PORSF 11.3.234.1 v.3
8/19/2008

CONOCOPHILLIPS COMPANY ("CONOCOPHILLIPS"),
ON BEHALF OF PHILLIPS PETROLEUM COMPANY,
TOSCO CORPORATION AND ASSETS OF 76 PRODUCTS COMPANY

RESPONSES TO JANUARY 18, 2008
EPA FIRST REQUEST FOR INFORMATION
PORTLAND HARBOR SUPERFUND SITE
PORTLAND, OREGON

MSDS SHEETS

RESPONSE TO QUESTIONS 21.b and 33

USEPA SF

1363560

Chemical/Product Name	Manufacturer Name	MSDS No.	Synonym	MSDS Date
#2 Heating Oil	0 - ConocoPhillips	724240		12/13/2007
100% HEAT RESISTANT RTV SILICONE SEALANT	RED DEVIL, INCORPORATED	798943		3/1/1996
2,2-DIMETHYLBUTANE, 98%	Acros Organics	798944		3/16/2007
2,4-D PHENOXY HERBICIDE	CENEX, INC.	798941		1/10/1996
2K7* BUGSTICK	OSP MICROCHECK INC	807907	2K7*	2/1/2005
51D PIPE JOINT COMPOUND 1PT	PERMATEX, INC.	798921		3/2/2001
7007 COLD GALVANIZING COMPOUND	AERVOE INDUSTRIES INC	736550		8/5/2004
76 PROCESSING OIL 100	0 - ConocoPhillips	781960		1/1/2002
76 SOLUBLE OIL	0 - ConocoPhillips	721630		9/12/2005
76 TRITON 2000 GEO 40	0 - ConocoPhillips	720600		1/1/2002
76 TRITON 4000 GEO 30	0 - ConocoPhillips	720340		1/1/2002
76 TRITON 4000 GEO 40	0 - ConocoPhillips	720350		1/1/2002
76 TRITON 5005 GEO 40	0 - ConocoPhillips	720390		1/1/2002
76 UNAX 46	0 - ConocoPhillips	722250		1/1/2002
76 UNOBA MOLY XD GREASE 2	0 - ConocoPhillips	722580		1/1/2002
ACETYLENE	UNION CARBIDE CORPORATION	33090		10/12/2000
AQUA-GEL (GEL AND LIQUID) WIRE PULLING LUBRICANT	IDEAL INDUSTRIES, INC.	748760		9/15/1994
ARCTIC LOW POUR HYDRAULIC OIL (76 LUBRICANTS)	0 - ConocoPhillips	720760		5/22/2007
ARDEX ENGINEERED CEMENTS	Ardex Engineered Cements	809944		1/8/2001
AW HYDRAULIC OIL ISO-32	MORAINE INDUSTRIES INC	798947		3/1/2002
BIODIESEL (CARGILL)	CARGILL INC	812476	BIODIESEL	10/1/2005
BP 800	CHEMAQUA INC	798791		3/25/2003
BUFFER SOLUTION, PH 7.0	CHEMPRODUCTS INC	798795		1/1/1996
CARBON (19501030-F200)	CALGON CARBON CORPORATION	813559		1/10/2006
CARBON DIOXIDE	AMEREX CORPORATION	474910		3/1/2001
CAT CRACKED CLARIFIED OIL /GAS OIL MIXTURE	0 - ConocoPhillips	728060		6/19/2007
CBD-94	CHEMAQUA INC	798792		2/5/2002
CGV, CGR, NGV, NGR, MGR, CEV	CLEAN CONCEPTS LLC	798948		3/1/2002
CHEM-AQUA 150	CHEMAQUA INC	798788		7/9/2004
CHEM-AQUA 777	CHEMAQUA INC	798789		1/23/2003
CHEM-AQUA 900 PLUS	CHEMAQUA INC	798790		10/29/1998
CHICO A SEALING COMP/CHICO A3/CHICO A4/CHICO A05/CHICO A200	COOPER INDUSTRIES/CROUSE HINDS DIVISION	794828		6/14/2005
CLASS LV4 2, 4-D PHENOXY	CENEX, INC.	798934		1/10/1996
CONOCO INDUSTRIAL OIL 150	0 - ConocoPhillips	775730		5/29/2003
CONOCO TURBINE OIL 100	0 - ConocoPhillips	775805		8/15/2005

CUTTER STOCK	0 - ConocoPhillips	724380		7/2/2008
D-815 DIRECT GLUE DOWN SEAM SEALER (EX D15)	BOSTIK FINDLEY, INC	810399		8/15/2002
DOWTHERM SR-1 HEAT TRANSFER FLUID	UNIVAR	798838		1/30/2003
ENGINE ENAMELS	PLASTI-KOTE CO., INC.	798876		4/10/2002
ETHANOL, FOR GASOLINE BLENDING	0 - ConocoPhillips	404070		5/1/2006
FC-203 LIGHT WATER BRAND AQUEOUS FILM FORMING FOAM	3M	767821		10/24/2000
FC-602 LIGHT WATER BRAND ATC PLUS	3M	798839		8/31/1992
FIREBIRD AW 32, 46, 68 (76 Lubricants)	0 - ConocoPhillips	721010		3/13/2008
FLEETWELD 5P	THE LINCOLN ELECTRIC COMPANY	1372		12/1/2004
FLEETWELD 5P+	THE LINCOLN ELECTRIC COMPANY	255600		12/1/2001
FULL FORCE ANTIFREEZE & COOLANT	OLD WORLD INDUSTRIES, INC	243740		6/5/2003
HALON 1301	ELF ATOCHEM NORTH AMERICA	798836		3/27/1992
HECTOR(R) OIL (ALL GRADES)	0 - ConocoPhillips	36770		5/11/2001
HIGH SOLIDS EPOXY (PART B), CATALYST	THE SHERWIN-WILLIAMS COMPANY	650870		9/30/2007
HITEC 6476 GASOLINE FUEL ADDITIVE	AFTON CHEMICAL CORPORATION	790237		6/11/2004
HITEC 6476A FUEL ADDITIVE	AFTON CHEMICAL CORPORATION	798818		6/18/2004
HYDRAULIC OIL AW/D (All Grades) (76 Lubricants)	0 - ConocoPhillips	721160		7/7/2008
Injex Pro 2-Cycle Motor Oil	0 - ConocoPhillips	717910		2/16/2007
IRGAMET 39	Ciba Specialty Chemicals Corporation	735497		3/7/2007
ISOPROPYL ALCOHOL (LC15750, LC15755, LC15760)	LABCHEM INC.	807284	ISOPROPYL ALCOHOL	2/7/2007
JET-LH 78 MR	THE LINCOLN ELECTRIC COMPANY	1376		2/1/1996
JETWELD 1	THE LINCOLN ELECTRIC COMPANY	731829		12/1/2001
JETWELD 3	THE LINCOLN ELECTRIC COMPANY	734807		12/1/2004
KATHON(R)886 MW BIOCIDE	ROHM AND HAAS COMPANY	781760		12/20/2001
KOLOR KUT GASOLINE GAUGING PASTE	KOLOR KUT PRODUCTS COMPANY	33230		3/1/2006
KOPR-SHIELD	JET-LUBE, INC.	798847		8/2/1993
LINCOLNWELD 780	THE LINCOLN ELECTRIC COMPANY	731879		8/15/2001
LINCOLNWELD L-56	THE LINCOLN ELECTRIC COMPANY	246190		7/28/2003
LINCOLNWELD L-61	THE LINCOLN ELECTRIC COMPANY	731882		12/1/2001
LIQUINOX	ALCONOX, INC.	123040		7/14/2006
LOCTITE 271 THREADLOCKER HIGH STRENGTH (27143)	HENKEL LOCTITE CORPORATION	798909		4/6/2003
LOCTITE 518 FLANGE SEALANT GASKET ELIMINATOR	HENKEL LOCTITE CORPORATION	798910		4/6/2003
LOCTITE 567 PST PIPE SEALANT WITH PTFE THREAD SEALANT PART NO. 56747	HENKEL LOCTITE CORPORATION	798912		10/20/2006
LOCTITE 567 PST PIPE SEALANT WITH TEFLON THREAD SEALANT FOR STAINLESS STEEL	HENKEL LOCTITE CORPORATION	798911		4/6/2003

LOCTITE 592 THREAD SEALANT PST PIPE SEALANT WITH TEFLON HI PERF.	HENKEL LOCTITE CORPORATION	798913		4/6/2003
LOCTITE LOCQUIC PRIMER T 7471 AEROSOL	HENKEL LOCTITE CORPORATION	798914		1/3/2005
MARINE DIESEL OIL	0 - ConocoPhillips	724260		12/13/2007
MCCABE GASOLINE LEVEL INDICATOR PASTE	McCABE AND SONS, INC	286100		2/17/1998
NA-103	CHEMAQUA INC	798793		7/11/2002
NALCON 7620-WB	NALCO/EXXON ENERGY CHEMICALS	798841		11/18/1998
NEVER-SEEZ LITHIUM EP GREASE	BOSTIK FINDLEY, INC	798815		2/20/2002
NEV-SZ REG NSBT16 1	BOSTIK FINDLEY, INC	798906		7/10/2002
n-HEXANE (H0285)	CHEMPRODUCTS INC	807818	n-HEXANE	12/7/1999
NITROGEN	PRAXAIR INC.	333390		9/1/2004
NITROGEN, COMPRESSED	PRAXAIR INC.	739444		9/1/2004
No. 1 Diesel Fuel	0 - ConocoPhillips	1929		3/20/2007
NO. 1 HEATING OIL	0 - ConocoPhillips	724220		12/26/2007
NO. 2 DIESEL FUEL 001847	0 - ConocoPhillips	1847		6/16/2008
NOALOX ANTI-OXIDANT	IDEAL INDUSTRIES, INC.	84600		3/10/2006
NON-FLAMMABLE GAS MIXTURE 50016	CALGAZ, LLC	779011		8/20/2007
NORDSTROM 1033 BULK SEALANT	FLOWSERVE	796012		5/28/2002
N-UNDECANE, 99%	Acros Organics	677970		3/18/2003
OIL-DRI(R) FLOOR ABSORBENT	OIL-DRI CORPORATION OF AMERICA	632020		4/23/2007
OLI-9101.X	INNOSPEC FUEL SPECIALTIES, FORMERLY OCTEL STARREON LLC	805250	OLI-9101.X	6/6/2006
OXYGEN	UNION CARBIDE CORPORATION	798940		9/1/1985
PAX-SOLV	HYDRITE CHEMICAL CO.	798811		12/9/1992
PHENICON HS FLAKE FILLED HIGH SOLIDS EPOXY (PART A), REDDISH GRAY	THE SHERWIN-WILLIAMS COMPANY	813796		2/29/2008
PHENICON* HIGH SOLIDS EPOXY (PART A), WHITE 651240	THE SHERWIN-WILLIAMS COMPANY	651240		2/29/2008
PLUG N' DIKE	PND CORPORATION	771761		9/3/2004
RC 620 RETAINING CMPD HIGH TEMP	HENKEL LOCTITE CORPORATION	798915		5/30/2006
RECTORSEAL T PLUS 2	THE RECTORSEAL CORPORATION	52710		2/10/2006
REDUX 333	REDUX TECHNOLOGY	808307	REDUX 333	9/15/2004
REPROCESSED FUEL OIL (RFO)	0 - ConocoPhillips	724300		6/13/2007
RESIDUAL FUEL OIL	0 - ConocoPhillips	724250		7/9/2007
RIDGE NUCLEAR THREAD CUTTING OIL	RIDGE TOOL COMPANY	55810		1/5/2006
RIDGE PREMIUM NUCLEAR THREAD CUTTING OIL	RIDGE TOOL COMPANY	798596		5/1/2004
RIDGID DARK THREAD CUTTING OIL	RIDGE TOOL COMPANY	55720		1/5/2006
RIDGID PREMIUM DARK THREAD CUTTING OIL	RIDGE TOOL COMPANY	777414		1/24/2002

