Maximum Level (ML)

562801/Terminal4.xls - Table 3

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Table 4 - Analytical Results for Bottom Sediment Samples

	Terminal 4		
	HC-T4-01B	HC-T4-02B	HC-T4-03B
	Dry Weight Basis		
Conventionals in percent			
Total Organic Carbon	1.25	0.501	0.83
Metals in mg/kg			
Cadmium	1.04	0.5 U	15.6
Lead	41.5	22.6	133
Zinc	134 J	97 J	236 J
PAHs in µg/kg			
Total LPAHs	1498 J*	872 J*	791 J*
Naphthalene	335 U	168 U	168 U
Acenaphthylene	335 U	168 U	168 U
Acenaphthene	398 J*	192 J*	181 J*
Fluorene	335 U	168 U	168 U
Phenanthrene	1100 J*	680 J*	610 J*
Anthracene	335 U	168 U	168 U
2-Methylnaphthalene			
Total HPAHs	13951 J*	8336 J*	5618 J*
Fluoranthene	2110 J*	1310 J*	1060 J*
Pyrene	2150 J*	1180 J*	1010 J*
Benzo(a)anthracene	1380 J*	871 J*	580 J*
Chrysene	1610 J*	1000 J*	644 J*
Total Benzofluoranthenes	2610 J*	1402 J*	842 J*
Benzo(a)pyrene	1560 J*	918 J*	514 J*
Indeno(1,2,3-c,d)pyrene	1000 J*	642 J*	442 J*
Dibenz(a,h)anthracene	341 J*	228 J*	335 U
Benzo(g,h,i)perylene	1190 J*	785 J*	526 J*
	Organic Carbon Normalized (mg/kg oc)		
PAHs in mg/kg (oc)			
Total LPAHs	119.8 J*	174.1 J*	95.3 J*
Naphthalene	26.8 U	33.5 U	20.2 U
Acenaphthylene	26.8 U	33.5 U	20.2 U
Acenaphthene	31.8 J*	38.3 J*	21.8 J*
Fluorene	26.8 U	33.5 U	20.2 U
Phenanthrene	88.0 J*	135.7 J*	73.5 J*
Anthracene	26.8 U	33.5 U	20.2 U
2-Methylnaphthalene			
Total HPAHs	1116.1 J*	1663.9 J*	676.9 J*
Fluoranthene	168.8 J*	261.5 J*	127.7 J*
Pyrene	172.0 J*	235.5 J*	121.7 J*
Benzo(a)anthracene	110.4 J*	173.9 J*	69.9 J*
Chrysene	128.8 J*	199.6 J*	77.6 J*
Total Benzofluoranthenes	208.8 J*	279.8 J*	101.4 J*
Benzo(a)pyrene	124.8 J*	183.2 J*	61.9 J*
Indeno(1,2,3-c,d)pyrene	80.0 J*	128.1 J*	53.3 J*
Dibenz(a,h)anthracene	27.3 J*	45.5 J*	40.4 U
Benzo(g,h,i)perylene	95.2 J*	156.7 J*	63.4 J*

J* - Holding Times Exceeded
J - Estimated concentration
U - Not detected at indicated detection limit.

562801/Terminal4.xls - Table 4

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Figures

Vicinity Map

Note: Base map prepared from USGS quadrangle maps of Linnton, Oregon photorevised 1984 and Portland, Oregon-Washington photorevised 1977.

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Figure 1

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Appendix A

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APPENDIX A
CHEMICAL DATA QUALITY REVIEW AND LABORATORY CERTIFICATES OF ANALYSIS

KMB00003936

APPENDIX A
CHEMICAL DATA QUALITY REVIEW
AND LABORATORY CERTIFICATES OF ANALYSIS

Sediment Chemical Data Quality Review

Four sediment samples, including one field duplicate, were collected on May 6, 1997. The sediment samples were submitted to North Creek Analytical of Bothell, Washington, for analyses of the following :

- Total Metals (EPA Method 6000/7000);
- Semivolatile Organics (GC/MS SIM);
- Pesticides/PCBs (EPA Method 8081);
- Tributyltin (TBT, GC/FPD);
- Total Organic Carbon (EPA Method 9060);
- Ammonia (EPA Method 350.3);
- Sulfide (PSEP);
- Total Volatile Solids (EPA Method 160.4); and
- Total Solids (EPA Method 160.3).

The following criteria were evaluated in the standard data quality review process for the results:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory Control Sample (LCS) and Blank spike recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries;
- Reporting limits; and
- Laboratory and field duplicates relative percent differences (RPDs).

Total Metals. Required holding times were met. No method blank contamination was present. LCS and MS recoveries were within control limits. Laboratory duplicate RPDs were acceptable. One blind field duplicate pair, HC-T4-02/HC-T4-04, was collected. The field duplicate RPDs ranged from 0 to 25 percent.

Semivolatile Organics. Required holding times were met. Method blank contamination was present for bis (2-ethylhexyl)phthalate and fluoranthene. Associated samples results for bis (2-ethylhexyl)phthalate less than ten times the blank contamination were qualified as not detected (U). Associated samples results for fluoranthene were greater then five times the blank contamination, so

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no results were qualified. Surrogate recoveries were acceptable. Blank spike and MS/MSD recoveries were within control limits. Reporting limits for 2-Methyphenol, 2,4-Dimethylphenol,diethyl phthalate, 1,2,4-trichlorobenzene, 1,2,-dichlorobenzene, hexachlorobenzene, and benzyl alcohol exceeded the PSDDA SL screening criteria but were less than the PSDDA ML criteria.

Laboratory duplicate RPDs were acceptable. The RPD for pyrene from the MS/MSD pair could not be calculated since the sample concentration was greater than the spike amount. No data were qualified based on duplicate RPDs. One blind field duplicate pair, HC-T4-02/HC-T4-04, was collected. The field duplicate RPDs ranged from 0 to 72.2 percent. Only the RPD for bis (2-ethylhexyl)phthalate was greater than 50 percent, likely the result of laboratory contamination.

Pesticides/PCBs. Required holding times were met. No method blank contamination was present. Surrogate recoveries were within control limits. LCS and MS/MSD recoveries were acceptable. Laboratory duplicate analysis was performed on HC-T4-01. RPDs could not be calculated for all compounds except Aroclor-1254 since sample results were not detected. The RPD for Aroclor-1254 was 82.5 percent, above the laboratory control limit. The laboratory noted a non-homogeneous sample matrix, so the detected sample results for HC-T4-01 were qualified as estimated (J). One blind field duplicate pair, HC-T4-02/HC-T4-04, was collected. The field duplicate RPD could not be calculated since sample results were not detected with the following exception. DDT was reported as detected at a concentration of 10.6 µg/kg in the project sample, but reported as not detected in the field duplicate sample. No results were qualified based on field duplicate results.

Tributyltin. Required holding times were met. No method blank contamination was present. Surrogate recoveries were within control limits. Blank spike and MS/MSD recoveries were acceptable. Laboratory duplicate RPDs were within control limits. One blind field duplicate pair, HC-T4-02/HC-T4-04, was collected. The field duplicate RPD could not be calculated since sample results were not detected.

Total Organic Carbon. Required holding times were met. No method blank contamination was detected. Blank spike and MS recoveries were acceptable. Laboratory duplicate RPDs were within control limits. The field duplicate RPD was 21.3 percent.

Ammonia/Sulfide. Required holding times were met. No method blank contamination was present. LCS recoveries were within control limits. Laboratory duplicate analysis were above control limits for ammonia and sulfide.

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The laboratory noted a non-homogeneous sample matrix, so the detected sample results for HC-T4-01 were qualified as estimated (J). Field duplicate RPDs were 44 percent for ammonia and 84 percent for sulfide.

Total Volatile Solids/Total Solids. Required holding times were met. Laboratory duplicate RPDs were within control limits. Field duplicate RPDs were 3.2 percent for total volatile solids and 4.1 percent for total solids.

Bottom Sediment Chemical Data Quality Review

In addition, three sediment samples collected on May 6, 1997, were analyzed in July 1997 upon request from U.S. Army Corps of Engineers (Corps). The sediment samples were submitted to North Creek Analytical of Bothell, Washington, for analyses of the following:

- Cadmium, Lead, and Zinc (EPA Method 6000/7000);
- Polycyclic Aromatic Compounds (GC/MS SIM); and
- Total Organic Carbon (EPA Method 9060).

The same criteria listed above were evaluated in the standard data quality review process for the results.

Total Metals. Required holding times were met. No method blank contamination was present. LCS recoveries were acceptable. No spike recoveries were reported for zinc because of the high concentration of sample. Sample results were qualified as estimates (J). Laboratory duplicate RPDs were within laboratory control limits.

PAHs. Recommended holding times were grossly exceeded. The samples would be rejected under normal circumstances, however, based on a request from the Corps to analyze samples for informational use, detected results were qualified as estimates (J*). Non-detected results were rejected (R). No method blank contamination was present. Surrogate recoveries were not reported due to sample dilutions. No qualifiers were assigned since data were already qualified based on holding time issue. LCS and MS/MSD recoveries were acceptable.

Total Organic Carbon. Required holding times were grossly exceeded. All results were qualified as estimates (J*). No method blank contamination was detected. LCS recoveries were acceptable. Laboratory duplicate RPDs were within laboratory control limits.

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CERTIFICATES OF ANALYSIS
NORTH CREEK ANALYTICAL

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PORTLAND ▪ (503) 643-9200 ▪ FAX 644-2202

Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
HC-T4-01	P705099-01	Other dry	5/6/97
HC-T4-02	P705099-02	Other dry	5/6/97
HC-T4-03	P705099-03	Other dry	5/5/97
HC-T4-03	P705099-03	Other dry	5/6/97
HC-T4-04	P705099-04	Other dry	5/6/97

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				**Other dry**	
Cadmium	0570208	5/9/97	5/12/97	EPA 6010A	0.500	**1.12**	mg/kg dry	
Copper	"	"	5/14/97	EPA 6010A	0.500	**31.9**	"	
Lead	"	"	5/12/97	EPA 6010A	10.0	**35.5**	"	
Nickel	"	"	5/14/97	EPA 6010A	1.25	**18.1**	"	
Silver	0570213	"	5/10/97	EPA 6010A	0.500	ND	"	1
Zinc	0570208	"	5/14/97	EPA 6010A	1.00	**119**	"	
Antimony	0570213	"	5/9/97	EPA 6020	0.500 UJ	ND	"	
Arsenic	"	"	"	EPA 6020	0.500	**4.76**	"	
Mercury	0570224	5/12/97	5/13/97	EPA 7471A	0.0500	ND	"	
HC-T4-02			**P705099-02**				**Other dry**	
Cadmium	0570208	5/9/97	5/12/97	EPA 6010A	0.500	**1.23**	mg/kg dry	
Copper	"	"	5/14/97	EPA 6010A	0.500	**33.7**	"	
Lead	"	"	5/12/97	EPA 6010A	10.0	**41.7**	"	
Nickel	"	"	5/14/97	EPA 6010A	1.25	**20.3**	"	
Silver	0570213	"	5/10/97	EPA 6010A	0.500	ND	"	1
Zinc	0570208	"	5/14/97	EPA 6010A	1.00	**130**	"	
Antimony	0570213	"	5/9/97	EPA 6020	0.500 UJ	ND	"	
Arsenic	"	"	"	EPA 6020	0.500	**4.78**	"	
Mercury	0570224	5/12/97	5/13/97	EPA 7471A	0.0500	ND	"	
HC-T4-03			**P705099-03**				**Other dry**	
Cadmium	0570208	5/9/97	5/12/97	EPA 6010A	0.500	**1.65**	mg/kg dry	
Copper	"	"	5/14/97	EPA 6010A	0.500	**38.4**	"	
Lead	"	"	5/12/97	EPA 6010A	10.0	**167**	"	
Nickel	"	"	5/14/97	EPA 6010A	1.25	**18.0**	"	
Silver	0570213	"	5/10/97	EPA 6010A	0.500	ND	"	1
Zinc	0570208	"	5/14/97	EPA 6010A	1.00	**236**	"	
Antimony	0570213	"	5/9/97	EPA 6020	0.500 UJ	ND	"	
Arsenic	"	"	"	EPA 6020	0.500	**7.20**	"	
Mercury	0570224	5/12/97	5/13/97	EPA 7471A	0.0500	ND	"	
HC-T4-04			**P705099-04**				**Other dry**	
Cadmium	0570208	5/9/97	5/12/97	EPA 6010A	0.500	ND	mg/kg dry	
Copper	"	"	5/14/97	EPA 6010A	0.500	**34.1**	"	
Lead	"	"	5/12/97	EPA 6010A	10.0	**29.3**	"	
Nickel	"	"	5/14/97	EPA 6010A	1.25	**21.4**	"	
Silver	0570213	"	5/10/97	EPA 6010A	0.500	ND	"	1

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-04 (continued)			**P705099-04**				**Other dry**	
Zinc	0570208	5/9/97	5/14/97	EPA 6010A	1.00	**101**	mg/kg dry	
Antimony	0570213	"	5/9/97	EPA 6020	0.500 UJ	ND	"	
Arsenic	"	"	"	EPA 6020	0.500	**4.87**	"	
Mercury	0570224	5/12/97	5/13/97	EPA 7471A	0.0500	ND	"	

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1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				**Other dry**	
Aldrin	0570171	5/9/97	5/22/97		5.00	ND	ug/kg dry	
alpha-BHC	"	"	"		5.00	ND	"	
beta-BHC	"	"	"		5.00	ND	"	
delta-BHC	"	"	"		5.00	ND	"	
gamma-BHC (Lindane)	"	"	"		5.00	ND	"	
Chlordane (tech)	"	"	"		150	ND	"	
Chlordane (alpha)	"	"	"		5.00	ND	"	
Chlordane (gamma)	"	"	"		5.00	ND	"	
4,4'-DDD	"	"	"		5.00	ND	"	
4,4'-DDE	"	"	"		5.00	ND	"	
4,4'-DDT	"	"	"		5.00	ND	"	
Dieldrin	"	"	"		5.00	ND	"	
Endosulfan I	"	"	"		5.00	ND	"	
Endosulfan II	"	"	"		5.00	ND	"	
Endosulfan sulfate	"	"	"		5.00	ND	"	
Endrin	"	"	"		5.00	ND	"	
Endrin aldehyde	"	"	"		5.00	ND	"	
Endrin ketone	"	"	"		5.00	ND	"	
Heptachlor	"	"	"		5.00	ND	"	
Heptachlor epoxide	"	"	"		5.00	ND	"	
Methoxychlor	"	"	"		5.00	ND	"	
Toxaphene	"	"	"		150	ND	"	
Aroclor 1016	"	"	5/19/97		50.0	ND	"	
Aroclor 1221	"	"	"		100	ND	"	
Aroclor 1232	"	"	"		50.0	ND	"	
Aroclor 1242	"	"	"		50.0	ND	"	
Aroclor 1248	"	"	"		50.0	ND	"	
Aroclor 1254	"	"	"		50.0	39.5 J	"	12
Aroclor 1260	"	"	"		50.0	ND	"	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	"	*5/22/97*	*42.0-151*		*85.4*	*%*	
Surrogate: Decachlorobiphenyl	"	"	*5/19/97*	*56.0-153*		*102*	"	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-02			**P705099-02**				**Other dry**	
Aldrin	0570171	5/9/97	5/22/97		5.00	ND	ug/kg dry	
alpha-BHC	"	"	"		5.00	ND	"	
beta-BHC	"	"	"		5.00	ND	"	
delta-BHC	"	"	"		5.00	ND	"	
gamma-BHC (Lindane)	"	"	"		5.00	ND	"	
Chlordane (tech)	"	"	"		150	ND	"	
Chlordane (alpha)	"	"	"		5.00	ND	"	
Chlordane (gamma)	"	"	"		5.00	ND	"	
4,4'-DDD	"	"	"		5.00	ND	"	
4,4'-DDE	"	"	"		5.00	ND	"	
4,4'-DDT	"	"	"		5.00	**10.6**	"	
Dieldrin	"	"	"		5.00	ND	"	
Endosulfan I	"	"	"		5.00	ND	"	
Endosulfan II	"	"	"		5.00	ND	"	
Endosulfan sulfate	"	"	"		5.00	ND	"	
Endrin	"	"	"		5.00	ND	"	
Endrin aldehyde	"	"	"		5.00	ND	"	
Endrin ketone	"	"	"		5.00	ND	"	
Heptachlor	"	"	"		5.00	ND	"	
Heptachlor epoxide	"	"	"		5.00	ND	"	
Methoxychlor	"	"	"		5.00	ND	"	
Toxaphene	"	"	"		150	ND	"	
Aroclor 1016	"	"	5/20/97		50.0	ND	"	
Aroclor 1221	"	"	"		100	ND	"	
Aroclor 1232	"	"	"		50.0	ND	"	
Aroclor 1242	"	"	"		50.0	ND	"	
Aroclor 1248	"	"	"		50.0	ND	"	
Aroclor 1254	"	"	"		50.0	ND	"	
Aroclor 1260	"	"	"		50.0	ND	"	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	"	*5/22/97*	*42.0-151*		*91.0*	*%*	
Surrogate: Decachlorobiphenyl	"	"	*5/20/97*	*56.0-153*		*98.4*	"	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-03			**P705099-03**				**Other dry**	
Aldrin	0570171	5/9/97	5/22/97		5.00	ND	ug/kg dry	
alpha-BHC	"	"	"		5.00	ND	"	
beta-BHC	"	"	"		5.00	ND	"	
delta-BHC	"	"	"		5.00	ND	"	
gamma-BHC (Lindane)	"	"	"		5.00	ND	"	
Chlordane (tech)	"	"	"		150	ND	"	
Chlordane (alpha)	"	"	"		5.00	ND	"	
Chlordane (gamma)	"	"	"		5.00	ND	"	
4,4'-DDD	"	"	"		5.00	ND	"	
4,4'-DDE	"	"	"		5.00	ND	"	
4,4'-DDT	"	"	"		5.00	ND	"	
Dieldrin	"	"	"		5.00	ND	"	
Endosulfan I	"	"	"		5.00	ND	"	
Endosulfan II	"	"	"		5.00	ND	"	
Endosulfan sulfate	"	"	"		5.00	ND	"	
Endrin	"	"	"		5.00	ND	"	
Endrin aldehyde	"	"	"		5.00	ND	"	
Endrin ketone	"	"	"		5.00	ND	"	
Heptachlor	"	"	"		5.00	ND	"	
Heptachlor epoxide	"	"	"		5.00	ND	"	
Methoxychlor	"	"	"		5.00	ND	"	
Toxaphene	"	"	"		150	ND	"	
Aroclor 1016	"	"	5/20/97		50.0	ND	"	
Aroclor 1221	"	"	"		100	ND	"	
Aroclor 1232	"	"	"		50.0	ND	"	
Aroclor 1242	"	"	"		50.0	ND	"	
Aroclor 1248	"	"	"		50.0	ND	"	
Aroclor 1254	"	"	"		50.0	**98.4**	"	
Aroclor 1260	"	"	"		50.0	ND	"	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	"	*5/22/97*	*42.0-151*		*95.2*	*%*	
Surrogate: Decachlorobiphenyl	"	"	*5/20/97*	*56.0-153*		*96.7*	"	

North Creek Analytical, Inc.

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Tabatha A Brochu, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-04			P705099-04				Other dry	
Aldrin	0570171	5/9/97	5/22/97		5.00	ND	ug/kg dry	
alpha-BHC	"	"	"		5.00	ND	"	
beta-BHC	"	"	"		5.00	ND	"	
delta-BHC	"	"	"		5.00	ND	"	
gamma-BHC (Lindane)	"	"	"		5.00	ND	"	
Chlordane (tech)	"	"	"		150	ND	"	
Chlordane (alpha)	"	"	"		5.00	ND	"	
Chlordane (gamma)	"	"	"		5.00	ND	"	
4,4'-DDD	"	"	"		5.00	ND	"	
4,4'-DDE	"	"	"		5.00	ND	"	
4,4'-DDT	"	"	"		5.00	ND	"	
Dieldrin	"	"	"		5.00	ND	"	
Endosulfan I	"	"	"		5.00	ND	"	
Endosulfan II	"	"	"		5.00	ND	"	
Endosulfan sulfate	"	"	"		5.00	ND	"	
Endrin	"	"	"		5.00	ND	"	
Endrin aldehyde	"	"	"		5.00	ND	"	
Endrin ketone	"	"	"		5.00	ND	"	
Heptachlor	"	"	"		5.00	ND	"	
Heptachlor epoxide	"	"	"		5.00	ND	"	
Methoxychlor	"	"	"		5.00	ND	"	
Toxaphene	"	"	"		150	ND	"	
Aroclor 1016	"	"	5/19/97		50.0	ND	"	
Aroclor 1221	"	"	"		100	ND	"	
Aroclor 1232	"	"	"		50.0	ND	"	
Aroclor 1242	"	"	"		50.0	ND	"	
Aroclor 1248	"	"	"		50.0	ND	"	
Aroclor 1254	"	"	"		50.0	ND	"	
Aroclor 1260	"	"	"		50.0	ND	"	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	"	*5/22/97*	*42.0-151*		*91.4*	*%*	
Surrogate: Decachlorobiphenyl	"	"	*5/19/97*	*56.0-153*		*103*	"	

North Creek Analytical, Inc.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				**Other dry**	**2**
Acenaphthene	0570347	5/19/97	5/28/97		13.4	**138**	ug/kg dry	
Acenaphthylene	"	"	"		13.4	ND	"	
Anthracene	"	"	"		13.4	**135**	"	
Benzo (a) anthracene	"	"	"		13.4	**710**	"	
Benzo (a) pyrene	"	"	"		13.4	**747**	"	
Benzo (b) fluoranthene	"	"	"		13.4	**670**	"	
Benzo (ghi) perylene	"	"	"		13.4	**511**	"	
Benzo (k) fluoranthene	"	"	"		13.4	**509**	"	
Benzoic Acid	"	"	"		400	ND	"	
Benzyl alcohol	"	"	"		50.0	ND	"	
Butyl benzyl phthalate	"	"	"		200	ND	"	
Chrysene	"	"	"		13.4	**714**	"	
Di-n-butyl phthalate	"	"	"		200	ND	"	
Di-n-octyl phthalate	"	"	"		200	ND	"	
Dibenzo (a,h) anthracene	"	"	"		13.4	**161**	"	
Dibenzofuran	"	"	"		13.4	**37.1**	"	
1,2-Dichlorobenzene	"	"	"		26.0	ND	"	
1,3-Dichlorobenzene	"	"	"		26.0	ND	"	
1,4-Dichlorobenzene	"	"	"		26.0	ND	"	
Diethyl phthalate	"	"	"		100	ND	"	
2,4-Dimethylphenol	"	"	"		40.0	ND	"	
Dimethyl phthalate	"	"	"		100	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	"		400	**877**	"	3
Fluoranthene	"	"	"		26.8	**1320**	"	
Fluorene	"	"	"		13.4	**76.6**	"	
Hexachlorobenzene	"	"	"		26.0	ND	"	
Hexachlorobutadiene	"	"	"		26.0	ND	"	
Hexachloroethane	"	"	"		50.0	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		13.4	**470**	"	
2-Methylnaphthalene	"	"	"		13.4	**27.8**	"	
2-Methylphenol	"	"	"		40.0	ND	"	
4-Methylphenol	"	"	"		40.0	ND	"	
Naphthalene	"	"	"		13.4	**37.4**	"	
N-Nitrosodiphenylamine	"	"	"		26.0	ND	"	
Pentachlorophenol	"	"	"		40.0	ND	"	
Phenanthrene	"	"	"		13.4	**546**	"	
Phenol	"	"	"		40.0	ND	"	
Pyrene	"	"	"		13.4	**653**	"	

North Creek Analytical, Inc.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-01 (continued)			**P705099-01**				**Other dry**	**2**
1,2,4-Trichlorobenzene	0570347	5/19/97	5/28/97		26.0	ND	ug/kg dry	
Surrogate: 2-Fluorobiphenyl	"	"	"	*20.0-150*		*110*	*%*	
Surrogate: 2-Fluorophenol	"	"	"	*20.0-150*		*74.2*	"	
Surrogate: Nitrobenzene-d5	"	"	"	*20.0-150*		*91.7*	"	
Surrogate: Phenol-d6	"	"	"	*20.0-150*		*88.2*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*20.0-150*		*62.4*	"	
Surrogate: 2,4,6-Tribromophenol	"	"	"	*20.0-150*		*119*	"	

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-02			**P705099-02**				**Other dry**	**2**
Acenaphthene	0570347	5/19/97	5/28/97		13.4	**266**	ug/kg dry	
Acenaphthylene	"	"	"		13.4	ND	"	
Anthracene	"	"	"		13.4	**273**	"	
Benzo (a) anthracene	"	"	5/29/97		67.0	**1560**	"	
Benzo (a) pyrene	"	"	"		67.0	**1630**	"	
Benzo (b) fluoranthene	"	"	"		67.0	**1410**	"	
Benzo (ghi) perylene	"	"	5/28/97		13.4	**1090**	"	
Benzo (k) fluoranthene	"	"	"		13.4	**871**	"	
Benzoic Acid	"	"	"		400	ND	"	
Benzyl alcohol	"	"	"		50.0	ND	"	
Butyl benzyl phthalate	"	"	"		200	ND	"	
Chrysene	"	"	5/29/97		67.0	**1500**	"	
Di-n-butyl phthalate	"	"	5/28/97		200	ND	"	
Di-n-octyl phthalate	"	"	5/29/97		1000	ND	"	
Dibenzo (a,h) anthracene	"	"	5/28/97		13.4	**395**	"	
Dibenzofuran	"	"	"		13.4	**54.1**	"	
1,2-Dichlorobenzene	"	"	"		26.0	ND	"	
1,3-Dichlorobenzene	"	"	"		26.0	ND	"	
1,4-Dichlorobenzene	"	"	"		26.0	ND	"	
Diethyl phthalate	"	"	"		100	ND	"	
2,4-Dimethylphenol	"	"	"		40.0	ND	"	
Dimethyl phthalate	"	"	"		100	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	5/29/97		2000	**2040**	"	3
Fluoranthene	"	"	"		67.0	**3030**	"	
Fluorene	"	"	5/28/97		13.4	**116**	"	
Hexachlorobenzene	"	"	"		26.0	ND	"	
Hexachlorobutadiene	"	"	"		26.0	ND	"	
Hexachloroethane	"	"	"		50.0	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		13.4	**1030**	"	
2-Methylnaphthalene	"	"	"		13.4	**28.6**	"	
2-Methylphenol	"	"	"		40.0	ND	"	
4-Methylphenol	"	"	"		40.0	ND	"	
Naphthalene	"	"	"		13.4	**42.8**	"	
N-Nitrosodiphenylamine	"	"	"		26.0	ND	"	
Pentachlorophenol	"	"	"		40.0	ND	"	
Phenanthrene	"	"	"		13.4	**883**	"	
Phenol	"	"	"		40.0	ND	"	
Pyrene	"	"	5/29/97		67.0	**1450**	"	

North Creek Analytical, Inc.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-02 (continued)			**P705099-02**				**Other dry**	**2**
1,2,4-Trichlorobenzene	0570347	5/19/97	5/28/97		26.0	ND	ug/kg dry	
Surrogate: 2-Fluorobiphenyl	"	"	"	*20.0-150*		*102*	%	
Surrogate: 2-Fluorophenol	"	"	"	*20.0-150*		*66.7*	"	
Surrogate: Nitrobenzene-d5	"	"	"	*20.0-150*		*83.5*	"	
Surrogate: Phenol-d6	"	"	"	*20.0-150*		*83.2*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*20.0-150*		*73.4*	"	
Surrogate: 2,4,6-Tribromophenol	"	"	"	*20.0-150*		*126*	"	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-03			P705099-03				Other dry	2
Acenaphthene	0570347	5/19/97	5/28/97		13.4	**372**	ug/kg dry	
Acenaphthylene	"	"	"		13.4	ND	"	
Anthracene	"	"	"		13.4	**429**	"	
Benzo (a) anthracene	"	"	5/29/97		134	**2600**	"	
Benzo (a) pyrene	"	"	"		134	**2810**	"	
Benzo (b) fluoranthene	"	"	"		134	**2510**	"	
Benzo (ghi) perylene	"	"	"		134	**1980**	"	
Benzo (k) fluoranthene	"	"	"		134	**1860**	"	
Benzoic Acid	"	"	5/28/97		400	ND	"	
Benzyl alcohol	"	"	"		50.0	ND	"	
Butyl benzyl phthalate	"	"	"		200	ND	"	
Chrysene	"	"	5/29/97		134	**2520**	"	
Di-n-butyl phthalate	"	"	5/28/97		200	ND	"	
Di-n-octyl phthalate	"	"	5/29/97		2000	ND	"	
Dibenzo (a,h) anthracene	"	"	5/28/97		13.4	**583**	"	
Dibenzofuran	"	"	"		13.4	**79.0**	"	
1,2-Dichlorobenzene	"	"	"		26.0	ND	"	
1,3-Dichlorobenzene	"	"	"		26.0	ND	"	
1,4-Dichlorobenzene	"	"	"		26.0	ND	"	
Diethyl phthalate	"	"	"		100	ND	"	
2,4-Dimethylphenol	"	"	"		40.0	ND	"	
Dimethyl phthalate	"	"	"		100	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	"		400	**863**	"	3
Fluoranthene	"	"	5/29/97		134	**5230**	"	
Fluorene	"	"	5/28/97		13.4	**177**	"	
Hexachlorobenzene	"	"	"		26.0	ND	"	
Hexachlorobutadiene	"	"	"		26.0	ND	"	
Hexachloroethane	"	"	"		50.0	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	5/29/97		134	**1760**	"	
2-Methylnaphthalene	"	"	5/28/97		13.4	**47.0**	"	
2-Methylphenol	"	"	"		40.0	ND	"	
4-Methylphenol	"	"	"		40.0	ND	"	
Naphthalene	"	"	"		13.4	**65.1**	"	
N-Nitrosodiphenylamine	"	"	"		26.0	ND	"	
Pentachlorophenol	"	"	"		40.0	ND	"	
Phenanthrene	"	"	5/29/97		134	**1980**	"	
Phenol	"	"	5/28/97		40.0	ND	"	
Pyrene	"	"	5/29/97		134	**2440**	"	

North Creek Analytical, Inc.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-03 (continued)			**P705099-03**				**Other dry**	**2**
1,2,4-Trichlorobenzene	0570347	5/19/97	5/28/97		26.0	ND	ug/kg dry	
Surrogate: 2-Fluorobiphenyl	"	"	"	*20.0-150*		*95.2*	%	
Surrogate: 2-Fluorophenol	"	"	"	*20.0-150*		*74.7*	"	
Surrogate: Nitrobenzene-d5	"	"	"	*20.0-150*		*96.6*	"	
Surrogate: Phenol-d6	"	"	"	*20.0-150*		*89.3*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*20.0-150*		*77.9*	"	
Surrogate: 2,4,6-Tribromophenol	"	"	"	*20.0-150*		*124*	"	

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-04			**P705099-04**				**Other dry**	**2**
Acenaphthene	0570347	5/19/97	5/28/97		13.4	**269**	ug/kg dry	
Acenaphthylene	"	"	"		13.4	ND	"	
Anthracene	"	"	"		13.4	**293**	"	
Benzo (a) anthracene	"	"	5/29/97		67.0	**1630**	"	
Benzo (a) pyrene	"	"	"		67.0	**1490**	"	
Benzo (b) fluoranthene	"	"	"		67.0	**1380**	"	
Benzo (ghi) perylene	"	"	5/28/97		13.4	**1010**	"	
Benzo (k) fluoranthene	"	"	"		13.4	**911**	"	
Benzoic Acid	"	"	"		400	ND	"	
Benzyl alcohol	"	"	"		50.0	ND	"	
Butyl benzyl phthalate	"	"	"		200	ND	"	
Chrysene	"	"	5/29/97		67.0	**1550**	"	
Di-n-butyl phthalate	"	"	5/28/97		200	ND	"	
Di-n-octyl phthalate	"	"	5/29/97		1000	ND	"	
Dibenzo (a,h) anthracene	"	"	5/28/97		13.4	**398**	"	
Dibenzofuran	"	"	"		13.4	**55.2**	"	
1,2-Dichlorobenzene	"	"	"		26.0	ND	"	
1,3-Dichlorobenzene	"	"	"		26.0	ND	"	
1,4-Dichlorobenzene	"	"	"		26.0	ND	"	
Diethyl phthalate	"	"	"		100	ND	"	
2,4-Dimethylphenol	"	"	"		40.0	ND	"	
Dimethyl phthalate	"	"	"		100	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	"		400	**957**	"	3
Fluoranthene	"	"	5/29/97		67.0	**3050**	"	
Fluorene	"	"	5/28/97		13.4	**121**	"	
Hexachlorobenzene	"	"	"		26.0	ND	"	
Hexachlorobutadiene	"	"	"		26.0	ND	"	
Hexachloroethane	"	"	"		50.0	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		13.4	**1040**	"	
2-Methylnaphthalene	"	"	"		13.4	**34.0**	"	
2-Methylphenol	"	"	"		40.0	ND	"	
4-Methylphenol	"	"	"		40.0	ND	"	
Naphthalene	"	"	"		13.4	**41.8**	"	
N-Nitrosodiphenylamine	"	"	"		26.0	ND	"	
Pentachlorophenol	"	"	"		40.0	ND	"	
Phenanthrene	"	"	"		13.4	**927**	"	
Phenol	"	"	"		40.0	ND	"	
Pyrene	"	"	5/29/97		67.0	**1520**	"	

North Creek Analytical, Inc.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-04 (continued)			**P705099-04**				**Other dry**	**2**
1,2,4-Trichlorobenzene	0570347	5/19/97	5/28/97		26.0	ND	ug/kg dry	
Surrogate: 2-Fluorobiphenyl	"	"	"	*20.0-150*		*95.6*	*%*	
Surrogate: 2-Fluorophenol	"	"	"	*20.0-150*		*67.2*	"	
Surrogate: Nitrobenzene-d5	"	"	"	*20.0-150*		*83.1*	"	
Surrogate: Phenol-d6	"	"	"	*20.0-150*		*81.9*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*20.0-150*		*78.1*	"	
Surrogate: 2,4,6-Tribromophenol	"	"	"	*20.0-150*		*125*	"	

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters per APHA/EPA Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				**Other dry**	
Total Volatile Solids	0570253	5/13/97	5/13/97	EPA 160.4	100	**32000**	mg/kg	
Ammonia-Nitrogen	0570476	5/22/97	5/22/97	EPA 350.3	1.00	**85.3** J	mg/kg dry	
HC-T4-02			**P705099-02**				**Other dry**	
Total Volatile Solids	0570253	5/13/97	5/13/97	EPA 160.4	100	**30700**	mg/kg	
Ammonia-Nitrogen	0570476	5/22/97	5/22/97	EPA 350.3	1.00	**46.4**	mg/kg dry	
HC-T4-03			**P705099-03**				**Other dry**	
Total Volatile Solids	0570253	5/13/97	5/13/97	EPA 160.4	100	**34300**	mg/kg	
Ammonia-Nitrogen	0570476	5/22/97	5/22/97	EPA 350.3	1.00	**43.5**	mg/kg dry	
HC-T4-04			**P705099-04**				**Other dry**	
Total Volatile Solids	0570253	5/13/97	5/13/97	EPA 160.4	100	**31700**	mg/kg	
Ammonia-Nitrogen	0570476	5/22/97	5/22/97	EPA 350.3	1.00	**72.7**	mg/kg dry	

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North Creek Analytical, Inc.