SAFETY KLEEN 105 SOLVENT RECYCLED	SAFETY-KLEEN CORP.	771876	SAFETY KLEEN 105 SOLVENT	4/20/2004
SCOTCHRAP BRAND PIPE PRIMER	3M	213650		11/8/2001
SCOTCH-WELD 1838 B/A PART A TAN EPOXY ADHESIVE	3M	798850		8/6/2001
SCOTCH-WELD 1838 B/A PART B TAN EPOXY ADHESIVE	3M	798849		8/6/2001
SEMI-SYNTHETIC 460 EP # 1.5 LITHIUM COMPLEX GREASE	AMSOIL INC.	798819		6/18/2003
SHIELD ARC 85	THE LINCOLN ELECTRIC COMPANY	246200		2/1/2002
STAINLESS STEEL WIRE OR RODS AND SUPER MISSILEWELD TIG AND 99T	J.W. HARRIS CO,. INC.	799000		2/13/2004
SULFIX 800 SCAVENGER	BAKER PETROLITE	796303		1/13/2004
TOLI 5050	CBC AMERICA - TOLI INTERNATIONAL	809943		8/23/2005
TRANSMIX 163980	0 - ConocoPhillips	163980		12/13/2007
TRITON 2000 GEO (ALL GRADES)	0 - ConocoPhillips	720330		2/1/2008
Triton Synthetic Transoil 50	0 - ConocoPhillips	778796		1/22/2007
TWO-LOOP MOTOR OIL (All Grades)	0 - ConocoPhillips	725980		8/11/2005
ULTRABOND ECO 575	MAPEI CORPORATION	809945	ULTRABOND(TM) ECO	7/15/2005
Unbranded Conventional Gasoline	0 - ConocoPhillips	724020		6/21/2007
Unbranded Gasoline Reformulated with Ethanol (Family of Brands)	0 - ConocoPhillips	724060		6/18/2008
Unbranded Gasoline Reformulated with Ethers	0 - ConocoPhillips	724050		10/25/2005
UNISOL LIQUID RED BK-50	UNITED COLOR MANUFACTURING, INC.	774580		2/17/2005
UNIVERSAL GEAR LUBE GL-4, SAE 90 AND 140	0 - ConocoPhillips	775802		7/17/2001
VANLUBE (R) SL	R. T. VANDERBILT COMPANY, INC.	787128		8/16/2004
VANLUBE NA	R. T. VANDERBILT COMPANY, INC.	771796	VANLUBE	7/22/2003
VERSILUBE G321	NSCG, INC	798917		10/3/2002
YELLOW 77 WIRE PULLING LUBRICANT	IDEAL INDUSTRIES, INC.	15156		12/21/2005

ConocoPhillips

#2 Heating Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: #2 Heating Oil

MSDS Code: 724240

Synonyms:
High Sulfur No. 2 Heating Oil
High Sulfur No. 2 Heating Oil - Dyed
High Sulfur No. 2 Heating Oil Blend Stock
Home Heating Oil
Low Sulfur No. 2 Heating Oil
No. 2 Fuel Oil
Winterized No. 2 Low Sulfur Heating Oil
#2 HO 20D
#2 HO 25D
#2 HO 30D
#2 HO 100D
#2 Marine Gas Oil HS NRLM

Intended Use: Heating Oil

Responsible Party:
ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information:
Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers:
Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!
Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard
Possible Skin Cancer Hazard

NFPA

Appearance: Straw colored. May be dyed yellow or red
Physical Form: Liquid
Odor: Diesel fuel

Potential Health Effects

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

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

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

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 respiratory tract, irritation of the digestive tract, nausea, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Other Comments: This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Fuel Oil No. 2	68476-30-2	100
Naphthalene	91-20-3	<1

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek 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.

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

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

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 and 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical 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. 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 with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors (see Section 5). Use water sparingly to minimize environmental contamination and reduce disposal requirements.
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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146.

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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 any 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

Component	ACGIH	OSHA	Other:
Fuel Oil No. 2	TWA: 100 mg/m^3 Skin	—	—
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m^3	TWA: 0.2 mg/m^3 (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

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.

Personal Protective Equipment (PPE):

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

Respiratory: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

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.

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:	Straw colored. May be dyed yellow or red
Physical Form:	Liquid
Odor:	Diesel fuel
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40 mm Hg
Vapor Density (air=1):	>1
Boiling Point/Range:	300-691°F / 149-366°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.81-0.88 @ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Viscosity:	1.7-4.1 cSt @ 40°C
Evaporation Rate (nBuAc=1):	<1
Flash Point:	125-180°F / 52-82°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	0.3
UEL (vol % in air):	10.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc.

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen and sulfur.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Fuel Oil No. 2

Carcinogenicity: Application of fuel oil No. 2 to mouse skin, three times a week (duration unspecified), resulted in an increased incidence of skin tumors. Fuel oil No. 2 has not been identified as a carcinogen by NTP, IARC, or OSHA.

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Fuel Oil No. 2	14.5 ml/kg (rat)	No data	No data

12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description: Heating oil, light, Combustible liquid, UN1202, III
Non-Bulk Package Marking: Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling: Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking: Combustible / 1202

14. TRANSPORTATION INFORMATION

Packaging - References: None; None; 49 CFR 173.241
(Exceptions; Non-bulk; Bulk)
Hazardous Substance: See Section 15 for RQ's
Emergency Response Guide: 128
Note: This product has been reclassified as a Combustible Liquid for domestic land transportation using 49 CFR 173.150(f).
Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.

International Maritime Dangerous Goods (IMDG)

Shipping Description: UN1202, Heating oil, light, 3, III, (52
Non-Bulk Package Marking: Heating oil, light, UN1202
Labels: Flammable liquid
Placards/Marking (Bulk): Flammable / 1202
Packaging - Non-Bulk: P001, LP01
EMS: F-E, S-E
Note: ***Proper Shipping name can be:*** Gas Oil ***or*** Diesel fuel ***or*** Heating Oil, light

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

UN/ID #: UN1202
Proper Shipping Name: Heating oil, light
Hazard Class/Division: 3
Packing Group: III
Non-Bulk Package Marking: Heating oil, light, UN1202
Labels: Flammable liquid
ERG Code: 3L

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Naphthalene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Various Polycyclic Aromatic Hydrocarbons	Skin 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
B3 - Combustible Liquids
D2A
D2B

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

Issue Date:	11-Jul-2007
Status:	Final
Previous Issue Date:	11-Jul-2007
Revised Sections or Basis for Revision:	Exposure limits (Section 8)
MSDS Code:	724240

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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 (MSDS)

Series:
#0809/01, #0829/01
(All Labels)

NFPA Rating: 0-1-0
HMIS Rating: 0-1-0-B

SECTION I

		EMERGENCY TELEPHONE NO.
TRADE NAME (IF NONE, PUT CHEMICAL)	6005 Heat Resistant RTV Silicone Sealant	(918) 825-5744 (24 Hrs.)
CHEMICAL NAME AND SYNONYMS		
MANUFACTURER'S NAME AND TELEPHONE NO.	Red Devil, Incorporated	(918) 825-5744
ADDRESS (Number, Street, City, State, Zip Code)	One Webb Street, Pryor, Oklahoma 74361	

SECTION II - HAZARDOUS INGREDIENTS

PRODUCT CONSISTS OF:	%	TLV	PEL	UNITS
Silica** (68855-54-9) (as Amorphous silica, total dust)	11	10*	7.3	mg/m3
Ethyltriacetoxysilane (01768-97-79)****	2	10	10	ppm
Methyltriacetoxysilane (4253-34-3) ****	2	10	10	ppm
Iron (III) Oxide** (1309-37-1) - (as nuisance particulate, total)	10	5	10	mg/m3
Non-hazardous ingredients*	≥75	NA	NA	

*Unlisted ingredients are not considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).
**Inhalation of particulates unlikely due to product's physical state.
****Comment: observe limits for acetic acid, formed during curing on exposure to water or humid air.

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	NE	SPECIFIC GRAVITY (H2O=1)	>1
VAPOR PRESSURE (mm Hg.)	NE	PERCENT VOLATILES BY VOLUME (%)	<5
VAPOR DENSITY (AIR=1)	>1	pH	NE
SOLUBILITY IN WATER	Insoluble	EVAPORATION RATE	NA
APPEARANCE AND ODOR	Thick liquid, slight vinegar odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	>200°F	FLAMMABLE LIMITS		LEL NE	UEL NE
EXTINGUISHING MEDIA	Carbon dioxide or foam				
SPECIAL FIRE FIGHTING PROCEDURES	No special procedures required.				
UNUSUAL FIRE AND EXPLOSION HAZARDS	None known				

NA - Not Applicable NE - Not Established UN - Unavailable

SECTION V - HEALTH HAZARD INFORMATION

SYMPTOMS/EFFECTS OR OVERIDISPOSURE

Eye, nose and throat irritation. Possible skin irritation.

FIRST AID

EYES

Immediately flush eyes with large amounts of water while holding the eyelids open. Get medical attention if irritation persists.

SKIN

Wipe material from skin with cloth or paper towel, then wash exposed area with soap and water. Get medical help if irritation persists.

INHALATION

Move victim to fresh air. Get medical help if irritation persists.

INGESTION

Contact local poison control center or physician IMMEDIATELY!!

SECTION VI - REACTIVITY DATA

STABILITY

Normally stable. Avoid extreme heat

INCOMPATIBLE MATERIALS

Moisture will release acetic acid vapor

HAZARDOUS DECOMPOSITION PRODUCTS

Silicon dioxide, Carbon monoxide, Carbon dioxide, traces of formaldehyde

SECTION VII - SPILL OR LEAK PROCEDURES

PROCEDURES

Wear personal protective equipment (See Section VIII). Clean up with absorbent material.

WASTE DISPOSAL METHOD

Dispose of in accordance with Local, State and Federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY

Not normally required. If TLV is exceeded, or for symptoms of overexposure, wear a NIOSH-approved respirator for organic vapors.

EYEWEAR

Wear safety glasses.

CLOTHING/GLOVES

Not normally required: in situations of extended skin contact, neoprene or other chemical resistant gloves are recommended.

VENTILATION

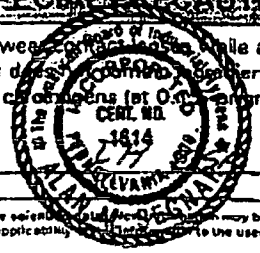
Local exhaust may be necessary under some handling/use conditions.

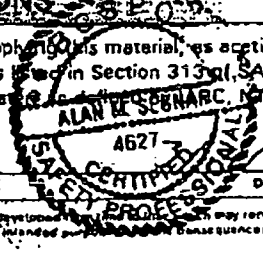
SECTION IX - SPECIAL PRECAUTIONS

Store in a closed container in dry area. NOTE: Do not wear contact lenses while applying this material, as acetic acid vapor may become trapped under lenses. This product does not contain ingredients listed in Section 313 of SARA Title III and 40 CFR 372.65. This product does not contain carcinogens (at 0.1% or greater) as defined by IARC, NTP or OSHA.

APPROVAL Alan M Segnar 1/4/96

NAME DATE





The information contained herein has been developed based upon current available scientific data. Nothing may be developed from this report 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.

ACROS COM

Material Safety Data Sheet

2,2-Dimethylbutane, 98%

MSDS# 83640

Section 1 - Chemical Product and Company Identification

MSDS Name:

2,2-Dimethylbutane, 98%

Catalog Numbers:

11609-0000, 11609-0050, 11609-1000, 11609-5000

Synonyms:

Neohexane.

Company Identification: Fisher Scientific UK
Bishop Meadow Road, Loughborough
Leics. LE11 5RG

For information in Europe, call:(01509) 231166

Emergency Number, Europe:01509 231166

Section 2 - Composition, Information on Ingredients

CAS#: 75-83-2

Chemical Name: 2,2-Dimethylbutane

%: 98

EINECS#: 200-906-6

Hazard Symbols:

F

Risk Phrases:

11

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Highly flammable.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation:

May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Aspiration may cause respiratory swelling and pneumonitis. May cause drowsiness, unconsciousness, and central nervous system depression. Aspiration may lead to pulmonary edema.

Chronic:

Exposure to large doses may cause central nervous system depression.

Section 4 - First Aid Measures

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Possible aspiration hazard. Get medical aid immediately.

Inhalation:

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media:

Use water spray to cool fire-exposed containers. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Do NOT use straight streams of water. For large fires, use water spray, fog or regular foam. For small fires, use dry chemical, carbon dioxide, water spray or regular foam.

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling:

Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

CAS# 75-83-2:

Belgium - TWA: (hexane isomers): 500 ppm VLE (other than n-hexane); 1786 mg/m3 VLE (other than n-hexane)

Belgium - STEL: (hexane isomers): 1000 ppm VLE (other than n-hexane); 3551 mg/m3 VLE (other than n-hexane)

France - VME: (hexane isomers): 500 ppm VME (other than n-Hexane); 1800 mg/m3 VME (other than n-Hexane)

Germany: 200 ppm TWA (exposure factor 2); 720 mg/m3 TWA (exposure factor 4)

Malaysia: (hexane isomers): 500 ppm TWA; 1760 mg/m3 TWA

Netherlands: 200 ppm MAC; 720 mg/m3 MAC

Spain: (hexane isomers): 500 ppm VLA-ED (other than n-hexane); 1790 mg/m3 VLA-ED (other than n-hexane)

Spain: (hexane isomers): 1000 ppm VLA-EC (other than n-hexane); 3580 mg/m3 VLA-EC (other than n-hexane)

Personal Protective Equipment

Eyes:

Wear chemical splash goggles.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29

CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Liquid
Color:	colorless
Odor:	Mild
pH:	Not available
Vapor Pressure:	319 mm Hg @ 25 deg C
Viscosity:	cSt 38 deg C
Boiling Point:	50 deg C @ 760 mm Hg (122.00 F)
Freezing/Melting Point:	-100 deg C (-148.00 F)
Autoignition Temperature:	405 deg C (761.00 deg F)
Flash Point:	-48 deg C (-54.40 deg F)
Explosion Limits: Lower:	1.20 vol %
Explosion Limits: Upper:	7.00 vol %
Decomposition Temperature:	Not available
Solubility in water:	insoluble
Specific Gravity/Density:	.6490g/cm3
Molecular Formula:	C6H14
Molecular Weight:	86.18

Section 10 - Stability and Reactivity

Chemical Stability:

Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid:

Ignition sources, excess heat.