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters per PSEP Recommended Guidelines
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01			P705099-01				Other dry	
Sulfide	0570479	5/22/97	5/22/97	PSEP	1.00	**8.21 J**	mg/kg dry	4
HC-T4-02			P705099-02				Other dry	
Sulfide	0570479	5/22/97	5/22/97	PSEP	1.00	**60.9**	mg/kg dry	4
HC-T4-03			P705099-03				Other dry	
Sulfide	0570479	5/22/97	5/22/97	PSEP	1.00	**37.9**	mg/kg dry	4
HC-T4-04			P705099-04				Other dry	
Sulfide	0570479	5/22/97	5/22/97	PSEP	1.00	**24.8**	mg/kg dry	4

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Physical Parameters per APHA/ASTM/EPA Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				**Other dry**	
Total Solids	0570219	5/12/97	5/13/97	EPA 160.3 mod.	0.0100	**504000**	mg/kg	
HC-T4-02			**P705099-02**				**Other dry**	
Total Solids	0570219	5/12/97	5/13/97	EPA 160.3 mod.	0.0100	**513000**	mg/kg	
HC-T4-03			**P705099-03**				**Other dry**	
Total Solids	0570219	5/12/97	5/13/97	EPA 160.3 mod.	0.0100	**569000**	mg/kg	
HC-T4-04			**P705099-04**				**Other dry**	
Total Solids	0570219	5/12/97	5/13/97	EPA 160.3 mod.	0.0100	**534000**	mg/kg	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Tributyltin by GC/FPD
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-01			P705099-01				Other dry	5
Tributyltin	0670017	5/20/97	5/20/97		0.0250	ND	ug/l	
Surrogate: Tripropyltin	"	"	"	*50.0-140*		*66*	%	
HC-T4-02			P705099-02				Other dry	5
Tributyltin	0670017	5/20/97	5/20/97		0.0250	ND	ug/l	
Surrogate: Tripropyltin	"	"	"	*50.0-140*		*74*	%	
HC-T4-03			P705099-03				Other dry	5
Tributyltin	0670017	5/20/97	5/20/97		0.0250	**0.0480**	ug/l	
Surrogate: Tripropyltin	"	"	"	*50.0-140*		*79*	%	
HC-T4-04			P705099-04				Other dry	5
Tributyltin	0670017	5/20/97	5/20/97		0.0250	ND	ug/l	
Surrogate: Tripropyltin	"	"	"	*50.0-140*		*69*	%	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters by APHA/EPA Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01			**P705099-01**				Other dry	
Total Organic Carbon	0570302	5/12/97	5/12/97	EPA 9060 mod	50.0	**20500**	mg/kg dry	
HC-T4-02			**P705099-02**				Other dry	
Total Organic Carbon	0570302	5/12/97	5/12/97	EPA 9060 mod	50.0	**23400**	mg/kg dry	
HC-T4-03			**P705099-03**				Other dry	
Total Organic Carbon	0570302	5/12/97	5/12/97	EPA 9060 mod	50.0	**17700**	mg/kg dry	
HC-T4-04			**P705099-04**				Other dry	
Total Organic Carbon	0570302	5/12/97	5/12/97	EPA 9060 mod	50.0	**29000**	mg/kg dry	

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1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
HC-T4-01	P705099-01	Other dry	53.7	%
HC-T4-02	P705099-02	Other dry	55.0	%
HC-T4-03	P705099-03	Other dry	54.8	%
HC-T4-04	P705099-04	Other dry	54.9	%

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled:	5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received:	5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported:	6/4/1997 10:52

Dry Weight Determination
North Creek Analytical - Portland

Sample Name	Lab ID	Matrix	Result	Units
HC-T4-01	P705099-01	Other dry	53.0	%
HC-T4-02	P705099-02	Other dry	52.9	%
HC-T4-03	P705099-03	Other dry	57.6	%
HC-T4-04	P705099-04	Other dry	52.2	%

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570208	**Date Prepared: 5/9/97**				**Extraction Method: EPA 3050**					
Blank	**0570208-BLK1**									
Cadmium	5/12/97			ND	mg/kg dry	0.500				
Copper	5/14/97			ND	"	0.500				
Lead	5/12/97			ND	"	10.0				
Nickel	5/14/97			ND	"	1.25				
Zinc	"			ND	"	1.00				
LCS	**0570208-BS1**									
Cadmium	5/12/97	20.0		18.4	mg/kg dry	80.0-120	92.0			
Copper	5/14/97	50.0		45.3	"	80.0-120	90.6			
Lead	5/12/97	100		87.5	"	80.0-120	87.5			
Nickel	5/14/97	50.0		45.1	"	80.0-120	90.2			
Zinc	"	50.0		46.1	"	80.0-120	92.2			
Duplicate	**0570208-DUP1**		**P705084-05**							
Cadmium	5/12/97		27.3	29.2	mg/kg dry			40.0	6.73	
Copper	5/14/97		856	904	"			40.0	5.45	
Lead	5/12/97		891	932	"			40.0	4.50	
Nickel	5/14/97		92.1	100	"			40.0	8.22	
Zinc	"		1860	2180	"			40.0	15.8	
Matrix Spike	**0570208-MS1**		**P705084-05**							
Cadmium	5/12/97	70.9	27.3	93.9	mg/kg dry	75.0-125	93.9			
Copper	5/14/97	177	856	1050	"	75.0-125	110			
Lead	5/13/97	354	891	1290	"	75.0-125	113			
Nickel	5/14/97	177	92.1	259	"	75.0-125	94.3			
Zinc	"	177	1860	2480	"	75.0-125	NR			6
Batch: 0570213	**Date Prepared: 5/9/97**				**Extraction Method: EPA 3050**					
Blank	**0570213-BLK1**									
Silver	5/9/97			ND	mg/kg dry	0.500				
Antimony	"			ND	"	0.500				
Arsenic	"			ND	"	0.500				
LCS	**0570213-BS1**									
Silver	5/9/97	5.00		4.59	mg/kg dry	80.0-120	91.8			
Antimony	"	5.00		4.95	"	80.0-120	99.0			
Arsenic	"	5.00		5.30	"	80.0-120	106			

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Duplicate	**0570213-DUP1**		**P705003-09**							
Silver	5/9/97		ND	ND	mg/kg dry			40.0		
Antimony	"		0.999	0.718	"			40.0	**32.7**	7
Arsenic	"		4.48	4.61	"			40.0	**2.86**	
Matrix Spike	**0570213-MS1**		**P705003-09**							
Silver	5/9/97	5.52	ND	5.04	mg/kg dry	75.0-125	**91.3**			
Antimony	"	5.52	0.999	4.13	"	75.0-125	**56.7**			8
Arsenic	"	5.52	4.48	9.77	"	75.0-125	**95.8**			
Batch: 0570224	**Date Prepared: 5/12/97**				**Extraction Method: Metals**					
Blank	**0570224-BLK1**									
Mercury	5/13/97			**ND**	mg/kg dry	**0.0500**				
LCS	**0570224-BS1**									
Mercury	5/13/97	0.500		0.500	mg/kg dry	80.0-120	100			
Duplicate	**0570224-DUP1**		**P705099-01**							
Mercury	5/13/97		ND	ND	mg/kg dry			20.0		
Matrix Spike	**0570224-MS1**		**P705099-01**							
Mercury	5/13/97	0.943	ND	1.00	mg/kg dry	75.0-125	**106**			

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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570171	**Date Prepared: 5/9/97**				**Extraction Method: EPA 3550**					
Blank	**0570171-BLK1**									
Aldrin	5/9/97			ND	ug/kg dry	5.00				
alpha-BHC	"			ND	"	5.00				
beta-BHC	"			ND	"	5.00				
delta-BHC	"			ND	"	5.00				
gamma-BHC (Lindane)	"			ND	"	5.00				
Chlordane (tech)	"			ND	"	150				
Chlordane (alpha,gamma)	"			ND	"	5.00				
4,4'-DDD	"			ND	"	5.00				
4,4'-DDE	"			ND	"	5.00				
4,4'-DDT	"			ND	"	5.00				
Dieldrin	"			ND	"	5.00				
Endosulfan I	"			ND	"	5.00				
Endosulfan II	"			ND	"	5.00				
Endosulfan sulfate	"			ND	"	5.00				
Endrin	"			ND	"	5.00				
Endrin aldehyde	"			ND	"	5.00				
Endrin ketone	"			ND	"	5.00				
Heptachlor	"			ND	"	5.00				
Heptachlor epoxide	"			ND	"	5.00				
Methoxychlor	"			ND	"	5.00				
Toxaphene	"			ND	"	150				
Aroclor 1016	5/28/97			ND	"	50.0				
Aroclor 1221	"			ND	"	100				
Aroclor 1232	"			ND	"	50.0				
Aroclor 1242	"			ND	"	50.0				
Aroclor 1248	"			ND	"	50.0				
Aroclor 1254	"			ND	"	50.0				
Aroclor 1260	"			ND	"	50.0				
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	*5/9/97*	*33.3*		*26.8*	"	*42.0-151*	*80.5*			
Surrogate: Decachlorobiphenyl	*5/28/97*	*33.3*		*37.0*	"	*56.0-153*	*111*			
LCS	**0570171-BS1**									
Aldrin	5/9/97	8.33		6.20	ug/kg dry	51.0-134	74.4			
gamma-BHC (Lindane)	"	8.33		5.87	"	62.0-151	70.5			
4,4'-DDT	"	33.3		31.9	"	75.0-157	95.8			
Dieldrin	"	33.3		33.3	"	76.0-155	100			
Endrin	"	33.3		31.3	"	77.0-157	94.0			
Heptachlor	"	8.33		5.97	"	62.0-153	71.7			

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

Tabatha A Brochu, Project Manager

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NORTH CREEK ANALYTICAL
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PORTLAND ▪ (503) 643-9200 ▪ FAX 644-2202

Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
LCS (continued)	**0570171-BS1**									
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	*5/9/97*	*33.3*		*26.7*	*ug/kg dry*	*42.0-151*	*80.2*			
Surrogate: Decachlorobiphenyl	"	*33.3*		*34.7*	"	*56.0-153*	*104*			
LCS	**0570171-BS2**									
Aroclor 1016	5/16/97	333		390	ug/kg dry	60.0-135	117			
Aroclor 1260	"	333		340	"	62.0-147	102			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	*33.3*		*29.8*	"	*42.0-151*	*89.5*			
Surrogate: Decachlorobiphenyl	"	*33.3*		*35.0*	"	*56.0-153*	*105*			
Duplicate	**0570171-DUP1**	**P705099-01**								
Aldrin	5/27/97		ND	ND	ug/kg dry			50.0		
alpha-BHC	"		ND	ND	"			50.0		
beta-BHC	"		ND	ND	"			50.0		
delta-BHC	"		ND	ND	"			50.0		
gamma-BHC (Lindane)	"		ND	ND	"			50.0		
Chlordane (tech, alpha, gamma)	"		ND	ND	"			50.0		
4,4'-DDD	"		ND	ND	"			50.0		
4,4'-DDE	"		ND	ND	"			50.0		
4,4'-DDT	"		ND	ND	"			50.0		
Dieldrin	"		ND	ND	"			50.0		
Endosulfan I	"		ND	ND	"			50.0		
Endosulfan II	"		ND	ND	"			50.0		
Endosulfan sulfate	"		ND	ND	"			50.0		
Endrin	"		ND	ND	"			50.0		
Endrin aldehyde	"		ND	ND	"			50.0		
Endrin ketone	"		ND	ND	"			50.0		
Heptachlor	"		ND	ND	"			50.0		
Heptachlor epoxide	"		ND	ND	"			50.0		
Methoxychlor	"		ND	ND	"			50.0		
Toxaphene	"		ND	ND	"			50.0		
Aroclor 1016	5/28/97		ND	ND	"			50.0		
Aroclor 1221	"		ND	ND	"			50.0		
Aroclor 1232	"		ND	ND	"			50.0		
Aroclor 1242	"		ND	ND	"			50.0		
Aroclor 1248	"		ND	ND	"			50.0		
Aroclor 1254	"		39.5	95.0	"			50.0	82.5	7
Aroclor 1260	"		ND	ND	"			50.0		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	*5/27/97*	*62.9*		*47.8*	"	*42.0-151*	*76.0*			

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Organochlorine Pesticides and PCBs per EPA Method 8081/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Duplicate (continued)	**0570171-DUP1**		**P705099-01**							
Surrogate: Decachlorobiphenyl	*5/28/97*	*62.9*		*57.7*	*ug/kg dry*	*56.0-153*	*91.7*			
Matrix Spike	**0570171-MS1**		**P705099-01**							
Aldrin	5/9/97	15.7	ND	9.34	ug/kg dry	51.0-134	**59.5**			12
gamma-BHC (Lindane)	"	15.7	ND	10.4	"	62.0-151	**66.2**			12
4,4'-DDT	"	62.9	ND	86.2	"	75.0-157	**137**			
Dieldrin	"	62.9	ND	56.3	"	76.0-155	**89.5**			
Endrin	"	62.9	ND	51.6	"	77.0-157	**82.0**			
Heptachlor	"	15.7	ND	14.0	"	62.0-153	**89.1**			12
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	*62.9*		*69.2*	"	*42.0-151*	*110*			
Surrogate: Decachlorobiphenyl	"	*62.9*		*78.3*	"	*56.0-153*	*124*			
Matrix Spike Dup	**0570171-MSD1**		**P705099-01**							
Aldrin	5/9/97	15.7	ND	9.15	ug/kg dry	51.0-134	**58.2**	50.0	**2.21**	12
gamma-BHC (Lindane)	"	15.7	ND	10.7	"	62.0-151	**68.1**	50.0	**2.83**	12
4,4'-DDT	"	62.9	ND	73.6	"	75.0-157	**117**	50.0	**15.7**	
Dieldrin	"	62.9	ND	52.5	"	76.0-155	**83.5**	50.0	**6.94**	
Endrin	"	62.9	ND	49.1	"	77.0-157	**78.1**	50.0	**4.87**	
Heptachlor	"	15.7	ND	12.4	"	62.0-153	**79.0**	50.0	**12.0**	12
Surrogate: 2,4,5,6-Tetrachloro-m-xylene	"	*62.9*		*67.3*	"	*42.0-151*	*107*			
Surrogate: Decachlorobiphenyl	"	*62.9*		*75.8*	"	*56.0-153*	*121*			

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570347	**Date Prepared: 5/19/97**				**Extraction Method: EPA 3550**					
Blank	**0570347-BLK1**									
Acenaphthene	5/28/97			ND	ug/kg dry	6.70				
Acenaphthylene	"			ND	"	6.70				
Anthracene	"			ND	"	6.70				
Benzo (a) anthracene	"			ND	"	6.70				
Benzo (a) pyrene	"			ND	"	6.70				
Benzo (b) fluoranthene	"			ND	"	6.70				
Benzo (ghi) perylene	"			ND	"	6.70				
Benzo (k) fluoranthene	"			ND	"	6.70				
Benzoic Acid	"			ND	"	200				
Benzyl alcohol	"			ND	"	25.0				
Butyl benzyl phthalate	"			ND	"	100				
Chrysene	"			ND	"	6.70				
Di-n-butyl phthalate	"			ND	"	100				
Di-n-octyl phthalate	"			ND	"	100				
Dibenzo (a,h) anthracene	"			ND	"	6.70				
Dibenzofuran	"			ND	"	6.70				
1,2-Dichlorobenzene	"			ND	"	13.0				
1,3-Dichlorobenzene	"			ND	"	13.0				
1,4-Dichlorobenzene	"			ND	"	13.0				
Diethyl phthalate	"			ND	"	50.0				
2,4-Dimethylphenol	"			ND	"	20.0				
Dimethyl phthalate	"			ND	"	50.0				
Bis(2-ethylhexyl)phthalate	"			103	"	200				12
Fluoranthene	"			7.42	"	6.70				
Fluorene	"			ND	"	6.70				
Hexachlorobenzene	"			ND	"	13.0				
Hexachlorobutadiene	"			ND	"	13.0				
Hexachloroethane	"			ND	"	25.0				
Indeno (1,2,3-cd) pyrene	"			ND	"	6.70				
2-Methylnaphthalene	"			ND	"	6.70				
2-Methylphenol	"			ND	"	20.0				
4-Methylphenol	"			ND	"	20.0				
Naphthalene	"			ND	"	6.70				
N-Nitrosodiphenylamine	"			ND	"	13.0				
Pentachlorophenol	"			ND	"	20.0				
Phenanthrene	"			ND	"	6.70				
Phenol	"			ND	"	20.0				

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	**0570347-BLK1**									
Pyrene	5/28/97			ND	ug/kg dry	6.70				
1,2,4-Trichlorobenzene	"			ND	"	13.0				
Surrogate: 2-Fluorobiphenyl	"	*83.3*		*70.9*	"	*20.0-150*	*85.1*			
Surrogate: 2-Fluorophenol	"	*167*		*120*	"	*20.0-150*	*71.9*			
Surrogate: Nitrobenzene-d5	"	*83.3*		*76.3*	"	*20.0-150*	*91.6*			
Surrogate: Phenol-d6	"	*167*		*127*	"	*20.0-150*	*76.0*			
Surrogate: p-Terphenyl-d14	"	*83.3*		*76.7*	"	*20.0-150*	*92.1*			
Surrogate: 2,4,6-Tribromophenol	"	*167*		*156*	"	*20.0-150*	*93.4*			
LCS	**0570347-BS1**									
Acenaphthene	5/28/97	83.3		75.9	ug/kg dry	20.0-150	91.1			
1,4-Dichlorobenzene	"	83.3		53.4	"	20.0-150	64.1			
Pentachlorophenol	"	167		146	"	10.0-150	87.4			
Phenol	"	167		139	"	10.0-150	83.2			
Pyrene	"	83.3		78.1	"	20.0-150	93.8			
1,2,4-Trichlorobenzene	"	83.3		67.5	"	20.0-150	81.0			
Surrogate: 2-Fluorobiphenyl	"	*83.3*		*76.5*	"	*20.0-150*	*91.8*			
Surrogate: 2-Fluorophenol	"	*167*		*122*	"	*20.0-150*	*73.1*			
Surrogate: Nitrobenzene-d5	"	*83.3*		*68.7*	"	*20.0-150*	*82.5*			
Surrogate: Phenol-d6	"	*167*		*133*	"	*20.0-150*	*79.6*			
Surrogate: p-Terphenyl-d14	"	*83.3*		*74.2*	"	*20.0-150*	*89.1*			
Surrogate: 2,4,6-Tribromophenol	"	*167*		*160*	"	*20.0-150*	*95.8*			
Duplicate	**0570347-DUP1**		**P705099-01**							**2**
Acenaphthene	5/29/97		138	127	ug/kg dry			60.0	**8.30**	
Acenaphthylene	"		ND	ND	"			60.0		
Anthracene	"		135	161	"			60.0	**17.6**	
Benzo (a) anthracene	"		710	789	"			60.0	**10.5**	
Benzo (a) pyrene	"		747	760	"			60.0	**1.73**	
Benzo (b) fluoranthene	"		670	688	"			60.0	**2.65**	
Benzo (ghi) perylene	"		511	538	"			60.0	**5.15**	
Benzo (k) fluoranthene	"		509	525	"			60.0	**3.09**	
Benzoic Acid	"		ND	ND	"			60.0		
Benzyl alcohol	"		ND	ND	"			60.0		
Butyl benzyl phthalate	"		ND	ND	"			60.0		
Chrysene	"		714	770	"			60.0	**7.55**	
Di-n-butyl phthalate	"		ND	ND	"			60.0		
Di-n-octyl phthalate	"		ND	ND	"			60.0		

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Duplicate (continued)	**0570347-DUP1**		**P705099-01**							2
Dibenzo (a,h) anthracene	5/29/97		161	192	ug/kg dry			60.0	17.6	
Dibenzofuran	"		37.1	44.8	"			60.0	18.8	
1,2-Dichlorobenzene	"		ND	ND	"			60.0		
1,3-Dichlorobenzene	"		ND	ND	"			60.0		
1,4-Dichlorobenzene	"		ND	ND	"			60.0		
Diethyl phthalate	"		ND	ND	"			60.0		
2,4-Dimethylphenol	5/28/97		ND	ND	"			60.0		
Dimethyl phthalate	5/29/97		ND	ND	"			60.0		
Bis(2-ethylhexyl)phthalate	"		877	814	"			60.0	7.45	3
Fluoranthene	"		1320	1550	"			60.0	16.0	
Fluorene	"		76.6	86.6	"			60.0	12.3	
Hexachlorobenzene	"		ND	ND	"			60.0		
Hexachlorobutadiene	"		ND	ND	"			60.0		
Hexachloroethane	"		ND	ND	"			60.0		
Indeno (1,2,3-cd) pyrene	"		470	481	"			60.0	2.31	
2-Methylnaphthalene	"		27.8	30.4	"			60.0	8.93	
2-Methylphenol	5/28/97		ND	ND	"			60.0		
4-Methylphenol	"		ND	ND	"			60.0		
Naphthalene	5/29/97		37.4	35.5	"			60.0	5.21	
N-Nitrosodiphenylamine	"		ND	ND	"			60.0		
Pentachlorophenol	5/28/97		ND	ND	"			60.0		
Phenanthrene	5/29/97		546	612	"			60.0	11.4	
Phenol	"		ND	ND	"			60.0		
Pyrene	"		653	759	"			60.0	15.0	
1,2,4-Trichlorobenzene	"		ND	ND	"			60.0		
Surrogate: 2-Fluorobiphenyl	"	*157*		*132*	"	*20.0-150*	*84.1*			
Surrogate: 2-Fluorophenol	*5/28/97*	*314*		*222*	"	*20.0-150*	*70.7*			
Surrogate: Nitrobenzene-d5	*5/29/97*	*157*		*120*	"	*20.0-150*	*76.4*			
Surrogate: Phenol-d6	*5/28/97*	*314*		*260*	"	*20.0-150*	*82.8*			
Surrogate: p-Terphenyl-d14	*5/29/97*	*157*		*146*	"	*20.0-150*	*93.0*			
Surrogate: 2,4,6-Tribromophenol	*5/28/97*	*314*		*423*	"	*20.0-150*	*135*			
Matrix Spike	**0570347-MS1**		**P705099-01**							
Acenaphthene	5/28/97	157	138	297	ug/kg dry	20.0-150	101			
1,4-Dichlorobenzene	"	157	ND	109	"	20.0-150	69.4			
Pentachlorophenol	"	314	ND	89.4	"	10.0-150	28.5			
Phenol	"	314	ND	275	"	10.0-150	87.6			
Pyrene	"	157	653	856	"	20.0-150	129			11

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Semivolatile Organic Compounds in Sediment per GC/MS with Selected Ion Monitoring/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike (continued)	**0570347-MS1**		**P705099-01**							
1,2,4-Trichlorobenzene	5/28/97	157	ND	136	ug/kg dry	20.0-150	**86.6**			
Surrogate: 2-Fluorobiphenyl	"	*157*		*183*	"	*20.0-150*	*117*			
Surrogate: 2-Fluorophenol	"	*314*		*212*	"	*20.0-150*	*67.5*			
Surrogate: Nitrobenzene-d5	"	*157*		*148*	"	*20.0-150*	*94.3*			
Surrogate: Phenol-d6	"	*314*		*248*	"	*20.0-150*	*79.0*			
Surrogate: p-Terphenyl-d14	"	*157*		*120*	"	*20.0-150*	*76.4*			
Surrogate: 2,4,6-Tribromophenol	"	*314*		*349*	"	*20.0-150*	*111*			
Matrix Spike Dup	**0570347-MSD1**		**P705099-01**							
Acenaphthene	5/28/97	157	138	298	ug/kg dry	20.0-150	**102**	60.0	**0.985**	
1,4-Dichlorobenzene	"	157	ND	109	"	20.0-150	**69.4**	60.0	**0**	
Pentachlorophenol	"	314	ND	92.5	"	10.0-150	**29.5**	60.0	**3.45**	
Phenol	"	314	ND	290	"	10.0-150	**92.4**	60.0	**5.33**	
Pyrene	"	157	653	1390	"	20.0-150	**NR**	60.0	**114**	11
1,2,4-Trichlorobenzene	"	157	ND	135	"	20.0-150	**86.0**	60.0	**0.695**	
Surrogate: 2-Fluorobiphenyl	"	*157*		*176*	"	*20.0-150*	*112*			
Surrogate: 2-Fluorophenol	"	*314*		*233*	"	*20.0-150*	*74.2*			
Surrogate: Nitrobenzene-d5	"	*157*		*152*	"	*20.0-150*	*96.8*			
Surrogate: Phenol-d6	"	*314*		*267*	"	*20.0-150*	*85.0*			
Surrogate: p-Terphenyl-d14	"	*157*		*147*	"	*20.0-150*	*93.6*			
Surrogate: 2,4,6-Tribromophenol	"	*314*		*353*	"	*20.0-150*	*112*			

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters per APHA/EPA Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570253	**Date Prepared: 5/13/97**				**Extraction Method: Wet Chem**					
Blank	**0570253-BLK1**									
Total Volatile Solids	5/13/97			ND	mg/kg	100				
Duplicate	**0570253-DUP1**		**P705099-01**							
Total Volatile Solids	5/13/97		32000	31900	mg/kg			20.0	**0.313**	
Duplicate	**0570253-DUP2**		**P705099-01**							
Total Volatile Solids	5/13/97		32000	32200	mg/kg			20.0	**0.623**	
Batch: 0570476	**Date Prepared: 5/22/97**				**Extraction Method: Wet Chem**					
Blank	**0570476-BLK1**									
Ammonia-Nitrogen	5/22/97			ND	mg/kg dry	1.00				
LCS	**0570476-BS1**									
Ammonia-Nitrogen	5/22/97	10.0		9.85	mg/kg dry	85.0-115	98.5			
Duplicate	**0570476-DUP1**		**P705099-01**							
Ammonia-Nitrogen	5/22/97		85.3	48.0	mg/kg dry			40.0	**56.0**	9
Duplicate	**0570476-DUP2**		**P705099-01**							
Ammonia-Nitrogen	5/22/97		85.3	68.6	mg/kg dry			40.0	**21.7**	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters per PSEP Recommended Guidelines/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570479	**Date Prepared: 5/22/97**					**Extraction Method: Wet Chem**				
Blank	**0570479-BLK1**									
Sulfide	5/22/97			ND	mg/kg dry	1.00				
LCS	**0570479-BS1**									
Sulfide	5/22/97	24.2		22.1	mg/kg dry	85.0-115	91.3			
Duplicate	**0570479-DUP1**		**P705099-01**							
Sulfide	5/22/97		8.21	39.0	mg/kg dry			40.0	**130**	9
Duplicate	**0570479-DUP2**		**P705099-01**							
Sulfide	5/22/97		8.21	49.0	mg/kg dry			40.0	**143**	9

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Physical Parameters per APHA/ASTM/EPA Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570219	**Date Prepared: 5/12/97**					**Extraction Method: Wet Chem**				
Blank	**0570219-BLK1**									
Total Solids	5/13/97			ND	mg/kg	0.0100				
Duplicate	**0570219-DUP1**		**P705099-01**							
Total Solids	5/13/97		504000	500000	mg/kg			10.0	0.797	
Duplicate	**0570219-DUP2**		**P705099-01**							
Total Solids	5/13/97		504000	509000	mg/kg			10.0	0.987	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Tributyltin by GC/FPD/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0670017	**Date Prepared: 5/20/97**					**Extraction Method: GC Semivolatiles**				
Blank	**0670017-BLK1**									
Tributyltin	5/20/97			ND	ug/l	0.0250				
Surrogate: Tripropyltin	"			*74.0*	%	*50.0-140*				
LCS	**0670017-BS1**									
Tributyltin	5/20/97	0.065		0.0500	ug/l	50.0-150	129			
Surrogate: Tripropyltin	"			*78.0*	%	*50.0-140*				
Duplicate	**0670017-DUP1**		**P705099-03**							
Tributyltin	5/20/97		0.0480	0.0530	ug/l	50.0-150		50.0		
Surrogate: Tripropyltin	"			*62.0*	*ug/l*	*50.0-140*				
Matrix Spike	**0670017-MSD1**		**14713**							
Tributyltin	5/20/97		ND	0.0520	ug/l	50.0-150	104	50.0		
Surrogate: Tripropyltin	"			*74.0*	%	*50.0-140*				
Matrix Spike Dup	**0670017-MSD1**		**14713**							
Tributyltin	5/20/97		ND	0.0560	ug/l	50.0-150	112	50.0	**7.00**	
Surrogate: Tripropyltin	"			*69.0*	%	*50.0-140*				

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Conventional Chemistry Parameters by APHA/EPA Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0570302	**Date Prepared: 5/12/97**					**Extraction Method: General Preparation**				
Blank	**0570302-BLK1**									
Total Organic Carbon	5/12/97			ND	mg/kg dry	**50.0**				
LCS	**0570302-BS1**									
Total Organic Carbon	5/12/97	2500		2680	mg/kg dry	95.0-111	107			
Duplicate	**0570302-DUP1**		**P705099-01**							
Total Organic Carbon	5/12/97		20500	22100	mg/kg dry			20.0	**7.51**	
Duplicate	**0570302-DUP2**		**P705099-01**							
Total Organic Carbon	5/12/97		20500	19600	mg/kg dry			20.0	**4.49**	

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland Terminal 4-Slip 3	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 5/8/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 6/4/1997 10:52

Notes and Definitions

#	Note
1	Method 6020 used for analysis to obtain needed detection limit.
2	Reporting limits raised due to matrix interference and/or dilution necessary for analysis.
3	Bis(2-ethylhexyl)phthalate is a suspected laboratory contaminant. Analyte detected in the Method Blank at an estimated concentration of 103 ppb.
4	The EPA has not established a recommended maximum hold time for sulfides in sediments. This sample was analyzed outside the seven day maximum hold time for water.
5	This analysis was performed by ToxScan, Inc. for North Creek Analytical. A copy of ToxScan's report is included for your review.
6	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
7	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
8	The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.
9	Visual evaluation indicates the RPD is above the control limit due to a non-homogeneous sample matrix.
10	Unable to quantitate spike recovery due to matrix interference and/or dilution necessary for analysis.
11	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
12	Estimated concentration. The value is below the method reporting limit, but greater than the method detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Tabatha A Brochu, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
HC-T4-01B	P707144-01	Soil	5/6/97
HC-T4-02B	P707144-02	Soil	5/6/97
HC-T4-03B	P707144-03	Soil	5/6/97

North Creek Analytical, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Sandra K. Wright, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01B			P707144-01				Soil	
Cadmium	0770172	7/9/97	7/11/97	EPA 6010A	0.500	**1.04**	mg/kg dry	
Lead	"	"	7/10/97	EPA 6010A	10.0	**41.5**	"	
Zinc	"	"	7/11/97	EPA 6010A	1.00	**134** J	"	
HC-T4-02B			P707144-02				Soil	
Cadmium	0770172	7/9/97	7/11/97	EPA 6010A	0.500	ND	mg/kg dry	
Lead	"	"	7/10/97	EPA 6010A	10.0	**22.6**	"	
Zinc	"	"	7/11/97	EPA 6010A	1.00	**97.0** J	"	
HC-T4-03B			P707144-03				Soil	
Cadmium	0770172	7/9/97	7/11/97	EPA 6010A	0.500	**15.6**	mg/kg dry	
Lead	"	"	7/10/97	EPA 6010A	10.0	**133**	"	
Zinc	"	"	7/11/97	EPA 6010A	1.00	**236** J	"	

8/12/97
JHL

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

S Wright
Sandra K. Wright, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-01B			P707144-01				Soil	1,2
Acenaphthene	0770252	7/14/97	7/31/97		335	398 J*	ug/kg dry	
Acenaphthylene	"	"	"		335	ND R	"	
Anthracene	"	"	"		335	ND R	"	
Benzo (a) anthracene	"	"	"		335	1380 J*	"	
Benzo (a) pyrene	"	"	"		335	1560	"	
Benzo (b) fluoranthene	"	"	"		335	1210	"	
Benzo (ghi) perylene	"	"	"		335	1190	"	
Benzo (k) fluoranthene	"	"	"		335	1400	"	
Chrysene	"	"	"		335	1610	"	
Dibenzo (a,h) anthracene	"	"	"		335	341	"	
Fluoranthene	"	"	"		335	2110	"	
Fluorene	"	"	"		335	ND R	"	
Indeno (1,2,3-cd) pyrene	"	"	"		335	1000 J*	"	
Naphthalene	"	"	"		335	ND R	"	
Phenanthrene	"	"	"		335	1100 J*	"	
Pyrene	"	"	"		335	2150 J*	"	
Surrogate: 2-Fluorobiphenyl	"	"	"	*30.0-115*		*NR*	%	*3*
Surrogate: Nitrobenzene-d5	"	"	"	*23.0-120*		*NR*	"	*3*
Surrogate: p-Terphenyl-d14	"	"	"	*18.0-137*		*NR*	"	*3*
HC-T4-02B			P707144-02				Soil	1,2
Acenaphthene	0770252	7/14/97	7/31/97		168	192 J*	ug/kg dry	
Acenaphthylene	"	"	"		168	ND R	"	
Anthracene	"	"	"		168	ND R	"	
Benzo (a) anthracene	"	"	"		168	871 J*	"	
Benzo (a) pyrene	"	"	"		168	918	"	
Benzo (b) fluoranthene	"	"	"		168	744	"	
Benzo (ghi) perylene	"	"	"		168	785	"	
Benzo (k) fluoranthene	"	"	"		168	658	"	
Chrysene	"	"	"		168	1000	"	
Dibenzo (a,h) anthracene	"	"	"		168	228	"	
Fluoranthene	"	"	"		168	1310	"	
Fluorene	"	"	"		168	ND R	"	
Indeno (1,2,3-cd) pyrene	"	"	"		168	642 J*	"	
Naphthalene	"	"	"		168	ND R	"	
Phenanthrene	"	"	"		168	680 J*	"	
Pyrene	"	"	"		168	1180 J*	"	
Surrogate: 2-Fluorobiphenyl	"	"	"	*30.0-115*		*NR*	%	*3*

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*Refer to end of report for text of notes and definitions.

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Sandra K. Wright, Project Manager

J*-Samples grossly exceeded holding time.
8/12/97 JHL

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
HC-T4-02B (continued)			P707144-02				Soil	1,2
Surrogate: Nitrobenzene-d5	*0770252*	*7/14/97*	*7/31/97*	*23.0-120*		*NR*	%	*3*
Surrogate: p-Terphenyl-d14	"	"	"	*18.0-137*		*NR*	"	*3*
HC-T4-03B			P707144-03				Soil	1,2
Acenaphthene	0770252	7/14/97	7/31/97		168	181 J*	ug/kg dry	
Acenaphthylene	"	"	"		168	ND R	"	
Anthracene	"	"	"		168	ND R	"	
Benzo (a) anthracene	"	"	"		168	580 J*	"	
Benzo (a) pyrene	"	"	8/1/97		335	514	"	
Benzo (b) fluoranthene	"	"	"		335	442	"	
Benzo (ghi) perylene	"	"	"		335	526	"	
Benzo (k) fluoranthene	"	"	"		335	400	"	
Chrysene	"	"	7/31/97		168	644	"	
Dibenzo (a,h) anthracene	"	"	8/1/97		335	ND R	"	
Fluoranthene	"	"	7/31/97		168	1060 J*	"	
Fluorene	"	"	"		168	ND R	"	
Indeno (1,2,3-cd) pyrene	"	"	8/1/97		335	442 J*	"	
Naphthalene	"	"	7/31/97		168	ND R	"	
Phenanthrene	"	"	"		168	610 J*	"	
Pyrene	"	"	"		168	1010 J*	"	
Surrogate: 2-Fluorobiphenyl	"	"	"	*30.0-115*		*NR*	%	*3*
Surrogate: Nitrobenzene-d5	"	"	"	*23.0-120*		*NR*	"	*3*
Surrogate: p-Terphenyl-d14	"	"	"	*18.0-137*		*NR*	"	*3*

J* - Samples grossly exceeded holding time.
8/12/97 JHL.