Incompatibilities with Other Materials

Strong oxidizing agents.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide.

Hazardous Polymerization

Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 75-83-2: None listed

LD50/LC50:

RTECS: Not available.

Carcinogenicity:

2,2-Dimethylbutane -

Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other:

See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Other:

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

IATA

Shipping Name:	HEXANES
Hazard Class:	3
UN Number:	1208
Packing Group:	II

IMO

Shipping Name:	HEXANES
Hazard Class:	3.1
UN Number:	1208
Packing Group:	II

RID/ADR

Shipping Name:	HEXANES
Hazard Class:	3
UN Number:	1208
Packing Group:	II

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: F

Risk Phrases:

R 11 Highly flammable.

Safety Phrases:

S 9 Keep container in a well-ventilated place.

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)
CAS# 75-83-2: Not available

Canada

CAS# 75-83-2 is listed on Canada's DSL List

US Federal

TSCA

CAS# 75-83-2 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date:
4/30/1999

Revision #4 Date
3/16/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET

CLASS 40A 2,4-D PHENOXY HERBICIDE

MANUFACTURER: CENEX/LAND O'LAKES AGRONOMY CO.
ADDRESS: P.O. BOX 64089 INVER GROVE HEIGHTS, MN 55164-0089
EMERGENCY NO. - DAY OR NIGHT: 1-800-424-9300

TELEPHONE NUMBER FOR INFORMATION: 1-800-232-3639

SECTION I – HAZARDOUS INGREDIENTS IDENTITY AND INFORMATION

HAZARDOUS COMPONENTS	OSHA PEL	ACGIH TLV	OTHER LIMITS STEL	CAS#	%
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	10 mg/m³		20 mg/m3	94-75-7	47.3
Inert Ingredients					52.7

SECTION II – PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT: 10°C SP. GRAVITY (H_2O): 1.157
VAPOR PRESSURE (mm Hg): NDA MELTING POINT: NA
VAPOR DENSITY: NDA EVAPORATION RATE: NDA
SOLUBILITY IN WATER: Infinite
APPEARANCE AND ODOR: Dark brown to black liquid with fish phenolic odor.

SECTION III – FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE FLAMMABLE LIMITS : Not determined.

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, foam, water fog.

SPECIAL FIRE FIGHTING PROCEDURES: If water is used, use a soft fog to avoid spreading contamination. Use self-contained breathing apparatus and full protective gear in confined areas of buildings. Contain water to prevent entry into water supplies. UNUSUAL FIRE AND EXPLOSION HAZARDS: Noxious vapors under high temperature conditions.

SECTION IV – REACTIVITY DATA - STABILITY:

UNSTABLE: [ ] CONDITIONS TO AVOID:

STABLE: [X] CONDITIONS TO AVOID: Avoid exposure to heat or flame.

INCOMPATIBILITY (MATERIALS TO AVOID): Acids and oxidizing materials.

HAZARDOUS DECOMPOSITION OR BY PRODUCTS: Hydrogen chloride, nitrogen oxide under fire conditions.

HAZARDOUS POLYMERIZATION:

MAY OCCUR: [ ] CONDITIONS TO AVOID:

WILL NOT OCCUR: [X] CONDITIONS TO AVOID:

SECTION V – HEALTH HAZARD DATA

HEALTH HAZARDS: EYE: May cause severe irritation with corneal injury and may result in permanent impairment of vision, even blindness. SKIN CONTACT: Prolonged exposure may cause skin irritation. SKIN ABSORPTION: A single prolonged skin exposure may result in the materials being absorbed in harmful amounts. The LD50 for skin absorption in rabbits is 2871 mg/kg. INGESTION: Single dose oral toxicity is low. The LD50 for male rats is 1482 mg/kg and for female is 837 mg/kg. Ingestion may cause gastrointestinal irritation. INHALATION: Single exposure to vapors is not likely to be hazardous.

SIGNS AND SYMPTOMS OF EXPOSURE: SYSTEMIC & OTHER EFFECTS: Excessive exposure may cause liver, kidney, gastrointestinal and muscular effects. Signs and symptoms of excessive exposure may be nausea and/or vomiting and abdominal cramps and/or diarrhea. Various animal cancer tests have shown no reliable positive association between 2,4-D exposure and cancer. Epidemiology studies have been both positive and negative with the majority being negative. Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother. High dietary levels of 2,4-D caused toxic effects (weight and viability reduction) in rats on a reproduction test. Has been shown to be negative in some vitro ("test tube") mutagenicity tests and positive in others. Results of mutagenicity tests in animals have been inconclusive.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

EMERGENCY FIRST AID PROCEDURES: EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel. SKIN: Wash off in flowing water or shower. Wash contaminated clothing before reuse. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. INGESTION: Induce vomiting by touching back of throat with finger. Give large amounts of water or milk , and transport to medical facility. INHALATION: Remove to fresh air if effects occur. Consult medical personnel.
FIRST AID: NOTE TO PHYSICIAN: Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagoscopic control. If burn is present, treat as any thermal burn after decontamination. Supportive care, treatment based on judgement of the physician in response to reaction of the patient. No specific antidote.

SECTION VI – PRECAUTIONS FOR SAFE HANDLING AND USE
STEPS TO BE TAKEN IN CASE MATERIAL is RELEASED OR SPILLED: Absorb spill in inert material. Dike area in case of large spills.
WASTE DISPOSAL METHOD: Dispose of in accordance with regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: See label. Keep out of reach of children. Do not get in eyes, on skin or clothing. Do not swallow. Washing facilities near work area. Do not store near fertilizer, seed, fungicide or insecticides. Do not contaminate irrigation ditches or water used for domestic purposes . OTHER PRECAUTIONS : Wash contaminated clothing separately before reuse.

SECTION VII – CONTROL MEASURES–PROCESS AREAS
RESPIRATORY PROTECTION: Not normally required during use
VENTILATION: LOCAL EXHAUST: General area exhaust is acceptable.
PROTECTIVE GLOVES: Impervious required.
EYE PROTECTION: Use safety glasses or goggles.
PROTECTIVE CLOTHING OR EQUIPMENT: Long-sleeved shirt or coveralls.
WORKPLACE AND HYGIENIC PRACTICES: Wash thoroughly after handling and before eating or smoking. Do not smoke or eat while handling.

SECTION VIII - - REGULATORY COMPLIANCE
THE FOLLOWING INFORMATION IS SUPPLIED TO AID IN COMPLIANCE WITH STATE AND FEDERAL REGULATIONS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ) . EPA REGULATION 40 CFR 302 (CERLA Section 102):CHEMICAL - 2,4-Dichlorophenoxyacetic acid CAS # 94-75-7
RQ: 100# (Equivalent amount of this product would be 28 gallons)

THRESHOLD PLANNING QUANTITY (TPQ) . EPA REGULATION 40 CFR 355 (SARA sections 301-304): CHEMICAL - NA CAS #: NA TPQ: NA

TOXIC CHEMICAL RELEASE REPORTING. EPA REGULATION 40 CFR 372 (SARA Section 313) : CHEMICAL - 2,4-Dichlorophenoxyacetic acid
CAS #: 94-75-7 % BY WEIGHT IN PRODUCT: 38.3%

HAZARDOUS CHEMICAL REPORTING. EPA REGULATION 40 CFR 370 (SARA Sections 311-312) : CHEMICAL - 2,4-Dichlorophenoxyacetic acid
CAS #: 94-75-7

EPA HAZARD CLASSIFICATION CODE:

ACUTE HAZARD	CHRONIC HAZARD	FIRE HAZARD	PRESSURE HAZARD	REACTIVE HAZARD	NOT APPLICABLE
XX	XX				

HAZARD RATING: NFPA
1 FIRE 2 TOXICITY 0 REACTIVITY 0 CORROSIVENESS

HAZARD RATING CODE : 0-None 1-Slight 2-Moderate 3-High U-Unknown

SECTION IX – TRANSPORTATION INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Material Incidents. DOT P 5800.5

DOT IDENTIFICATION:	RQ:
4 x 1 gallon and 2 x 2-1/2 gallon: Not regulated	100# 2,4-D (Equivalent amount of product would be 28 gallons)

30 gallon drum, 119 gallon or less of bulk: RQ. Other regulated substance, liquid, n.o.s., (2,4-D), 9, NA 3082, PG III

Bulk over 119 gallons: RQ. Other regulated substance, liquid, n. o. s. , (2, 4-D), Marine Pollutant, 9, NA 3082, PG III

OSHA REQUIRED LABEL INFORMATION: In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment . NONE

NOTE: Product label will contain additional non-OSHA related information.

DATE: January 10, 1996 SUPERSEDES: May 4, 1995

Revision: Format change

The information herein was given in good faith but no warranty, expressed or implied was made. Consult Cenex/Land O' Lakes Agronomy Company for further information

NA = NOT APPLICABLE NDA = NO DATA AVAILABLE

COPPOR00000755

Revised February 1, 2005

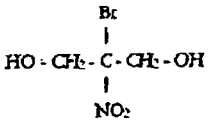
MATERIAL SAFETY DATA SHEET

2K7* BUGSTICK

PCP #21281, 25325
EPA REG. #67420-1 EPA EST. #67420-CN-01

PRODUCT IDENTIFICATION:

Synonyms: Myacide AS Technical Stick
Chemical name : 2-Bromo-2-Nitropropane-1,3-Diol (BNPD)
CAS No : 52-51-7
EINECS No : 200-143-0
Formula :



PHYSICAL/CHEMICAL PROPERTIES:

Purity	:	85% BNPD
M. Pt.	:	About 70°C
Flash point	:	None
Appearance	:	White or off white "stick"
Solubility	:	Soluble in water

PRECAUTIONARY MEASURES:

Health : Eye and skin irritant. Avoid ingestion, inhalation and contact with skin, eyes and clothing. Where there is a risk of contact, wear protective clothing.

Storage : Store away from:
a) Oxidizing materials
b) Heat and sources of ignition
c) Food and food containers
AVOID CONTACT WITH METALS

Waste : For information on the disposal of unused, unwanted product and the clean up of spills, contact the regional office of Environment Canada or the Manufacturer.

TOXICOLOGY INFORMATION:

The active ingredient in the 2K7® Bugstick has been used for many years as a preservative for skin applied cosmetics and toiletries and also in toothpaste and oral pharmaceuticals. In these application areas, its record of safe and effective use is unique.

A summary is given below of the main features of the compound relating to mammalian and environmental toxicity. Full details of the tests referred to are available on request.

Mammalian Toxicity: Myacide CAS

Acute LD_{50}	Rat	(oral)	- 307 mg/kg (females)
		(dermal)	- 1600 mg/kg
	Mouse	(oral)	- 327 mg/kg (females)

No evidence of mutagenicity of carcinogenicity has been observed.

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Irritancy and contact sensitivity:

Irritancy is a localized response and in general is treated rapidly by removal of the irritant. Sensitization is an allergic response, the body "recognized" a sensitizer on subsequent exposure and exhibits a less localized reaction, ranging from itching and redness of the skin in the surrounding area, through to more serious whole body responses.

Myacide CAS is the industrial grade of a chemical used in cosmetics all over the world. Records show that complaints of skin reactions attributable to this compound are extremely rare. In normal use therefore, Myacide CAS can be regarded as a significantly safer material to handle than many other biocides. The high water solubility of Myacide CAS contributes to safety, enabling rapid and easy skin/eye washing in cases of accidental contact.

Environmental toxicity: Myacide CAS has a low order of toxicity to fish and wildlife. 96 hr LC_{50} concentrations have been determined for the following species

Rainbow Trout	20 mg/litre
Brown Shrimp	121 mg/litre
Mysid Shrimp	5.9 mg/litre
Blue Gill Sunfish	35.7 mg/litre
Sheepshead Minnow	57.6 mg/litre

Acute Oral LD_{50} Mallard Duck 510 mg/kg

Field trials and laboratory studies have shown that Myacide CAS is environmentally non-persistent. It undergoes chemical breakdown and biological degradation. In model activated sewage treatment systems, experiments have shown that levels up to 15 ppm are tolerated. Furthermore, many years use in water treatment confirm that correct use of Myacide CAS will produce no harmful effect on the environment.

Myacide CAS has been awarded Category Classification by the U.K. Department of Energy Scheme of Selection of Chemicals for use offshore. This allows discharge of up to 10 tonnes of Myacide CAS into the sea at each site of operation (eg. offshore oil rigs) per year, before the authorities require notification.

EMERGENCY MEASURES:

Fire Fighting The Bugstick will burn in air producing toxic gases. Self-contained breathing apparatus should be provided for firemen fighting fires in confined spaces.
Water spray, foam, carbon dioxide and dry chemical powder are suitable extinguishing agents.

Spillage Immediately sweep up and remove spilled material, then clean the area with detergent and water.

First aid: In case of contact with skin or eyes, give prolonged irrigation with water. In case of ingestion, wash out the mouth thoroughly with water and give water to drink. In all cases obtain medical attention.

TRANSPORT CLASSIFICATION:

Less than 500 kg: "Limited Quantity"
More than 500 kg: Class 4.1

The information in this Safety Sheet is believed to be accurate, but is given without warranty.
For more information contact:

OSP MICROCHECK INC.
#1, 1715 - 27 AVENUE NE
CALGARY, ALBERTA CANADA T2E 7E1

Phone: (403) 291-1658
Fax: (403) 250-6711

* 2K7 is a registered trademark of OSP Microcheck Inc.

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Supplier:
Permatex, Inc.
10 Columbus Blvd.
Hartford, CT 06106
Telephone: 1-87-Permatex
(877) 376-2839

Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: 51D PIPE JOINT COMPOUND 1PT
Item No: 80045
Product Type: Sealant

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percent	ACGIH 8 Hr. TWA:	OSHA 8 Hr. TWA:
KAOLIN 1332-58-7	30-40	2 mg/m3 dust	10 mg/m3 dust; 5 mg/m3 respir.
VEGETABLE OIL 68187-84-8	15-25		
ROSIN 8050-09-7	15-25	sensitizer; reduce exposure to as low as possible	15 mg/m3 total dust; 5 mg/m3 respir.
2-PROPANOL 67-63-0	10-20	400 ppm TWA; 983 mg/m3 TWA	400 ppm TWA
TALC 14807-96-6	1-10	2 mg/m3 respir. dust TWA	2 mg/m3 TWA
SILICA, QUARTZ 14808-60-7	0.1-1.0	0.1 mg/m3 TWA (respirable dust)	0.1 mg/m3 TWA (respirable dust)

3. HAZARDS IDENTIFICATION

Toxicity: May cause eye, skin and respiratory irritation. Oral LD50 greater than 5000 mg/kg.
Primary Routes of Entry: Eye and skin contact, ingestion, inhalation.
Signs and Symptoms of Exposure: Excessive accidental exposure may cause headache, dizziness, nausea and mild respiratory irritation. Overexposure may cause eye and skin redness.

Ingredients	Percent	NTP:	ACGIH Carcinogens	IARC:
SILICA, QUARTZ 14808-60-7	0.1-1.0	Known Carcinogen		Group 1; Vol. 68; 1997

Medical Conditions Recognized as Being Aggravated by Exposure: *Preexisting eye, skin and respiratory disorders may be aggravated by overexposure to this product.*

4. FIRST AID MEASURES

Ingestion: If swallowed, DO NOT induce vomiting. Keep individual calm. Obtain medical attention.
Inhalation: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.
Skin Contact: Remove contaminated clothing. Wash area with soap and water. If irritation persists, seek medical attention.
Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

5. FIRE FIGHTING MEASURES

Flash Point (°F/C): 76 degrees F. Method: Tag Closed Cup
Recommended Extinguishing Media: Carbon Dioxide, Dry Chemicals, Foam.
Special Fire-Fighting Procedures: *Firefighters should wear self-contained breathing apparatus. Water spray may be ineffective on flames but should be used to keep fire-exposed containers cool.*

Hazardous Products Formed by Fire or Thermal Decomposition:	Aldehydes, Oxides of carbon. Carboxylic acids
Unusual Fire/Explosion Hazards:	Closed containers may rupture or explode when exposed to extreme heat.
Lower Explosive Limit:	2.3
Upper Explosive Limit:	12.7

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures:	Eliminate all sources of ignition. Maintain good ventilation. Take up with an inert absorbent. Store in a closed waste container until disposal. Residues may be cleaned up with isopropyl alcohol.

7. HANDLING AND STORAGE

Storage:	Store away from heat, sparks or open flame. Do not store at temperatures above 120 degrees F.
Handling:	Avoid contact with skin and eyes. Do not inhale vapors. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes:	Safety glasses or goggles.
Skin:	Rubber or plastic gloves
Ventilation:	General; *local exhaust ventilation as necessary to control any air contaminants to within their* exposure limits during the use of this product.
Respiratory Protection:	An approved respirator (i.e. NIOSH, etc.) should be worn when exposures are expected to exceed the applicable limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black paste
Odor:	Alcohol Odor
Boiling Point (°F):	180 degrees F.
pH:	Does not apply
Solubility in Water:	Partial
Specific Gravity:	1.28 @ 25 degrees C.
VOC Content(Wt.%):	17% by weight
Vapor Pressure:	33 mm Hg @ 68 degrees F.
Vapor Density (Air=1):	2.07
Evaporation Rate:	Not available

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable at normal conditions
Hazardous Polymerization:	WILL NOT OCCUR
Incompatabilities:	Strong oxidizers.
Conditions to Avoid:	Do not expose to heat or store at temperatures above 120 F.
Hazardous Products Formed by Fire or Thermal Decomposition:	Aldehydes, Oxides of carbon. Carboxylic acids

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal:	Disposal should be made in accordance with federal, state and local regulations.
US EPA Waste Number:	D001 as per 40CFR 261.21

14. TRANSPORT INFORMATION

DOT (49CFR 172)

Domestic Ground Transport

DOT Shipping Name:	Consumer Commodity (Not more than five liters)

Product Name: 51D PIPE JOINT COMPOUND 1PT
Item No: 80045

Hazard Class:	ORM-D
UN/ID Number:	None
Marine Pollutant:	None

IATA

Proper Shipping Name:	Consumer Commodity (Not more than 500 ml)
Class or Division:	Class 9
UN/NA Number:	ID 8000

IMDG

Proper Shipping:	Resin Solution, Flammable, Limited Quantity
Hazard Class:	Class 3.3
UN Number:	UN 1866

15. REGULATORY INFORMATION

SARA 313 Chemicals: *The following component(s) is listed as a SARA Section 313 Toxic Chemical*
NONE

CALIFORNIA PROP 65:
No California Prop 65 chemicals are known to be present.

TSCA Inventory Status:
All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating:	HEALTH 2, FLAMMABILITY 3, REACTIVITY 0
Estimated HMIS Classification:	FLAMMABILITY 3, REACTIVITY 0, HEALTH 2

NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By:	**Denise Boyd**	**Health and Safety Manager**
Company:	**Permatex, Inc.**	**10 Columbus Blvd. Hartford, CT 06106**
Telephone Number:	**1-87-Permatex**	**(877) 376-2839**
Revision Date:		03/02/2001

Crown 7007 Cold Galvanizing Compound - Aerosol

Material Safety Data Sheet

The information presented in these forms is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication standard (29 CFR 1910.1200) concerning worker's right to know.

This MSDS covers the following Aervoe aerosol product.

PRODUCT NAME:

CROWN® 7007 Cold Galvanizing Compound

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Aervoe Industries Inc.
INFORMATION PHONE: 775-782-0100
DATE REVISED: 08-05-04
ADDRESS: 1198 Mark Circle, Gardnerville, NV 89410
EMERGENCY PHONE: 1-800-424-9300
REASON REVISED: Updated

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

HAZARDOUS COMPONENTS	WEIGHT PERCENT	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	LD50 SPECIES & ROUTE	LC50 SPECIES & ROUTE
Zinc (CAS 7440-66-6)	30 - 60	N / AV	N / AV	N / AV	N / AV
*Xylene (CAS 1330-20-7)	10 - 30	100 ppm	100 ppm	4300 mg / kg (Rat-Oral)	5700 ppm / 4 hr (Rat-Inha)
Hydrocarbon Propellant (CAS 68476-85-8)	10 - 30	1000 ppm	1000 ppm	N / AV	N / AV
Aliphatic Petroleum Distillates (CAS 64742-89-8)	1 - 5	N / AV	300 ppm	N / AV	N / AV

*Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

NOTE: N / AP = Not Applicable N / AV = Not Available

7007MA

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: N / AP
VAPOR DENSITY: Heavier than air
EVAPORATION RATE: Slower than n-Butyl Acetate
SPECIFIC GRAVITY (H20=1, @70°F): 1.4
SOLUBILITY IN WATER: Negligible
APPEARANCE AND ODOR: Metallic gray with hydrocarbon odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: < 0°F (-18°C) **METHOD USED:** Estimated **FLAMMABLE LIMITS - LEL:** 0.9% **UEL:** 9.5%
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, water spray.
SPECIAL FIRE FIGHTING PROCEDURES: Use water spray to cool containers exposed to heat or fire to prevent pressure build up. Self-contained breathing apparatus should be used if product is involved in fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Treat as cylinders of compressed gas. Closed containers may rupture due to pressure build up from extreme temperature.
FLAMMABILITY: Flammable aerosol under conditions of sparks, flame, or hot surfaces.
SENSITIVITY TO IMPACT: Aerosol cans are under pressure. Product will be expelled rapidly if container is punctured.
SENSITIVITY TO STATIC DISCHARGE: Primarily vapors

SECTION V - REACTIVITY DATA

STABILITY: Stable **CONDITIONS TO AVOID:** Open flames, sparks, electrical arcs.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents, strong acids or bases.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide, Carbon Dioxide.
HAZARDOUS POLYMERIZATION: Will not occur

SECTION VI - HEALTH HAZARD DATA

INHALATION: Respiratory tract irritant. May cause dizziness, light-headedness and / or headaches.
SKIN CONTACT: Prolonged or repeated contact may cause irritation and dermatitis.
EYE CONTACT: Painful with slight to moderate irritation.
SKIN ABSORPTION: Not likely to be absorbed in toxic amounts under normal use.
INGESTION: Not likely in normal use but swallowing large amounts may be harmful.
CARCINOGENICITY: The ingredients are not listed as a human carcinogen by IARC, ACGIH, NTP, or OSHA.
TERATOGENICITY: Not established **MUTAGENICITY:** Not established
MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: Not established
EMERGENCY AND FIRST AID PROCEDURES: INHALATION - Remove from exposure, seek medical attention if signs/symptoms persist.
SKIN - Wash effected area with soap and water, remove contaminated clothing, seek medical attention if irritation persists.
EYES - Flush immediately with water for 15 minutes, seek medical attention if irritation persists.
INGESTION - Do NOT induce vomiting, drink plenty of water, seek medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Ventilate area. Prevent from entering a watercourse. Use an inert absorbent material and non-sparking type tools.
WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate closed containers.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F (49° C). Do not store or use near heat, sparks or flame.
OTHER PRECAUTIONS: Do not smoke while using this product. Dust from sanding the dry paint film should be treated as a nuisance dust with a TLV of 15 mg / cubic meter.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: In areas with poor ventilation, use a NIOSH approved Organic Vapor Cartridge Respirator. For concentrations above the TLV (as defined in Section II), use a positive air supplied respirator.
VENTILATION: General ventilation to maintain exposure limits below TLV's as defined in Section II.
PROTECTIVE GLOVES: Chemical resistant gloves such as Neoprene or Nitrile rubber.
EYE PROTECTION: Safety glasses or goggles.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Not established.
WORK / HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated clothing prior to reuse.

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE SO. NOTHING CONTAINED HEREIN CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR THE INTENDED USE.

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MATERIAL SAFETY DATA SHEET

UNOCAL 76

Product Name: UNOCAL PROCESSING OIL 32
Product Code No: 04403

Issue Date: 7/15/85

MANUFACTURER:	Transportation Emergencies: Call CHEMTREC (800) 424-9300 Cont. U.S. (202) 483-7616 (Collect) from Alaska & Hawaii Health Emergencies: CALL LOS ANGELES POISON INFORMATION CENTER (24 hrs.) (213) 664-2121
UNOCAL REFINING & MARKETING DIVISION UNION OIL COMPANY OF CALIFORNIA 1201 W. 5TH STREET LOS ANGELES, CALIFORNIA 90017 CONTACT FOR FURTHER INFORMATION: MSDS COORDINATOR (213) 977-7589	

PRODUCT IDENTIFICATION

PRODUCT NAME: UNOCAL PROCESSING OIL 32

SYNONYMS: UNION PROCESSING OIL 32

GENERIC NAME: INDUSTRIAL OILS

CHEMICAL FAMILY: PETROLEUM HYDROCARBON

DOT PROPER SHIPPING NAME: NOT APPLICABLE

ID NUMBER: NONE

SECTION I - INGREDIENTS	TLV	UNITS	AGENCY	TYPE
OIL MIST, IF GENERATED	5.00	MG/M3	OSHA	FULL TERM TWA

THE IDENTITIES OF INGREDIENTS THAT ARE TRADE SECRETS ARE EXCLUDED FROM THIS LIST.