North Creek Analytical, Inc.

Refer to end of report for text of notes and definitions.

Sandra K. Wright, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Conventional Chemistry Parameters by APHA/EPA Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
HC-T4-01B			P707144-01				Soil	
Total Organic Carbon	0770845	7/25/97	7/28/97	EPA 9060 mod	50.0	12500 J*	mg/kg dry	
HC-T4-02B			P707144-02				Soil	
Total Organic Carbon	0770845	7/25/97	7/28/97	EPA 9060 mod	50.0	5010 J*	mg/kg dry	
HC-T4-03B			P707144-03				Soil	
Total Organic Carbon	0770845	7/25/97	7/28/97	EPA 9060 mod	50.0	8300 J*	mg/kg dry	

J* - Samples grossly exceeded holding time
8/12/97 JHL

North Creek Analytical, Inc.

Refer to end of report for text of notes and definitions.

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
HC-T4-01B	P707144-01	Soil	60.8	%
HC-T4-02B	P707144-02	Soil	72.3	%
HC-T4-03B	P707144-03	Soil	68.5	%

North Creek Analytical, Inc.

Sandra K. Wright, Project Manager

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled:	5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received:	7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported:	8/4/97 13:39

Dry Weight Determination
North Creek Analytical - Portland

Sample Name	Lab ID	Matrix	Result	Units
HC-T4-01B	P707144-01	Soil	67.5	%
HC-T4-02B	P707144-02	Soil	69.1	%
HC-T4-03B	P707144-03	Soil	67.5	%

North Creek Analytical, Inc.

S Wright

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0770172	**Date Prepared: 7/9/97**					**Extraction Method: EPA 3050**				
Blank	**0770172-BLK1**									
Cadmium	7/11/97			ND	mg/kg dry	0.500				
Lead	7/10/97			ND	"	10.0				
Zinc	7/14/97			ND	"	1.00				
LCS	**0770172-BS1**									
Cadmium	7/11/97	20.0		18.6	mg/kg dry	80.0-120	93.0			
Lead	7/10/97	100		94.5	"	80.0-120	94.5			
Zinc	7/11/97	50.0		47.7	"	80.0-120	95.4			
Duplicate	**0770172-DUP1**		**P707158-13**							
Cadmium	7/11/97		9.19	7.23	mg/kg dry			40.0	23.9	
Lead	7/10/97		93.4	84.3	"			40.0	10.2	
Zinc	7/14/97		1050	986	"			40.0	6.29	4
Matrix Spike	**0770172-MS1**		**P707158-13**							
Cadmium	7/11/97	30.1	9.19	32.6	mg/kg dry	75.0-125	77.8			
Lead	7/10/97	151	93.4	215	"	75.0-125	80.5			
Zinc	7/14/97	75.3	1050	949	"	75.0-125	NR			4

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

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KMB00003985

NORTH CREEK ANALYTICAL
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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Polynuclear Aromatic Compounds per EPA 8270M-SIM/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0770252	**Date Prepared: 7/14/97**					**Extraction Method: EPA 3550**				
Blank	**0770252-BLK1**									
Acenaphthene	7/15/97			ND	ug/kg dry	6.70				
Acenaphthylene	"			ND	"	6.70				
Anthracene	"			ND	"	6.70				
Benzo (a) anthracene	"			ND	"	6.70				
Benzo (a) pyrene	"			ND	"	6.70				
Benzo (b) fluoranthene	"			ND	"	6.70				
Benzo (ghi) perylene	"			ND	"	6.70				
Benzo (k) fluoranthene	"			ND	"	6.70				
Chrysene	"			ND	"	6.70				
Dibenzo (a,h) anthracene	"			ND	"	6.70				
Fluoranthene	"			ND	"	6.70				
Fluorene	"			ND	"	6.70				
Indeno (1,2,3-cd) pyrene	"			ND	"	6.70				
Naphthalene	"			ND	"	6.70				
Phenanthrene	"			ND	"	6.70				
Pyrene	"			ND	"	6.70				
Surrogate: 2-Fluorobiphenyl	"	*83.3*		*90.3*	"	*30.0-115*	*108*			
Surrogate: Nitrobenzene-d5	"	*83.3*		*77.3*	"	*23.0-120*	*92.8*			
Surrogate: p-Terphenyl-d14	"	*83.3*		*84.0*	"	*18.0-137*	*101*			
LCS	**0770252-BS1**									
Acenaphthylene	7/15/97	167		149	ug/kg dry	50.0-150	89.2			
Benzo (k) fluoranthene	"	167		148	"	50.0-150	88.6			
Pyrene	"	167		147	"	50.0-150	88.0			
Surrogate: 2-Fluorobiphenyl	"	*83.3*		*87.7*	"	*30.0-115*	*105*			
Surrogate: Nitrobenzene-d5	"	*83.3*		*73.0*	"	*23.0-120*	*87.6*			
Surrogate: p-Terphenyl-d14	"	*83.3*		*83.7*	"	*18.0-137*	*100*			
Matrix Spike	**0770252-MS1**		**P707230-02**							
Acenaphthylene	7/15/97	193	ND	175	ug/kg dry	50.0-150	**90.7**			
Benzo (k) fluoranthene	"	193	ND	179	"	50.0-150	**92.7**			
Pyrene	"	193	ND	171	"	50.0-150	**88.6**			
Surrogate: 2-Fluorobiphenyl	"	*96.5*		*79.1*	"	*30.0-115*	*82.0*			
Surrogate: Nitrobenzene-d5	"	*96.5*		*70.2*	"	*23.0-120*	*72.7*			
Surrogate: p-Terphenyl-d14	"	*96.5*		*92.6*	"	*18.0-137*	*96.0*			

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

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1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Polynuclear Aromatic Compounds per EPA 8270M-SIM/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike Dup	**0770252-MSD1**		**P707230-02**							
Acenaphthylene	7/15/97	193	ND	163	ug/kg dry	50.0-150	**84.5**	60.0	**7.08**	
Benzo (k) fluoranthene	"	193	ND	166	"	50.0-150	**86.0**	60.0	**7.50**	
Pyrene	"	193	ND	157	"	50.0-150	**81.3**	60.0	**8.59**	
Surrogate: 2-Fluorobiphenyl	"	*96.5*		*95.7*	"	*30.0-115*	*99.2*			
Surrogate: Nitrobenzene-d5	"	*96.5*		*82.6*	"	*23.0-120*	*85.6*			
Surrogate: p-Terphenyl-d14	"	*96.5*		*88.4*	"	*18.0-137*	*91.6*			

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
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Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Conventional Chemistry Parameters by APHA/EPA Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0770845	**Date Prepared: 7/25/97**					**Extraction Method: General Preparation**				
Blank	**0770845-BLK1**									
Total Organic Carbon	7/28/97			ND	mg/kg dry	50.0				
LCS	**0770845-BS1**									
Total Organic Carbon	7/28/97	2500		2440	mg/kg dry	91.0-112	97.6			
Duplicate	**0770845-DUP1**		**P707144-01**							
Total Organic Carbon	7/28/97		12500	14800	mg/kg dry			24.0	16.8	

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

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Hart Crowser, Inc. - Seattle	Project:	Port of Portland T4 Dredging	Sampled: 5/6/97
1910 Fairview Ave. East	Project Number:	5628-01/52051-900	Received: 7/9/97
Seattle, WA 98115	Project Manager:	Taku Fuji	Reported: 8/4/97 13:39

Notes and Definitions

#	Note
1	Analysis request received past recommended hold time.
2	Reporting limits raised due to dilution necessary for analysis.
3	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
4	The reporting limit for this analyte was raised due to the high analyte concentration present in the sample.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Sandra K. Wright, Project Manager

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KMB00003989

Appendix B

KMB00003990

APPENDIX B
SEDIMENT CORE LOGS

KMB00003991

Key for Sediment Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.
Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 – 4	Very soft	0 – 2	<0.125
Loose	4 – 10	Soft	2 – 4	0.125 – 0.25
Medium dense	10 – 30	Medium stiff	4 – 8	0.25 – 0.5
Dense	30 – 50	Stiff	8 – 15	0.5 – 1.0
Very dense	>50	Very stiff	15 – 30	1.0 – 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

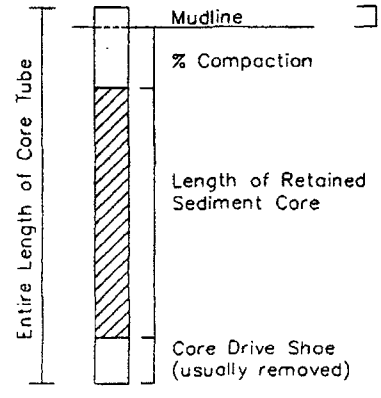
	Estimated Percentage
Not identified in description	0 – 5
Slightly (clayey, silty, etc.)	5 – 12
Clayey, silty, sandy, gravelly	12 – 30
Very (clayey, silty, etc.)	30 – 50

Legends

Sample Acceptability Criteria

1. Overlying water is present
2. Water has low turbidity
3. Sampler is not overfilled
4. Surface is flat
5. Penetration depth is acceptable
6. Compaction is less than 25 percent
7. Core tube is intact

Core Observations



Major Sediment Unit Contacts
Minor Sediment Unit Contacts

Estimated Percentage of Other Minor Constituents

(i.e., shells, wood, organics, plastic, metal, brick, refuse)

Description	Estimated Percentage
Dusting	Trace on Surface
Trace	Discernible
Scattered	0–5
Moderate	5–20
Substantial	20–50
Major Constituent	>50

Test Symbols

CHEM	Chemical Testing
GS	Grain Size
ARC	Archive
▨	Continuous Vibracore
AL	Atterberg Limits

HARTCROWSER

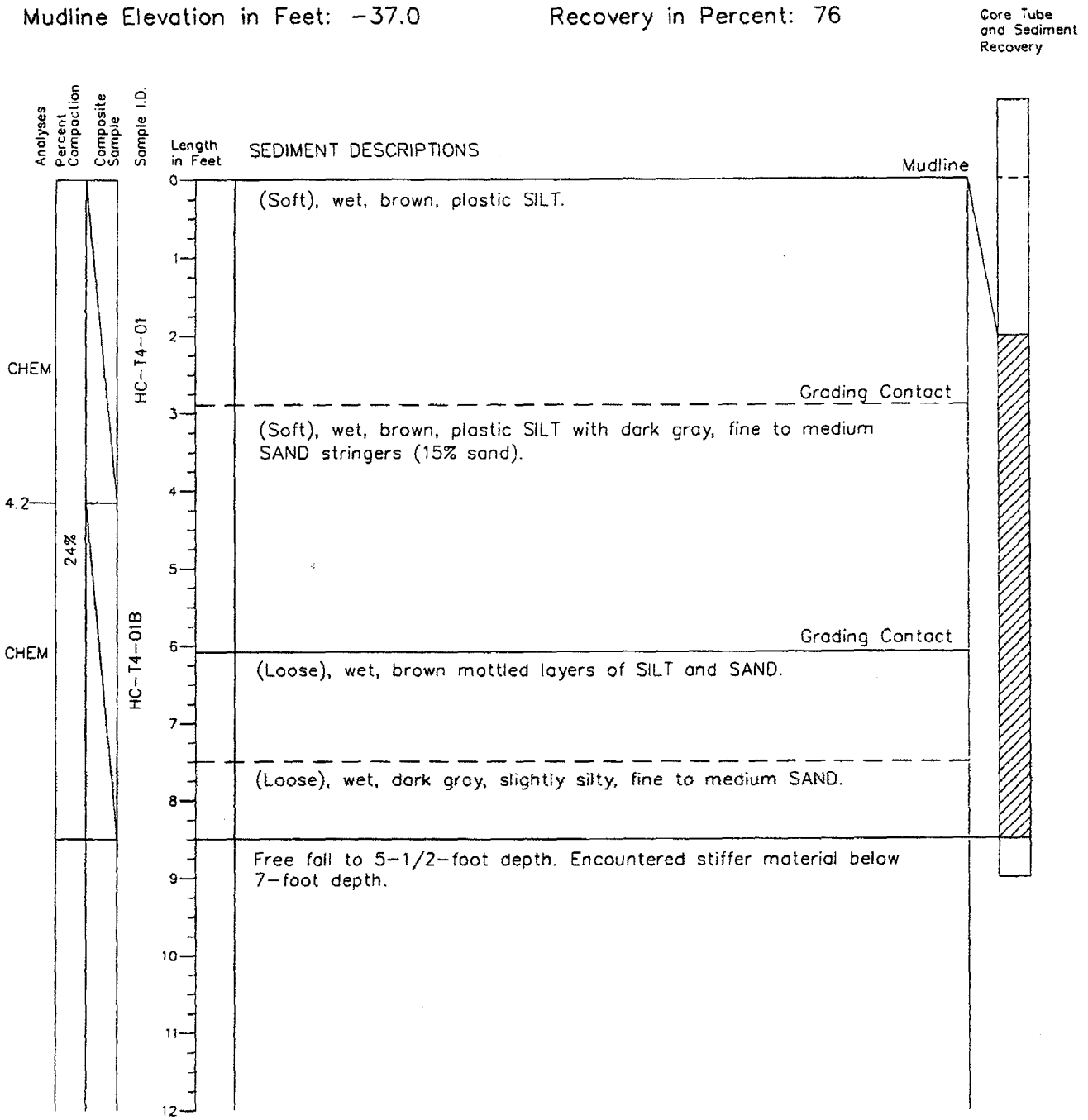
J-5628-01 8/97

Figure B-1

Sediment Core Log HC-VC-01

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97 1345
Recovery Length in Feet: 6.5
Mudline Elevation in Feet: −37.0

Northing: 45° 36.082' N
Easting: 122° 46.627' W
Drive Length in Feet: 8.5
Recovery in Percent: 76



Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on Columbia River Datum.
2. Samples composited from HC−VC−01 and HC−VC−02 cores.
3 Refer to Figure B−1 for Key and Legend for Sediment Logs.

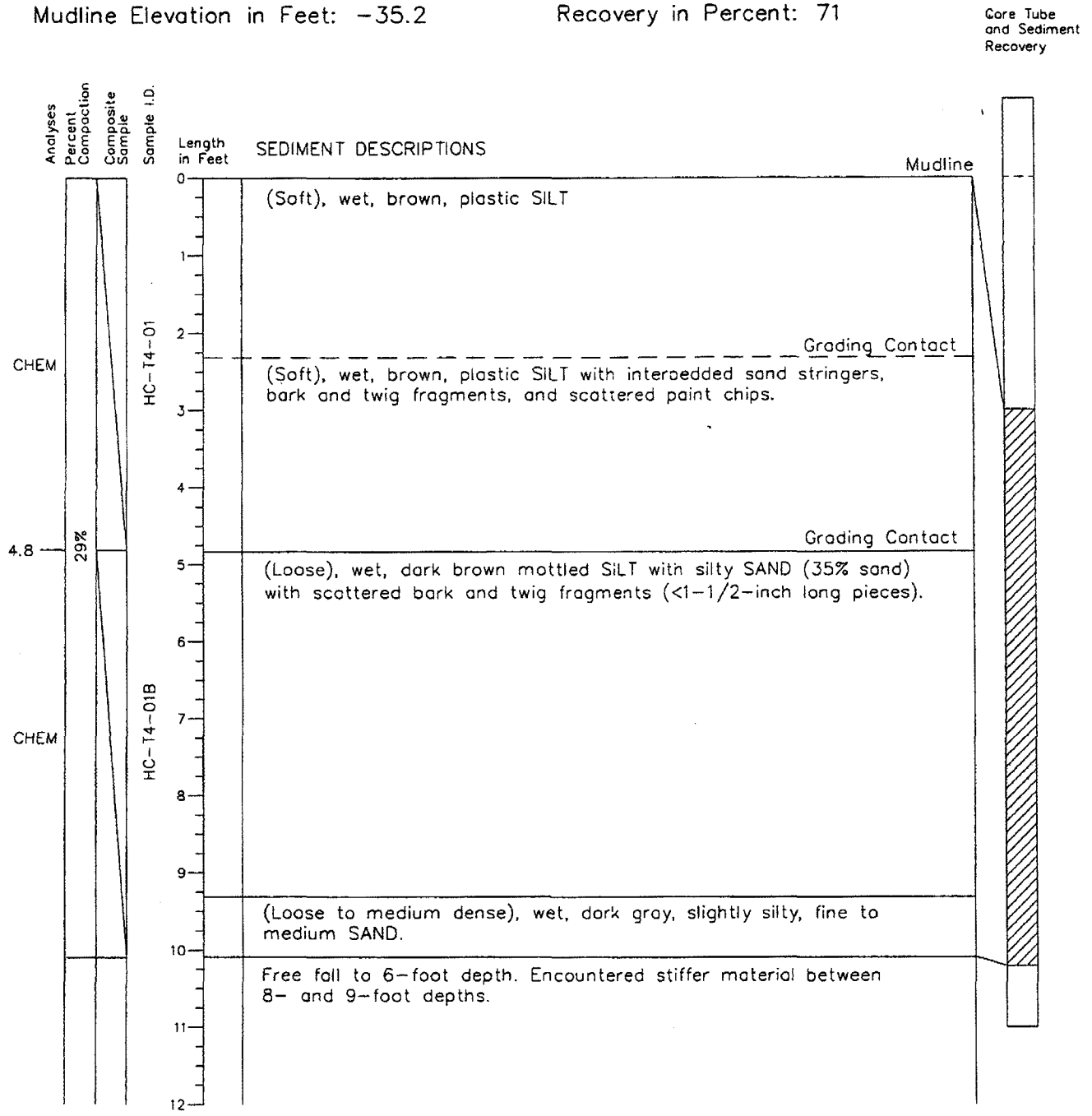
HARTCROWSER
J-5628-01 7/97
Figure B-2

cvd 7/7/95 1=1 hc-pcp
99500 SEDLOG

Sediment Core Log HC-VC-02

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97 1320
Recovery Length in Feet: 7.2
Mudline Elevation in Feet: −35.2

Northing: 45° 36.081' N
Easting: 122° 46.605' W
Drive Length in Feet: 10.1
Recovery in Percent: 71



Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on Columbia River datum.
2. Samples composited from HC-VC-01 and HC-VC-01 cores.
3. Refer to Figure B-1 fro Key and Legend for Sediment Logs.

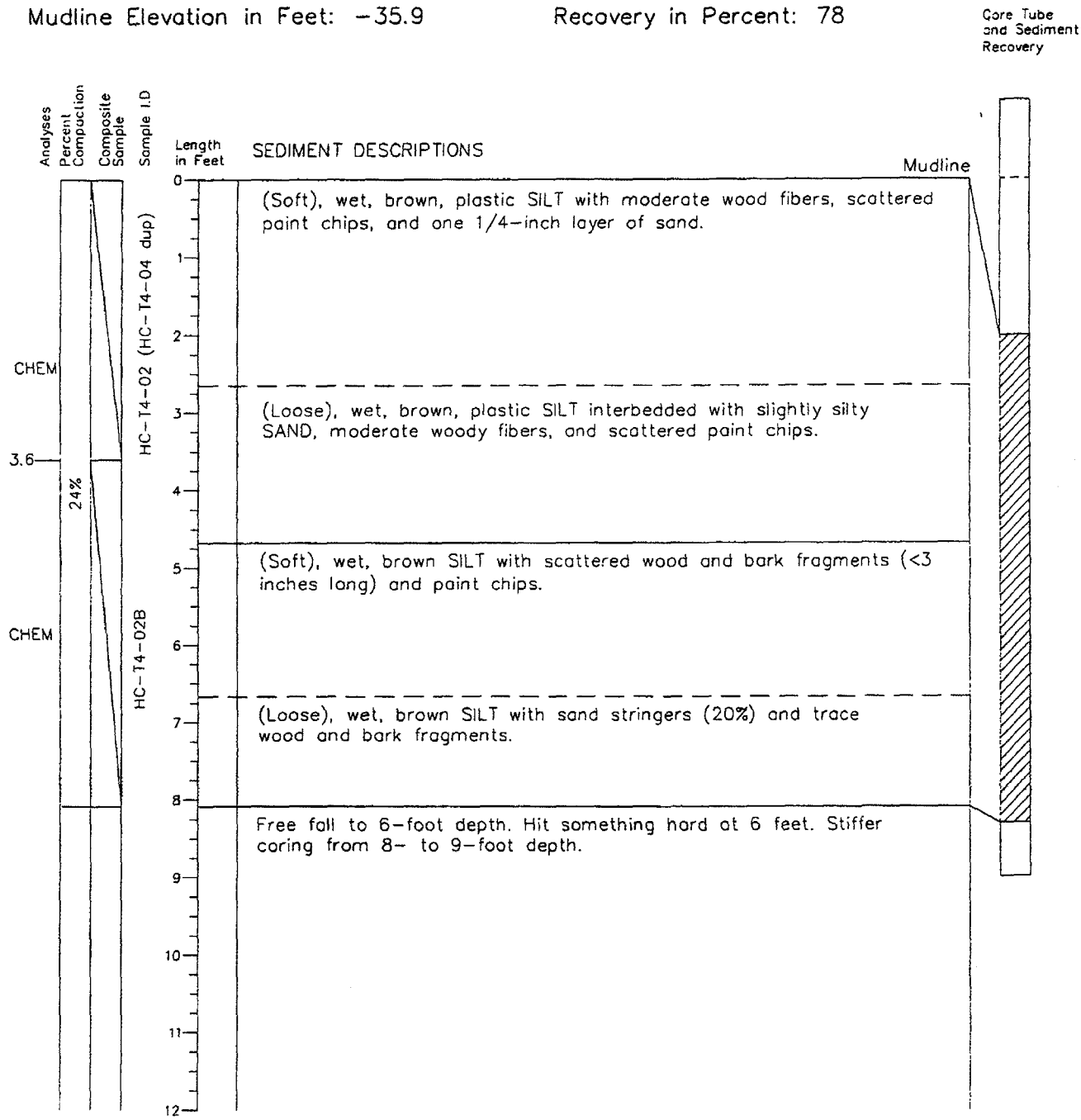
HARTCROWSER
J-5628-01 7/97
Figure B-3

cwd 7/7/95 1=1 hc-pcp
99500 SEDLOG

Sediment Core Log HC-VC-03

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97 1520
Recovery Length in Feet: 6.3
Mudline Elevation in Feet: −35.9

Northing: 45° 36.078' N
Easting: 122° 46.592' W
Drive Length in Feet: 8.1
Recovery in Percent: 78



Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on Columbia River datum.
2. Samples composited from HC−VC−03 and HC−VC−04 cores.
3. Refer to Figure B−1 for Key and Legend for Sediment Logs.

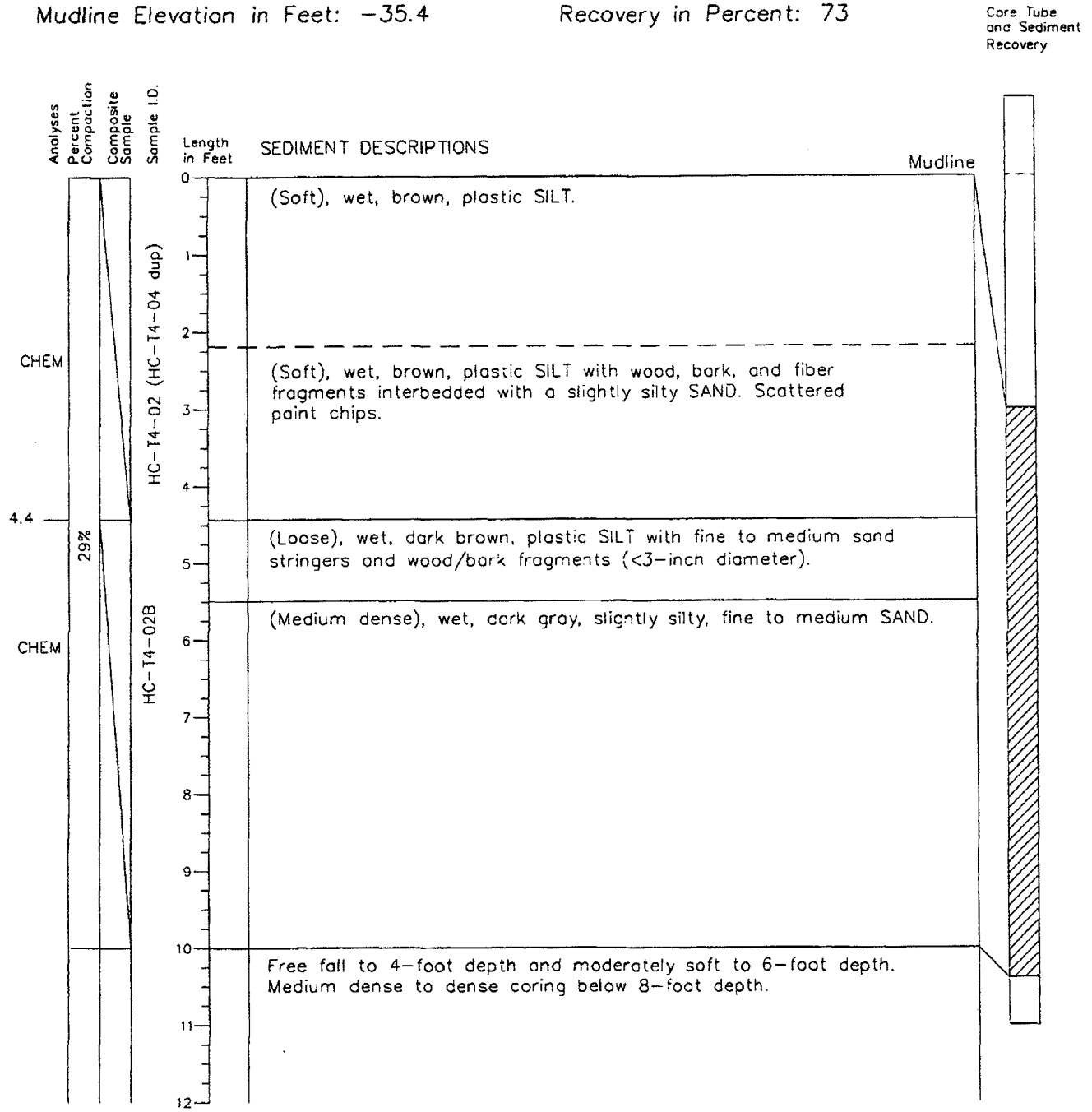
HARTCROWSER
J-5628-01 7/97
Figure B-4

cvd 7/7/95 1=1 hc-pcp
9950D SEDLOG

Sediment Core Log HC-VC-04

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97 1630
Recovery Length in Feet: 7.3
Mudline Elevation in Feet: −35.4

Northing: 45° 36.078' N
Easting: 122° 46.569' W
Drive Length in Feet: 10.0
Recovery in Percent: 73



Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on local Port of Portland datum.
2. Samples composited from HC-VC-03 and HC-VC-04 cores.
3. Refer to Figure B-1 for Key and Legend for Sediment Logs.

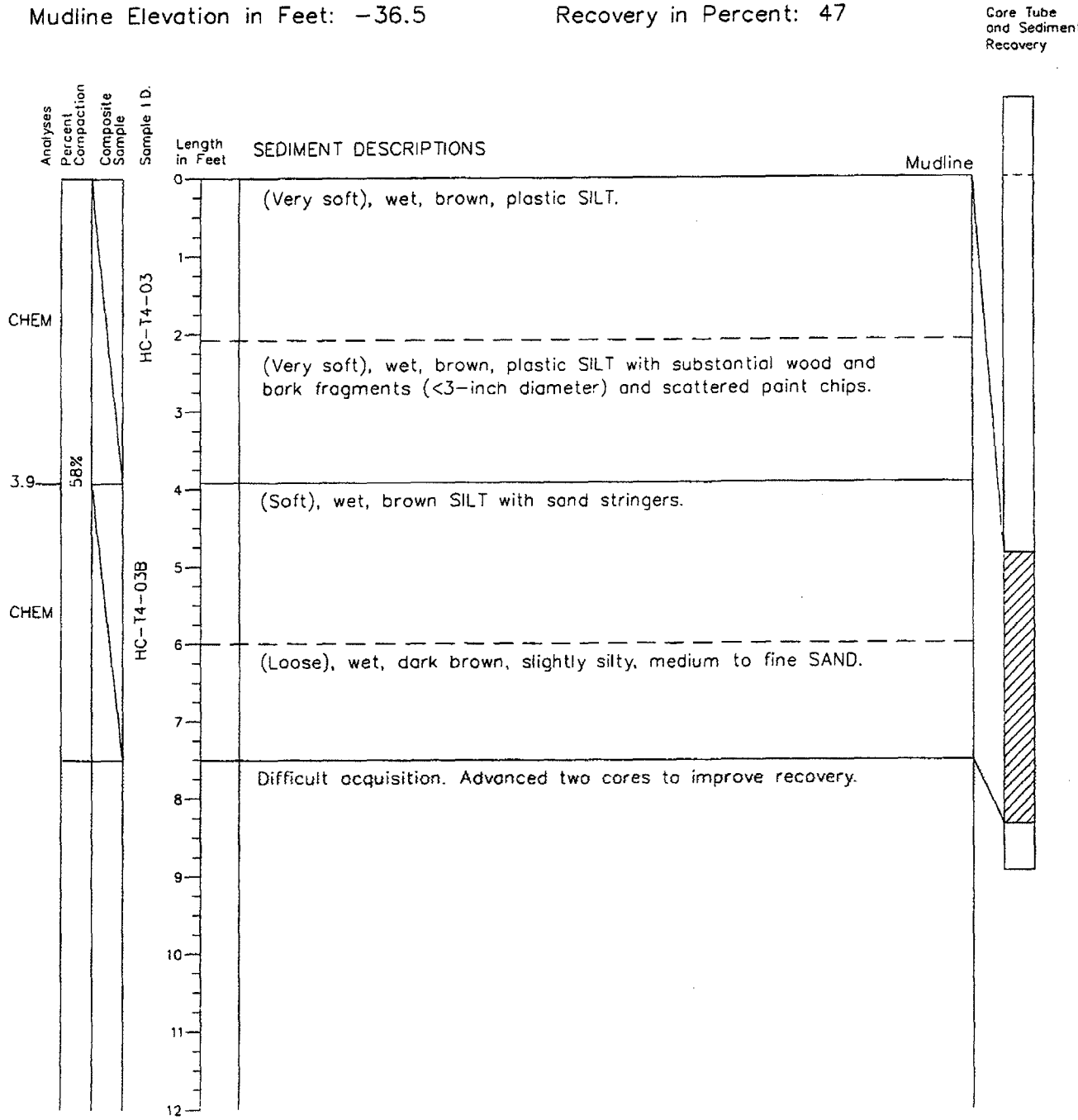
HARTCROWSER
J-5628-01 7/97
Figure B-5

cvd 7/7/95 1=1 hc-pcp
99500 SEDLOG

Sediment Core Log HC-VC-05

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97 1700
Recovery Length in Feet: 3.5
Mudline Elevation in Feet: −36.5

Northing: 45° 36.074' N
Easting: 122° 46.546' W
Drive Length in Feet: 7.5
Recovery in Percent: 47



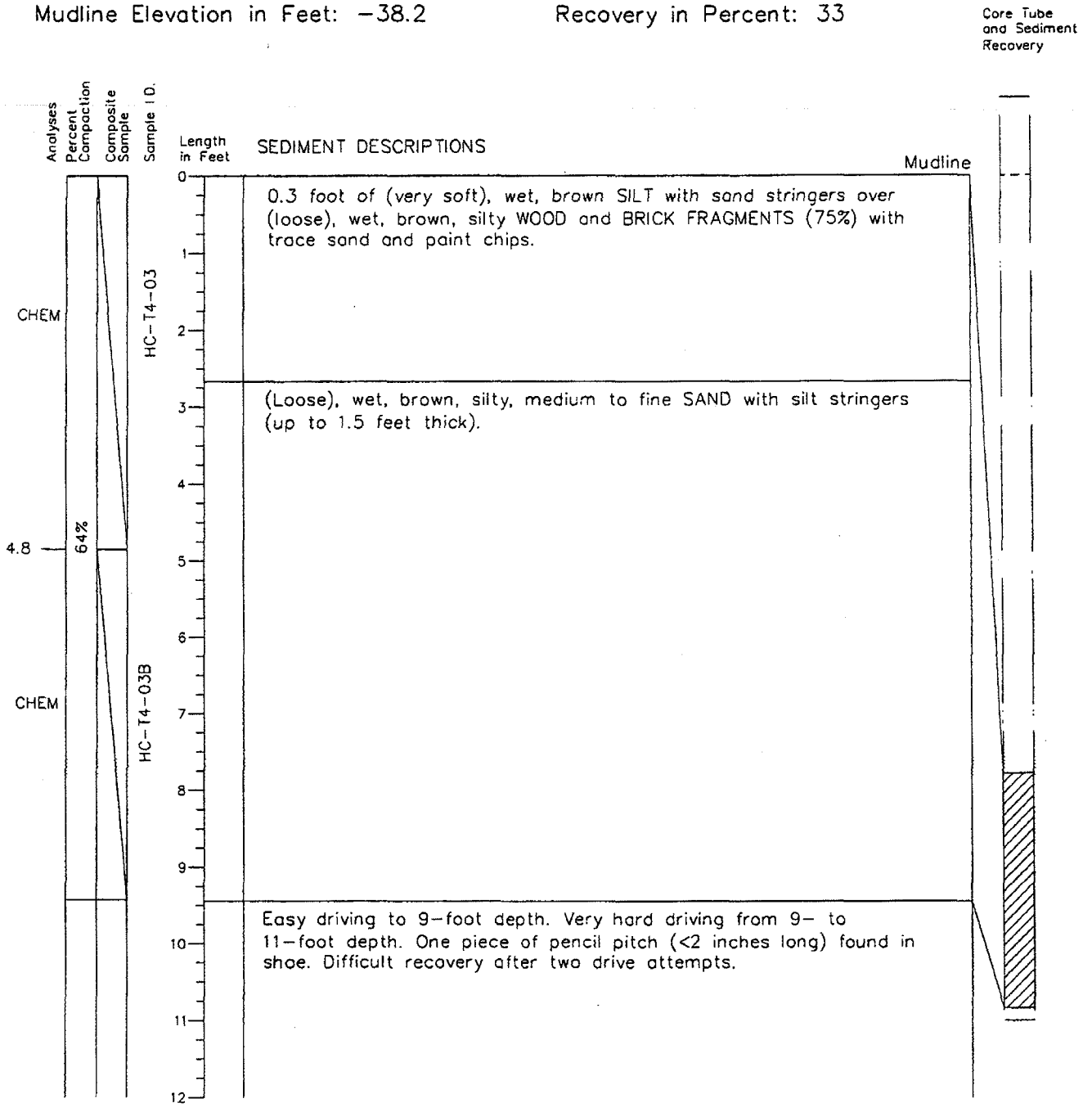
Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on local Port of Portland datum.
2. Samples composited from HC-VC-05 and HC-VC-06 cores.
3. Refer to Figure B-1 for Key and Legend for Sediment Logs.

HARTCROWSER
J-5628-01 7/97
Figure B-6

Sediment Core Log HC-VC-06

Type of Sample: 4" diameter Vibracore
Date/Time: 5/4/97
Recovery Length in Feet: 3.1
Mudline Elevation in Feet: −38.2

Northing: 45° 36.073' N
Easting: 122° 46.523' W
Drive Length in Feet: 9.4
Recovery in Percent: 33



Notes: 1. Horizontal control is based on LAT/LONG NAD 83 datum (DGPS) and vertical control is based on local Port of Portland datum.
2. Samples composited from HC-VC-05 and HC-VC-06 cores.
3. Refer to Figure B-1 for Key and Legend for Sediment Logs.