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY
Have physician call LOS ANGELES POISON INFORMATION CENTER (24 hrs.) (213) 664-2121

EYE CONTACT:

FOR DIRECT CONTACT, FLUSH THE AFFECTED EYE(S) WITH CLEAN WATER. IF IRRITATION OR REDNESS DEVELOPS, SEEK MEDICAL ATTENTION.

SKIN CONTACT:

DO NOT USE GASOLINES, THINNERS OR SOLVENTS TO REMOVE PRODUCT FROM SKIN. WIPE MATERIAL FROM SKIN AND REMOVE CONTAMINATED CLOTHING. CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH SOAP AND WATER AND, IF NECESSARY, A WATERLESS SKIN CLEANSER. IF IRRITATION OR REDNESS DEVELOPS AND PERSISTS, SEEK MEDICAL ATTENTION.

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY
Have physician call LOS ANGELES POISON INFORMATION CENTER (24 hrs.) (213) 664-2121

INHALATION (BREATHING):

IF IRRITATION OF NOSE OR THROAT DEVELOPS, MOVE AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING OR IF BREATHING DIFFICULTIES DEVELOP, ARTIFICIAL RESPIRATION OR OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2 TO 3 CUPS OF MILK OR WATER TO DRINK. SEEK MEDICAL ATTENTION. TO PHYSICIAN: EMESIS OR LAVAGE IS NOT RECOMMENDED FOR INGESTIONS OF MINUTE QUANTITIES OR TASTES OF MOST HYDROCARBONS. MEDICAL OPINION IS DIVIDED FOR LARGER INGESTIONS. EMESIS OR LAVAGE HAS BEEN RECOMMENDED FOR THOSE PETROLEUM PRODUCTS WHICH HAVE A HIGH ORAL TOXICITY. GASTRIC LAVAGE WITH A CUFFED ENDOTRACHEAL TUBE IS RECOMMENDED BY SOME PHYSICIANS TO PREVENT ASPIRATION.

SECTION III - POTENTIAL ADVERSE HEALTH EFFECTS

EYE CONTACT:

THIS MATERIAL MAY CAUSE EYE IRRITATION. DIRECT CONTACT MAY CAUSE BURNING, TEARING AND REDNESS.

SKIN CONTACT:

THIS MATERIAL MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE REDNESS, BURNING AND DERMATITIS.

INHALATION (BREATHING):

EXPOSURE TO MISTS, OR PROLONGED OR REPEATED EXPOSURE TO FUMES OR VAPORS THAT MAY BE GENERATED WHEN THIS MATERIAL IS HEATED, MAY CAUSE IRRITATION OF NOSE AND THROAT.

INGESTION (SWALLOWING):

ACCIDENTAL INGESTION OF THIS MATERIAL MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE IN MAINTAINING AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I), ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED.

RESPIRATORY PROTECTION:

IF AIRBORNE CONCENTRATIONS EXCEED RECOMMENDED EXPOSURE LIMITS, A SUITABLE FILTER-TYPE RESPIRATOR SHOULD BE WORN. (SEE SECTION I.)

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

SECTION IV - SPECIAL PROTECTION INFORMATION

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN WORK AREA FOR FLUSHING EYES AND SKIN. BARRIER CREAMS THAT ARE SPECIFIC FOR OIL-BASED MATERIALS ARE RECOMMENDED WHEN GLOVES ARE IMPRACTICAL.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

CONDITIONS TO AVOID (STABILITY):

AVOID CONTACT WITH ANY SOURCE OF IGNITION.

INCOMPATIBILITY (MATERIALS TO AVOID):

AVOID CONTACT WITH STRONG OXIDIZING AGENTS. EXTENDED EXPOSURE TO HIGH TEMPERATURES MAY CAUSE DECOMPOSITION.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION IN THE PRESENCE OF AIR MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE AND OXIDES OF SULFUR.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

SECTION VI - SPILL OR LEAK PROCEDURES

HIGHWAY OR RAILWAY SPILLS
Call CHEMTREC (800) 424-9300 Cont. U.S.
(Collect) (202) 483-7616 from Alaska & Hawaii

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

COLLECT LEAKING LIQUID IN SEALABLE CONTAINERS. ABSORB SPILLED LIQUID IN SAND OR INERT ABSORBANT. CONTACT FIRE AUTHORITIES AND APPROPRIATE STATE/LOCAL AGENCIES. IF SPILL OF ANY AMOUNT IS MADE INTO OR UPON U.S. NAVIGABLE WATERS, THE CONTIGUOUS ZONE, OR ADJOINING SHORELINES, NOTIFY COAST GUARD NATIONAL RESPONSE CENTER (PHONE NUMBER 800-424-8802).

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

STORE IN A COOL, DRY LOCATION. KEEP AWAY FROM INCOMPATIBLE MATERIALS (SEE SECTION V). AVOID GENERATING OIL MISTS WHILE HANDLING. AVOID PROLONGED OR REPEATED SKIN CONTACT. WASH THOROUGHLY AFTER HANDLING. DO NOT WEAR OIL-SOAKED CLOTHING OR SHOES.

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		
	REACTIVITY: 0	2 = MODERATE		
	OTHER:	3 = HIGH	NOT REGULATED	388, COC F
		4 = EXTREME		198 C

EXTINGUISHING MEDIA:

EXTINGUISH WITH DRY CHEMICAL, CO2, WATER SPRAY, FOAM, SAND OR EARTH. WATER AND FOAM MAY CAUSE FROTHING.

FIRE & EXPLOSION HAZARDS:

THIS MATERIAL WILL BURN, BUT WILL NOT IGNITE READILY.

FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE USEFUL IN MINIMIZING VAPORS AND COOLING CONTAINERS EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES. MOVE UNDAMAGED CONTAINERS FROM FIRE AREA IF YOU CAN DO SO WITHOUT RISK.

SECTION IX - PHYSICAL DATA

APPROX. BOILING RANGE	VAPOR DENSITY	EVAPORATION RATE	% VOLATILE
ABOVE 600 F (316) C	HEAVIER THAN AIR	SLOWER THAN ETHER	NEGLIGIBLE
% SOLUBILITY IN WATER	**SPECIFIC GRAVITY**	**APPEARANCE**	
NEGLIGIBLE	0.88	CLEAR, YELLOW	

ODOR

CHARACTERISTIC

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 7/15/85 PRODUCT CODE NO. 04403

PREV. DATE: _____ PREV. PROD. CODE NO. _____

MSDS NO: _____ PREV. MSDS NO: _____

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. **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 THIS INFORMATION, 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.** This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

MATERIAL SAFETY DATA SHEET

76 Soluble Oil

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	76 Soluble Oil
Synonyms:	76 Soluble Oil 10 76 Soluble Oil 12
Intended Use:	Metalcutting Fluid
Chemical Family:	Petroleum Hydrocarbon
Responsible Party:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	888-766-7676
Technical Information:	800-435-7761

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) 356-3219

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance:	Clear brown
Physical Form:	Liquid
Odor:	Characteristic petroleum

NFPA 704 Hazard Class:

Health:	1 (Slight)
Flammability:	1 (Slight)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Hexylene Glycol 107-41-5	1-5	25 ppm CEIL	NE	NE	NE

NON-HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Additives PROPRIETARY	4-12	NE	NE	NE	NE
Lubricant Base Oil (Petroleum) VARIOUS	70-90	5mg/m³ TWA 10 mg/m³ STEL	5 mg/m³ TWA	2500 mg/m³ IDLH	as Oil Mist, if Generated 5 mg/m³ NOHSC TWA

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-83-7; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). Contact may result in skin absorption but symptoms of toxicity are not anticipated by this route alone under normal conditions of use.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): Low to moderate degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the respiratory tract, irritation of the digestive tract, nausea, diarrhea, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Cancer: *Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of* individual components, if any.

Target Organs: Inadequate data available for this material.

Developmental: A component is a potential hazard to the fetus (see Section 11).

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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): If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on the left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occured within the last hour, vomiting should be induced for ingestions of large amounts (more than 5 ounces in an adult) preferably under direction from a physician or poison center. If possible, do not leave victim unattended and observe closely for adequacy of breathing.

Notes to Physician: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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

Flammable Properties:

Flash Point:	> 350°F / 177°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
OSHA Flammability Class:	Not applicable
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. 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, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. Use good personal hygiene practices.

"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.

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.

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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Clear brown
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data

pH:	9.8
Vapor Pressure (mm Hg):	<1
Vapor Density (air=1):	>1
Boiling Point:	> 212°F / 100°C
Melting/Freezing Point:	< -24°F / -31°C
Solubility in Water:	Soluble upon agitation (emusifiable)
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.86 - 0.97
Bulk Density:	7.20 - 7.63 lbs/gal
Viscosity cSt @ 100°C:	5.0
Viscosity cSt @ 40°C:	29 - 34
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	> 350°F / 177°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data
Decomposition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents, strong acids, strong bases.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Carcinogenicity: A mortality study sponsored by General Motors and the United Auto Workers suggested a link between cutting oils or machining fluids and various forms of cancer (e.g., esophageal, laryngeal,and rectal) The study evaluated workplace exposures from 1940-1984. Since the composition of these materials has changed substantially since 1940, and because the most notable effects were seen among those with work histories dating back to that time, the relevance of these findings to present-day exposures is uncertain. Cutting oils or machining fluids have not been identified as carcinogens by NTP, IARC, or OSHA.

Lubricant Base Oil (Petroleum) - CAS: VARIOUS

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and therefore none are listed as a carcinogen by NTP, IARC, or OSHA.

Acute Data:

Lubricant Base Oil (Petroleum) - CAS: VARIOUS
Dermal LD50 = >2 g/kg
LC50 = No information available
Oral LD50 = >5 g/kg

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

Proper Shipping Description: Not Regulated

Note: Material is unregulated unless in container of 3500 gallons or more, then provisions of 49 CFR Part 130 apply for land shipment.

IMDG Shipping Description: Not regulated

ICAO/IATA Shipping Description: Not regulated

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

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

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
–None Known–

EPA (CERCLA) Reportable Quantity (in pounds):
–None Known–

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:
– 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):
– None Known –

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.

TSCA:
All components are listed on the TSCA inventory.

16. OTHER INFORMATION

Issue Date:	12-Sep-2005
Previous Issue Date:	03-Mar-2005
Product Code:	7932
Revised Sections or Basis for Revision:	Product name (Section 1) Physical Properties (Section 9)
Previous Product Code:	7932
MSDS Code:	721630

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
76 Triton 2000 GEO 40

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Triton 2000 GEO 40
Product Code: 3752040000
Sap Code:
Intended Use: Crankcase oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: Phillips 66 Company
Lubricants Division
P.O. Box 25376
Santa Ana, CA 92799-5376
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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear brown
Physical Form: Liquid
Odor: Characteristic petroleum

NFPA Hazard Class:

Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

HMIS Hazard Class

Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous components identified per 29 CFR 1910.1200.

OTHER COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	92-93	(See: Oil Mist, If Generated)		

Additives CAS# Proprietary	7-8	Not Established

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated CAS# None	5 mg/m3 10 mg/m3 5 mg/m3 2500 mg/m3	ACGIH ACGIH OSHA NIOSH	TWA STEL TWA IDLH

All components are listed on the TSCA inventory

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties:
Flash Point: 428°F/220°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 potential for 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance: Clear brown

Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >600°F / >316°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.88-0.90 @ 15°C
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 13.0-13.5 cSt @ 100°C / 119-143 cSt @ 40°C
Bulk Density: 7.42 lbs/gal
Flash Point: 428°F / 220°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen, sulfur and phosphorus oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

Note: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
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:

--None--

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**

Used engine oils, 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.

EPA (CERCLA) Reportable Quantity:

--None--

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 04/03/00
Product Code: 3752040000
Revised Sections: None
Previous Product Code: 3752040000
MSDS Number: 3752040000

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.