HARTCROWSER
J-5628-01 7/97
Figure B-7

KMB00003998

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URS

June 21, 2001

Mr. John Childs
Marine Environmental Department
Port of Portland
7201 N. Marine Drive
Portland, OR 97203

Re: Terminal 4 - Track 401 Soil Sampling Project
URS Project No. 52-00082010.12

Dear Mr. Childs:

This report describes the soil sampling activities completed along the Track 401 alignment at Terminal 4 in Portland, Oregon. This work was completed in general agreement with the Scope of Work as outlined in Work Order 12, dated April 24, 2001.

PROJECT BACKGROUND

The Port is planning to repair railroad track 401, at Terminal 4. Figure 1 shows the site vicinity. The repair work will consist of removing and replacing the soil beneath approximately 710 linear feet of the track. The removal area will be approximately 10 feet wide, and extend to a depth of approximately 16 inches. Up to approximately 350 cubic yards of soil may be removed during the repair work.

The Port identified a need to characterize the soil to be removed, based upon the known presence of pencil pitch (a binding agent for making carbon anode), and on historical information about the usage of this rail segment. The historical information indicated that lead ore had been transported in rail cars along the track alignment during the late 1960's.

To characterize the soil for proper disposal, the Port performed a preliminary site investigation. The work area of the track was divided into three segments. One sample was collected from each segment. Each sample was analyzed for volatile organics (VOCs), polychlorinated biphenyls (PCBs), total metals (RCRA 8), and diesel and residual range organics, using SW-846 and Oregon DEQ methods. The totals metals results indicated that the samples should be analyzed for TCLP; the TCLP results identified one soil sample exceeding the limit of 5 mg/L for lead. The results from the preliminary sampling are included as Table 1. No PCBs or VOCs were detected in the samples collected by the Port. Diesel range and residual range organics were detected at concentrations below DEQ cleanup standards. Soil with concentrations of lead that fail TCLP are hazardous waste and require disposal at a RCRA Subtitle C facility. In order to minimize the amount of soil requiring such disposal, the Port contracted with URS to further characterize the existing soil along the track segment planned for repair.

SCOPE OF WORK

The site vicinity is shown on Figure 1. The work area includes approximately 870 linear feet of track, with the exception of a switch section of approximately 160 linear feet. The switch section is not scheduled for repair, and as such was not characterized for disposal. The two remaining sections to north and south of the switch section were divided into five segments total. The northern segments

(1-3) are each approximately 150 feet long, while the two southern segments (4-5) are each approximately 130 feet long. URS collected samples, each representing one segment, from five locations along the alignment. The sample locations are shown on Figure 2. The sample locations were identified using a measuring wheel, and approved by Port personnel.

Three soil samples were collected from each of the five sections for a total of 15 discrete soil samples. One sample was collected from each section at the surface (0 to 6 inches below ground surface); one sample was collected from each section at an intermediate interval (6 to 12 inches); and one soil sample was collected from each section a deep interval (12 to 16 inches). In addition to the discrete samples, a total of three composite samples were collected: one composite sample was collected from each section at the surface; one composite sample from each of section at the intermediate interval; and one composite sample from each section at the deep interval.

Samples were collected using the following procedures:

- Port personnel dug a hole at each sample location to a depth of 16 inches with a shovel;
- Soil from the three vertical levels was collected from the sidewalls of each hole with a clean stainless steel spoon;
- Soil was composited in separate clean stainless steel bowls;
- The composited soil was thoroughly mixed with a clean stainless steel spoon and placed in the appropriate laboratory-supplied sample container;
- Individual samples were collected from the sidewalls of each hole with a clean stainless steel spoon and placed in the appropriate laboratory-supplied sample containers;
- The spoons were decontaminated between locations using a wash of distilled water and Alconox, followed by a distilled water rinse.

The samples were submitted under standard chain-of-custody procedures to Columbia Analytical Services, Inc. (CAS) of Kelso, Washington, for analysis of total metals (RCRA 8[1]) and metals by TCLP. The analytical program was divided into two phases. The first phase consisted of analyzing each of the three composite samples to identify which depth interval (or intervals) contained the leachable lead identified in the Port's preliminary site investigation. The results of the composite analyses are included as Table 2.

The second phase (contingent on the composite results) consisted of analyzing selected discrete samples to further delineated impacted soil. The determination to analyze discrete samples was made based upon the TCLP results from the composites, such that discrete samples were analyzed only if the composite sample from the corresponding depth interval demonstrated the characteristic of toxicity. As described below, the composite and the discrete samples from the surface were analyzed, while only the composite sample from the intermediate and deep samples were analyzed.

[1] Arsenic (As), barium (Ba), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), and silver (Ag).

RESULTS

The laboratory results indicated lead (by TCLP) in the soil at concentrations of 15.9 mg/L in the shallow composite sample (401-SC-S), 2.41 mg/L in the intermediate composite sample (401-SC-I), and 0.13 mg/L in the deep composite sample (401-SC-D). Cadmium was also detected in the composite samples; the highest concentration was 0.19 mg/L in the shallow composite sample.

Because the lead concentrations in the surface composite sample were above the RCRA characteristic level for toxicity, the discrete samples collected from the surface of each section were analyzed for TCLP metals (RCRA 8). The shallow sample 401-375-S contained lead at 194 mg/L. The individual samples from the other segments were all less than 0.5 mg/L, well below the 5 mg/L characteristic for toxicity. Cadmium was detected in the discrete samples from segments 1 through 4, with the highest concentration (0.62 mg/L) detected in 401-375-S. The results of the discrete soil sampling are included as Table 3.

CONCLUSIONS

The historical information suggests the likelihood of lead ore transported along the track 401 alignment is the source of the elevated lead detected in soil from segment 3. Sample 401-375-S is considered to be representative of shallow soil in segment 3 along the track 401 alignment. The concentration of lead in the intermediate interval in segment (i.e., 2.41 mg/L in sample 401-SC-I) suggests a spatially limited amount of lead leaching from the surface through the shallow interval. The concentration of lead in the deep interval (i.e., 0.13 mg/L in sample 401-SC-D) suggests that the lead contamination is probably limited to the shallow interval. However, as discussed with Port personnel, there is a mathematical possibility that the intermediate interval of segment 3 may be hazardous waste, based upon the composite sample results.

Discussions with Port personnel indicated the following:

- The Port intends to manage all of the soil removed from the shallow interval of segment 3 as a hazardous waste.
- The soil within the intermediate interval of segment 3, while not a hazardous waste based on the composite sample results, will also be managed as a hazardous waste, as a conservative measure.
- The soil removed from the other segments will be disposed of at the Hillsboro Landfill, a RCRA Subtitle D facility.

Based upon the results of these discussions, soil from the shallow and intermediate intervals of segment 3 should be excavated separately from the other segments. URS reviewed the requirements for disposal of the soil at the RCRA Subtitle C landfill operated by Waste Management at Arlington. If this landfill is selected, prior to excavation, a sample (or the existing sample at CAS) must be sent to the Arlington facility for batch processing. A profile must also be completed. The soil could then

be removed from the site by a licensed hauler at the Port's convenience. Following excavation, the soil characterized as hazardous waste should be containerized or loaded directly into trucks. The waste should not be stored on the ground.

If requested, we would be pleased to provide assistance to the Port as necessary regarding coordination of the batching and profiling process within the Technical Assistance task (Work Order 13). We can also provide assistance as necessary with respect to worker safety issues. We appreciate the opportunity to provide continuing service to the Port on these projects. Please call either of us at (503) 222-7200 if you have any questions.

Sincerely,

James Peale, RG
Hydrogeologist

Jeffrey Wallace, RG
Project Manager

Attachments: Figures
Tables
Analytical Results

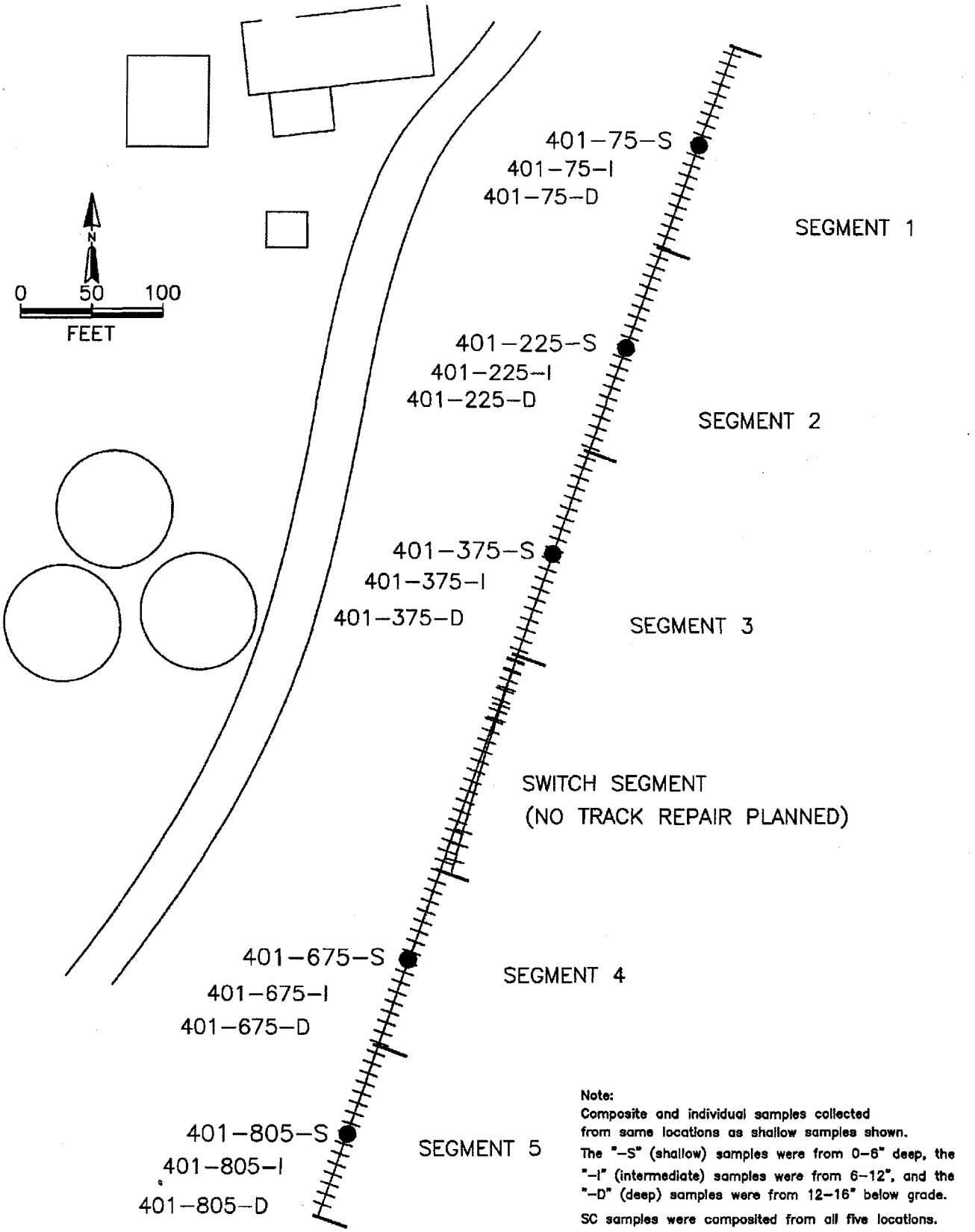
URS

TITLE:
Terminal 4
Track 401 Soil Sampling
Portland, OR

0 500 1000
FEET

DWN: jgdp	DES.:	PROJECT NO.: 52-00082010.12
CHKD:	APPD:	
DATE: 6/6/01	REV.: 0	FIGURE NO.: 1

KMB00004004



Note:
Composite and individual samples collected from same locations as shallow samples shown. The "-S" (shallow) samples were from 0-6" deep, the "-I" (intermediate) samples were from 6-12", and the "-D" (deep) samples were from 12-16" below grade.
SC samples were composited from all five locations.

URS	TITLE: Sample Locations Track 401 Sampling Portland, OR	DWN: jgdp	DES.:	PROJECT NO.: 52-00082010.12
		CHKD:	APPD:	
		DATE: 6/21/01	REV.: 1	FIGURE NO.: 2

Table 1 – Results of Preliminary Sample Analysis by the Port

Analysis	Sample ID	401-WEST	401-MID	401-EAST	Limit(1)	Units
TCLP Metals	Cadmium	NA	0.499	NA	1.0	mg/L
	Lead	NA	**6.81**	NA	5.0	
Total Metals	Arsenic	12	23	77		mg/Kg
	Barium	102	93	74		
	Cadmium	2	29	6		
	Chromium	20	17	50		
	Lead	355	1130	879		
	Mercury	0.03	1.62	0.21		
	Selenium	1U	1U	1U		
	Silver	1	2	3		

Notes:
(1) Characteristic of toxicity, as defined by 40 CFR 261
NA- Not analyzed.
U – Not detected at the concentration shown.

Table 2 – Results of Composite Sample Analysis by URS

Analysis	Sample ID	401-SC-S	401-SC-I	401-SC-D		
	Sample Type	Composite				
	Soil Interval	Shallow	Intermediate	Deep	Regulatory Limit[1]	Units
	Segment	All				
TCLP Metals	Cadmium	0.19	0.13	0.06	1.0	mg/L
	Lead	**15.9**	2.41	0.13	5.0	
Total Metals	Arsenic	24	16.3	4.9		
	Barium	91.2	89.9	87.6		
	Cadmium	9.7	8.6	4.5		
	Chromium	21.6	20.9	19.5		
	Lead	1530	978	153		mg/Kg
	Mercury	0.26	0.17	0.04		
	Silver	4.1	2.2U	2.2U		
	Selenium	0.1U	0.1U	0.1U		
	Zinc	1900	1500	801		

Notes:
(1) Characteristic of toxicity, as defined by 40 CFR 261.
Only cadmium and lead were detected using TCLP.
U – Not detected at the concentration shown.

Table 3 – Results of Discrete Sample Analysis by URS

Analysis	TCLP	
Metal	Cadmium (mg/L)	Lead (mg/L)
Regulatory Limit(1)	1.0	5.0
Sample ID		
401-75-S	0.03	0.12
401-75-I	NA	NA
401-75-D	NA	NA
401-225-S	0.16	0.08
401-225-I	NA	NA
401-225-D	NA	NA
401-375-S	0.62	**194**
401-375-I	NA	NA
401-375-D	NA	NA
401-675-S	0.08	0.46
401-675-I	NA	NA
401-675-D	NA	NA
401-805-S	0.01U	0.07
401-805-I	NA	NA
401-805-D	NA	NA

Notes:
(1) Characteristic of toxicity, as defined by 40 CFR 261.
Only cadmium and lead were detected using TCLP.
NA – Not analyzed.
U – Not detected at the concentration shown.
The number in the individual sample identifiers refers to the linear distance from the starting point of the track alignment scheduled for repair. For instance, 401-375-I refers to the intermediate sample collected approximately 375 feet from the northern end of the track 401 alignment.

Columbia Analytical Services INC.
An Employee-Owned Company

June 5, 2001 Service Request No: K2102986

James Peale
URS Greiner Woodward Clyde
111 S.W. Columbia, Suite 900
Portland, OR 97201

Re: P.O.PDX Track 401 Sampling/5200082010.12

Dear James:

Enclosed are the results of the sample(s) submitted to our laboratory on April 28, 2001. For your reference, these analyses have been assigned our service request number K2102986.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

Harvey Jacky
Project Chemist

HJ/dj

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 360/577-7222 • Fax 360/636-1068

KMB00004009

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The reported value is estimated because of the presence of matrix interference.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Portland, Port of	**Service Request No.:**	K2102986
Project:	P.O. PDX Track 401 Sampling/5200082010.12	**Date Received:**	4/28/01
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP) and Matrix Spike (MS).

Sample Receipt

Eighteen soil samples were received by Columbia Analytical Services, on 4/28/01, for analysis of Metals. The samples were received in good condition. No anomalies associated with the receipt of these samples were observed. Copies of the Chain of Custody and sample receipt forms are included in this report.

General Comments

All EPA recommended holding times have been met for analyses in this sample delivery group.

Metals

Matrix Spike Exceptions (Total Metals)
The Matrix Spike (MS) recoveries of Lead and Zinc are not applicable. The analyte concentrations in sample 401-SC-S were significantly higher than the added spike concentrations, preventing accurate evaluation of the spike recoveries.

Matrix Spike Exceptions (TCLP Metals)
The Matrix Spike (MS) recovery of Lead is not applicable. The analyte concentration in sample 401-SC-S was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Approved by HC Date 6/4/01

00004

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

SR#: 1C210 2986

PAGE 1 OF 2 COC #

PROJECT NAME: PORDXTRACK 401 SAMPLING
PROJECT NUMBER: 5200082010.12
PROJECT MANAGER: J. Peale
COMPANY/ADDRESS: URS
1 SW COLUMBIA PDX 97201
PHONE #: 503 2227200 FAX #: -4292
SAMPLER'S SIGNATURE: J Peale

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐	Volatile Organics 624☐ 8260☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1☐ 418.1☐ 1664 SGT☐ 1664 HEM☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	GC/MS-SIM PAH☐ Phenol☐ Phthalates☐	Metals, Total or Dissolved (See list below) RCRA 8	Cyanide☐ Hex-Chrom☐	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle)	NH3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOX 9020☐ AOX 1650☐ 506☐					REMARKS
401-SC-S	4/27/01	1100	1	S	1											X									
401-SC-I		1115	2													X									
401-SC-D		1120	3													X									
401-75-S		1125	4													X									HOLD
401-75-I		1135	5													X									
401-75-D		1145	6													X									ARCHIVE
401-225-S		1150	7													X									
401-225-I		1155	8													X									
401-225-D		1200	9													X									
401-375-S		1205	10													X									

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: JOHN CHILDS
PORT PORTLAND
503 240 2011

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg
Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
ANALYZE 401-SC-S/I/D SAMPLES ONLY.
HOLD ALL OTHER SAMPLES PENDING RESULTS.
CALL JAMES PEALE W/?S

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature	Date/Time	Signature: [signature]	Date/Time: 4-27-01 3:20	Signature: [signature]	Date/Time: 4-27-01 5:30	Signature	Date/Time
Printed Name	Firm	Printed Name: B Wygant	Firm: CAS	Printed Name: B Wygant	Firm: CAS	Printed Name	Firm

RCOC #1 04/01

KMB00004013

P 2 / 2

COLUMBIA ANALYTICAL

~~Environmental Services Laboratory, Inc~~

CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

1210-1984

Company: URS | Project Manager: J. Peak | LABORATORY #

Address: 111 SW COLUMBIA Ste 900 PDX 97201

Phone: 503 222 7200 Fax: -4292

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	PETROLEUM HYDROCARBONS: NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	ORGANICS: Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles	8270 GCMS Semivolatiles	8081 GC Pesticides/PCBs	8081m PCBs only	INORGANICS: RCRA Metals (8)	Priority Pollutant Metals (13)	Metals:	TCLP: TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	# OF CONTAINERS
401-375-I	4/17	1210	S	11												X						
401-375-D		1215		12												X						
401-675-S		1230		13												X						
401-675-I		1225		14												X						
401-675-D		1230		15												X						
401-T705-S		1235		16												X						
401-705-I		1240		17												X						
401-705-D	↓	1245	↓	18												X						

HOLD / ARCHIVE

PROJECT INFORMATION

PROJECT NUMBER: 20008 2010.12

PROJECT NAME: PDX - T401

PURCHASE ORDER NUMBER:

ONGOING PROJECT? YES ☐ NO ☐

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS: 6 This COC

COC SEALS INTACT? Y / N / NA

RECEIVED INTACT? Y / N

RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS:

Sampled by:

Received via:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Time: 4-27 0	SIGNATURE: Time:	SIGNATURE: Time:
Printed Name: Date: 5:30	Printed Name: Date:	Printed Name: Date:
Company: CAS	Company:	Company:
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company: CAS	Company:	ESL Inc.:

DISTRIBUTION: White, Canary - ESL, Pink - Originator 4 27 0 3:20

KMB00004014

Columbia Analytical Services
Cooler Receipt And Preservation Form

Project/Client URS Work Order K21 02986

Cooler received on 4/28/02 and opened on 4/28/02 by JAmen

1. Were custody seals on outside of cooler? (YES) NO
   If yes, how many and where? 1 front
2. Were seals intact and signature & date correct? (YES) NO
3. COC # ____ ____ ____ ____ ____
   Temperature of cooler(s) upon receipt: 6.5 ____ ____ ____ ____
   Temperature Blank: 4.7 ____ ____ ____ ____
4. Were custody papers properly filled out (ink, signed, etc.)? YES (NO)
5. Type of packing material present cardboard - glue
6. Did all bottles arrive in good condition (unbroken)? (YES) NO
7. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
8. Did all bottle labels and tags agree with custody papers? (YES) NO
9. *Were the correct types of bottles used for the tests indicated?* (YES) NO
10. Were all of the preserved bottles received at the lab with the appropriate pH? ~~YES NO~~
11. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~YES NO~~
12. Did the bottles originate from CAS/K or a branch laboratory? _____ (YES) NO

Explain any discrepancies _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00007

CRFREV.DOC1/2/01

Columbia Analytical Services

TOTAL METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Portland, Port of

Service Request: K2102986

Project No.: 5200082010.12

Project Name: P.O.PDX Track 401 Sampling

Sample No.	Lab Sample ID.
401-SC-S	K2102986-001
401-SC-SD	K2102986-001D
401-SC-SS	K2102986-001S
401-SC-I	K2102986-002
401-SC-D	K2102986-003
Method Blank	K2102986-MB

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: RCRA Metals

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Date: 5/14/01

011008

TOTAL METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: SOIL

Service Request: K2102986
Date Collected: 04/27/01
Date Received: 04/28/01
Units: MG/KG
Basis: Dry

Sample Name: 401-SC-S

Lab Code: K2102986-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	7060A	1.1	5	5/9/01	5/11/01	24.0		
Barium	6010B	1.1	2	5/7/01	5/8/01	91.2		
Cadmium	6010B	1.1	2	5/7/01	5/8/01	9.7		
Chromium	6010B	1.1	2	5/7/01	5/8/01	21.6		
Lead	6010B	22	2	5/7/01	5/8/01	1530		
Mercury	7471A	0.02	1	5/8/01	5/8/01	0.26		
Selenium	7740	1.1	5	5/9/01	5/11/01	1.1	U	
Silver	6010B	2.2	2	5/7/01	5/8/01	4.1		
Zinc	6010B	2.2	2	5/7/01	5/8/01	1900		

% Solids: 91.1

Comments:

00009

SW-846

TOTAL METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: SOIL

Service Request: K2102986
Date Collected: 04/27/01
Date Received: 04/28/01
Units: MG/KG
Basis: Dry

Sample Name: 401-SC-I
Lab Code: K2102986-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	7060A	1.1	5	5/9/01	5/11/01	16.3		
Barium	6010B	1.1	2	5/7/01	5/8/01	89.9		
Cadmium	6010B	1.1	2	5/7/01	5/8/01	8.6		
Chromium	6010B	1.1	2	5/7/01	5/8/01	20.9		
Lead	6010B	22	2	5/7/01	5/8/01	978		
Mercury	7471A	0.02	1	5/8/01	5/8/01	0.17		
Selenium	7740	1.1	5	5/9/01	5/11/01	1.1	U	
Silver	6010B	2.2	2	5/7/01	5/8/01	2.2	U	
Zinc	6010B	2.2	2	5/7/01	5/8/01	1500		

% Solids: 89.3

Comments:

00010

TOTAL METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Portland, Port of	Service Request:	K2102986
Project No.:	5200082010.12	Date Collected:	04/27/01
Project Name:	P.O.PDX Track 401 Sampling	Date Received:	04/28/01
Matrix:	SOIL	Units:	MG/KG
		Basis:	Dry

Sample Name: 401-SC-D Lab Code: K2102986-003

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	7060A	1.1	5	5/9/01	5/11/01	4.9		
Barium	6010B	1.1	2	5/7/01	5/8/01	87.6		
Cadmium	6010B	1.1	2	5/7/01	5/8/01	4.5		
Chromium	6010B	1.1	2	5/7/01	5/8/01	19.5		
Lead	6010B	22	2	5/7/01	5/8/01	153		
Mercury	7471A	0.02	1	5/8/01	5/8/01	0.04		
Selenium	7740	1.1	5	5/9/01	5/11/01	1.1	U	
Silver	6010B	2.2	2	5/7/01	5/8/01	2.2	U	
Zinc	6010B	2.2	2	5/7/01	5/8/01	801		

% Solids: 90.0

Comments:

00011

TOTAL METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: SOIL

Service Request: K2102986
Date Collected:
Date Received:
Units: MG/KG
Basis: Dry

Sample Name: Method Blank
Lab Code: K2102986-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	7060A	1.0	5	5/9/01	5/11/01	1.0	U	
Barium	6010B	1.0	2	5/7/01	5/8/01	1.0	U	
Cadmium	6010B	1.0	2	5/7/01	5/8/01	1.0	U	
Chromium	6010B	1.0	2	5/7/01	5/8/01	2.0	U	
Lead	6010B	20	2	5/7/01	5/8/01	20	U	
Mercury	7471A	0.02	1	5/8/01	5/8/01	0.02	U	
Selenium	7740	1.0	5	5/9/01	5/11/01	1.0	U	
Silver	6010B	2.0	2	5/7/01	5/8/01	2.0	U	
Zinc	6010B	2.0	2	5/7/01	5/8/01	2.0	U	

% Solids: 100.0

Comments:

00012

TOTAL METALS
- 5a -
SPIKE SAMPLE RECOVERY

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: SOIL

Service Request: K2102986
Units: MG/KG
Basis: Dry
% Solids: 91.1

Sample Name: 401-SC-SS
Lab Code: K2102986-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	60 - 130	31.0		24.0		8.8	80		7060A
Barium	75 - 125	567		91.2		439	108		6010B
Cadmium	75 - 125	20.7		9.7		11.0	100		6010B
Chromium	75 - 125	65.9		21.6		43.9	101		6010B
Lead		4590		1530		110	2782		6010B
Mercury	75 - 125	0.79		0.26		0.50	105		7471A
Selenium	60 - 130	8.5		1.1	U	8.8	96		7740
Silver	75 - 125	17.0		4.1		11.0	117		6010B
Zinc		2140		1900		110	218		6010B

Comments:

00013

TOTAL METALS
- 6 -
DUPLICATES

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: SOIL

Service Request: K2102986
Units: MG/KG
Basis: Dry
% Solids: 91.1

Sample Name: 401-SC-SD
Lab Code: K2102986-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic		24.0		23.5		2		7060A
Barium		91.2		92.5		1		6010B
Cadmium		9.7		10.1		4		6010B
Chromium		21.6		20.7		4		6010B
Lead		1530		1810		17		6010B
Mercury		0.26		0.30		15		7471A
Selenium		1.1	U	1.1	U			7740
Silver	2.2	4.1		3.9		4		6010B
Zinc		1900		1850		3		6010B

00014

TCLP METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Portland, Port of

Service Request: K2102986

Project No.: 5200082010.12

Project Name: P.O.PDX Track 401 Sampling

Sample No.	Lab Sample ID.
401-SC-S	K2102986-001
401-SC-SS	K2102986-001S
401-SC-I	K2102986-002
401-SC-D	K2102986-003
Method Blank	K2102986-MB

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: TCLP Package

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Date: 5/4/01

TCLP METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: TCLP

Service Request: K2102986
Date Collected: 04/27/01
Date Received: 04/28/01
Units: MG/L
Basis: NA

Sample Name: 401-SC-S
Lab Code: K2102986-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6010B	0.1	1	5/8/01	5/8/01	0.1	U	
Barium	6010B	1.0	1	5/8/01	5/8/01	1.0	U	
Cadmium	6010B	0.01	1	5/8/01	5/8/01	0.19		
Chromium	6010B	0.01	1	5/8/01	5/8/01	0.01	U	
Lead	6010B	0.05	1	5/8/01	5/8/01	15.9		
Mercury	7470A	0.001	1	5/8/01	5/8/01	0.001	U	
Selenium	6010B	0.10	1	5/8/01	5/8/01	0.10	U	
Silver	6010B	0.02	1	5/8/01	5/8/01	0.02	U	

% Solids: 0.0

Comments:

00016

TCLP METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Portland, Port of	Service Request:	K2102986
Project No.:	5200082010.12	Date Collected:	04/27/01
Project Name:	P.O.PDX Track 401 Sampling	Date Received:	04/28/01
Matrix:	TCLP	Units:	MG/L
		Basis:	NA

Sample Name: 401-SC-I Lab Code: K2102986-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6010B	0.1	1	5/8/01	5/8/01	0.1	U	
Barium	6010B	1.0	1	5/8/01	5/8/01	1.0	U	
Cadmium	6010B	0.01	1	5/8/01	5/8/01	0.13		
Chromium	6010B	0.01	1	5/8/01	5/8/01	0.01	U	
Lead	6010B	0.05	1	5/8/01	5/8/01	2.41		
Mercury	7470A	0.001	1	5/8/01	5/8/01	0.001	U	
Selenium	6010B	0.10	1	5/8/01	5/8/01	0.10	U	
Silver	6010B	0.02	1	5/8/01	5/8/01	0.02	U	

% Solids: 0.0

Comments:

00017

TCLP METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: TCLP

Service Request: K2102986
Date Collected: 04/27/01
Date Received: 04/28/01
Units: MG/L
Basis: NA

Sample Name: 401-SC-D

Lab Code: K2102986-003

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6010B	0.1	1	5/8/01	5/8/01	0.1	U	
Barium	6010B	1.0	1	5/8/01	5/8/01	1.0	U	
Cadmium	6010B	0.01	1	5/8/01	5/8/01	0.06		
Chromium	6010B	0.01	1	5/8/01	5/8/01	0.01	U	
Lead	6010B	0.05	1	5/8/01	5/8/01	0.13		
Mercury	7470A	0.001	1	5/8/01	5/8/01	0.001	U	
Selenium	6010B	0.10	1	5/8/01	5/8/01	0.10	U	
Silver	6010B	0.02	1	5/8/01	5/8/01	0.02	U	

% Solids: 0.0

Comments:

00018

TCLP METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: TCLP

Service Request: K2102986
Date Collected:
Date Received:
Units: MG/L
Basis: NA

Sample Name: Method Blank
Lab Code: K2102986-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6010B	0.1	1	5/8/01	5/8/01	0.1	U	
Barium	6010B	1.0	1	5/8/01	5/8/01	1.0	U	
Cadmium	6010B	0.01	1	5/8/01	5/8/01	0.01	U	
Chromium	6010B	0.01	1	5/8/01	5/8/01	0.01	U	
Lead	6010B	0.05	1	5/8/01	5/8/01	0.05	U	
Mercury	7470A	0.001	1	5/8/01	5/8/01	0.001	U	
Selenium	6010B	0.10	1	5/8/01	5/8/01	0.10	U	
Silver	6010B	0.02	1	5/8/01	5/8/01	0.02	U	

% Solids: 0.0

Comments:

00019

TCLP METALS
- 5a -
SPIKE SAMPLE RECOVERY

Client: Portland, Port of
Project No.: 5200082010.12
Project Name: P.O.PDX Track 401 Sampling
Matrix: TCLP

Service Request: K2102986
Units: MG/L
Basis: NA
% Solids: 0.0

Sample Name: 401-SC-SS
Lab Code: K2102986-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	75 - 125	4.8		0.1	U	5.0	96		6010B
Barium	75 - 125	10.0		1.0	U	10.0	100		6010B
Cadmium	75 - 125	1.03		0.19		1.00	84		6010B
Chromium	75 - 125	4.44		0.01	U	5.00	89		6010B
Lead		16.4		15.9		5.00	10		6010B
Mercury	75 - 125	0.005		0.001	U	0.005	102		7470A
Selenium	75 - 125	0.99		0.10	U	1.00	99		6010B
Silver	75 - 125	0.92		0.02	U	1.00	91		6010B

Comments:

000020

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Portland, Port of	**Service Request:**	K2102986
Project:	P.O. PDX Track 401 Sampling/5200082010.12	**Date Collected:**	4/27/01
Sample Matrix:	Soil	**Date Received:**	4/28/01
		Date TCLP Performed:	5/24/01
		Date Extracted:	5/25/01

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
Units: mg/L (ppm) in TCLP Extract

				Sample Name:	**401-75-S**	**401-225-S**	**104-373-S**
				Lab Code:	K2102986-004	K2102986-007	K2102986-010
				Date Analyzed:	5/25-29/01	5/25-29/01	5/25-29/01
Analyte	**EPA Method**	**MRL**	**Regulatory Limit***				
Arsenic	3010A/6010B	0.1	5		ND	ND	ND
Barium	3010A/6010B	1	100		ND	ND	ND
Cadmium	3010A/6010B	0.01	1		0.03	0.16	0.62
Chromium	3010A/6010B	0.01	5		ND	ND	ND
Lead	3010A/6010B	0.05	5		0.12	0.08	194
Mercury	7470A	0.001	0.2		ND	ND	ND
Selenium	3010A/6010B	0.1	1		ND	ND	ND
Silver	3010A/6010B	0.05	5		ND	ND	ND

* From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990.

Approved By: _____ Date: 5/30/01

TCLP/102194
02986ICP.EA1 - TCLP 5/30/01

KMB00004029

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Portland, Port of	**Service Request:**	K2102986
Project:	P.O. PDX Track 401 Sampling/5200082010.12	**Date Collected:**	4/27/01
Sample Matrix:	Soil	**Date Received:**	4/28/01
		Date TCLP Performed:	5/24/01
		Date Extracted:	5/25/01

Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
Units: mg/L (ppm) in TCLP Extract

				Sample Name:	**401-675-S**	**401-705-S**	**Method Blank**
				Lab Code:	K2102986-013	K2102986-016	K2102986-MB
				Date Analyzed:	5/25-29/01	5/25-29/01	5/25-29/01
Analyte	**EPA Method**	**MRL**	**Regulatory Limit***				
Arsenic	3010A/6010B	0.1	5		ND	ND	ND
Barium	3010A/6010B	1	100		ND	ND	ND
Cadmium	3010A/6010B	0.01	1		0.08	ND	ND
Chromium	3010A/6010B	0.01	5		ND	ND	ND
Lead	3010A/6010B	0.05	5		0.46	0.07	ND
Mercury	7470A	0.001	0.2		ND	ND	ND
Selenium	3010A/6010B	0.1	1		ND	ND	ND
Silver	3010A/6010B	0.05	5		ND	ND	ND

* From 40 CFR Part 261, et al., and *Federal Register*, March 29, 1990 and June 29, 1990.

Approved By: _____ Date: 5/30/01

TCLP/102194
02986ICP.EA1 - TCLP (2) 5/30/01

KMB00004030

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Portland, Port of	**Service Request:**	K2102986
Project:	P.O. PDX Track 401 Sampling/5200082010.12	**Date Collected:**	4/27/01
Sample Matrix:	Soil	**Date Received:**	4/28/01
		Date TCLP Performed:	5/24/01
		Date Extracted:	5/25/01
		Date Analyzed:	5/25-29/01

Matrix Spike Summary
Toxicity Characteristic Leaching Procedure (TCLP)
EPA Method 1311
Metals
Units: mg/L (ppm) in TCLP Extract

Sample Name: 401-75-S
Lab Code: K2102986-004MS

Analyte	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery*
Arsenic	5	ND	5.0	100
Barium	10	ND	10	100
Cadmium	1	0.03	0.98	95
Chromium	5	ND	4.75	95
Lead	5	0.12	4.65	91
Mercury	0.005	ND	0.005	100
Selenium	1	ND	0.98	98
Silver	1	ND	0.94	94

* Percent recovery information is provided in order to assess the performance of the method on this matrix.

Approved By: _____ Date: 5/30/01

AMENDMENT NO. 2
TO
TERMINAL LEASE
BETWEEN
HALL-BUCK MARINE AND THE PORT OF PORTLAND

This Amendment No. 2 (this "Amendment") is executed by the PORT OF PORTLAND, a port district organized under the laws of the State of Oregon (the "Port"), and Kinder Morgan Bulk Terminals, Inc., a Louisiana company ("Lessee"), effective as of July 1, 1999.

RECITALS

A. The Port is Lessor under a lease, as amended, to Hall-Buck Marine, Inc. ("Lessee") dated October 30, 1987, as amended by Amendment No. 1 thereto, ("Amendment No. 1") dated November 24, 1993, (the "Lease"), Port Agreement No. 87-109, at the Port's Marine Terminal 4.

B. Effective July 1, 1998, all the outstanding stock in Lessee was acquired by Kinder Morgan Energy Partners, L.P., and Lessee changed its name to "Kinder Morgan Bulk Terminals, Inc." ("Kinder Morgan") a transaction which the Port acknowledges did not constitute, or result in, a breach or default under the Lease.

C. Kinder Morgan has notified the Port in writing of its intention to take its first five-year option but requests a reduction in term to four (4) years and a reduction in the Throughput Rate for soda ash.

D. NOW, THEREFORE, in consideration of the covenants and promises contained in this Amendment No. 2, the parties agree as follows:

1. ACKNOWLEDGMENT OF CHANGE OF OWNERSHIP

The Port acknowledges that Lessee has changed its name to "Kinder Morgan Bulk Terminals, Inc.", and the continuation of the Lessee's interest in the Lease dated October 30, 1987, between Hall-Buck Marine, Inc., and the Port, Port Agreement No. 87-109.

2. KINDER-MORGAN'S INTERESTS

Kinder-Morgan represents and warrants that it continues to have all of Lessee's right, title and interest in any property or improvements of Lessee located on the Premises.

3. INSURANCE CERTIFICATE

Kinder-Morgan agrees to carry insurance in the amounts and types not less than those required by the Lease to cover all of it's activities on the Premises. Kinder-Morgan shall provide to the Port certificates evidencing the required insurance and naming the Port as an additional insured as a prior condition to this Amendment No. 2 being executed by the Port.

4. NO AMENDMENT OF LEASE

Except as expressly set forth herein, nothing in this Amendment No. 2 shall be construed to modify the Lease in any way. Without limiting the generality of the foregoing, this Amendment No. 2 shall

KMB00004032

not be construed to imply the waiver by the Port of any rights the Port may have to declare a default for any condition now or hereafter existing at the Premises, whether or not known to the Port.

5. NOTICES

Section 9.12 of the Lease is hereby amended to reflect that notices required or permitted to be given to Lessee under the Lease shall be given to Kinder-Morgan at the following address:

Kinder Morgan Bulk Terminals, Inc.
7116 Hwy. 22
P.O. Box 625
Sorrento, LA 70778-0625

6. OPTION TERM

Section 2.2 - Renewal Options of the Lease, as amended by Amendment No. 1, shall remain in full force and effect except the terms of the option periods shall be amended as follows:

First Option:	July 1, 1999 to June 30, 2003
Second Option:	July 1, 2003 to June 30, 2008
Third Option:	July 1, 2008 to June 30, 2013

7. MINIMUM ANNUAL GUARANTEE RENT

Section 3.2 of the Lease, as amended by Amendment No. 1 is hereby amended and replaced with the following:

Lessee shall pay to the Port annual rent, payable in monthly installments, for each Lease Year for use of the Facility, referred to as the "Basic Rent," which shall be based on the volume of mineral bulk commodities processed through the Facility. In no case, however, regardless of volume, shall Basic Rent ever be less than the annual minimum amount ("Minimum Basic Rent") of $850,000. The Minimum Basic Rent shall be adjusted annually on July 1 each year beginning July 1, 2000, per Section 3.4 of the Lease, as amended in Amendment No. 1.

8. RENTAL

Section 3.3 of the Lease, as amended by Amendment No. 1, is hereby amended such that Throughput Charges are replaced with the following:

Throughput Charges - Soda Ash

Time Period	Tons Per Year	Throughput Charge/Ton	CPI Adjustment
7/1/99 - 6/30/00	0 - 500,000	$0.75	N/A
	500,001 - 1,500,000	$0.64	N/A
	Over 1,500,000	$0.25	N/A
7/1/00 - Thereafter	0 - 500,000	$0.86	Per Sec. 3.4 as amended
	500,001 - 1,500,000	$0.75	Per Sec. 3.4 as amended
	Over 1,500,000	$0.28	Per Sec. 3.4 as amended

Throughput Charges - All Other Commodities

Time Period	Tons Per Year	Throughput Charge/Ton	CPI Adjustment
7/1/98 - 6/30/99	0 - 500,000	$0.89	Per Sec. 3.4 as amended
	Over 500,000	$0.77	Per Sec. 3.4 as amended

9. SODA ASH BULK STORAGE FACILITY CHARGE

The parties acknowledge that the Bulk Storage Facility Surcharge, subject to an annual minimum/maximum guarantee payment of $385,000, more fully described in Section 3.3(B) of the Lease has been paid in full as of June 30, 1999, such that no further payments pursuant to said Section 3.3(B) or elsewhere in the Lease are due as a Bulk Storage Facility Surcharge.

10. ADJUSTMENT TO THROUGHPUT CHARGES

Section 3.4 of the Lease as amended by Amendment No. 1 is hereby amended as follows:

> The "Beginning Index" contained in the first paragraph of Section 3.4 of the Lease and as modified in Amendment No. 1 is hereby changed to December 1998 by changing in Section 3.4 "1992" to "1998."

11. AUTHORITY

The individual executing this Amendment No. 2 on behalf Kinder-Morgan represents and warrants that he is authorized by Kinder-Morgan to do so.

KINDER MORGAN BULK TERMINALS, INC.

By: Thomas B. Stanley
Title: President

THE PORT OF PORTLAND

By: _____
Mike Thorne, Executive Director

APPROVED AS TO LEGAL SUFFICIENCY

By: _____
Counsel, Port of Portland

TERMINAL LEASE

BETWEEN

THE PORT OF PORTLAND

AND

HALL-BUCK MARINE INC.

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KMB00004037

TERMINAL USE AND DEVELOPMENT LEASE

THIS TERMINAL USE AND DEVELOPMENT LEASE, dated October 30, 1987, by and between THE PORT OF PORTLAND, a municipal corporation of the state of Oregon, hereinafter referred to as "Port," and HALL-BUCK MARINE, INC., hereinafter referred to as "Hall-Buck," a corporation organized under the laws of the state of Louisiana,

W I T N E S S E T H:

ARTICLE I - PREMISES

Section 1.1 - Description: Port leases to Hall-Buck, on the terms and conditions stated below, the premises at Terminal 4 consisting of approximately one acre of a paved area adjacent to Berths 410 and 411 as shown in Exhibit A, attached hereto and made a part hereof, including rails, associated buildings, and utilities, and hereinafter referred to as "Premises."

Section 1.2 - Preferential Use: Hall-Buck shall have the preferential use of the wharves, rail tracks and aprons at Berths 410 and 411, Terminal 4, as shown in Exhibit A, for the export of commodities under the terms and conditions of this Terminal Lease.

Section 1.3 - Railcar Storage: Although tracks outside of the Premises are not preferentially assigned, the Port will make trackage available to Hall-Buck to store up to 200 railcars necessary for Hall-Buck's operation. Said storage area may include both leased and non-leased area.

Section 1.4 - Port's Secondary Use: The Port reserves the right to the use of the wharves, rail tracks and aprons at Berths 410 and 411 upon notice to Hall-Buck when there is no ship at berth being served by Hall-Buck. The Port also retains the right to the use of the Dravo bulk outloader and the Whirley crane presently located on the Premises. Both parties to this Terminal Lease shall keep these Premises clear of cargo and gear when not loading or discharging vessels so as not to interfere with the operations of the other.

The Port, its employees, agents and contractors shall have access to and use of lunchroom, toilet facilities and supercargo office on the Premises.

The Port and vessel stevedores authorized by the Port and their employees, agents, and contractors shall have access across the Premises when needed for their operations at Berths 410 and 411.

Port and Hall-Buck agree to provide a minimum of seven days' written notice to the other party of any potential conflicting uses on the Premises.

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Section 1.5 - Use of Premises: Hall-Buck shall use the Premises only for the following purpose: Construction and operation of a facility for the export of soda ash and compatible mineral bulk products. Other commodities may be shipped only with written approval by the Port.

Hall-Buck shall provide the parking space for the vehicles of Hall-Buck employees and its contractors, including but not limited to the ILWU work force, agents and invitees within the Premises.

Section 1.6 - Good Faith: The terms and conditions set forth in this Agreement are for the mutual benefit of both parties. Because of the nature of this Agreement, the parties agree that there is an obligation and implied duty of reasonable diligence and good faith imposed on both parties to make reasonable efforts to fulfill the terms, conditions, and covenants imposed by this Agreement. In the event of any disagreement between the parties, the Port and Hall-Buck shall attempt to resolve the disagreement by good faith negotiations.

ARTICLE II - TERM

Section 2.1 - Term: The term of this Terminal Lease shall commence on the Date of Execution of the Agreement and shall continue for a period of five years from the first day of the month following substantial completion as defined in Section 4.2.

Section 2.2 - Renewal Options: If Hall-Buck is not then in default, Hall-Buck shall have two options to renew this Terminal Lease on the same terms and conditions except for the establishment of rentals as herein provided. Each option shall be for a period of five years and shall be exercised in writing given to the Port not less than one hundred and eighty days prior to the last day of the expiring term.

15 years

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Section 2.3 - Third Option: If Hall-Buck is not then in default at the end of the second five-year option, and provided that the Port continues to designate the Premises for the export of bulk mineral products, Hall-Buck shall have the option to renew this Terminal Lease Agreement for a period of time which is mutually agreeable to both parties, not to exceed ten years (hereinafter referred to as "third option"). The renewal of this Terminal Lease Agreement shall be on the same terms and conditions except for the establishment of rentals, which shall be adjusted in accordance with Paragraphs 3.4 and 3.5, and the minimum annual guarantee rent shall be based on 600,000 tons per year.

Notwithstanding any other provision contained herein, if the Port decides, in its sole discretion, during the third option, to use the Premises for some use other than the export of bulk mineral products, the Port shall have the right to terminate this agreement for its convenience by giving Hall-Buck one year's written notice.

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The Port shall give Hall-Buck notice of its intentions with regard to the facility fifteen months prior to the end of the second five-year option period. If the Port elects to continue the facility as a bulk terminal, the parties shall immediately begin negotiations on a new renewal term with the intent that the term will be finalized not less than twelve months prior to the expiration of the second five-year option period.

ARTICLE III - RENTAL

Section 3.1 - Rent Prior to Substantial Completion: During the period prior to substantial completion of the Facility, or until the end of the ninth month after the Date of Execution of this Lease, whichever comes first, Hall-Buck shall pay the Port a Basic Rent equal to $700 per month.

Section 3.2 - Minimum Annual Guarantee Rent: For the first one-year period, commencing with the first of the month following substantial completion of construction of the Facility as determined in Section 4.2 or the end of the ninth month after the Date of Execution of this Lease, whichever comes first, Hall-Buck shall pay the Port a Minimum Annual Guarantee Rent ("Minimum Guarantee") equal to $325,000, said Minimum Annual Guarantee Rent established on the basis of the Basic Throughput Charge as described in Section 3.3.

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Section 3.3 - Throughput Charges:

A. Hall-Buck shall pay the Port a Basic Throughput Charge, which shall be defined as the rate charged per ton on the first 500,000 tons of soda ash or other mineral bulk commodity loaded on vessel per year, and an Excess Throughput Charge, which shall be defined as the rate charged per ton on the excess over 500,000 tons of soda ash or other mineral bulk commodity loaded on vessel per year, for all soda ash and other mineral bulk commodities loaded on vessels by Hall-Buck at Terminal 4 in accordance with the following scale:

Tons Per Lease Year	Payment Per Ton
Basic Throughput Charge: (the first 500,000 tons)	$0.65 per ton
Excess Throughput Charge: (over 500,000 tons)	$0.55 per ton

Tonnage shall be calculated on an annual basis. The term "ton" shall mean a standard metric ton of 2,204 pounds.

B. For any vessels loaded by Hall-Buck between the date of substantial completion and the first of the month following substantial completion, Hall-Buck shall pay the Port the Basic Throughput Charge.

C. Hall-Buck shall keep true and accurate accounts, records, books and data, including but not limited to vessel arrival and departure data, which shall show all tonnage handled by Hall-Buck at the Premises. The Port and its agents shall have the right at all

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reasonable times to inspect and audit such books, records, agreements, Oregon income tax returns, and other data relating to throughput charges or Minimum Annual Guarantee rental charges as may be required in the judgment of the Port or its auditors to confirm all items necessary for the computation of the rental payments provided for under this Agreement.

Section 3.4 - Adjustment to Throughput Charges: The Basic Throughput Charge and the Excess Throughput Charge shall be subject to adjustment at one-year intervals ("Adjustment Lease Years") as follows:

A. The consumer price index for all urban customers (base year 1967 = 100) for the United States, published by the United States Department of Labor, Bureau of Labor Statistics ("Index") which is published in December of the year preceding the adjustment lease year ("Adjustment Index"), shall be compared with the index published in December 1987 ("Beginning Index").

B. If the Adjustment Index has increased over the Beginning Index, the throughput charge payable commencing in each adjustment lease year (until the next adjustment lease year) shall be set by multiplying the throughput charge set forth in Subsection 3.3(A) by a fraction, the numerator of which is the Adjustment Index and the denominator of which is the Beginning Index; provided, however, that the Basic Throughput Charge shall never be less than the rate of $0.65 per ton and the Excess Throughput Charge shall never be less than the rate of $0.55 per ton.

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C. If the index is changed so that the base year differs from that in effect when the term commences, the Index shall be converted in accordance with the conversion factor published by the United States Department of Labor Statistics. If the Index is discontinued or revised during the term, such other government index or computation with which it is replaced shall be used in order to obtain substantially the same result as would be obtained if the index had not been discontinued or revised.

Section 3.5 - Adjustment to the Minimum Annual Guarantee Rent: The Minimum Annual Guarantee shall be subject to adjustment at one-year intervals by multiplying the adjusted Basic Throughput Charge as computed in Section 3.4 by 500,000 tons, provided, however, that the Minimum Annual Guarantee shall never be less than the $325,000 per year.

Section 3.6 - Adjustment of Minimum Annual Guarantee Upon Renewal: It is understood by both parties that Hall-Buck's Minimum Annual Guarantee to the Port is based on tonnage commitments made to Hall-Buck by the American Natural Soda Ash Corporation (ANSAC), and that at the end of the initial five-year term of this Lease, ANSAC may or may not renew its tonnage commitments to Hall-Buck at the 500,000-ton level. If ANSAC does not renew its tonnage commitments to Hall-Buck at the 500,000-ton level of tonnage, at the time of renewal of this Lease for the first five-year option, Hall-Buck's Minimum Annual Guarantee to the Port shall be adjusted to equal the annual

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volume of tonnage guaranteed by ANSAC, companies previously affiliated with ANSAC, and companies shipping similar mineral bulk commodities through Hall-Buck multiplied by the adjusted Basic Throughput Charge, but in no event shall Minimum Annual Guarantee be less than 300,000 tons per year times the adjusted Basic Throughput Charge.

Section 3.7 - Terminal Tariff Dockage Charges: The Port and Hall-Buck agree that during the Agreement term and any extensions thereof, the Port reserves the exclusive right to determine the rate for dockage charges on all vessels berthing at Terminal 4 in accordance with the Port of Portland published tariff in effect at the time of berthing. All published tariff rates applicable to Terminal 4, including any published discounts shall at all times be competitive with rates in effect by the Port at its other facilities, whether or not such facilities are operated by the Port.

Section 3.8 - Time and Place of Payments:

A. Hall-Buck shall pay to the Port on or before the fifteenth day of each calendar month the throughput charges provided in Section 3.3 for the immediately preceding calendar month, such payment to be accompanied by a statement in such reasonable detail as required by the Port. Within thirty days after the anniversary date of this Lease, Hall-Buck shall pay to the Port any deficiency between monthly throughput charges theretofore paid and the minimum guaranteed throughput charges required by the Lease pursuant to Section 3.2, as adjusted pursuant to Sections 3.4, 3.5, and 3.6.

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B. Hall-Buck shall perform the billing and collection of their marine terminal facility and service rates and charges, such as storage, throughput charge, and truck and rail loading and unloading, when they perform marine terminal services at the Premises.

C. Payments shall be accompanied by a written report of vessel activity and tonnage by shipper and by commodity.

D. Payment shall be to Port at The Port of Portland, Post Office Box 3529, Portland, Oregon 97208, or such other place as Port may designate. All amounts not paid by Hall-Buck when due shall bear interest at the rate of 18% per annum. The interest rate of 18% on overdue accounts is subject to periodic adjustment to reflect the Port's then current interest rate charged on overdue accounts.

ARTICLE IV - HALL-BUCK OBLIGATIONS

Section 4.1 - Construction of Facility:

A. Hall-Buck shall construct, or cause to be constructed, a dry bulk export facility (Facility) upon the Premises to unload soda ash and other compatible mineral bulk commodities, by rail and load vessels berthed at a dock located upon the Premises consistent with Exhibit B and future changes as approved by the Port in writing. The Facility shall have a designed capacity to transfer soda ash from rail to ship of at least 1,500 tons per hour.

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B. Prior to any planned construction, alteration, or changes upon the Premises, Hall-Buck shall submit to Port final plans and specifications, site-use plan, and architectural rendering thereof and shall not commence any construction until it has received Port's written approval. All plans for construction, alteration, or changes to the Facility or any other modifications to the Premises during the term of this Lease shall be prepared and signed by an architect or engineer registered in the State of Oregon. All landscape plans, to the extent they are required to landscape pursuant to city code, shall be prepared and signed by a landscape architect registered in the State of Oregon. Should Port fail to take action concerning plans and/or specifications submitted to it within forty-five days, said plans and/or specifications shall be deemed approved.

Hall-Buck shall, as a condition of this Lease, invest or cause to be invested directly in the improvements to be made upon the demised Premises under this Lease not less than 90% of the cost estimates as set forth in the attached Exhibit C made by Hall-Buck for the design, engineering, construction, equipping, furnishing, and landscaping of the Premises in a manner so specified in such Exhibit B.

C. Hall-Buck shall be responsible for obtaining all necessary local building permits and authorizations prior to operation of the Facility.

D. Hall-Buck shall begin construction of the Facility no later than one month after the Date of Execution of this Lease, and shall substantially complete construction and begin operating the Facility within nine months from the start of construction. At the time of execution of this Terminal Lease, Hall-Buck shall execute and deliver to the Port a 100% performance and payment bond, insuring construction and completion of the improvements contemplated herein and payment of all contractors and subcontractors, and jointly and severally binding and holding Hall-Buck and a surety authorized to transact business in the State of Oregon to the Port and guaranteeing the faithful performance of Hall-Buck's obligation to construct and complete the improvements required by this agreement's construction requirements.

E. In compliance with Section 4.1(D), Fidelity & Deposit Company of Maryland ("Bonding Company") has agreed to issue a 100% Performance and Payment Bond for the construction of the Facility in the sum of $4,300,000. The Bonding Company requested that a separate Construction Contract be developed between Hall-Buck and the Port for the purpose of clearly specifying the construction obligations of Hall-Buck and clearly indicating that the Bonding Company's Performance and Payment Bond insures completion of the improvements contemplated herein and the payment of all contractors and subcontractors but does not extend to all obligations of Hall-Buck under this Terminal Lease. The Construction Contract outlining Hall-Buck's construction obligations under this Terminal Lease is marked Exhibit D, the provisions of which are fully incorporated by reference

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herein. To the extent that any terms, conditions, and requirements of the Construction Contract conflict with the terms of this Terminal Lease Agreement, the Terminal Lease Agreement shall prevail.

Section 4.2 - Substantial Completion: When Hall-Buck considers the Facility to be substantially complete, Hall-Buck shall submit to the Port a written notice of substantial completion. The Port shall then make such inspection or review as necessary to determine that the Facility is acceptable, constructed in accordance with the terms and conditions of this Lease, and ready for use and occupancy. Substantial completion of construction shall mean that construction has progressed to the point where, in the written opinion of both the Port and Hall-Buck, said written opinion to be signed by both parties prior to any ship loading, the Facility is sufficiently complete and is available for commercial loading of bulk commodities.

Section 4.3 - Joint Inspection: Before construction starts on the Facility, representatives of Hall-Buck and the Port shall inspect the wharves, aprons, utility station, buildings, and all other improvements on the Premises and at Berths 410 and 411. At the time of this inspection, both parties shall agree in writing as to the condition of the existing improvements.

Section 4.4 - Conduct of Business: Hall-Buck agrees once construction under Section 4.2 is completed to continuously during the term of the Lease conduct and carry on its soda ash and other approved

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bulk export business on the leased Premises and shall keep such Premises open for business and cause such business to be conducted therein each and every business day generally observed by like businesses, except for acts of God, labor disputes, or other causes beyond Hall-Buck's reasonable control.

If the ILWU imposes a dust penalty charge or stops work at any other operation at Terminal 4 because of dust from a ship being loaded by Hall-Buck, Hall-Buck shall be responsible for any reasonable extra charges incurred.

Section 4.5 - Title to Improvements: Upon termination of this Terminal Lease by the passage of time or otherwise, the Port shall have the option to either require removal of the Facility and all structures, installations, or improvements installed by Hall-Buck except rail tracks within one hundred twenty days after the termination of the Terminal Lease at Hall-Buck's expense or shall have the option to take title to the Facility including any structures, installations, and improvements, including the rail tracks pursuant to Article VIII.

Section 4.6 - Maintenance:

A. Hall-Buck shall at its own expense keep and maintain the leased Premises, the Facility, and all improvements of any kind, which may be erected, installed or made thereon by Hall-Buck, and any rail tracks, pavement, or buildings within the lease area, in good and substantial repair and condition, including the exterior condition

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thereof, and shall make all necessary repairs and alterations thereto. Hall-Buck shall provide proper containers for trash and garbage and shall keep the Facility and Premises free and clear of rubbish, debris, and litter at all times. Port shall at all times during ordinary business hours have the right to enter upon and inspect the Facility and Premises. Port shall give Hall-Buck prior notice of any inspections.

B. Hall-Buck shall be responsible for payment of all costs due to damage to Port property associated with its operation of the Facility, including damage from derailment when Hall-Buck is operating switching equipment. For any ship damage to the wharves not proximately caused by the negligence of Hall-Buck, the Port shall bear the cost of investigating, compromising, or litigating the claim. Hall-Buck shall be required to immediately notify the Port of any ship damage to the wharves.

Section 4.7 - Compliance with Permits and Standards: Hall-Buck shall comply with the requirements of all permits obtained by the Port or Hall-Buck from the Oregon Department of Environmental Quality, State Land Board, U.S. Army Corps of Engineers, and all requirements of other federal agencies and local jurisdictions. Hall-Buck shall pay any fines or penalties which may be rendered for violation of such permits.

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Section 4.8 - Utilities: Hall-Buck shall promptly pay any charges for sewer, water, gas, electricity, telephone, and all other charges for utilities which may be furnished to the Facility and leased Premises, including the installation of metering devices necessary to meter the utilities. Hall-Buck shall be responsible for any additional costs necessary to bring the utilities to the Facility or Premises.

Section 4.9 - Liens: Hall-Buck agrees to pay, when due, all sums of money that may become due for, or purporting to be for, any labor, services, materials, supplies, utilities, furnishings, machinery, or equipment which have been furnished or ordered with Hall-Buck's consent to be furnished to or for Hall-Buck in, upon, or about the Facility and Premises herein leased, which may be secured by any mechanics', materialsmen's, or other lien against the Premises herein leased or Port's interest therein, and will cause each such lien to be fully discharged and released at the time the performance of any obligation secured by any such lien matures or becomes due, provided that Hall-Buck may in good faith contest any mechanics' or other liens filed or established, and in such event may permit the items so contested to remain undischarged and unsatisfied during the period of such contest.

Section 4.10 - Taxes: Hall-Buck agrees to pay all lawful taxes and assessments which during the term hereof or any extension may become a lien or which may be levied by the state, county, city, or

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any other tax-levying body upon the Facility, the Premises or upon any taxable interest by Hall-Buck acquired in this Terminal Lease or any taxable possessory right which Hall-Buck may have in or to the Premises or facilities hereby leased or the improvements thereon by reason of its occupancy thereof as well as all taxes on all taxable property, real or personal, owned by Hall-Buck in or about said premises. Upon making such payments, Hall-Buck shall give to the Port a copy of the receipts and vouchers showing such payment. Upon any termination of tenancy, all taxes then levied or then a lien on any of said property or taxable interest therein shall be paid in full without proration by Hall-Buck forthwith or as soon as a statement thereof has been issued by the tax collector.

Section 4.11 - Operating Program: On or before July 1 of each calendar year, the parties shall meet and discuss Hall-Buck's operating plan for the ensuing twelve-month period which discussion shall include, among other things, the sharing of Hall-Buck's program for marketing, method of relationship with community groups, regulatory agencies, and other interested groups.

ARTICLE V - PORT OBLIGATIONS

Section 5.1 - Port's Warranty: The Port warrants that it is the owner of the leased Premises and has the right to lease them free of all encumbrances. The Port further warrants that it has no actual knowledge of any latent defects or unsound physical conditions on the Premises. The Port will upgrade the rail trackage and roads serving

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Terminal 4 and will defend Hall-Buck's right to quiet enjoyment of the leased Premises from the lawful claims of all persons during the lease term.

Section 5.2 - Dredging: The Port will dredge and maintain a 40-foot depth Columbia River Datum at Berths 410 and 411.

Section 5.3 - Additional Permits: The Port will cooperate with Hall-Buck in the obtaining by Hall-Buck of any permits (in addition to those set forth in Section 4.7) required by government agencies for the construction, operation, maintenance, and expansion of the Facility.

Section 5.4 - Maintenance: The Port shall have the obligation to maintain the wharves and aprons at Berth 410 and 411 and the rail and roads outside the lease area serving the Premises in good operating condition and in good repair.

The Port shall be responsible for damages to the Facility and the Premises due to other ships being worked by the Port or its stevedores separate from ships handled by Hall-Buck.

Once the Facility is operational, the Port may conduct periodic preventative maintenance inspections including underdock inspection before and after arrivals of ships being served by the Port or its stevedores. Hall-Buck may accompany the Port representative on any and all inspections.

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ARTICLE VI - INDEMNITY AND INSURANCE

Section 6.1 - Indemnity: Hall-Buck agrees fully to indemnify, save harmless, and defend the Port, its commissioners, officers and employees from and against all claims and actions and all expenses incidental to the investigation and defense thereof, including but not limited to those claims or actions, based upon or arising out of damages or injuries to third persons or their property, caused by the fault or negligence in whole or in part of Hall-Buck, its subtenants, or employees in the use or occupancy of the Facility or the Premises hereby leased; provided that the Port shall give to Hall-Buck prompt and reasonable notice of any such claims or actions, and Hall-Buck shall have the right to investigate, compromise, and defend same, provided such claim is not the result of negligent act of the Port.

Subject to the limitations of the Oregon Tort Claim Act, ORS 30.260 et. seq., the Port shall indemnify, save harmless and defend Hall-Buck, its directors, officers, employees, representatives, and agents from and against all claims and actions and all expenses incidental to the investigation and defense thereof, based upon or arising out of injuries or damages to third persons or their property, caused by the fault or negligence of the Port, or its agents in carrying out this Agreement.

Section 6.2 - Insurance:

A. Hall-Buck shall keep the Premises herein leased together with the Facility and any and all improvements placed thereon conti-

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nuously insured with an insurance underwriter(s) satisfactory to the Port and authorized to do business in Oregon. The policy(ies) shall be written on an all risk form including flood and earthquake in an amount equal to 80% of the actual cash value of the Facility. Said replacement value as of the inception date of this Agreement is $4,300,000 for the Facility. The Port shall maintain all risk property insurance on the wharf, pier, apron, and any other area not under the sole control of Hall-Buck.

B. Hall-Buck shall maintain a terminal operators liability policy and comprehensive general and automobile liability insurance for the protection of Hall-Buck, directors, officers, servants, and employees, insuring Hall-Buck against liability for damages because of personal injury, bodily injury, death, or damage to property, including loss of use thereof, and occurring on or in any way related to the Facility or Premises or occasioned by reason of the operations of Hall-Buck with insurance of not less than $1,000,000 combined single limit.

C. All insurance shall name the Port, its commissioners, officers, and employees as additional named insureds with the stipulation that this insurance, as to the interest of the Port only therein, shall not be invalidated by any act or neglect or breach of contract by Hall-Buck.

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D. Hall-Buck shall maintain in force Workers' Compensation insurance, including coverage for Employer's Liability and the Longshoremen's and Harbor Workers' Compensation Act.

E. Hall-Buck shall furnish to the Port a certificate(s) of insurance evidencing the date, amount, and type of insurance that has been procured pursuant to this Terminal Lease. All policies of insurance will provide for not less than thirty days' written notice to the Port and Hall-Buck before such policies may be revised, nonrenewed, or cancelled.

Section 6.3 - Waiver of Subrogation: The Port and Hall-Buck agree that each forfeits any right of action that it may later acquire against the other of the parties to the Terminal Lease for loss or damage to its property, or to property in which it may have an interest, where such loss is caused by fire, or any of the extended coverage hazards, and arises out of or is connected with the leasing of the Premises.

Section 6.4 - Damage or Destruction of Premises: If the Facility or leased Premises or any improvements thereon are damaged or destroyed by fire or other casualty, Hall-Buck: (1) shall promptly repair, rebuild, or restore the property damaged or destroyed to substantially the same condition consistent with drawings and plans as approved by the Port, marked Exhibit B as attached, and in accordance with the applicable building codes as existed at the time of loss

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causing such damage or destruction; and (2) shall apply for such purpose so much as may be necessary of any net proceeds of insurance resulting from claims for such losses, as well as any additional money of Hall-Buck necessary therefor.

Section 6.5 - Damage or Destruction of Preferential Use Areas: If the Preferential Use area as defined in Section 1.2 or any improvement thereon is damaged or destroyed by fire or other casualty, the Port shall have the option of replacing said Preferential Use area, terminal facilities or improvements to substantially the same condition or to provide Hall-Buck with alternative arrangements to serve the Facility which permits Hall-Buck to operate its Facility without diminution of its capacity as set forth in Section 4.1.

ARTICLE VII - DEFAULT

Section 7.1 - Events of Default: The occurrence of the following events shall constitute defaults of this Terminal Lease Agreement:

A. Default in Rent: Failure of Hall-Buck to pay any rent or other charge within ten days after it is due shall result in an automatic termination of this Terminal Lease. Hall-Buck's liability to the Port shall survive such automatic termination. Hall-Buck shall have an irrevocable right to reinstate this Lease for nonpayment of rent within ten days after notice of its termination by tendering to Port all past due and presently due rent and other charges.

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B. Default in Other Covenants: Failure of Hall-Buck to comply with any term or condition or fulfill any obligation of the Terminal Lease (other than the payment of rent or other charges) within ten days after written notice by Port specifying the nature of the default with reasonable particularity. If the default is of such a nature that it cannot be completely remedied within the ten-day period, this provision shall be complied with if Hall-Buck begins correction of the default within the ten-day period and thereafter proceeds with reasonable diligence and in good faith to effect the remedy as soon as practicable.

C. Insolvency: Insolvency of Hall-Buck; an assignment by Hall-Buck for the benefit of creditors; the filing by Hall-Buck of a voluntary petition in bankruptcy; an adjudication that Hall-Buck is bankrupt or the appointment of a receiver of the properties of Hall-Buck; the filing of an involuntary petition of bankruptcy and failure of Hall-Buck to secure a dismissal of the petition within thirty days after filing; attachment of or the levying of execution on the leasehold interest and failure of Hall-Buck to secure discharge of the attachment or release of the levy of execution within ten days.

D. Abandonment: Failure of Hall-Buck for fifteen days or more to occupy the property for one or more of the purposes permitted under this Terminal Lease unless such failure is excused under other provisions of this Terminal Lease.

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Section 7.2 - Remedies on Default:

A. Notice: In the event of a default under the provision of Section 7.1 B and C, the Port at its option may terminate the Terminal Lease by notice in writing by certified mail to Hall-Buck. The notice may be given before or within ten days after the running of the grace period for default and may be included in a notice of failure of compliance. If the property is abandoned by Hall-Buck, termination shall be automatic and without notice.

B. Damages: In the event of termination on default, the Port shall be entitled to recover immediately, without waiting until the due date of any future rent or until the date fixed for expiration of the Lease term, the value of Hall-Buck's obligations under this Lease, including but not limited to the obligation to pay rent, plus the reasonable cost or reentry and reletting, including, without limitation, the cost of any cleanup, refurbishing, removal of Hall-Buck's property and fixtures or any other expense occasioned by Hall-Buck's failure to quit the demised Premises upon termination or to leave the Premises in the required condition, attorney's fees and court costs.

C. Other Remedies Provided By Law: In addition to the remedies provided in Subsection B of Section 7.2, the Port may at any time exercise any other remedies available to it under law or equity in the event of a default by Hall-Buck. Suit(s) or action(s) for the recovery of the rents and other amounts and damages, or for the

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recovery of possession may be brought by the Port from time to time, at Port's election, and nothing in this Lease will be deemed to require Port to await the date on which the Lease Term expires. Each right and remedy in this Lease will be cumulative and will be in addition to every other right or remedy in this Lease or existing at law or in equity or by statute or otherwise, including, without limitation, suits for injunctive relief and specific performance. The exercise or beginning of the exercise by Port of any such rights or remedies will not preclude the simultaneous or later exercise by Port of any other such rights or remedies. All such rights and remedies are nonexclusive.

ARTICLE VIII - TERMINATION

Upon termination of this Terminal Lease for default or through the passage of time, or at the end of fifteen years from the Date of Execution of this Agreement, whichever period shall occur first, Hall-Buck shall surrender possession of the Facility and Premises peacefully and promptly, and shall, at the option of the Port evidenced by written notice to Hall-Buck: (a) remove the Facility and all structures, installations, or improvements except rail tracks from the Premises within one hundred twenty days after termination and restore the Premises to its original condition, all at the expense of Hall-Buck; or (b) surrender the Facility and all structures, installations, or improvements existing on the Premises, free of all encumbrances, liens, or security interests, as the property of the Port without requirement of the payment of any compensation or consideration by the Port.

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ARTICLE IX - GENERAL PROVISIONS

Section 9.1 - Assignment and Sublease: No part of the leased Premises or Facility may be assigned, mortgaged, or subleased, nor may a right of use of any portion of the property, including assignments of the leasehold interest for security purposes, be conferred on any third person by any other means, without the prior written consent of the Port. The Port's consent may not be unreasonably withheld. The parties recognize that, during the term of this Agreement, Hall-Buck and ANSAC may form a new joint venture to operate the facility. If Hall-Buck is not then in default of this Lease, the Port will consent to an assignment of this Agreement to the newly formed Hall-Buck/ANSAC joint venture if this newly formed entity has the financial ability, key personnel, and business experience to perform all obligations under this Agreement.

Notwithstanding any other provision contained in this Agreement, Hall-Buck shall not grant to any person or execute any security interest, mortgage, trust deed, or other instrument which purports to give a third party any rights in the Facility, improvements, or structures to be constructed pursuant this Lease Agreement which are superior to the Port's rights to the Facility, improvements, or structures.