Lubricants Company

MATERIAL SAFETY DATA SHEET
76 Triton 4000 GEO 30

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Triton 4000 GEO 30
Product Code: 3754030000
Sap Code:
Intended Use: Crankcase oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: Phillips 66 Company
Lubricants Division
P.O. Box 25376
Santa Ana, CA 92799-5376
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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear, brown
Physical Form: Liquid
Odor: Characteristic petroleum

NFPA Hazard Class:

Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

HMIS Hazard Class

Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Hindered Alkyl Phenol CAS# Proprietary	0-1	Not Established		

	% VOLUME	EXPOSURE GUIDELINE

OTHER COMPONENTS

		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	87-89	(See: Oil Mist, If Generated)		
Additives CAS# Proprietary	11-13	Not Established		

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated CAS# None	5 mg/m3	ACGIH	TWA
	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH

All components are listed on the TSCA inventory

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: There is limited evidence from animal studies that overexposure to a component may cause injury to the liver (see Section 11).

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and liver 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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

Flammable Properties:
Flash Point: 428°F/220°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. 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, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 potential for 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance: Clear, brown
Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >555°F / >291°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.87 - 0.89
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 9.5-10.5 cSt @ 100°C /78-84 cSt@40°C
Bulk Density: 7.26-7.34 lbs/gal
Flash Point: 428°F / 220°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen, sulfur and phosphorus oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

Hindered Alkyl Phenol (CAS# Proprietary)

Target Organ(s): Repeated oral administration to rats resulted in liver cellular hypertrophy.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

Note: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
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:

--None--

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**

Used engine oils, 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. Used motor oil has been identified as a possible skin carcinogen by IARC.

EPA (CERCLA) Reportable Quantity:

--None--

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 03/29/01
Product Code: 3754030000
Revised Sections: None
Previous Product Code: 3754030000
MSDS Number: 3754030000

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
76 Triton 4000 GEO 40

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Triton 4000 GEO 40
Product Code: 3754040000
Sap Code:
Intended Use: Crankcase oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: Phillips 66 Company
Lubricants Division
P.O. Box 25376
Santa Ana, CA 92799-5376
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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear, brown
Physical Form: Liquid
Odor: Characteristic petroleum

NFPA Hazard Class:

Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

HMIS Hazard Class

Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Hindered Alkyl Phenol CAS# Proprietary	1	Not Established		

	% VOLUME	EXPOSURE GUIDELINE

OTHER COMPONENTS

		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	87-89	(See: Oil Mist, If Generated)		
Additives CAS# Proprietary	11-13	Not Established		

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated CAS# None	5 mg/m3	ACGIH	TWA
	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH

All components are listed on the TSCA inventory

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: There is limited evidence from animal studies that overexposure to a component may cause injury to the liver (see Section 11).

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and liver 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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

Flammable Properties:
Flash Point: 439°F/226°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 potential for 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance: Clear, brown
Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >555°F / >291°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.88-0.89
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 12.5-13.5 cSt @ 100°C /120-128 cSt @ 40°C
Bulk Density: 7.34-7.43 lbs/gal
Flash Point: 439°F / 226°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen, sulfur and phosphorus oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

Hindered Alkyl Phenol (CAS# Proprietary)

Target Organ(s): Repeated oral administration to rats resulted in liver cellular hypertrophy.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

Note: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
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:

--None--

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**

Used engine oils, 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. Used motor oil has been identified as a possible skin carcinogen by IARC.

EPA (CERCLA) Reportable Quantity:

--None--

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 03/29/01
Product Code: 3754040000
Revised Sections: None
Previous Product Code: 3754040000
MSDS Number: 3754040000

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
76 Triton 5005 GEO 40

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Triton 5005 GEO 40
Product Code: 3798040000
Sap Code: 1042012
Intended Use: Crankcase oil - Natural gas engines
Chemical Family: Petroleum hydrocarbon mixture
Responsible Party: 76 Lubricants
A Division of ConocoPhillips
600 N. Dairy Ashford
Houston, TX 77079-1175
For Additional MSDSs 800-435-7761
Technical Information: 800-435-7761

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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear, brown
Physical form: Liquid
Odor: Characteristic petroleum

NFPA Hazard Class:

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Health:       1 (Slight)
Flammability: 1 (Slight)
Reactivity:   0 (Least)
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HMIS Hazard Class