Any assignment or attempted assignment without the Port's prior written consent shall be void.

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No consent in one instance shall prevent the provision from applying to a subsequent instance. The Port shall consent to a transaction covered by this provision when withholding such consent would be unreasonable in the circumstances.

In determining whether to consent to sublease or assignment, the Port may consider the following factors: financial ability; business experience; intended use; value of sublease or assignment.

Section 9.2 - Condemnation:

A. Either party receiving any notice of intended taking, any service of legal process relating to condemnation or any other notification in connection with any taking, condemnation or purchase, sale or transfer in lieu of condemnation shall promptly give the other party notice of such receipt. The Port, Hall-Buck and any leasehold mortgagee shall have the right to represent its respective interest in each such proceeding or negotiation and to make full proof of its claims. No sale, transfer, agreement, or settlement with the condemning authority shall be made without the consent of the Port and Hall-Buck. For purposes of this Terminal Lease, taking or condemnation includes a sale to a purchaser with the power of eminent domain in the face of a threat or the probability of the exercise of the power.

B. If the leased Premises or any interest therein is taken as a result of the exercise of the right of eminent domain during the term of this Lease, this Terminal Lease shall terminate as to such portion

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as may be taken. If the portion taken does not feasibly permit the continuation of the operation of the Facility by Hall-Buck, Hall-Buck shall have the right to cancel. Such cancellation shall be effective as of the date of taking. The Port shall be entitled to that portion of the award as represented by the land, the improvements existing on the Premises on the Date of Execution of this Lease, plus the improvements placed on the Premises during the term of the agreement at the Port's expense, plus the value of the amortized Facility and improvements constructed by Hall-Buck. For purposes of determining the value of the amortized Facility and improvements, the parties agree that Hall-Buck will totally amortize the Facility and all improvements over the fifteen years from the commencement date of this Lease.

Section 9.3 - Terminal Tariff and Dockage Charges: The Port and Hall-Buck agree that during the lease term and any extensions thereof, the Port reserves the exclusive right to assess and collect dockage charges on all vessels berthing at the Facility in accordance with the Port of Portland published tariffs in effect at the time of berthing.

Section 9.4 - Labor Agreements: Hall-Buck recognizes an agreement made between International Longshoremen's and Warehousemen's Union, Locals 8 and 40 and 92, and the Port of Portland dated December 9, 1981, that "New leases or operating agreements by The Port involving such 'Public Cargo Handling Facilities' owned or controlled by the Port or hereafter owned or controlled by the Port shall provide

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that any traditional longshore and warehouse work assignment provisions of the ILWU-PMA Agreements dated July 1, 1987, are applicable to the signatories of this Agreement and their lessees and assigns."

Hall-Buck recognizes an Agreement made between the District Council of Trade Unions and Columbia-Pacific Building and Construction Trades Council and the Port of Portland dated April 10, 1985, that "the scope of this Agreement shall include any marine cargo handling facilities leased by the Port to an independent operator to the extent the Port retains the responsibility for the maintenance or repair of any such leased facility or facilities. In the event the Port leases any existing facilities that are covered under this Agreement to an independent operator, and such operator is responsible for maintenance of such facility, the jurisdiction of the respective crafts shall be maintained in respect to any personnel employed by such operator to perform work covered by the scope of this Agreement and such employees performing such work shall receive not less than the terms and conditions of this Agreement."

Section 9.5 - Force Majeure: If by reason of force majeure Hall-Buck is unable in whole or in part to carry out its obligations under this Terminal Lease, Hall-Buck shall not be deemed in default during the continuance of such inability, provided notice thereof is given to the Port and Hall-Buck makes the Minimum Guarantee payment as provided in Sections 3.2 and 3.5. The term "force majeure" as used

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herein shall mean, without limitation, the following: acts of God; strikes, lock-outs of other industrial disturbances; acts of public enemies; orders or restraints of the United States of America or the State of Oregon, or their respective departments, agencies, or officials, or any civil or military authority; insurrections; riots; earthquakes; fires; storms; droughts; floods; explosions; breakage or accident to machinery; or any other cause or event not reasonably within the control of Hall-Buck and not resulting from its negligence. Hall-Buck agrees, however, to remedy with all reasonable dispatch the cause or causes preventing Hall-Buck from carrying out its Agreement, provided that the settlment of strikes, lockouts or other industrial disturbances shall be entirely within the discretion of Hall-Buck and Hall-Buck shall not be required to make settlement of strikes, lockouts, or other industrial disturbances by acceding to the demands of the opposing party or parties when such course is in the judgment of Hall-Buck unfavorable to Hall-Buck. Notwithstanding any other provision contained in the Lease, Hall-Buck shall continue to be obligated to pay the Minimum Guaranteed Annual Rent as provided in Section 3.2, as adjusted pursuant to Sections 3.4, 3.5, and 3.6.

Section 9.6 - Nonwaiver: Waiver by either party of strict performance of any provision of this Terminal Lease shall not be a waiver of or prejudice the party's right to require strict performance of the same provision in the future or of any other provision.

Section 9.7 - Attorney Fees: If suit or action is instituted in connection with any controversy arising out of this Terminal Lease, the prevailing party shall be entitled to recover in addition to costs such sum as the court may adjudge reasonable as attorney fees, or in the event of appeal as allowed by the appellate court.

Section 9.8 - Statutory Provisions: This Terminal Lease shall be governed by the laws of the State of Oregon. The contract provisions required by ORS Chapter 279 to be included in public contracts are hereby incorporated by reference and shall become a part of this Terminal Lease as if fully set forth herein. Hall-Buck shall comply with all permits, adhere to all applicable federal, state, and local laws, rules, regulations, and ordinances, including laws governing its relationship with its employees, including but not limited to laws, rules, regulations, and policies concerning Workers' Compensation, and minimum and prevailing wage requirements.

Section 9.9 - Time of Essence: It is mutually agreed that time is of the essence in the performance of all covenants and conditions to be kept and performed under the terms of this Terminal Lease.

Section 9.10 - Warranties/Guarantees: The Port makes no warranty, guarantee, or averment of any nature whatsoever concerning the physical condition of the leased premises, and it is agreed that the Port will not be responsible for any loss, damage, or costs which may be incurred by Hall-Buck by reason of any such physical condition.

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Section 9.11 - Consent of Port: Whenever consent, approval, or direction by the Port is required under the terms contained herein, all such consent, approval, or direction shall be received in writing from the Executive Director of The Port of Portland.

Section 9.12 - Notices: All notices required under this Terminal Lease shall be deemed to be properly served if sent by certified mail to the last address previously furnished by the parties hereto. Until hereafter changed by the parties by notice in writing, notices shall be sent to the Port at The Port of Portland, Post Office Box 3529, Portland, Oregon 97208, and to Hall-Buck Marine, Inc., P.O. Box 35, Burnside, LA 70738. Date of Service of such notice is date such notice is deposited in a post office of the United States Post Office Department, postage prepaid.

Section 9.13 - Pledge of Leasehold Interest: Hall-Buck may, from time to time, pledge its leasehold interest in buildings, structures, and fixtures as security for (a) bona fide loan(s) from (a) reputable lender(s) or lending institution(s). The leasehold interest shall not include any interest in the land of the Port known as the demised Premises in this Lease and such leasehold interest shall be automatically extinguished upon termination of the lease.

Section 9.14 - Entire Agreement: It is understood and agreed that this instrument contains the entire Agreement between the parties hereto. It is further understood and agreed by Hall-Buck that Port

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and Port's agents have made no representations or promises with respect to this Agreement or the making or entry into this Agreement, except as in this Agreement expressly set forth, and that no claim or liability or cause for termination shall be asserted by Hall-Buck against Port for, and Port shall not be liable by reason of, the breach of any representations or promises not expressly stated in this Agreement, any other written or oral agreement with Port being expressly waived by Hall-Buck, it being understood that the Port requires agreements to be in writing and adopted by Port Commission.

The individuals executing this Agreement warrant that they have full authority to execute this Lease on behalf of the entity for whom they are acting herein.

The parties hereto further acknowledge that they thoroughly read this Agreement, including any exhibits or attachments hereto, and have sought and received whatever competent advice and counsel was

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necessary for them to form a full and complete understanding of all rights and obligations herein; and, having so done, do hereby execute this Agreement on the 30 day of October 1987 which is the designated "Date of Execution."

IN WITNESS WHEREOF, the parties hereto have subscribed their names.

HALL-BUCK MARINE, INC.

By _____
President

By _____

THE PORT OF PORTLAND

By _____
President

By _____
Assistant Secretary

APPROVED AS TO LEGAL SUFFICIENCY

_____
Counsel for Hall-Buck

APPROVED AS TO LEGAL SUFFICIENCY

_____
Counsel for
The Port of Portland

APPROVED BY COMMISSION ON

October 14, 1987

10/29/87
3847L:12G184

KMB00004071

7. KMBT will contact DEQ in about two to three weeks for further discussions.

Pursuant to Item 2 above, we are sending with this letter the Environmental Best Management Practices that are currently in effect at the Terminal. You will note that the BMPs refer to employee job descriptions. To assure that the BMP's are fully integrated into day-to-day operations, the attached Environmental BMPs have been incorporated into each employee's job description. We did not include all of those individual job descriptions because they are lengthy and contain largely technical operational details.

For your convenience, we have also enclosed a copy of PBT-4's revised Stormwater Pollution Control Plan. This revised plan was submitted to DEQ in January, 1999.

With respect to Item 3 above, OAL has informed us that they will have the data by the week of August 23rd. We will contact you that week to discuss the data and determine what the next step may be in addressing this problem.

Again, we thank DEQ for its help and direction in solving our pH dilemma at PBT-4. Please do not hesitate to call me at 1-800-535-8170 with any questions or if we have in any way misunderstood the substance of our meeting.

Sincerely yours,

KINDER MORGAN BULK TERMINALS, INC.

Marie E. Krien-Schmidt

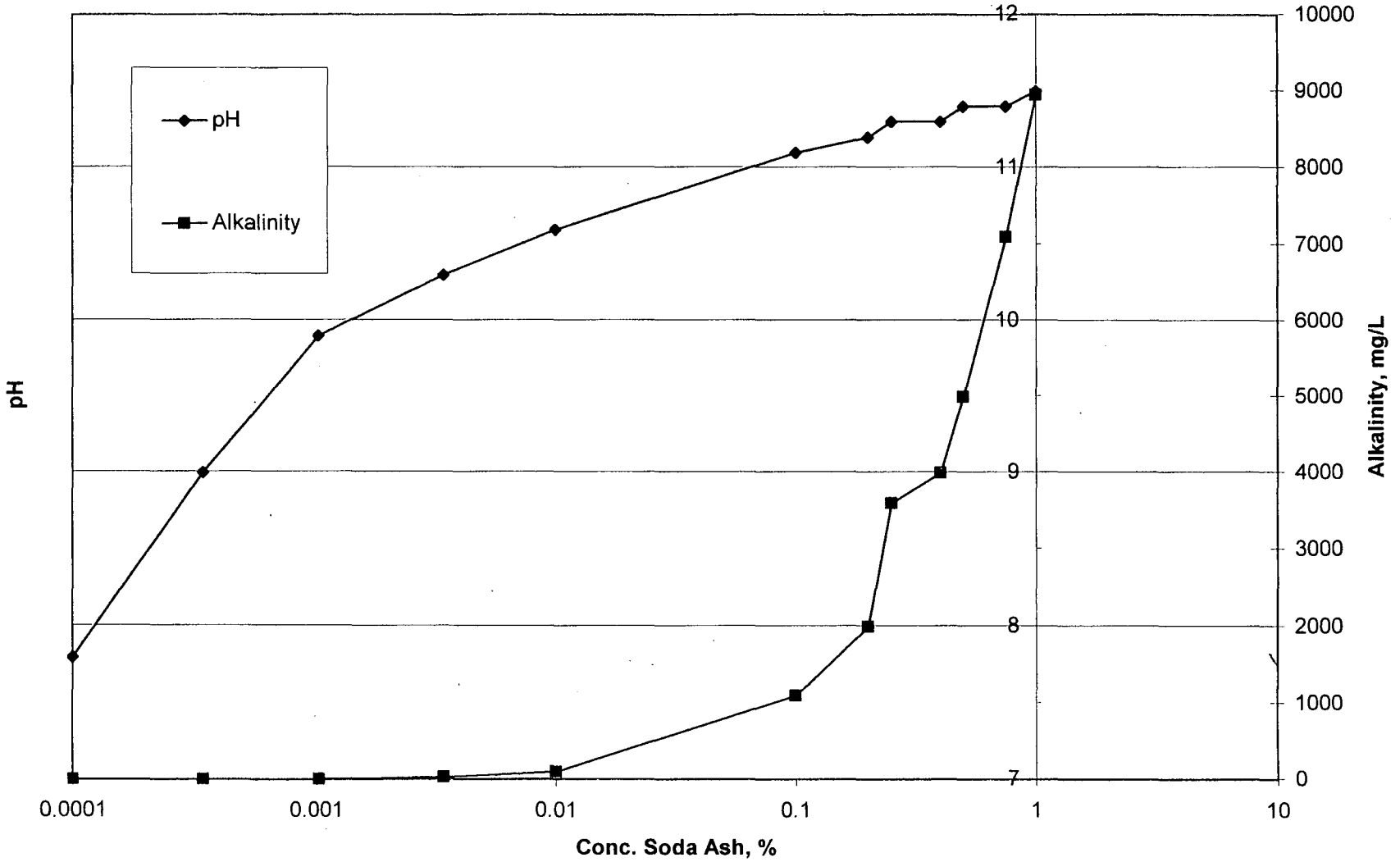
Marie E. Krien-Schmidt
Director, Environmental Affairs

cc: (w/att.) Mr. Neil Mullane – DEQ
Mr. Dennis Jurries – DEQ
Mr. Pad Quinn – Port of Portland
Mr. Brian Cone - OAL

Mr. K. Jones - KMBT
Mr. B. Clinefelter - KMBT/PBT4
Mr. B. McMullin - KMBT

cc: (w/o att.) Mr. T. Stanley – KMBT
Mr. S. Daigle - KMBT
Mr. M. Brown - KMBT

pH - Alkalinity Study on Soda Ash (L12393-1)



GAL
8/3/99

KINDER MORGAN
ENERGY PARTNERS, L.P.

Kinder Morgan Bulk Terminals, Inc.
Terminal 4, Pier 4
P. O. Box 83838
11040 N. Lombard
Portland, Oregon 97203

ENVIRONMENTAL BEST MANAGEMENT PRACTICES
-Safety First-

General Practices During Operations at Terminal:

- ☐ All dust collection equipment is operated during cargo transfers.
- ☐ Daily inspections of all dust control equipment are performed during each work shift (see attached daily inspection checklist).
- ☐ Spilled cargo from railcars is shoveled, swept or vacuumed at first opportunity as safety allows.
- ☐ Any inadvertently spilled cargo is shoveled, swept or vacuumed at first opportunity as safety allows.
- ☐ After railcars have been emptied, bottom hopper gates are fully closed and locked prior to progression of the car out of dump building.
- ☐ Preventative maintenance of all product handling equipment is performed regularly; frequency is a function of hours operated and weather conditions.
- ☐ The Storm Water Pollution Control Plan (copy attached) is fully implemented at all times.
- ☐ These Environmental Best Management Practices are incorporated into each employee's job description as appropriate. Employee reviews are based on satisfactory performance of the job description.

Phone (503) 285-2990 - Wats 800-659-2990 - Fax (503) 285-4467

KINDER MORGAN
ENERGY PARTNERS, LP

Kinder Morgan Bulk Terminals, Inc.
Terminal 4, Pier 4
P.O Box 83836
11040 N. Lombard
Portland, Oregon 97203

Date: April 13, 1999

To: Superintendents

Cc: George Lynn

RE: " Superintendents Daily Inspection Soda Ash Dust Control Equipment"

Gentlemen,

This form is to be completed on each superintendents work shift. At the minimum, this form requires your name, date, time and weather conditions. The "notes" section is at your discretion, but I would recommend not logging down redundant notes from the "relieving notes" or the "shift reports"

If all three of you work a particular day then three of these forms are required. The priorities at this facility are simple; SAFETY IS ALWAYS FIRST, ENVIRONMENTAL IS ALWAYS RIGHT BEHIND SAFETY, generally they both require the same actions.

The items noted on this dust control inspection report does not encompass all the dust control equipment on this terminal, but address the major areas. Your jobs require that all three of you are familiar with the proper operation of this equipment, environmental releases such as heavy dusting due to the choke feeder not being positioned at close proximity to the hold tank top or cargo pile is not acceptable and any employee creating a problem such as this is subject to disciplinary action. By now, you all understand that the mercury switches must be touching either the cargo pile or the hold tank top. **NEVER** is anything else acceptable unless a hatch tent or cement holes are being utilized.

It can not be overemphasized the importance of operating within the boundaries of regulatory agencies such as DEQ. If we continue to operate out of compliance, the results could be disastrous. At this point we are all aware of what degree of dust can be considered an excessive emission.

Our permit states that emissions to the atmosphere shall not exceed 20% opacity for an accumulative time of 30 seconds in any one hour. This can be translated to terms such as that a moderate dust of moderate density for a total of 30 seconds or more in any one hour means that we are out of compliance and we are at great risk of being fined, shut down, or worse. So in the event that dust emissions are deemed somewhat excessive, then we must stop operations until the problem can be remedied, or figure out another way to operate within compliance. Any time you observe an excess dust emission, please describe the circumstances on the new dust control report. This policy must be strictly adhered to, regardless of the weather, time of day or night, etc...

Brad Clinefelter
Terminal Manager

I, _____, have received this memorandum to dust control policy
Your Signature
And, understand its contents. _____.
Date

KINDER MORGAN
ENERGY PARTNERS, L.P.

Kinder Morgan Bulk Terminals, Inc.
Terminal 4, Pier 4

11040 N. Lombard
Portland, Oregon 97203

SUPERINTENDENT DAILY INSPECTION
SODA ASH DUST CONTROL EQUIPMENT

PERFORMED BY: DATE: TIME:
WEATHER CONDITIONS:
WIND SPEED:
WIND FROM WHAT DIRECTION:

CHOKE FEEDER:

- Check prior to start of each workshift.
- Check prior to start of each ship's hold.
- All six proximity switches
- Vane pneumatic actuating system.
- Oiler
- Spout auto raise system.
- Vertical dust shroud assembly.
- Verify proper operation at 1st cargo.

SHIP LOADER:

- Lower gimbal
- Upper gimbal
- Mid boom packing.
- CV-4 head chute proximity switch.

DUST COLLECTORS:

- DC-1, DC-2, DC-3
- All conveyor bin vents.

Notes:

Phone (503) 285-2990 – Wats 800-659-2990 – Fax (503) 285-4467

① TBs/KPP/BMM ② file. T-4 – Water – "Stormwater PCP" MKS

January 25, 1999

Mr. Dennis Jurries
Department of Environmental Quality
Northwest Region
2020 SW Fourth Street, Suite 400
Portland, OR 97201

Dear Mr. Jurries:

RE: PORTLAND BULK TERMINAL-4
STORM WATER POLLUTION CONTROL PLAN
GENERAL PERMIT 1200 – Z; FILE NO. 100025

As required by Schedule A of our Storm Water Permit, enclosed is the revised Storm Water Pollution Control Plan for KMBT's Portland Bulk Terminal 4 facility located on Slip 3 at the Port of Portland. Please note that Outfall B, which is the site of KMBT's storm water monitoring, drains a large portion of Port property that is not under KMBT's control. The elevated pH is due to the fact that soda ash (sodium carbonate) has been loaded into vessels at Terminal 4 for well over 20 years. In fact, soda ash was handled at the Terminal long before KMBT took over the operation at Terminal 4.

It should be noted that soda ash is a non-toxic, inorganic salt similar in character to baking soda, and that the slightly elevated pH due to this product is readily dissipated in the river with no adverse environmental effect. Please refer section II.A.6. of the Plan for discussion of this matter.
If there are questions, please contact me or Mr. Brent McMullin at 285-4200.

Sincerely,

KINDER MORGAN BULK TERMINALS, INC.

Brad Clinefelter
Terminal Manager

Enclosure

cc: Mr. Brent McMullin (w/attach.)
Mr. Kevin Jones (w/o attach.)
Ms. Marie Krien-Schmidt – KMBT
Mr. Pad Quinn - POP

KINDER MORGAN BULK TERMINALS, INC.

STORM WATER POLLUTION CONTROL PLAN

PORTLAND BULK TERMINAL 4
11040 NORTH LOMBARD
PORTLAND, OREGON 97203
(503) 285-2990

****

REVISED JANUARY 28, 1999

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Brad Clinefelter, Facility Manager

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Revised: February 2, 1999

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FIGURES

Figure 1 - General Location Map
Figure 2 - Site Drainage Map

APPENDIX

APPENDIX A: Internal Reporting Forms

KMB00004079

STORM WATER POLLUTION CONTROL PLAN

This plan is intended to meet the requirements for a Storm Water Pollution Control Plan as specified in Permit 1200-Z issued to Kinder Morgan Bulk Terminals, Inc.'s (KMBT) Portland Bulk Terminal 4 (PBT-4) on 10/23/97. The original SWPCP for this site was prepared by Bergeson, Boese & Associates in April, 1993.

I. Site Description

The KMBT/PBT-4 facility is located on the east bank of the Willamette River approximately four miles south of the confluence of the Willamette and Columbia Rivers (see Figure 1 for Site Location Map). The property includes three (3) parcels leased to KMBT by the Port of Portland. The first parcel is irregular in shape and encompasses 6.524 acres. This parcel includes an 8,700 square foot warehouse with an attached 1,900 square foot service building, a 2,700 square foot unloading building, and a 31,104 square foot product storage building. The second parcel is also irregular in shape. It encompasses 0.038 acres, and includes the washwater settling basin. The third parcel encompasses 0.010 acres and includes the structural footing of a loading tower.

The Port of Portland has granted KMBT an additional three (3) acres of preferential dock use area. Under an agreement with the Port of Portland, KMBT is permitted to perform any necessary industrial operations on this area in the absence of a lease. For the purpose of preparing this SWPCP, the property shall be assumed to include both the leased parcels and all preferential dock use areas.

The property is located between Slip Number 2 and Slip Number 3 of Terminal 4, Pier 4 of the Portland Bulk Terminal, operated by the Port of Portland in Portland, Oregon (see Figure 1).

The site lies within the Willamette River drainage basin at an elevation of 30 feet.[1] Precipitation occurs mainly in the form of rain with an annual average of 36.30 inches per year.[2] The site and vicinity are generally flat with little topographic relief. The site and vicinity are located near the northern portion of the Willamette Valley physiographic province. The region is underlain by unconsolidated alluvial deposits consisting largely of sand, gravel, and silt.[3]

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1 US Geologic Survey Map; Linnton, Oregon; 45112-E7-TF Photorevised 1984.

2 Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990, National Ocean and Atmospheric Administration, January 1992.

3 United States Geologic Survey, "Geologic Map of Oregon West of the 121st Meridian", 1961.

Built in 1957, the facility was operated by the Port of Portland until 1988 when it was leased to Hall-Buck Marine, Inc., now Kinder Morgan Bulk Terminals, Inc. It has been in continuous operation since this time. In 1994, while continuing operations, a 30,000 MT product storage building (31,104 sq. ft.) was added to the system.

A. Industrial Activities

KMBT operates a cargo handling facility located at Terminal 4, Pier 4 of the Portland Bulk Terminal in Portland, Oregon (PBT-4) (see Figure 1). Bulk quantities of outbound dry material are transferred from railcars directly onto cargo ships or alternatively into the storage building, where it is later reclaimed and transferred into cargo ships. Inbound material is unloaded from cargo ships and transferred to railcars or trucks for overland distribution.

Railcars containing bulk quantities of outbound material enter the facility on rail tracks 4-10 and 4-12 as identified on the Site Drainage Map (see Figure 2). Railcars enter the structure identified as the unloading building and discharge their contents into a pit located beneath the tracks. An enclosed conveyor transports the material from the pit directly to the top of an unloading tower located adjacent to the edge of Berth 411 on the smaller of the two parcels leased to HBM or to the storage building where it is later reclaimed and directed to the unloading tower. The tower regulates the transfer of material from the conveyor to the cargo holds of ships docked at Berths 410 and 411.

Discharge of airborne product generated by the materials handling system at PBT-4 are permitted under Air Discharge Permit #26-2909.

Spills occurring during the transportation of materials on the leased parcels are swept or vacuumed up.

PBT-4 operates a wash water treatment facility to treat water prior to disposal to the sanitary sewer. The facility treats the water used to wash the pit area beneath the railcar unloading building, and storm water runoff from portions of the dock.

Washwater is discharged into a settling basin as identified on the Site Drainage Map. The settling basin provides primary removal of settleable solids. Effluent from the settling basin is pumped to a treatment facility located in the warehouse where the pH is adjusted with the addition of sulfuric acid and further settling occurs.

PBT-4 cleans materials handling equipment using a portable pressure washer located adjacent to the south wall of the warehouse. Washwater discharge from this operation drains to the washwater treatment system described above.

A list of bulk materials that may be handled by PBT-4 include the following products:

- Soda Ash
- Bentonite Clay
- Potash
- Sodium Sulfate

Other materials used by PBT-4 as part of industrial operations include:

- Gasoline
- Diesel Fuel
- Petroleum Lubricants
- Sulfuric Acid

B. General Location Map

The street address of the subject property is 11040 North Lombard, Terminal 4, Pier 4, Portland, Oregon 97203. A general location map is included as Figure 1.

C. Site Drainage Map

A Site Drainage Map is included as Figure 2. It illustrates directional storm water runoff patterns and impervious surface areas.

D. Impervious Areas

Impervious surfaces include all paved surfaces and roofed areas. Impervious surface areas account for 100% of the subject property surface area.

E. Potential Pollutants

PBT-4 ships and receives bulk quantities of materials at the Portland Bulk Terminal. The principal material handled by PBT-4 is soda ash. Other products such as bentonite clay, soybean meal, aluminum trihydrate, sodium sulfate, talc, and calcined coke may be handled infrequently. In addition, the facility maintains various quantities of petroleum-based lubricants, diesel fuel, and sulfuric acid.

The introduction of these materials into storm water runoff may result in changes in pH levels and an increase in levels of oil and grease, suspended solids and chemical oxygen demand.

F. Receiving Waters

Storm water discharge from PBT-4 is discharged directly into the Willamette River.

G. Discharge Outfalls

Two storm water discharge outfalls are located in the vicinity of the subject property (see Figure 2). Storm Water Outfall A is located near the southeast corner of the subject property. This outfall receives storm water runoff collected by two catch basins located east of the subject property. These catch basins are located outside both the preferential dock use area and leased areas and are unlikely to receive storm water impacted by industrial activities performed by KMBT-4. No storm water sampling shall be performed at this outfall or at any of the associated catch basins.

Storm Water Outfall B is located approximately 550 feet west of the service building and discharges into Slip Number 2. Storm water from more than 40 catch basins discharge to an underground drainage network which underlies the subject property, the rail yard to the east, and adjacent properties to the north. Within the boundaries of the subject property are thirteen catch basins which discharge to this drainage network. These are identified as CB-2 through 8 and CB-10 through 15 on the Site Drainage Map. Storm water sumps located adjacent to machinery are equipped with shut-of valves to minimize the possibility of oil or other contaminants entering the River.

Samples of storm water are taken semi-annually at Outfall B. This outfall represents runoff from the PBT-4 activities as well as extensive areas of rail trackage on the Port's property but outside of the PBT-4 work area. Contribution to this Outfall may come from other tenants. In the event that any parameter exceeds DEQ limits, PBT-4 will work with the Port to address the problem.

II. Site Controls

A. Storm Water Best Management Practices

Existing storm water management practices designed to minimize industrial impact on storm water discharge include:

1. Containment

PBT-4 operates one (1) 5,000 gallon underground storage tank containing diesel used to supply fuel to locotives and other equipment. The tank is constructed of double-wall steel and is equipped with a leak-detection alarm system.

The facility stores up to 330 gallons of sulfuric acid for use in the washwater treatment facility inside the warehouse. The above-ground storage tank is elevated above a secondary containment trough designed to contain the entire volume of the tank in the event of a leak or rupture.

Petroleum lubricants and used oil are stored inside the warehouse. The petroleum lubricants are placed on top of spill containment trays and troughs. The warehouse floor is sloped toward a central clean-out basin which is not connected with any storm sewer or sanitary drain line. The clean-out basin is periodically emptied of accumulated liquids.

The facility also has a 500-gallon gasoline tank located above-ground outside the east wall of the warehouse. The tank has an integral containment system and concrete vehicular restraints for protection.

Material arriving by railcar is unloaded into the pit area located underneath the unloading building. The unloading building is open at either end to permit railcars to pass through the structure. An enclosed conveyor reduces spillage of outbound materials transported to the storage building and to the unloading tower.

2. Oil & Grease Separation

An oil/water separation is part of the facility's washwater treatment system. Water resulting from steam cleaning of machinery is treated b y the oil water seperator. Catch basins located adjacent to converor machinery have oil absorbant material in them.

3. Waste Chemical Disposal

Used oils are stored and recycled. All other wastes are disposed of as solid waste.

PBT-4 generates no liquid chemical or hazardous wastes as part of its Industrial activities.

4. Erosion & Sediment Control

The entire site is paved so erosion and sediment control were not applicable.

5. Debris Control

Debris is picked up as necessary on a daily basis.

6. Storm Water Diversion/Treatment

Concrete berms and bullrail on the 411 warf restrict the flow of storm water runoff in this area. Storm water runoff generated within the area confined by the berms flows into the washwater settling basin. Rainfall contacting all other areas flows to one of the catch basins identified on the Site Drainage Map.

Past sampling events have shown pH values of over 9.0. The elevated pHs are due to the long time handling of soda ash at the facility. Soda ash was handled at this location by the Port before KMBT took over operation. Soda ash is entrained in the trackage well beyond the KMBT operating area. All of this trackage drains to outfall B.

KMBT has been working with the Port over the past year to evaluate the existing old piping system and determine if changes are feasible. At this time, it does not appear that a physical change in the storm drainage piping at the Terminal 4 facility is workable. KMBT and the Port are continuing to investigate various neutralization possibilities. (It should be noted that more than half of the drainage basin for the Outfall in question comes from property that is not leased by KMBT from the Port.)

Our objective is to achieve the desired pH in the storm water discharge without adding a pollutant that is worse for the river ecosystem than the soda ash. Soda ash (sodium carbonate) is an innocuous substance that is not listed in the Clean Water Regulations as a conventional pollutant. Sulfates, on the other hand, are listed as such a pollutant (40 CFR 122, App. D., Table IV). Accordingly, we are trying to avoid addressing a minor pH problem, one which instantly dissipates as soon as the storm water co-mingles with the river with no adverse affects on the environment, by adding a listed pollutant to the storm water discharge. Unfortunately, all of the data and information gathered to date indicates that large volumes of sulfate containing acids would be required to lower the pH of the huge volume of storm water that discharges at the Terminal 4 Outfall.

At this time, neutralization of the storm water discharge with river water in a large tank installed just upstream of the discharge point may be the most effective means of addressing the pH issue without causing worse pollution than that created by the soda ash. Sizing and location of such a tank and an appropriate pumping system are issues that continue to be investigated.

7. Covering Activities

Materials received at PBT-4 which are destined for outbound shipment are stored and transported within enclosed areas. Outbound materials are first unloaded from railcars in the unloading building. An enclosed conveyor then transports these materials either to the unloading tower for final loading onto cargo ships, or to the enclosed 30,000 MT storage building where it is later reclaimed and transported by enclosed conveyor to the unloading tower for final loading into cargo ships.

PBT-4 stores used oils, petroleum lubricants and sulfuric acid inside the warehouse.

Trash dumpsters are kept covered.

8. Housekeeping

Inadvertent leaks or drips of oil and the materials are cleaned up daily. Spilled cargo products are cleaned up after completion of each loading or unloading activity.

B. Spill Prevention and Response Procedures

The PBT-4 facility is not required to have a Spill Prevention Control and Countermeasure (SPCC) Plan as described under Title 40, Code of Federal Regulations, Part 112 because there are no affected tanks on the site.

In addition to an underground 5,000 gallon diesel storage tank, 500 gallon above ground gasoline tank and a 330 gallon above-ground sulfuric acid storage tank, PBT-4 maintains hydraulic fluid, petroleum lubricants, and used oils in quantities less than 55 gallons.

Used oil, petroleum lubricants, and sulfuric acid are stored in the warehouse. No floor drains are present in the floor which is lower than the exterior grade elevation. Spills or leaks of materials stored within the warehouse are unlikely to enter the storm water drainage system.
Oil absorbents are kept on hand in the warehouse where oils are stored.

C. Preventive Maintenance

The facility manager shall be responsible for administering the preventive maintenance programs. These programs provide for monthly inspections of potential spill areas, all containment areas, and all loading and unloading areas.

D. Employee Education

PBT-4 provides training and instruction for all personnel regarding the goals and content of the SWPCP. This training addresses storm water management, spill response procedures, and materials management practices.

PBT-4 may choose to present this information as part of regularly scheduled health and safety meetings, education seminars, posted materials, or combination thereof. The effectiveness of this program shall be evaluated and modified as necessary as part of the Annual Review.

E. Record Keeping and Internal Reporting Procedures

The Storm Water Pollution Control Plan shall be maintained on file at PBT-4 and made available to the DEQ for inspection upon request. A copy of the Storm Water Discharge Permit including the General Conditions shall be kept on file with the Plan.

In accordance with the Internal Reporting Procedures, PBT-4 shall maintain records of the following events:

- A checklist of the regular maintenance activities.
- Records of any failure, modification, or replacement of storm water-related equipment.

Copies of these forms are included in Appendix A.

PBT-4 shall maintain the following documents on file for a minimum of five years:

- Analytical results from semi-annual sampling events.
- Copies of all annual DEQ reports.

F. Annual Review

A full review of the SWPCP shall be conducted annually and documented below. The review shall include a complete site inspection of those areas where spills or industrial activities may impact storm water discharge. The review shall evaluate each component of the SWPCP for effectiveness in preventing contamination of storm water runoff at the facility. Revisions to the SWPCP shall reflect those modifications necessary to address the potential impact of industrial operations on storm water discharge at the site. If the review indicates no changes are needed, then an update form shall be added to this plan stating "no change needed."

Review Date	Revision Date	Reviewer
1/25/99	01/04/99	MKS + BAC

APPENDIX A

INTERNAL MAINTENANCE AND REPORTING FORMS

PBT-4

MONTHLY STORMWATER CHECKLIST (19_____)

Enter one of the following for each item: "OK"; "NR" (No Rain); or "RM" (Repairs Made)

Month (Date)	Containment Areas	Debris & Dust Control	Unloading Areas	Oil Sheen* OUTFALL B	Inspector's Initials	Comments *(Describe any repairs or other action taken to prevent stormwater pollution.)*
JANUARY ( )						
FEBRUARY ( )						
MARCH ( )						
APRIL ( )						
MAY ( )						
JUNE ( )						
JULY ( )						
AUGUST ( )						
SEPTEMBER ( )						
OCTOBER ( )						
NOVEMBER ( )						
DECEMBER ( )						

*If oil sheen is observed, a sample must be taken and tested for oil and grease. See attached Sketch for location.

INCIDENT INVESTIGATION FORM

I.D. Number _____

PART I: INCIDENT DESCRIPTION

1. Facility _____ Date _____ Time _____ am / pm

   Facility Area _____ First Reported Date _____ To _____

   Classification (Check all that apply.):

Environmental Release	_____	Storage Failure	_____
Fire	_____	Piping Failure	_____
Explosion	_____	Control Failure	_____
Implosion	_____	Other Failure	_____
Near Miss	_____		

   Equipment Involved: _____

2. What was occurring in the process when the incident occurred?
   (Be specific, describe what materials were being used, how they were being acted upon, or what was being done when the incident occurred.)