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Health:           1 (Slight)
Flammability:     1 (Slight)
Physical Hazard:  0 (Least)
```

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Zinc Compound CAS# Proprietary	0-1	Not Established		

OTHER COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	89-91	(See: Oil Mist, If Generated)		
Additives CAS# Proprietary	9-11	Not Established		

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated CAS# None	5 mg/m3	ACGIH	TWA
	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH
	5 mg/m3	NOHSC	TWA

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

1%=10,000 PPM.

All components are listed on the TSCA inventory.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties:
Flash Point: 511°F/226°C (COC)
OSHA Flammability Class: Not regulated
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. 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, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: Hazardous combustion/decomposition products may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection. 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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).
Appearance: Clear, brown
Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >555°F / >291°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.88-0.89
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 13.0-14.0cSt @ 100°C /135 cSt @ 40°C
Bulk Density: 7.35 lbs/gal
Flash Point: 511°F / 226°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield major amounts of oxides of carbon and minor amounts of oxides of nitrogen, phosphorus, sulfur, and zinc. Heating this product above 160°F (71°C) may produce hydrogen sulfide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Not classified as hazardous

Note: Material is unregulated unless in container of 3500 gal or more then provisions of 49 CFR Part 130 apply for land shipment.

IMDG: Not regulated
IATA: Not regulated

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
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 %
Zinc Compound (Aryl)	Proprietary	0-1

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
-- None --	

Used engine oils, 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. Used motor oil has been identified as a possible skin carcinogen by IARC.

EPA (CERCLA) Reportable Quantity:

RQ #1 Zinc Compound (Aryl)
1000 lb equal to 76297 lb, (10288 gal), of this material.

Canada - Domestic Substances List: Listed

WHMIS Class:

Not regulated
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 CPR.

16. OTHER INFORMATION

Issue Date: 09/17/03
Previous Issue Date: 01/01/02
Product Code: 3798040000
Revised Sections: 1, 2, 5, 8, 9, 14, 16
Previous Product Code: 3798040000
MSDS Number: 720390
Status: Final

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.

Lubricants Company

MATERIAL SAFETY DATA SHEET
76 Unax 46

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Unax 46
Product Code: 4804046000
Sap Code:
Intended Use: Industrial oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: Phillips 66 Company
Lubricants Division
P.O. Box 25376
Santa Ana, CA 92799-5376
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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear yellow
Physical Form: Liquid
Odor: Characteristic petroleum

NFPA Hazard Class:

Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

HMIS Hazard Class

Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous components identified per 29 CFR 1910.1200.

OTHER COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	100	(See: Oil Mist, If Generated)		

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated	5 mg/m3	ACGIH	TWA
CAS# None	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH

All components are listed on the TSCA inventory

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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

Flammable Properties:
Flash Point: 446°F/230°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: 716°F/380°C

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. 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, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 potential for 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance: Clear yellow

Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >555°F / >291°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.86
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 6.63-7.02 cSt @ 100°C / 46 cSt @ 40°C
Bulk Density: 7.19 lbs/gal
Flash Point: 446°F / 230°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

Note: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
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:

–None–

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

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.

EPA (CERCLA) Reportable Quantity:

–None–

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 02/16/99
Product Code: 4804046000
Revised Sections: None
Previous Product Code: 4804046000
MSDS Number: 4804046000

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
76 Unoba Moly XD Grease 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Unoba Moly XD Grease 2
Product Code: 5477020000
Sap Code:
Intended Use: Grease
Chemical Family: Petroleum hydrocarbon
Responsible Party: Phillips 66 Company
Lubricants Division
P.O. Box 25376
Santa Ana, CA 92799-5376
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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Black
Physical Form: Semi-solid
Odor: Characteristic petroleum

NFPA Hazard Class:

Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

HMIS Hazard Class

Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% WEIGHT	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Deasphalted Residuum ..C24 CAS# 64741-95-3	30-50	(See: Oil Mist, If Generated)		
Molybdenum Disulfide	1-5	(See: Molybdenum, Insoluble Compounds (as Mo))		

CAS# 1317-33-5

Zinc Compound CAS# Proprietary	<1	Not Established

OTHER COMPONENTS	% WEIGHT	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Lubricant Base Oil (Petroleum) CAS# Various	50-70	(See: Oil Mist, If Generated)		
Additives CAS# Proprietary	5-13	Not Established		

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Molybdenum, Insoluble Compounds (as Mo) CAS# None	10 mg/m3 3 mg/m3 15 mg/m3	ACGIH ACGIH OSHA	TWA TWA-Resp. TWA-Tot.
Oil Mist, If Generated CAS# None	5 mg/m3 10 mg/m3 5 mg/m3 2500 mg/m3	ACGIH ACGIH OSHA NIOSH	TWA STEL TWA IDLH

All components are listed on the TSCA inventory

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No data available. However, inhalation is not an expected route of exposure.

Ingestion (Swallowing): Low degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, irritation of the respiratory tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. Seek immediate medical attention.

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

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties:
Flash Point: 450°F/232°C (COC)
OSHA Flammability Class: Not applicable
LEL%: 0.9 / UEL%: 7.0
Autoignition Temperature: No Data
Burn Rate (solids): No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily.

Extinguishing Media: Dry chemical, carbon dioxide, foam, water, sand, or earth is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confines spaces.

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. Contain spill if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Cool equipment exposed to fire with water, if it can be done with minimal risk.

6. ACCIDENTAL RELEASE MEASURES

This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay

upwind and away from spill. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Contain spill 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. Notify fire authorities and appropriate federal, state, and local agencies. Cleanup under expert supervision is advised. Minimize dust generation. Sweep up and package appropriately for disposal. 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: 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. 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 of 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, ANSI Z49.1 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: Inhalation is not an expected route of exposure. However, a NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 potential for 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation, and absorption (see glove manufacturer literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Burn Rate (solids only): No Data
Appearance: Black
Physical State: Semi-solid
Odor: Characteristic petroleum
Vapor Pressure (mm Hg): <0.01
Vapor Density (air=1): >5
Boiling Point/Range: No Data
Freezing/Melting Point: 365°F/185°C
Solubility in Water: Negligible
Specific Gravity: 0.90 @ 60°F
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <0.01
Bulk Density: 7.50 lbs/gal
Flash Point: 450°F / 232°C (COC)
Flammable/Explosive Limits (%): LEL: 0.9 / UEL: 7.0

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

Hazardous Decomposition Products: Combustion can yield major amounts of oxides of carbon and minor amounts of oxides of sulfur and nitrogen. Oxides of molybdenum may also be formed.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

Deasphalted Residuum ..C24 (CAS# 64741-95-3)

Carcinogenicity: Skin application of a similar material, vacuum tower bottoms, produced equivocal results in mouse tumor bioassays, but negtive results in both skin tumor initiation and promotion studies. Untreated vacuum distillates have been identified as a carcinogen by IARC.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not a RCRA "listed" or "characteristic" hazardous waste. Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with properly characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

14. TRANSPORT INFORMATION

Note: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
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 %
Zinc Compound	Proprietary	<1

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
Residual Fuel Oils	Skin 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.

EPA (CERCLA) Reportable Quantity:

--None--

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 05/31/01
Product Code: 5477020000
Revised Sections: None
Previous Product Code: 5477020000
MSDS Number: 5477020000

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.

UNION CARBIDE CORPORATION
A Subsidiary of The Dow Chemical Company

MATERIAL SAFETY DATA SHEET

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; 2) Furnish this same information to each of its customers for the product; and 3) Request its customers to notify their employees, customers, and other users of the product of this information.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name	ACETYLENE
Chemical Name	Acetylene
Chemical Family	Alkyne
Formula	C2H2
Synonym	Ethyne, Éthine, Acetylen

1.2 COMPANY IDENTIFICATION

Union Carbide Corporation
A Subsidiary of The Dow Chemical Company
39 Old Ridgebury Road
Danbury, CT 06817-0001

1.3 EMERGENCY TELEPHONE NUMBER

24 hours a day: CHEMTREC 1-800-424-9300.
Number for non-emergency questions concerning MSDS (732) 563-5522
Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

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2. COMPOSITION INFORMATION

Component	CAS #	Amount (%W/W)
Acetylene	74-86-2	>= 99.2 <= 100%
Ethane	74-84-0	<= 0.55%
Ethylene	74-85-1	<= 0.55%
Methane	74-82-8	<= 0.2%
Acetone	67-64-1	<= 0.1%
Propane	74-98-6	<= 0.05%
Propene	115-07-1	<= 0.05%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance Transparent colorless

Physical State Gas

Odor Garlic

Hazards of product DANGER!

GAS UNDER PRESSURE.
MAY FORM EXPLOSIVE MIXTURES WITH AIR.
FLAMMABLE.
CAN CAUSE RAPID SUFFOCATION.
STATIC IGNITION HAZARD CAN RESULT FROM HANDLING AND USE.

MAY CAUSE DIZZINESS AND DROWSINESS.

3.2 POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation Asphyxiant. Moderate concentrations of vapor may cause headache, drowsiness, dizziness, difficulty in concentration, vomiting, unconsciousness and death from lack of oxygen.

Eye Contact No evidence of harmful effects from available information.

Skin Contact No evidence of harmful effects from available information.

Skin Absorption No evidence of harmful effects from available information.

Swallowing An unlikely route of exposure. This material is a gas at normal temperature and pressure.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure No adverse effects anticipated from available information.

Other Effects of Overexposure This material in gaseous form can exclude oxygen, resulting in unconsciousness and death.

Medical Conditions Aggravated by Exposure

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

4.2 EYE CONTACT

Flush eyes thoroughly with water for several minutes. Remove contact lenses, if worn.

4.3 SKIN CONTACT

No emergency care anticipated.

4.4 SWALLOWING

This product is a gas at normal temperature and pressure.

4.5 NOTES TO PHYSICIAN

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Flash Point - Closed Cup: *Tag Closed Cup ASTM D 56* **-17.8 °C 0 °F**

Flash Point - Open Cup: *Not currently available.*

Autoignition Temperature: **299 °C 571 °F** Flammable gas

Flammable Limits In Air:

Lower	**2.5 %(V)**
Upper	**81.0 %(V)**

5.2 EXTINGUISHING MEDIA

Flammable gas: Do not extinguish due to possible hazard of explosive reignition. Use water spray to cool containers and structures and to protect personnel attempting to shut-off flow. Attempt shut-off only if hazard is not too great. Extinguish surrounding and/or residual fires with appropriate fire fighting foam, carbon dioxide or dry chemical media.

5.3 EXTINGUISHING MEDIA TO AVOID

No information currently available.

5.4 SPECIAL FIRE FIGHTING PROCEDURES

Use water spray to cool fire-exposed containers and structures. Use remote spray monitors or fight fire from behind shields. Use water spray to disperse vapors; re-ignition is possible.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point.
When this material is exposed to extreme heat, as in a fire, it may decompose explosively, and can rupture a closed container.
Acetylene is capable of detonating with extreme force.

Acetylene should not be exposed to temperatures above 50°C.
Firefighters should not approach equipment containing acetylene if it is exposed to fire.
See Section 7.2 - Storage

5.7 HAZARDOUS COMBUSTION PRODUCTS

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Hydrogen. Carbon monoxide is highly toxic if inhaled. Carbon dioxide in sufficient concentrations can act as an asphyxiant.

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:
DANGER! Forms explosive mixtures with air. Immediately evacuate all personnel from danger area; isolate area and deny entry. Shut off ignition sources, no flares, smoking, or flames in the hazard area. Use spark-proof tools and explosion-proof equipment. Stop leak if you can do so without risk. Use water spray to reduce vapors; isolate area until gas has dispersed. Stay upwind; keep out of low areas. Ventilate area of leak or move container to well-ventilated area. Before entering area, especially confined areas, check atmosphere with appropriate device. Use self-contained breathing apparatus and firefighting clothing. Isolate for 1/2 mile in all directions if large quantities of flammable liquids are involved in a fire. Refer to DOT P-5800.5, 1990 Emergency Response Guidebook. See Section 5 - Firefighting Measures and Section 7.2 - Storage.

Personal Precautions: Use self-contained breathing apparatus and firefighting clothing. See Section 8.2 - Personal Protection.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling
Avoid pressure above 15 psig and temperatures above 50 degrees C.
Store and use with adequate ventilation.
Vapor forms from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point and may flash back explosively.
Do not breathe vapor.
Electrically bond and ground all containers, personnel and equipment before transfer or use of material.
Keep away from heat, sparks and flame.

Close valve after each use and when empty.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

Ventilation
This product must be confined within sealed equipment. If a leak develops in the system, ventilation may not be adequate to control hazards. Self-contained breathing apparatus may be necessary for personnel and explosion-proof equipment may be needed to prevent ignition.

7.2 STORAGE

Storage and Transfer: As a result of the well documented hazards involved in handling pure Acetylene, it has become standard practice to avoid pressures above 15 psig and temperatures above 50 degrees C. All equipment must be protected from ignition sources, especially fire exposure, by proper insulation and deluge systems. Pipe lines used for transferring acetylene should be designed to withstand detonation pressures, be insulated against fire exposure, and be provided with properly placed flame arresters. Ground all equipment. Only use spark-proof tools and explosion-proof equipment. (Avoid copper alloy wrenches.)

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin	Form
Acetylene	Simple asphyxiant ACGIH		
Ethane	Simple asphyxiant ACGIH		
Ethylene	Simple asphyxiant ACGIH		
Methane	Simple asphyxiant ACGIH		
Acetone	500 ppm TWA8 ACGIH		
	750 ppm STEL ACGIH		
	750 ppm TWA8 OSHA-Vacated		
	1000 ppm STEL OSHA-Vacated		
	1000 ppm TWA8 OSHA		
	2400 mg/m3 TWA8 OSHA		
Propane	1000 ppm TWA8 OSHA		
	2500 ppm TWA8 ACGIH		
Propene	Simple asphyxiant ACGIH		

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

8.2 PERSONAL PROTECTION

Respiratory Protection:	Select in accordance with 29CFR1910.134. Air purifying, supplied air or self-contained breathing apparatus recommended if personnel exposure exceeds exposure limits.
Ventilation:	This product must be confined within sealed equipment. If a leak develops in the system, ventilation may not be adequate to control hazards. Self-contained breathing apparatus may be necessary for personnel and explosion-proof equipment may be needed to prevent ignition.
Eye Protection:	Safety glasses or monogoggles
Protective Gloves:	Polyvinyl chloride coated
Other Protective Equipment:	Eye Bath, Safety Shower

8.3 ENGINEERING CONTROLS

No information available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Gas

Appearance: Transparent colorless

pH: **Not currently available.**

Solubility in Water (by weight): *20 °C* **0.12 %**

Odor: Garlic

Flash Point - Closed Cup: *Tag Closed Cup ASTM D 56* **-17.8 °C 0 °F**

Molecular Weight: **26.04 g/mol**

Boiling Point (760 mmHg): **-84.0 °C -119.2 °F** Sublimes

Freezing Point: *Triple point* **-81 °C -113.8 °F**

Specific Gravity (H2O = 1): *Not applicable.*

Vapor Pressure at 20°C: **4475 kPa 635 psig**

Vapor Density (air = 1): **0.90**

Evaporation Rate (Butyl Acetate = 1): *Not determined.*

Melting Point: *Not applicable.*

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Unstable

Conditions to Avoid: Stable as shipped. Relatively pure acetylene should not be handled above 15 psig and/or 50 degrees C. Relatively pure acetylene should never be cooled below -65 degrees C to prevent condensing or freezing. Avoid mechanical shock, ignition sources and open flame.

Incompatible Materials: Strong oxidizers, strong acids, and halogens. Acetylene will form acetylides with metals such as copper, silver, mercury or their alloys. These acetylide compounds are explosive and are very hazardous when dry. Known polymerization catalysts, including 13X molecular sieves.

10.2 HAZARDOUS POLYMERIZATION May occur.

Conditions to Avoid : Elevated temperature (above 50°C) and pressure (above 15 psig) and/or the presence of a catalyst.

10.3 INHIBITORS/STABILIZERS Not applicable.

11. TOXICOLOGICAL INFORMATION

None known from currently available information.

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Information may be available, call Union Carbide.