3. a) Are there safety rules applying to this procedure? _____ Yes _____ No

   b) Were they followed? _____ Yes _____ No

4. How did the incident occur?
   (Describe fully the events which resulted in the incident. Tell what happened. Name any objects or substances involved and tell how they were involved. Give details on factors which led or contributed to the incident.) _____

5. Where possible, describe temporary or permanent effects of the incident.
   (e.g., brief gas cloud, damaged piping, ruptured vessel, etc.)

6. What immediate corrective actions were taken?

7. If this was an Environmental Incident, was a "release" or spill reported to any government agency? Yes _____ No _____
(Refer to the Flow Chart for Environmental Reporting on Page 4 of this Section. Please list below the name and phone number of any agency that was notified of the incident.)

_____

_____

_____

PART II: PREVENTION OF RECURRENCE

1. What points were brought out during the investigation?

_____

_____

_____

_____

_____

_____

2. How could the incident have been prevented?

_____

_____

_____

_____

3. Recommendations of action to prevent recurrence response.

_____

_____

_____

_____

Target Date: _____ Completion Date: _____

4. Overall responsibility for follow up: _____

Investigated by (All Team Members): _____

_____

_____

Prepared By: _____
Facility Manager

_____
Date

Distribution: _____

_____

_____

_____

FOLLOW-UP

I.D. Number _____

(Note: This page is to be completed by the Facility Manager.)

Person(s) Responsible for Follow-up.

_____

_____

_____

_____

_____

Start Date of Recommendations:

a) _____

b) _____

c) _____

Estimated Completion Date of Recommendations:

a) _____

b) _____

c) _____

Are all of the Investigation Team's recommendations being implemented?

_____ YES _____ NO

If "NO", state the reason(s) why:

_____

_____

_____

_____

Describe the follow-up actions being taken to eliminate a recurrence.

_____

_____

_____

_____

_____

_____

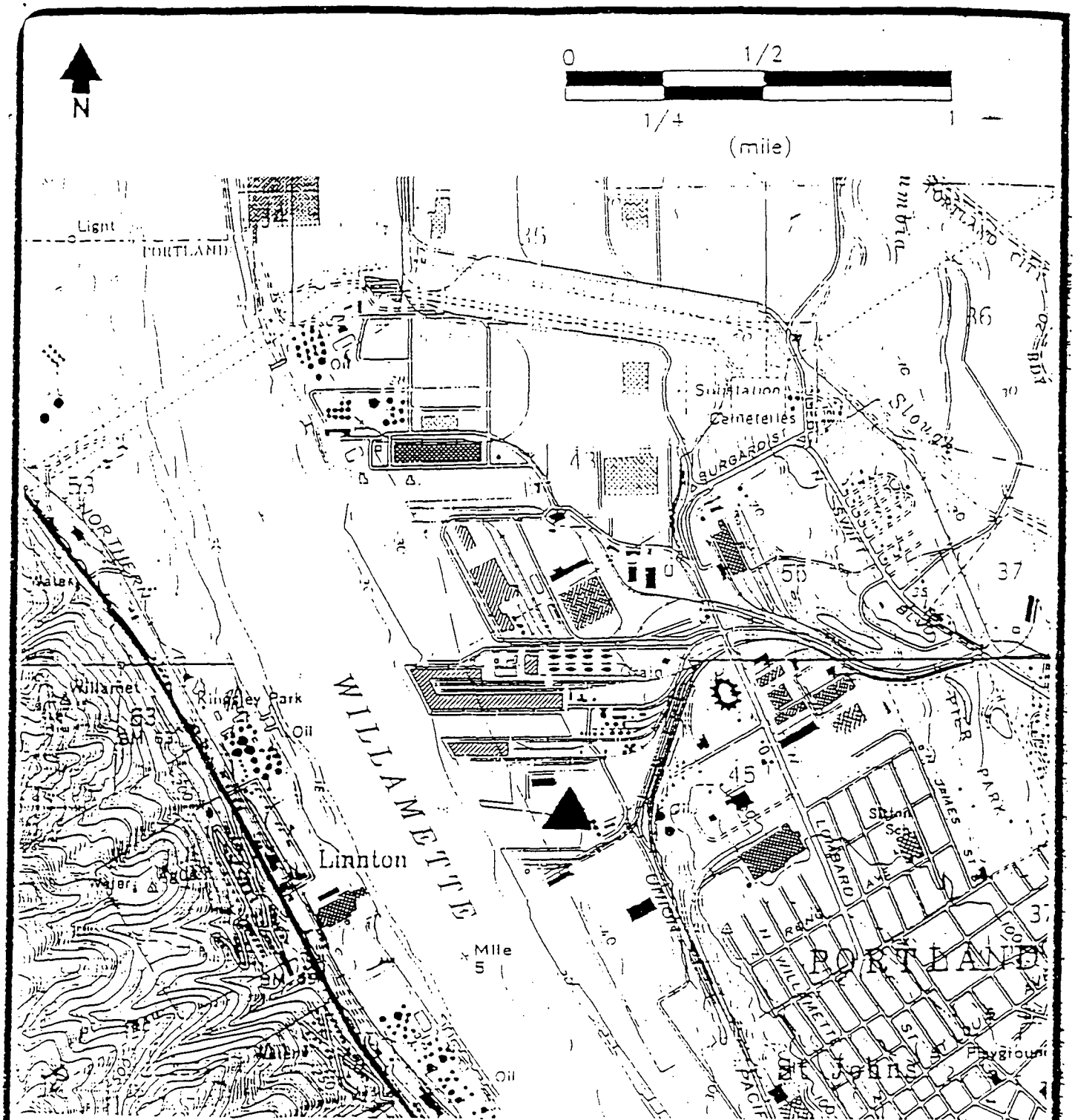
_____

_____
Facility Manager

_____
Date

FIGURE 1

GENERAL LOCATION MAP



▲ SITE LOCATION

FIGURE 1

SOURCE: LINNTON QUADRANGLE
SERIES: 7.5 MINUTE

HALL BUCK MARINE INC., Portland, OR

Site Location Map

Bergeson–Boese & Associates, Inc.
Hydro–Geotechnical Research
65 Centennial Loop
Eugene, Oregon 97401
(503) 484–9484

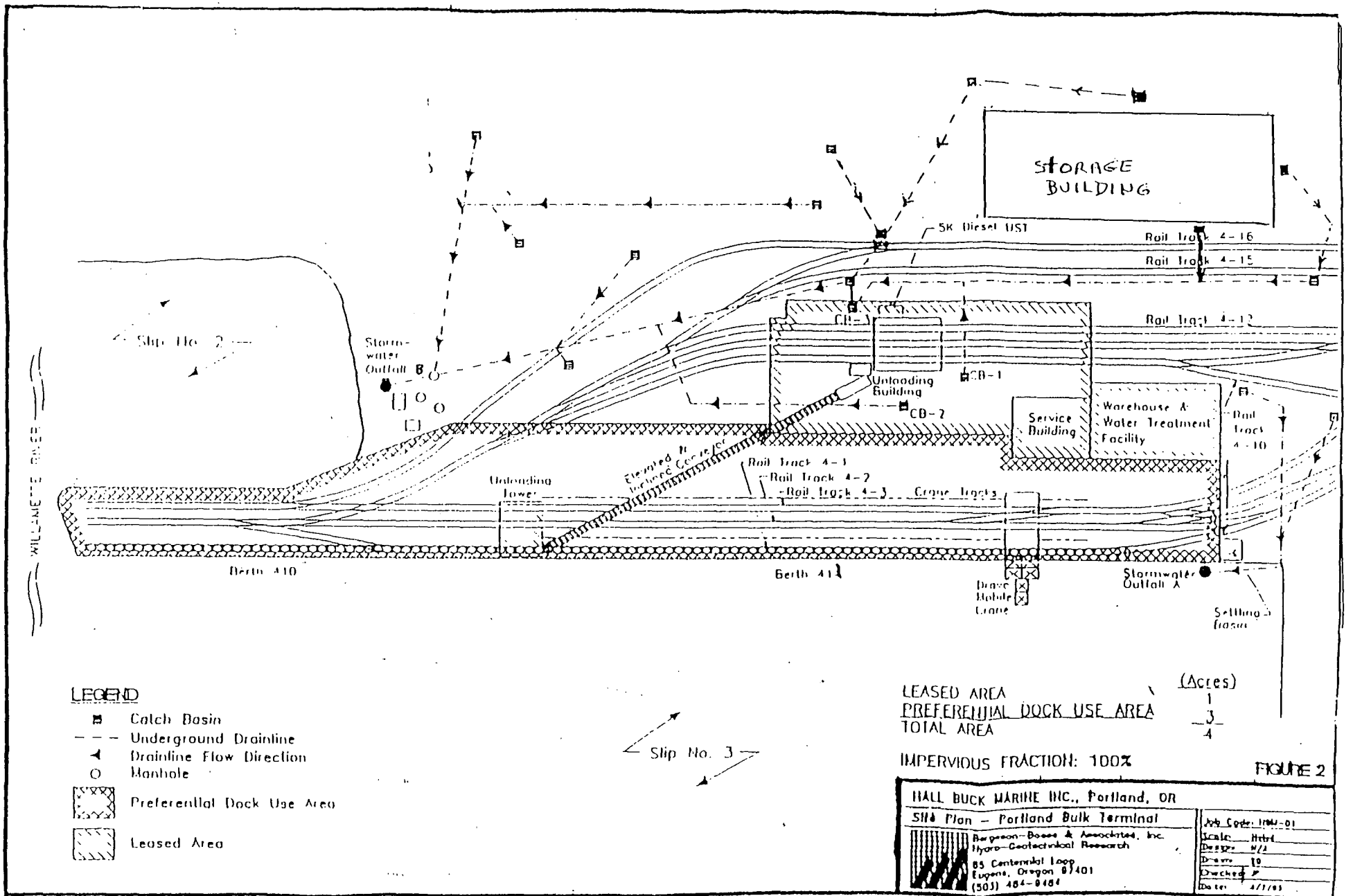
Job Code:	HBM–01
Scale:	Noted
Design:	N/A
Drawn:	DB
Checked:	JP
Date:	4/13/93

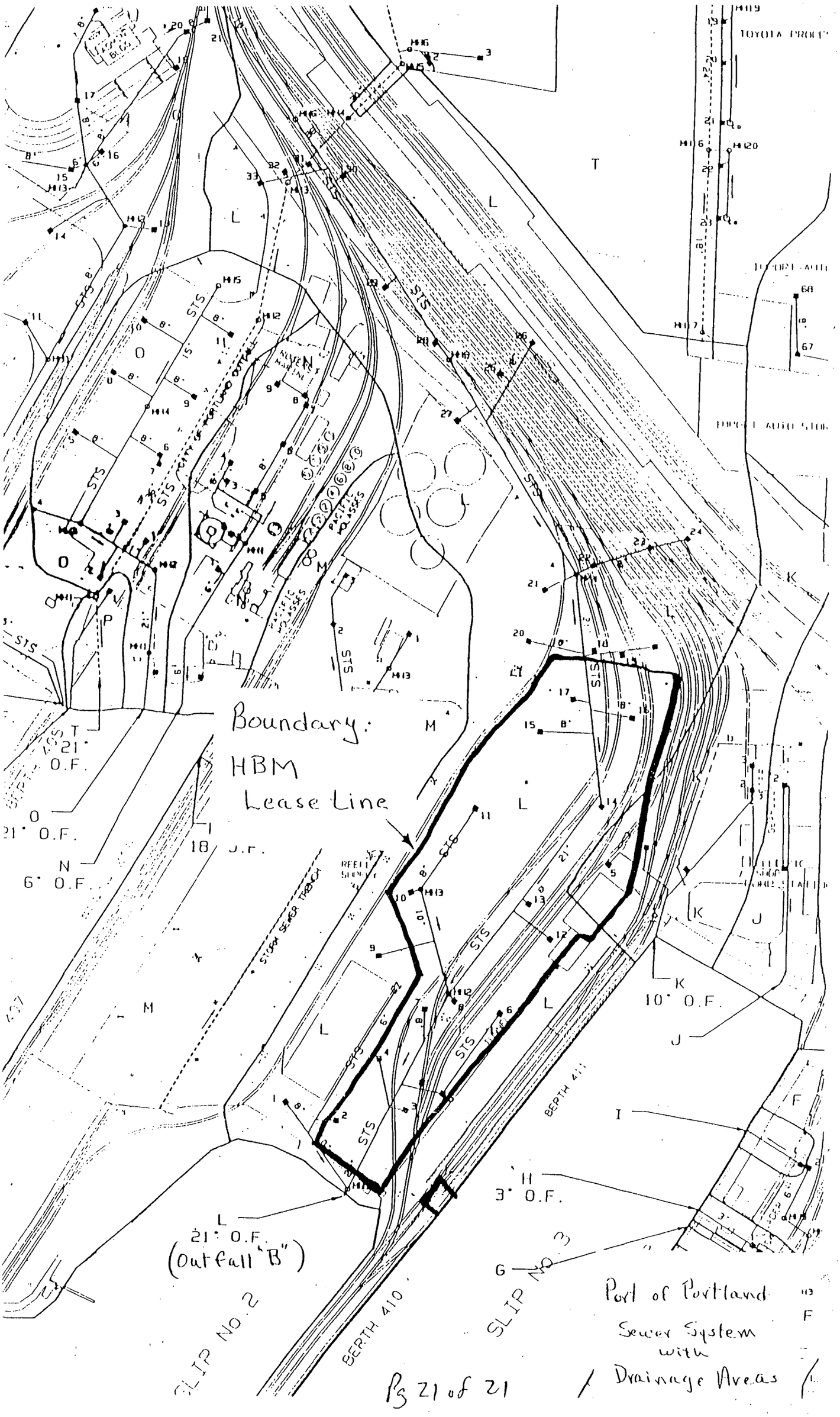
KMB00004095

FIGURE 2

SITE DRAINAGE MAP

KMB00004096


STORAGE BUILDING
5K Diesel UST
Rail Track 4-16
Rail Track 4-15
Rail Track 4-14
Slip No. 2
Storm-water Outfall B
CB-1
Unloading Building
CB-2
Service Building
Warehouse A
Water Treatment Facility
Rail Track 4-10
Elevated Belt Conveyor
Rail Track 4-1
Rail Track 4-2
Rail Track 4-3
Crane Tracks
Unloading Tower
Berth 410
Berth 411
Drave Mobile Crane
Stormwater Outfall A
Settling Basin
MILLENNIUM BASIN
LEGEND
Catch Basin
Underground Drainline
Drainline Flow Direction
Manhole
Preferential Dock Use Area
Leased Area
Slip No. 3
LEASED AREA (Acres) 1
PREFERENTIAL DOCK USE AREA 3
TOTAL AREA 4
IMPERVIOUS FRACTION: 100%
FIGURE 2
HALL BUCK MARINE INC., Portland, OR
Site Plan – Portland Bulk Terminal
Bergeson-Boese & Associates, Inc.
Hydro-Geotechnical Research
85 Centennial Loop
Eugene, Oregon 97401
(503) 484-9484
Job Code: HBM-01
Scale: Hdrd
Design: M/J
Drawn: LD
Checked: JP
Date: 4/7/93
REVISED 1/22/98 mlw



Pg 21 of 21

KMB00004098

KINDER MORGAN
ENERGY PARTNERS, L.P.

Kinder Morgan Bulk Terminals, Inc.

July 20, 1999

Mr. Robert Baumgartner
Department of Environmental Quality
Water Resources Division
2020 SW Fourth Street, Suite 400
Portland, OR 97201

Dear Mr. Baumgartner:

RE: PORTLAND BULK TERMINAL 4 (PBT4)
GENERAL PERMIT 1200Z; FILE NO. 10025

Thank you for agreeing to meet with us in August to discuss the stormwater issues at our Portland Bulk Terminal 4 facility at the Port of Portland. At this time, I have confirmed travel reservations for arrival in Portland on August 2nd and will plan on meeting with you at your office on August 3, 1999, at 10:00 am.

As we discussed by phone, the problem we are experiencing at PBT-4 is elevated pH in the stormwater discharges due to the facility's many years of operation as a transfer terminal for soda ash (Na_2CO_3) from railcars to storage and to vessels. As a follow-up to our phone conversation and in preparation for our meeting in August, we are sending the below listed documents for your review.

1. The facility's 1998 and 1999 Annual Stormwater Reports in which you will note that the pH of the stormwater discharges ranges from 9.8 to 10.3.

2. A letter dated June 7, 1999, to Mr. Dennis Jurries from me concerning our proposed plans to adjust the pH of the stormwater using river water instead of chemicals.

3. A fax message dated June 10, 1999, to Mr. Dennis Jurries from me concerning the age of the facility and potential costs to enclose or cover soda ash handling areas and treatment of stormwater under the General Permit.

4. A table of stormwater data collected from January through April, 1999, showing the pH and total alkalinity of discharges from the facility. It is our understanding that DEQ has total alkalinity data for the river and will be able to use the alkalinity data we have to evaluate the impact of the PBT4 stormwater discharges on the river.

Please do not hesitate to call me (1-800-535-8170) if you need any other information prior to our meeting. We appreciate DEQ's willingness to work with us and help us find an environmentally sound solution to our pH problem.

Sincerely yours,

KINDER MORGAN BULK TERMINALS, INC.

Marie E. Krien-Schmidt

Marie E. Krien-Schmidt
Director, Environmental Affairs

cc: (w/o att.) T. Stanley – KMBT
S. Daigle – KMBT
K. Jones – KMBT
B. McMullin - KMBT
B. Clinefelter – KMBT/PBT4

7116 Hwy. 22 P.O. Box 625 Sorrento, LA 70778-0625 800/535-8170 Fax 225/675-5923

STORMWATER

HALL-BUCK MARINE, INC.

7116 Highway 22, P.O. Box 625, Sorrento, LA 70778-0625
Phone: (504) 675-5387 - Fax: (504) 675-8259

FAX TRANSMITTAL

DATE: 2-20-98	TOTAL NUMBER OF PAGES INCLUDING COVER SHEET: 4

TO: K. Jones; B. McMullen
COMPANY:
FAX NO.:
CC:

FROM:
Marie

MESSAGE:

IF YOU DO NOT RECEIVE THE CORRECT NUMBER OF PAGES OR ANY ARE ILLEGIBLE, PLEASE CALL (504) 675-5387.

Kennedy/Jenks Consultants

Engineers and Scientists
2828 S.W. Naito Parkway, Suite 350
Portland, Oregon 97201
503-295-4911
Fax: 503-295-4901

**** FACSIMILE COVER SHEET ****

ROUTE TO:
TO: Mike L
RE:
TBS
SJS
DWD
KFP
BMM

DATE: 2/19/98
~~FROM~~ FROM: Marie Knien-Schmidt
LOCATION: Sorrento, LA
FAX NUMBER: (504)675 5923
SUBJECT: Results of Sample Set #1 - pH survey @ T4
~~TO~~ TO → Brent Jorgensen
TOTAL PAGES (including cover) 3

* fax cc to:
B. Clinefelter
B. McMullin
K. Jones

Ive enclosed a copy of my field notes and a site map of T-4 for your review. The results of this first sampling set indicate that there is high pH way up at the area near the guard shack which is a least 500 yds upstream of Hall-Buckles lease area. Ironically, I still believe most of that is from soda ash spillage along the tracks slightly northwest of T-4.

Im out Friday but will return on Monday to discuss in detail.

Thx,

Brent

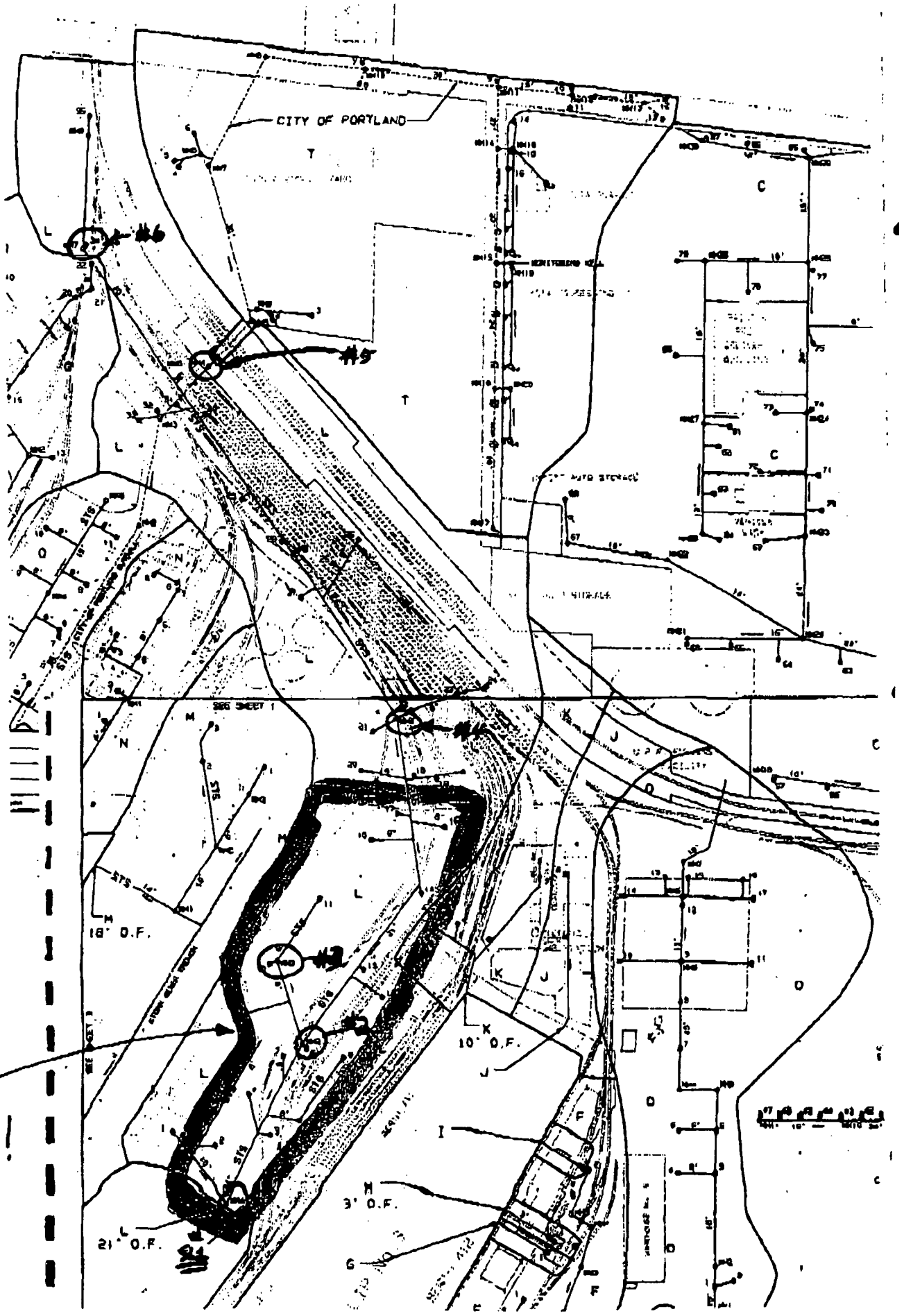
2/20/98
Brent: I will be out Monday + Tuesday - let's talk on Wednesday!! - Mike

RECEIVED
FEB 20 1998

pH survey : Sample Set No. 1
2-19-98
Time: 12:30 - 2:15 pm

Sample Location Number	pH	Estimated Flow	Comments
#1.	10.1	15 gpm	- Final Outfall (light brown color, low turbidity)
#2.	9.97	5 gpm	- Upstream of #1. (light brown color) low turbidity
#3.	9.8	1 gpm	- Light brown color; low turbidity - upstream of #2.
#4.	9.76	10 gpm	- Slightly turbid - upstream of #3.
#5.	8.04	5 gpm	- Discharg from Toyota (clean sample) - DOES NOT connect w/ Hall-Buck's LINE.
#6	9.48	1 gpm	- Cloudy sample (TURBID) Near Guard Shack; upstream of #4.

Note: pH is below 9 OK to discharge per


CITY OF PORTLAND
#6
#5
#4
#2
#1
18' O.F.
10' O.F.
3' O.F.
21' O.F.
T-4 Lease Area!

HALL-BUCK MARINE, INC.

7116 Hwy 22 • P.O. Box 625 • Sorrento, LA 70778-0625 • TWX 510-994-3131 • Cable-HALLBUCK, Baton Rouge • Phone (504) 675-5387 • Fax (504) 675-5923

January 26, 1998

Mr. Robert Hrdlicka
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr. Hrdlicka:

We want to thank you for your participation in the January 20th meeting regarding issues of concern to HBM at Terminal 4. In the interest of coordinating our activities with those of the Port, we will attempt to summarize in this letter our understanding of the conclusions and actions agreed to during that meeting.

I. Stormwater

As discussed at our meeting, the stormwater situation is as follows: HBM holds a DEQ General Permit for discharges of stormwater from its operating area at Terminal 4. The permit requires that the pH of all stormwater discharges be between 6 and 9. The discharge from Outfall L (referred to on HBM's permit as "Outfall B") comes from a drainage area substantially larger than HBM's leased area (Please refer to Attachment 1). The discharge has consistently exhibited a pH over 9 due to the presence of soda ash. (The pH observed in the outfall has varied from about 10.1 to 10.8.) The elevated pH has persisted despite efforts over the past several years to minimize spillage and other sources of soda ash in the storm water run-off. Further, due to the nature of pH, the elevated pH persists even when the discharge is diluted 10 to 1. This is particularly significant in that it means that even *clean* run-off to Outfall L from outside the HBM lease area contributes to the problem in that it results in an increase in volume of high pH water discharged.

The recently renewed General Permit (DEQ's new 1200Z permit) requires that when a specific "benchmark" is exceeded, the permittee must revise the facility's Storm Water Pollution Control Plan to include steps to be taken to correct the situation and achieve the benchmark. The Plan must also include a schedule for making any improvements needed to achieve the benchmark. HBM recently submitted such a revised Storm Water Pollution Control Plan to DEQ. Inasmuch as 1) more than half of the area draining to Outfall L is outside of HBM's lease; 2) even minimal amounts of soda ash in the storm water immediately raise the pH to 10 or more; and 3) drainage from outside of HBM's operating area, even when not contaminated with soda ash, adds to the volume of high pH water at Outfall L, the revised Storm Water Pollution Control Plan indicated that HBM will work with the Port to evaluate the existing storm sewer system at Terminal 4, and identify how best to manage the run-off from drainage area L. As for a schedule, the revised Plan simply indicated that the evaluation and study of alternatives is expected to be completed by December, 1998. We hope, but have no assurance at this time, that DEQ will accept this time frame.

To begin the process of identifying effective storm water management for drainage area L, Messrs. Pad Quinn and Tim VanWormer of the Port, and Messrs. Brad Clinefelter and Brent McMullin of HBM will meet as soon as convenient for all participants, with a representative of an appropriate wastewater and storm water management consulting firm to tour the site and discuss alternative approaches to storm water handling. The matter of cost allocation was deferred pending further evaluation of the situation.

II. Coal Tar Pitch (CTP)

It was agreed at our January 20th meeting that HBM would proceed with development of a sampling plan to address the area of the June 18th spill of CTP into Slip 3 and submit that plan to DEQ for approval as required in the agency's letter of December 17, 1997, (copy included as Attachment 2). This Plan will focus on the spill area and provide only general information on the assessment of the overall Slip 3 area, indicating that the sampling will duplicate that performed in 1995 under the auspices of the EPA and the Consent Decree. HBM will plan to take grab samples in all locations unless the bathymetry indicates that core samples are needed in some areas. It is HBM's understanding that the Port will be conducting a bathymetric survey in the spring and will provide a copy of the results to HBM before the end of May. After receiving DEQ's approval of the Sampling Plan, HBM will proceed with completion of the dredge plan, mobilization and dredge work. Dredging is expected to take place within the last two weeks of July, 1998. (Please refer to the Cleanup Schedule in Attachment 3.)

HBM understands that the Port will prepare its own internal sampling plan to address concerns about the possibility of residual CTP in Slip 3 after termination of the CTP contract. Every effort will be made to achieve economies of mobilization by having HBM's sampling in the spill area and the Port's sampling in the larger Slip 3 area conducted at the same time by the same contractor. HBM further understands that, as stated during the meeting, the Port will consider samples taken (either grab or core depending on the bathymetric survey discussed above) in the same locations (based on recorded GPS positioning data) identified in the 1995 post-dredging report as sufficient to determine the condition of the Slip with regard to residual CTP.

We trust this letter accurately reflects the content of our January 20th meeting. If we have misunderstood or misrepresented here any aspect of our discussion, would you please give me or Brent McMullin a call. We look forward to continuing to work with the Port toward a satisfactory and timely resolution of both the CTP and the storm water matters at Terminal 4.

Sincerely yours,

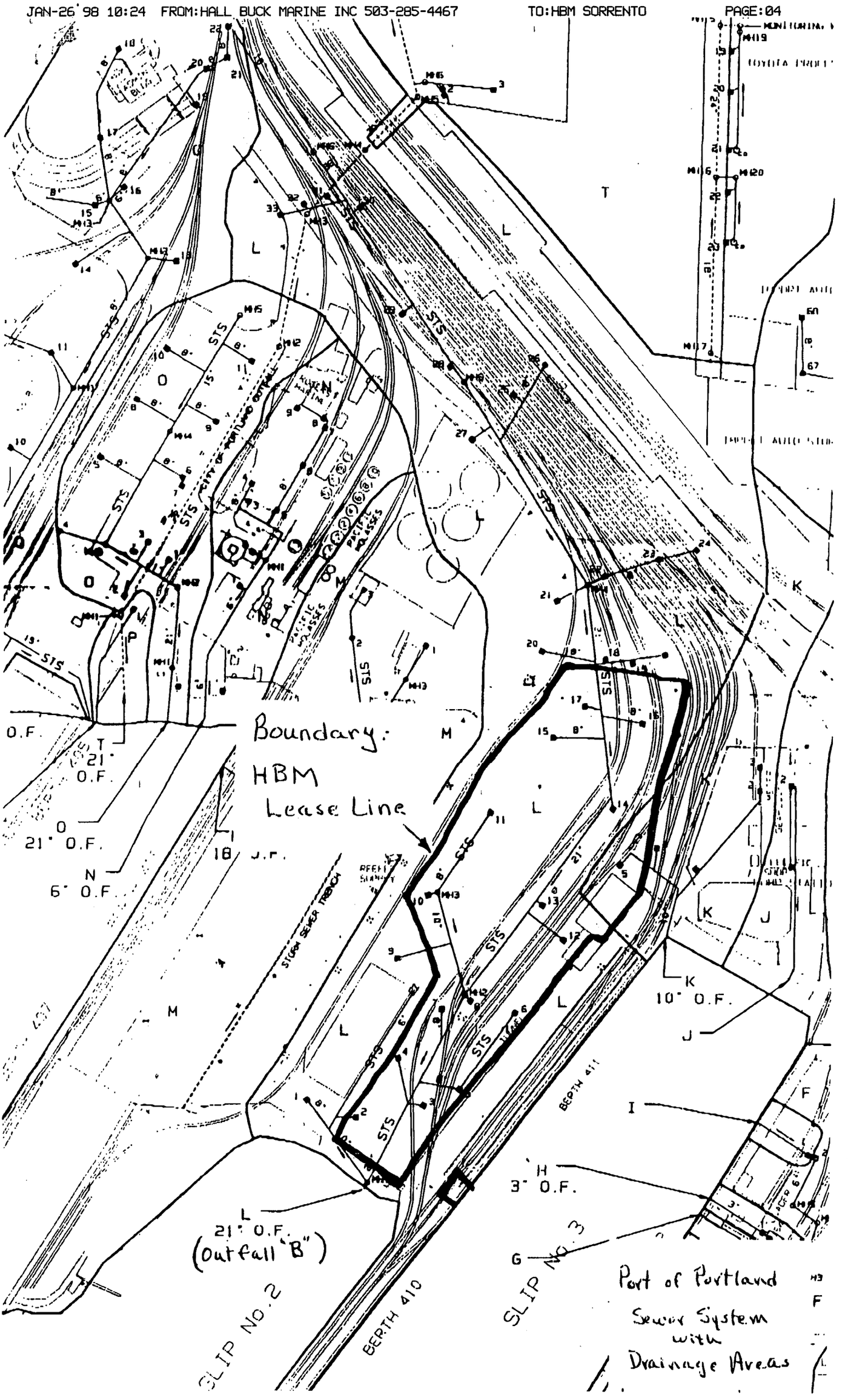
HALL-BUCK MARINE, INC.

Marie E. Krien-Schmidt

Marie E. Krien-Schmidt
Director,
Corporate Environmental Affairs

MKS:ap

cc: Mr. Kermit Pitre
Mr. Kevin Jones
Mr. Brent McMullin
Mr. Brad Clinefelter



Port of Portland
Sewer System
with
Drainage Areas

Attachment 1

December 17, 1997

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHWEST REGION

Marie Krien-Schmidt
Hall-Buck Marine, Inc.
PO Box 625
Sorrento, LA 70778

Re: WQ - Multnomah County
Hall-Buck Marine
OERS No. 97-1605

Dear Ms. Krien-Schmidt:

This is in response to your letter of November 11, 1997, regarding the cleanup of pencil pitch spilled on June 18, 1997, into the Willamette River at the Hall-Buck Marine facility at the Port of Portland Terminal 4 in Portland, Oregon. We have completed our review of your proposal to extend the completion of the spill cleanup until Summer 1998, following the expiration of your contract for handling pencil pitch.

Your proposal is approved, subject to the following requirements:

1. A revised cleanup and sampling plan for the spill area and the assessment of the overall area must be submitted for review and approval. Sampling frequency in or near the specific spill area should be increased adequately to account for possible redistribution of the pencil pitch due to vessel activity or river currents. Also, the sampling depths should be adjusted in consideration of any sedimentation that may occur.

2. Vessel traffic must be controlled as much as possible within the spill area to minimize disturbance and redistribution of the contaminated sediments.

3. The cleanup must proceed promptly once the contract activity has been completed and the river conditions are appropriate for the dredging and hydraulic removal activities. The cleanup and area sampling must be completed by August 31, 1998, and the final report submitted to the Department by September 30, 1998.

4. Appropriate controls must be implemented to minimize turbidity during the work. The water generated during the cleanup may be treated and discharged to the river under the Nationwide Permit 38, without the need for further permitting. Close monitoring of the treatment process and representative sampling of the return water will be required, as previously discussed.

Attachment 2

John A. Kitzhaber
Governor

2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471
DEQ-1

5. The spill will be considered resolved when all confirmatory samples show less than 0.5 percent by weight of Coal Tar Pitch as established by the US EPA in Consent Decree CV 93-267-RE. Please note that the Department's cleanup program considers this an acceptable interim or expedited cleanup standard. The acceptability of this standard for final cleanup and resolution of the overall historical problems in the area will be evaluated as part of our coordination on the Terminal 4 area within our cleanup program.

If you have any questions about this letter, please contact me at (503) 229-5614.

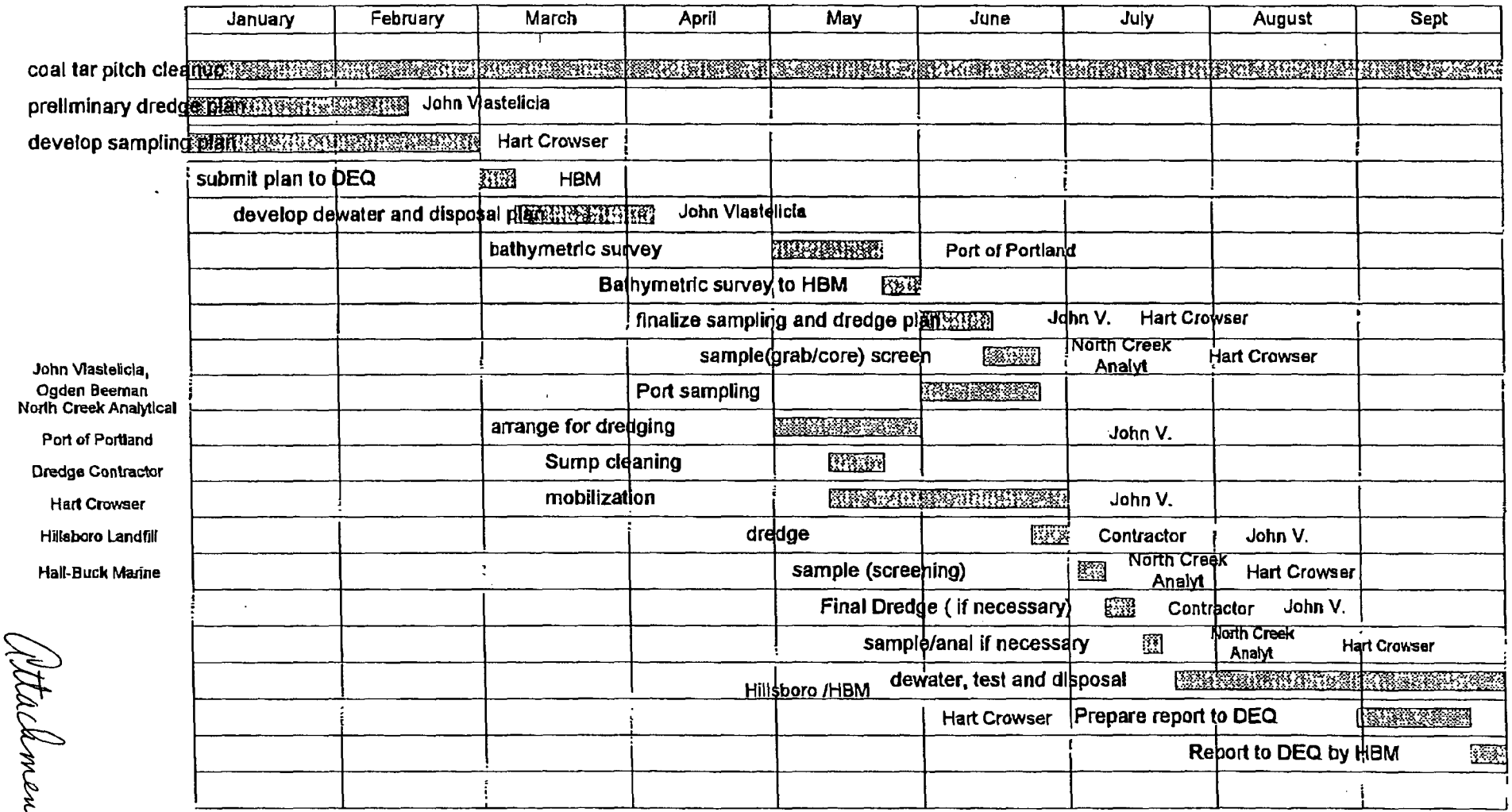
Sincerely,

Loren G. Garner
State On-Scene Coordinator
Spill Management Program

cc: Pad Quinn
Port of Portland
Box 3529
Portland, OR 97208
Brent McMullin
Hall-Buck Marine, Inc.
P.O. Box 83838
Portland, OR 97283-0838
Brad Clinefelter
Hall-Buck Marine, Inc.
P.O. Box 83838
Portland, OR 97283-0838
Steve Fortuna DEQ-NWR-VCS
Jim Sheetz DEQ-NWR-WQ

Attachment 3

Coal Tar Pitch Spill Clean-up Project



HALL-BUCK MARINE, INC.

P.O. Box 83838 • Portland, OR 97283-0838

January 23, 1998

Department of Environmental Quality
Northwest Region
2020 SW Fourth Street, Suite 400
Portland, OR 97201

Dear Sir or Madam:

RE: HALL-BUCK MARINE, INC. – PORTLAND BULK TERMINAL - 4
STORM WATER POLLUTION CONTROL PLAN
GENERAL PERMIT 1200 - Z; FILE NO. 100025

As required by Schedule A of our Storm Water Permit, enclosed is the Storm Water Pollution Control Plan for HBM"S Portland Bulk Terminal 4 facility located on Slip 3 at the Port of Portland. Please note that Outfall B, which is the site of HBM's storm water monitoring, drains a large portion of Port property that is not under HBM's control. Because Outfall B has shown pH levels of about 10.0 to 10.5, this plan has been revised (Section II. A. 6.) to include newly initiated studies by the Port and HBM to evaluate the existing sewer system and identify potential solutions to the pH problem. The elevated pH is due to the fact that soda ash (sodium carbonate) has been loaded into vessels at Terminal 4 for well over 15 years. In fact, soda ash was handled at the Terminal long before HBM took over the operation at Terminal 4.

It should be noted that soda ash is a non-toxic, inorganic salt similar in character to baking soda, and that the slightly elevated pH due to this product is readily dissipated in the river with no adverse environmental effect.

If there are questions, please contact me or Mr. Brent McMullin at 285-4200.

Sincerely,

Brad Clinefelter
Terminal Manager

cc: B. McMullin
K. Jones
M. Krien-Schmidt

Phone: (503) 285-2990 • WATS: 1-800-659-2990 • FAX: (503) 285-4467 • TELEX: 62185550

STORM WATER POLLUTION CONTROL PLAN

HALL-BUCK MARINE, INC.
PORTLAND BULK TERMINAL 4
11040 NORTH LOMBARD
PORTLAND, OREGON 97203
(503) 285-2990

****

REVISED JANUARY, 1998

****

Brad Clinefelter, Facility Manager

f:\mw\alice\mks\pbtstorm.doc
Revised: January 22, 1998

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FIGURES

Figure 1 - General Location Map
Figure 2 - Site Drainage Map

APPENDIX

APPENDIX A: Internal Reporting Forms

STORM WATER POLLUTION CONTROL PLAN

This plan is intended to meet the requirements for a Storm Water Pollution Control Plan as specified in Permit 1200-Z issued to Hall-Buck Marine's Portland Bulk Terminal 4 (HBM/PBT-4) on 10/23/97. The original SWPCP for this site was prepared by Bergeson, Boese & Associates in April, 1993.

I. Site Description

The HBM/PBT-4 facility is located on the east bank of the Willamette River approximately four miles south of the confluence of the Willamette and Columbia Rivers (see Figure 1 for Site Location Map). The property includes three (3) parcels leased to HBM by the Port of Portland. The first parcel is irregular in shape and encompasses 6.524 acres. This parcel includes an 8,700 square foot warehouse with an attached 1,900 square foot service building, a 2,700 square foot unloading building, and a 31,104 square foot product storage building. The second parcel is also irregular in shape. It encompasses 0.038 acres, and includes the washwater settling basin. The third parcel encompasses 0.010 acres and includes the structural footing of a loading tower.

The Port of Portland has granted HBM an additional three (3) acres of preferential dock use area. Under an agreement with the Port of Portland, HBM is permitted to perform any necessary industrial operations on this area in the absence of a lease. For the purpose of preparing this SWPCP, the property shall be assumed to include both the leased parcels and all preferential dock use areas.

The property is located between Slip Number 2 and Slip Number 3 of Terminal 4, Pier 4 of the Portland Bulk Terminal, operated by the Port of Portland in Portland, Oregon (see Figure 1).

The site lies within the Willamette River drainage basin at an elevation of 30 feet.[1] Precipitation occurs mainly in the form of rain with an annual average of 36.30 inches per year.[2] The site and vicinity are generally flat with little topographic relief. The site and vicinity are located near the northern portion of the Willamette Valley physiographic province. The region is underlain by unconsolidated alluvial deposits consisting largely of sand, gravel, and silt.[3]

---

1 US Geologic Survey Map; Linnton, Oregon; 45112-E7-TF Photorevised 1984.

2 Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990, National Ocean and Atmospheric Administration, January 1992.

3 United States Geologic Survey, "Geologic Map of Oregon West of the 121st Meridian", 1961.

KMB00004113

Built in 1950, the facility was operated by the Port of Portland until 1988 when it was leased to HBM. HBM added the service building adjacent to the warehouse at this time. It has been in continuous operation since this time. In 1994, while continuing operations, a 30,000 MT product storage building (31,104 sq. ft.) was added to the system.

A. Industrial Activities

HBM operates a cargo handling facility located at Terminal 4, Pier 4 of the Portland Bulk Terminal in Portland, Oregon (PBT-4) (see Figure 1). Bulk quantities of outbound dry material are transferred from railcars directly onto cargo ships or alternatively into the storage building, where it is later reclaimed and transferred into cargo ships. Inbound material is unloaded from cargo ships and transferred to railcars or trucks for overland distribution.

Railcars containing bulk quantities of outbound material enter the facility on rail tracks 4-10 and 4-12 as identified on the Site Drainage Map (see Figure 2). Railcars enter the structure identified as the unloading building and discharge their contents into a pit located beneath the tracks. An enclosed conveyor transports the material from the pit directly to the top of an unloading tower located adjacent to the edge of Berth 411 on the smaller of the two parcels leased to HBM or to the storage building where it is later reclaimed and directed to the unloading tower. The tower regulates the transfer of material from the conveyor to the cargo holds of ships docked at Berths 410 and 411.

Inbound material received by HBM/PBT-4 is unloaded from ships by a large, rail-mounted mobile crane identified as a Dravo. The Dravo spans the width of rail tracks 4-2 and 4-3 and is mounted on a pair of narrow rails. The Dravo crane bucket transports material from the docked cargo ships into a hopper located on the Dravo. The hopper discharges material into the railcars located underneath.

Discharge of airborne product generated by the materials handling system at HBM are permitted under Air Discharge Permit #26-2909.

Spills occurring during the transportation of materials on the leased parcels are swept up with a vacuum truck.

HBM/PBT-4 operates a wash water treatment facility to treat water prior to disposal to the sanitary sewer. The facility treats the water used to wash the pit area beneath the unloading building, as well as storm water runoff originating in the area beneath the Dravo.

Washwater is discharged into a settling basin as identified on the Site Drainage Map. The settling basin provides primary removal of settleable solids. Effluent from the settling basin is pumped to a treatment facility located in the warehouse where the pH is adjusted with the addition of sulfuric acid and further settling occurs.

HBM/PBT-4 cleans materials handling equipment using a portable pressure washer located adjacent to the south wall of the warehouse. Washwater

discharge from this operation drains to the washwater treatment system described above.

A list of bulk materials handled by HBM/PBT-4 include the following products:

- Soda Ash
- Bentonite Clay
- Pencil Pitch
- Soybean Meal
- Aluminum Trihydrate
- Sodium Sulfate
- Talc
- Calcined Coke

Other materials used by HBM as part of industrial operations include:

- Diesel Fuel
- Petroleum Lubricants
- Sulfuric Acid

B. General Location Map

The street address of the subject property is 11040 North Lombard, Terminal 4, Pier 4, Portland, Oregon 97203. A general location map is included as Figure 1.

C. Site Drainage Map

A Site Drainage Map is included as Figure 2. It illustrates directional storm water runoff patterns and impervious surface areas.

D. Impervious Areas

Impervious surfaces include all paved surfaces and roofed areas. Impervious surface areas account for 100% of the subject property surface area.

E. Potential Pollutants

HBM/PBT-4 ships and receives bulk quantities of materials at the Portland Bulk Terminal. The principal materials handled by HBM/PBT-4 include soda ash, bentonite clay, pencil pitch, soybean meal, aluminum trihydrate, sodium sulfate, talc, and calcined coke. In addition, HBM maintains various quantities of petroleum-based lubricants, diesel fuel, and sulfuric acid.

The introduction of these materials into storm water runoff may result in changes in pH levels and an increase in levels of oil and grease, suspended solids and chemical oxygen demand.

F. Receiving Waters

Storm water discharge from HBM/PBT-4 is discharged directly into the Willamette River.

G. Discharge Outfalls

Two storm water discharge outfalls are located in the vicinity of the subject property (see Figure 2). Storm Water Outfall A is located near the southeast corner of the subject property. This outfall receives storm water runoff collected by two catch basins located east of the subject property. These catch basins are located outside both the preferential dock use area and leased areas and are unlikely to receive storm water impacted by industrial activities performed by HBM. No storm water sampling shall be performed at this outfall or at any of the associated catch basins.

Storm Water Outfall B is located approximately 550 feet west of the service building and discharges into Slip Number 2. Storm water from more than 40 catch basins discharge to an underground drainage network which underlies the subject property, the rail yard to the east, and adjacent properties to the north. Within the boundaries of the subject property are thirteen catch basins which discharge to this drainage network. These are identified as CB-2 through 8 and CB-10 through 15 on the Site Drainage Map. Storm water sumps located adjacent to machinery are equipped with shut-of valves to minimize the possibility of oil or other contaminants entering the River.

Samples of storm water are taken semi-annually at Outfall B. This outfall represents runoff from HBM's activities as well as extensive areas of rail trackage on the Port's property but outside of HBM's work area. Some small contribution to this Outfall comes from other tenants. In the event that any parameter exceeds DEQ limits, HBM/PBT-4 will work with the Port to address the problem.

II. Site Controls

A. Storm Water Best Management Practices

Existing storm water management practices designed to minimize industrial impact on storm water discharge include:

1. Containment

HBM/PBT-4 operates one (1) 5,000 gallon underground storage tank containing diesel used to supply fuel to a fleet of locomotives, lift trucks and service vehicles. The tank is constructed of double-wall steel and is equipped with a leak-detection alarm system and cathodic protection.

The facility stores up to 330 gallons of sulfuric acid for use in the washwater treatment facility inside the warehouse. The above-ground storage tank is elevated above a secondary containment trough designed to contain the entire volume of the tank in the event of a leak or rupture.

Barrels of petroleum lubricants and waste oil are stored inside the warehouse. Secondary containment is provided for petroleum lubricants at PBT-4. The warehouse floor is sloped toward a central clean-out basin which is not connected with any storm sewer or sanitary drain line. The clean-out basin is periodically emptied of accumulated liquids.

The Facility also has a 500-gallon gasoline tank located above-ground outside the east wall of the warehouse. The tank has an integral containment system and concrete vehicular restraints for protection.

Material arriving by railcar is unloaded into the pit area located underneath the unloading building. The unloading building is open at either end to permit railcars to pass through the structure. An enclosed conveyor reduces spillage of outbound materials transported to the storage building and to the unloading tower.

Inbound material are off-loaded by means of the Dravo mobile crane. Spills of inbound material are generally limited to the area underneath the Dravo. The tracks upon which the Dravo operates are located on top of raised concrete berms which provide containment of spilled inbound material. Spills occurring in this area are washed into a drain located at the east boundary of the leased property as identified on Figure 2. Water collected by the drain is treated by the washwater treatment system before being discharged to the sanitary sewer.

KMB00004117

2. **Oil & Grease Separation**

An oil/water separation is part of the facility's washwater treatment system. Storm water from under the Dravo unloading equipment is treated in this system.

3. **Waste Chemical Disposal**

Waste oils are stored and recycled. All other wastes are disposed of as solid waste.

HBM generates no liquid chemical or hazardous wastes as part of its industrial activities.

4. **Erosion & Sediment Control**

The entire site is paved so erosion and sediment control were not applicable.

5. **Debris Control**

Debris is picked up as necessary on a daily basis.

6. **Storm Water Diversion**

Concrete berms supporting the tracks of the Dravo restrict the flow of storm water runoff in this area. Storm water runoff generated within the area confined by the berms flows into the washwater settling basin. Rainfall contacting all other areas flows to one of the catch basins identified on the Site Drainage Map.

Past sampling events have shown pH values of over 9.0. The elevated pHs are due to the long time handling of soda ash at the terminal and facility. Soda ash was handled at this location by the Port before HBM took over operation.

HBM/PBT-4 is working with the Port to identify 1) ways to isolate soda ash handling areas and 2) possible changes to the Port's sewer system. Evaluation of the site drainage system and identification of possible alterations is expected to be completed by December, 1998

7. **Covering Activities**

Materials received at PBT-4 which are destined for outbound shipment are stored and transported within enclosed areas. Outbound materials are first unloaded from railcars in the unloading building. An enclosed conveyor then transports these materials either to the unloading tower for final loading onto cargo ships, or to the enclosed 30,000 MT storage

building where it is later reclaimed and transported by enclosed conveyor to the unloading tower for final loading into cargo ships.

PBT-4 stores waste oils, petroleum lubricants and sulfuric acid inside the warehouse.

Trash dumpsters are kept covered.

8. **Housekeeping**

Inadvertent leaks or drips of oil and the materials are cleaned up daily. Spilled cargo products are cleaned up after completion of each loading or unloading activity.

B. Spill Prevention and Response Procedures

The HBM/PBT-4 facility is not required to have a Spill Prevention Control and Countermeasure (SPCC) Plan as described under Title 40, Code of Federal Regulations, Part 112 because there are no affected tanks on the site.

In addition to an underground 5,000 gallon diesel storage tank and a 330 gallon above-ground sulfuric acid storage tank, HBM/PBT-4 maintains hydraulic fluid, petroleum lubricants, and waste oils in minimal quantities.l

Waste oil, petroleum lubricants, and sulfuric acid are stored in the warehouse. No floor drains are present in the floor which is lower than the exterior grade elevation.

Oil absorbents are kept on hand in the warehouse where oils are stored.

C. Preventive Maintenance

The facility manager shall be responsible for administering the preventive maintenance programs. These programs provide for monthly inspections of potential spill areas, all containment areas, and all loading and unloading areas.

D. Employee Education

PBT-4 provides training and instruction for all personnel regarding the goals and content of the SWPCP. This training addresses storm water management, spill response procedures, and materials management practices.

HBM may choose to present this information as part of regularly scheduled health and safety meetings, education seminars, posted materials, or combination thereof. The effectiveness of this program shall be evaluated and modified as necessary as part of the Annual Review.

E. Record Keeping and Internal Reporting Procedures

The Storm Water Pollution Control Plan shall be maintained on file at HBM/PBT-4 and made available to the DEQ for inspection upon request. A copy of the Storm Water Discharge Permit including the General Conditions shall be kept on file with the Plan.

In accordance with the Internal Reporting Procedures, HBM/PBT-4 shall maintain records of the following events:

- A checklist of the regular maintenance activities.
- Records of any failure, modification, or replacement of storm water-related equipment.

Copies of these forms are included in Appendix A.

HBM/PBT-4 shall maintain the following documents on file for a minimum of five years:

- Analytical results from semi-annual sampling events.
- Copies of all annual DEQ reports.

F. Annual Review

A full review of the SWPCP shall be conducted annually. The review shall include a complete site inspection of those areas where spills or industrial activities may impact storm water discharge. The review shall evaluate each component of the SWPCP for effectiveness in preventing contamination of storm water runoff at the facility. Revisions to the SWPCP shall reflect those modifications necessary to address the potential impact of industrial operations on storm water discharge at the site. If the review indicates no changes are needed, then an update form shall be added to this plan stating "no change needed."

APPENDIX A

INTERNAL MAINTENANCE AND REPORTING FORMS

KMB00004121

PBT

MONTHLY STORMWATER CHECKLIST (19____)

Enter one of the following for each item: "OK"; "NR" (No Rain); or "RM" (Repairs Made)

Month (Date)	Containment Areas	Debris & Dust Control	Unloading Areas	Oil Sheen* OUTFALL B	Inspector's Initials	Comments *(Describe any repairs or other action taken to prevent stormwater pollution.)*
JANUARY ( )						
FEBRUARY ( )						
MARCH ( )						
APRIL ( )						
MAY ( )						
JUNE ( )						
JULY ( )						
AUGUST ( )						
SEPTEMBER ( )						
OCTOBER ( )						
NOVEMBER ( )						
DECEMBER ( )						

*If oil sheen is observed, a sample must be taken and tested for oil and grease. See attached Sketch for location.

INCIDENT INVESTIGATION FORM

I.D. Number _____

PART I: **INCIDENT DESCRIPTION**

1. Facility _____ Date _____ Time _____ am / pm

   Facility Area _____ First Reported Date _____ To _____

   Classification (Check all that apply.):

Environmental Release	_____	Storage Failure	_____
Fire	_____	Piping Failure	_____
Explosion	_____	Control Failure	_____
Implosion	_____	Other Failure	_____
Near Miss	_____		

   Equipment Involved: _____

2. What was occurring in the process when the incident occurred?
   (Be specific, describe what materials were being used, how they were being acted upon, or what was being done when the incident occurred.)

3. a) Are there safety rules applying to this procedure? _____ Yes _____ No

   b) Were they followed? _____ Yes _____ No

4. How did the incident occur?
   (Describe fully the events which resulted in the incident. Tell what happened. Name any objects or substances involved and tell how they were involved. Give details on factors which led or contributed to the incident.)

5. Where possible, describe temporary or permanent effects of the incident.
   (e.g., brief gas cloud, damaged piping, ruptured vessel, etc.)

6. What immediate corrective actions were taken?

7. If this was an Environmental Incident, was a "release" or spill reported to any government agency? Yes _____ No _____
(Refer to the Flow Chart for Environmental Reporting on Page 4 of this Section. Please list below the name and phone number of any agency that was notified of the incident.)

_____
_____
_____

PART II: PREVENTION OF RECURRENCE

1. What points were brought out during the investigation?

_____
_____
_____
_____
_____
_____

2. How could the incident have been prevented?

_____
_____
_____
_____

3. Recommendations of action to prevent recurrence response.

_____
_____
_____
_____

Target Date: _____ Completion Date: _____

4. Overall responsibility for follow up: _____

Investigated by (All Team Members): _____
_____
_____

Prepared By: _____
Facility Manager

_____
Date

Distribution: _____
_____
_____
_____

FOLLOW-UP

I.D. Number _____

(Note: This page is to be completed by the Facility Manager.)

Person(s) Responsible for Follow-up.

_____

_____

_____

_____

_____

Start Date of Recommendations:

a) _____
b) _____
c) _____

Estimated Completion Date of Recommendations:

a) _____
b) _____
c) _____

Are all of the Investigation Team's recommendations being implemented?

_____ YES _____ NO

If "NO", state the reason(s) why:

_____

_____

_____

_____

Describe the follow-up actions being taken to eliminate a recurrence.

_____

_____

_____

_____

_____

_____

_____

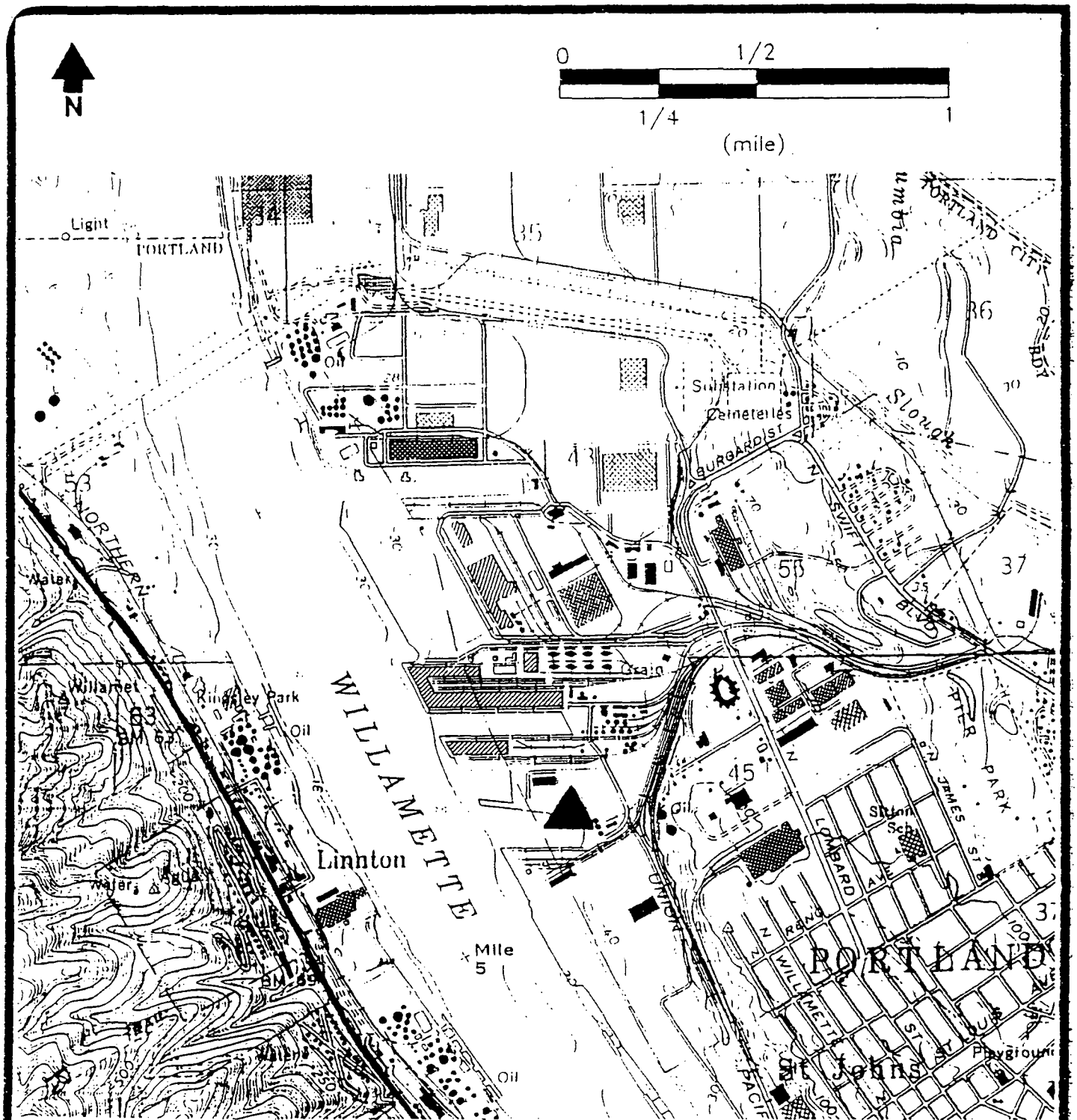
_____
Facility Manager

_____
Date

FIGURE 1

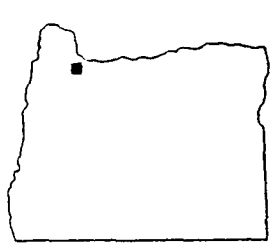
GENERAL LOCATION MAP

KMB00004126



▲ SITE LOCATION

FIGURE 1



SOURCE: LINNTON QUADRANGLE
SERIES: 7.5 MINUTE

HALL BUCK MARINE INC., Portland, OR

Site Location Map

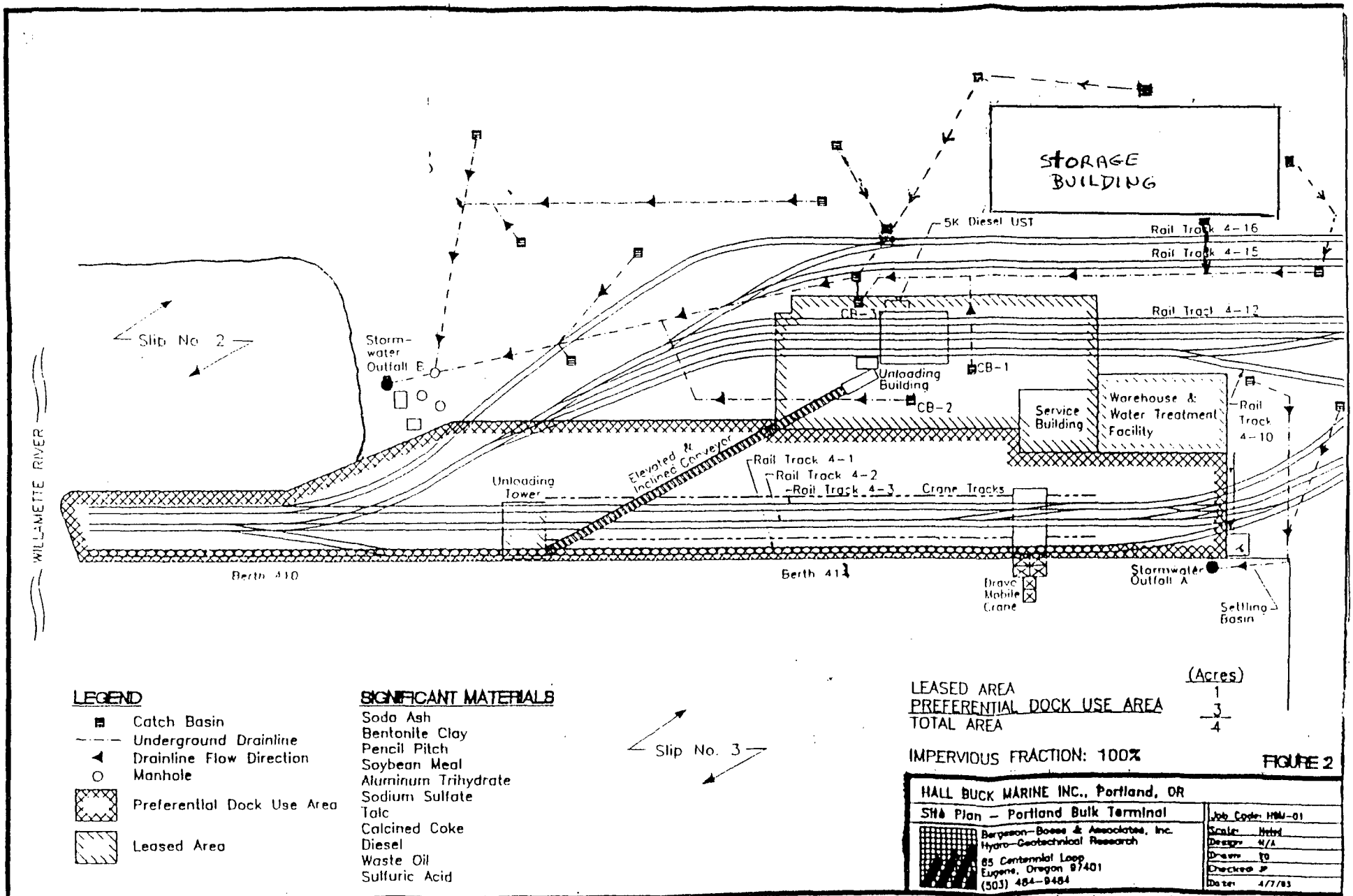
Bergeson–Boese & Associates, Inc.
Hydro–Geotechnical Research
65 Centennial Loop
Eugene, Oregon 97401
(503) 484–9484

Job Code:	HBM–01
Scale:	Noted
Design:	N/A
Drawn:	EG
Checked:	JP
Date:	4/13/83

FIGURE 2

SITE DRAINAGE MAP

KMB00004128



LEGEND

- Catch Basin
- Underground Drainline
- Drainline Flow Direction
- Manhole
- Preferential Dock Use Area
- Leased Area

SIGNIFICANT MATERIALS

Soda Ash
Bentonite Clay
Pencil Pitch
Soybean Meal
Aluminum Trihydrate
Sodium Sulfate
Talc
Calcined Coke
Diesel
Waste Oil
Sulfuric Acid

	(Acres)
LEASED AREA	1
PREFERENTIAL DOCK USE AREA	3
TOTAL AREA	4

IMPERVIOUS FRACTION: 100%

FIGURE 2

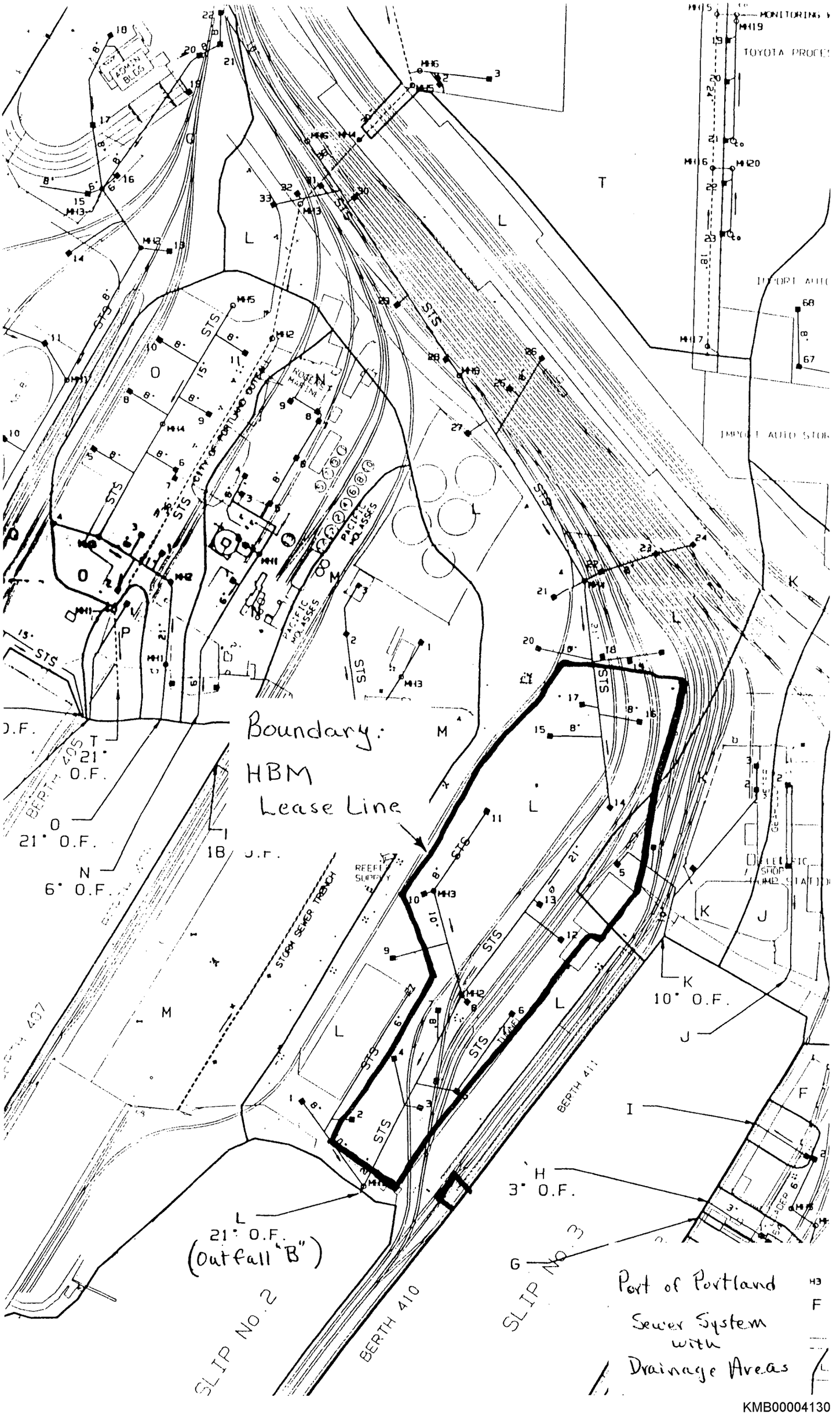
HALL BUCK MARINE INC., Portland, OR

SWA Plan – Portland Bulk Terminal

Bergeson–Boese & Associates, Inc.
Hydro–Geotechnical Research
85 Centennial Loop
Eugene, Oregon 97401
(503) 484–9484

Job Code: HBM-01
Scale: Horiz
Design: M/A
Drawn: TD
Checked: JP
Date: 4/7/93

REVISED 1/22/98 mlb



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