12.2 ECOTOXICITY

Information may be available, call Union Carbide.

12.3 FURTHER INFORMATION

None.

13. DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL METHOD

Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations. Dispose in accordance with all applicable Federal, State, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

13.2 DISPOSAL CONSIDERATIONS

See Section 13.1

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK
Proper Shipping Name : ACETYLENE, DISSOLVED
ID Number : UN1001
Hazard Class : 2.1

BULK
Proper Shipping Name : ACETYLENE, DISSOLVED
ID Number : UN 1001
Hazard Class : 2.1

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 SECTION 103 (CERCLA)

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting:

Component	CAS #	Amount
Acetone	67-64-1	<= 0.1000%

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 302 AND 304

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning:

None.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTION 313

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

This product does not contain toxic chemicals at levels which require reporting under the statute.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 311 AND 312

Delayed Hazard : Yes
Fire Hazard : Yes
Immediate Health Hazard : Yes
Reactive Hazard : No
Sudden Release of Pressure Hazard : Yes

CEPA - DOMESTIC SUBSTANCES LIST (DSL)

The components of this product are on the DSL or are exempt from reporting under the New Substances Notification Regulations.

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS)

The components of this product are on the EINECS inventory or are exempt from EINECS inventory requirements.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS:

Component	CAS #	Amount
Acetylene	74-86-2	<= 100.0000%

MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

Component	CAS #	Amount
Acetylene	74-86-2	<= 100.0000%

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1 LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)

VOC: Not determined.

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 AVAILABLE LITERATURE AND BROCHURES

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

16.2 SPECIFIC HAZARD RATING SYSTEM

HMIS ratings for this product are: H - 0 F - 4 R - 3

NFPA ratings for this product are: H - 0 F - 4 R - 3

These ratings are part of specific hazard communications program(s) and should be disregarded where individuals are not trained in the use of these hazard rating systems. You should be familiar with the hazard communication applicable to your workplace.

16.3 RECOMMENDED USES AND RESTRICTIONS

FOR INDUSTRY USE ONLY.

16.4 REVISION

Version: 5.
Revision: 10/12/2000
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

A	Asphyxiant
Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
HMIS	Hazardous Materials Information System
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
P	Peroxide Former
R	Reactivity
TS	Trade Secret

VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.

IDEAL INDUSTRIES, INC.

Flammability
Health 1 0 0 Reactivity
HMIS Rating

MATERIAL SAFETY DATA SHEET

GENERAL INFORMATION

PRODUCT NAME OR NUMBER (as it appears on label) Aqua-Gel® (Gel and Liquid) Wire Pulling Lubricant	CATALOG NUMBER All "31" Series
MANUFACTURER'S NAME Ideal Industries, Inc.	EMERGENCY TELEPHONE NO. (815) 895-5181
ADDRESS (Number, Street, City, State, Zip Code) Becker Place, Sycamore, IL 60178	
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101) None	
CHEMICAL DESCRIPTION Polymer-based Mixture	FORMULA Proprietary

SECTION I - INGREDIENTS

CAS REGISTRY NO.	%W	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(x) (specify)
7732-18-5	<90	Water	No
67-56-1	<10	Methanol (methyl alcohol)	No
Proprietary	<10	Aqueous Acrylic Emulsion	No
25322-68-3	<1	Polyether	No
1310-73-2	<1	Sodium Hydroxide (10-50%)	No
129-17-9	<1	Blue Pigment	No

SECTION II - PHYSICAL DATA

BOILING POINT 212 °F ___ °C	SPECIFIC GRAVITY (H_2O=1) 0.98	PERCENT VOLATILE BY VOLUME (%) <90
SOLUBILITY IN WATER Infinite	pH = 7.0 - 8.1	PERCENT SOLID BY WEIGHT (%) ~10
APPEARANCE AND ODOR Light blue gel, mild odor		IS MATERIAL: LIQUID GAS SOLID PASTE GEL POWDER

SECTION III - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None	method used C.O.C	FLAMMABLE LIMITS LEL None	LEL None
EXTINGUISHING MEDIA Dry chemical; Carbon dioxide; Foam; Water Fog			
SPECIAL FIRE FIGHTING PROCEDURES Self-contained respiratory protection should be provided for fire fighters. Keep fire-exposed containers cool with water.			
UNUSUAL FIRE AND EXPLOSION HAZARDS Heavy methanol vapors can travel to source of ignition and flash back.			

Some of the chemicals contained in this form are on continued hazardous under the Federal Hazards Communication Standard 29 CFR 1910.1200

Aqua-Gel® (Gel or Liquid) Wire Pulling Lubricant

SECTION IV - HEALTH HAZARD INFORMATION

EFFECTS OF OVEREXPOSURE - Conditions to Avoid: Mild eye and skin irritation may develop upon prolonged contact. Dizziness, nausea, headaches are signs or exposure to methanol fumes.

THRESHOLD LIMIT VALUE: Methanol fume: 200 ppm; Sodium Hydroxide: 2mg/m³

PRIMARY ROUTES OF ENTRY: Inhalation ☒ Skin Contact ☒ Other (specify)

EMERGENCY FIRST AID PROCEDURES
SKIN CONTACT: Wash with soap and water for 15 minutes.
EYE CONTACT: Flush with water for 15 minutes. Inhalation- Move to fresh air.
INGESTION: Administer water or milk. Consult physician or local poison control center.

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Do not expose material to temperatures
	STABLE	X	exceeding 125 F.

INCOMPATIBILITY (materials to avoid): Avoid strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of carbon.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: None
	WILL NOT OCCUR	X	

SECTION VI - SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Wipe up, shovel or vacuum spilled material. Clean up spills immediately as they can be dangerously slippery.

WASTE DISPOSAL METHOD: Comply with Federal, state and local regulations for solid landfill.

CERCLA (Superfund) REPORTABLE QUANTITY (in lbs): N/A

RCRA HAZARDOUS WASTE NO. (40CFR §61.33): N/A

VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water): N/A

☐ Theoretical ____ lb/gal: N/A ☐ Analytical ____ lb/gal: N/A

SECTION VII - PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): If TLV exceeded, use NIOSH respirator.

VENTILATION	LOCAL EXHAUST (Specify Rate): May be necessary to maintain TLV	SPECIAL	None
	MECHANICAL (General) (Specify Rate): Recommended in closed areas.	OTHER	None

PROTECTIVE GLOVES (specify type): Neoprene

EYE PROTECTION (specify type): Safety glasses or splash goggles.

OTHER PROTECTIVE EQUIPMENT: Eye fountain in work area is recommended.

SECTION VIII - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store at temperatures between 25 - 125 F.

OTHER PRECAUTIONS: Keep away from children, infants and pets.

SECTION IX - ADDITIONAL INFORMATION

Methanol is considered hazardous because of flash point and toxicological data under Federal Hazard Communications Standard 29 CFR (1910.1200). Sodium Hydroxide is hazardous because its corrosive and toxic characteristics.

N/A = Not Applicable, N.E. = None Established

THIS MATERIAL SAFETY DATA SHEET PREPARED BY:

Name	Ronald Petersen	SIGNATURE: Ronald Petersen
Title	Senior Product Development Chemist	
Date	09/15/94	

Arctic Low Pour Hydraulic Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Arctic Low Pour Hydraulic Oil
MSDS Code:	720760
Intended Use:	Hydraulic Oil
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Clear light yellow
Physical Form: Liquid
Odor: Characteristic 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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). 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: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Lubricant Base Oil (Petroleum)	VARIOUS	> 82
Additives	PROPRIETARY	<18

4. FIRST AID MEASURES

Eye: If irritation or redness develops from exposure, flush eyes with clean water. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. Seek medical attention. If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: 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. Seek immediate medical attention.

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

Notes to Physician: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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. Vapors are heavier than air and can accumulate in low areas.

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

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.

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.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Immediate cleanup of any spill is recommended. Notify fire authorities and appropriate federal, state, and local agencies. 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practices.

"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.

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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	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.

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

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

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of gloves impervious to the specific material handled, such as nitrile, is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

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 light yellow
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1
Vapor Density (air=1):	>1
Boiling Point/Range:	400204
Melting/Freezing Point:	<-58°F / <-50°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.87 @ 60°F (15.6°C)
Bulk Density:	7.3 lbs/gal
Viscosity:	5.5 cSt @ 100°C; 15 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>203°F / >95°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
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 storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents, strong acids and strong bases.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and/or dewaxing to remove aromatics and improve performance characteristics. They contain low concentrations of PAH's and none have been identified as a carcinogen by NTP, IARC or OSHA.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No Data

12. ECOLOGICAL INFORMATION

Lubricant oil basestocks are complex mixtures of hydrocarbons (primarily branched chain alkanes and cycloalkanes) ranging in carbon number from C15 to C50. The aromatic hydrocarbon content of these mixtures varies with the severity of the refining process. White oils have negligible levels of aromatic hydrocarbons, whereas significant proportions are found in unrefined basestocks. Olefins are found only at very low concentrations. Volatilization is not significant after release of lubricating oil basestocks to the environment due to the very low vapor pressure of the hydrocarbon constituents. In water, lubricating oil basestocks will float and will spread at a rate that is viscosity dependent. Water solubilities are very low and dispersion occurs mainly from water movement with adsorption by sediment being the major fate process. In soil, lubricating oil basestocks show little mobility and adsorption is the predominant physical process.

Both acute and chronic ecotoxicity studies have been conducted on lubricant base oils. Results indicate that the acute aquatic toxicities to fish, Daphnia, Ceriodaphnia and algal species are above 1000 mg/l using either water accommodated fractions or oil in water dispersions. Since lubricant base oils mainly contain hydrocarbons having carbon numbers in the range C15 to C50, it is predicted that acute toxicity would not be observed with these substances due to low water solubility. Results from chronic toxicity tests show that the no observed effect level (NOEL) usually exceeds 1000 mg/l for lubricant base oils with the overall weight of experimental evidence leading to the conclusion that lubricant base oils do not cause chronic toxicity to fish and invertebrates.

Large volumes spills of lubricant base oils into water will produce a layer of undissolved oil on the water surface that will cause direct physical fouling of organisms and may interfere with surface air exchange resulting in lower levels of dissolved oxygen. Petroleum products have also been associated with causing taint in fish even when the latter are caught in lightly contaminated environments. Highly refined base oils sprayed onto the surface of eggs will result in a failure to hatch.

Extensive experience from laboratory and field trials in a wide range of crops has confirmed that little or no damage is produced as a result of either aerosol exposure or direct application of oil emulsion to the leaves of crop plants. Base oils incorporated into soil have resulted in little or no adverse effects on seed germination and plant growth at contamination rates up to 4%.

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: Federal compliance requirements may apply. See 49 CFR 171.12.

14. TRANSPORTATION INFORMATION

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

UN/ID #: Not regulated
Note: Federal compliance requirements may apply. See 49 CFR 171.11.

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

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 CPR.

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 listed on the Canadian DSL.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date: 22-May-2007
Status: Final
Revised Sections or Basis for Revision: NFPA ratings (Section 2)
Regulatory information (Section 15)
MSDS Code: 720760

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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
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)

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.
ARDEX FEATHER FINISH – WHITE	

Section I

Manufacturer's Name ARDEX ENGINEERED CEMENTS	Emergency Telephone Number (800) 255-3924
Address *(Number, Street, City, State and Zip Code)* 400 Ardex Park Drive Aliquippa, PA 15001 U.S.A.	Telephone Number for Information (724) 857-6400
	Date Prepared 01/8/2001
	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)*
40% MAX PORTLAND CEMENT	65997-15-1	10MG/M^3	10MG/M^3		
45% MAX LIMESTONE	1317-65-3	N/A	30 MPPCF		
20% MAX VINYL ACETATE COPOLYMER	24937-78-8	10MG/M^3	10 MG/M^3		

Section III – Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	1.2
Vapor Pressure (mm Hg)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water
LESS THAN 50 G/1000 CM^3

Appearance and Odor
FINE WHITE POWDER - ODORLESS

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
NON-FLAMMABLE	N/A	N/A	N/A

Extinguishing Media
WILL NOT BURN

Special Fire Fighting Procedures
NONE

Unusual Fire and Explosion Hazards
NONE

(Reproduce Locally)

OSHA 174, July 2006

Section V – Reactivity Data

Stability			
	Unstable	☐	Conditions to Avoid
	Stable	☒	NONE

Incompatibility *(Materials to Avoid)*
NONE

Hazardous Decomposition or Byproducts
NONE

Hazardous Polymerization			
	May Occur	☐	Conditions to Avoid
	Will Not Occur	☒	NONE

Section VI – Health Hazard Data

Route(s) of Entry	Inhalation?	Skin?	Ingestion?
	YES	YES	YES

Health Hazards *(Acute and Chronic)*
EXCESSIVE OR LONG-TERM INHALATION MAY CAUSE IRRITATION TO NOSE, THROAT AND RESPIRATORY PASSAGES.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	No	No	No

Signs and Symptoms of Exposure
EXPOSURE TO SKIN OR EYES MAY CAUSE RASH OR IRRITATION. INHALATION MAY CAUSE COUGH, SHORTNESS OF BREATH, WHEEZING AND REDUCED PULMONARY FUNCTION.

Medical Conditions Generally Aggravated by Exposure
ALLERGIES TO PORTLAND CEMENT, OR INDIVIDUALS WITH RESPIRATORY DISEASE OR SUBJECT TO EYE IRRITATION.

Emergency First Aid Procedures: SEEK MEDICAL ATTENTION. INHALATION MAY RESULT IN RESPIRATORY IRRITATION - REMOVE TO FRESH AIR. SKIN WASH WITH SOAP AND WATER. EYES - FLUSH WITH WATER. INGESTION - DILUTE WITH WATER.

Section VII – Precautions for Safe Handling and Use

Steps to Be Taken In Case Material is Released or Spilled
COLLECT USING DUSTLESS METHOD (HEPA VACUUM OR WET METHOD). WHERE APPROPRIATE – PROTECTIVE EQUIPMENT – COLLECT FOR DISPOSAL.

Waste Disposal Method
DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE/PROVINCIAL AND FEDERAL REGULATIONS.

Precautions to Be Taken in Handling and Storing
NONE. STORE IN A COOL, DRY AREA. USE NORMAL PRECAUTIONS AGAINST BAG BREAKAGE. USE GOOD HOUSEKEEPING TO PREVENT DUST ACCUMULATION.

Other Precautions
DO NOT BREATHE DUST.

Section VIII – Control Measures

Respiratory Protection *(Specify Type)*
WEAR A NIOSH/MSHA APPROVED RESPIRATOR.

Ventilation	Local Exhaust	Special
	TO CONTROL TO RECOMMENDED P.E.L.	N/A
	Mechanical *(General)*	Other
	N/A	N/A

Protective Gloves	Eye Protection
RECOMMENDED	RECOMMENDED

Other Protective Clothing or Equipment
AS APPROPRIATE FOR WORK ENVIRONMENT. COVERALLS, APRON AND BOOTS TO PREVENT CONTACT.

Work/Hygienic Practices
DUSTY CLOTHING SHOULD BE LAUNDERED BEFORE REUSE. WHEN FINISHED SHOWER WITH SOAP AND WATER TO REMOVE DUST.

DATE PRINTED: 05/15/03

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: AW Hydraulic Oil ISO-32
STOCK NUMBER: BO510
Enerpac Product Name: Enerpac HF Hydraulic Oil
Enerpac Part No.: CM40885

Supplier Information:
Moraine Liquid Technologies, Ltd.
1212 W. Second Street
Oconomowoc, WI 53066

Manufacturers Information:
Moraine Liquid Technologies, Ltd.
1212 W. Second Street
Oconomowoc, WI 53066

Emergency Telephone: 1 800 851 0403

Prepared by: Steven Zimmerman Phone: 262 567 7523 Prepare Date: 3/2002

NFPA CODE: HEALTH: 1 FIRE: 1 REACTIVITY: 0

CHEMICAL IDENTITY: Lubricating Oil, Petroleum, Hydrotreated Paraffinic CAS #64742-58-1 99%.

The remainder of the ingredients are additive. Each individual additive is not present in concentrations that would exceed an established OSHA Permissible Exposure Limit or ACGIH Threshold Limit Value or present at concentrations that present a health risk.

SECTION 1 -- HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS: This material does not contain any chemical listed as a carcinogen or potential carcinogen by OSHA, IARC Monographs or National Toxicology Program.

SECTION 2 -- FIRE AND EXPLOSION HAZARDS

FLASH POINT: 376 degrees F LOWER & UPPER FLAMMABLE LIMIT: N/A

EXTINGUISHING MEDIA: CO2, dry chemical, foam, water spray; water fog.
FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus with a full-face piece. Avoid breathing fumes.
UNUSUAL FIRE & EXPLOSION HAZARDS: Toxic fumes may be evolved on burning or exposure to heat. Pressure may increase in overheat closed containers. Not sensitive to mechanical impact or static discharge.

SECTION 3 -- HEALTH HAZARD DATA

ORAL TOXICITY: Greater than 5000 mg/kg in rats. Based on data from components.
EYE IRRITATION: Not expected to cause eye irritation. Based on data from components.
SKIN IRRITATION: Not expected to cause skin irritation. Based on data from components.
TLV: None established. Oil mist = 5 mg/cu meter.

****EMERGENCY FIRST AID PROCEDURES****
AW Hydraulic Oils

SKIN: Wash skin thoroughly with soap and water. Get medical attention if irritation develops. Launder contaminated clothing before reuse. If product is injected under pressure into or under the skin; or into any part of the body; regardless of the appearance of the wound or its size, a physician should immediately evaluate the individual.
EYES: Flush eyes with plenty of water for 15 minutes. Get medical attention if eye irritation develops or persists.
INHALATION: Remove to fresh air. Get medical attention if breathing difficulty persists.
ORAL: Call a physician. Do NOT induce vomiting. Never give anything to an unconscious person by mouth.

SECTION 4 – SPECIAL PROTECTION INFORMATION

VENTILATION PROCEDURE: Mechanical ventilation recommended.
EYE PROTECTION: Safety glasses recommended.
GLOVES PROTECTION: Neoprene or Nitrile rubber gloves recommended.
RESPIRATORY: Normally not required. Mask or respiratory for mists.
HYGIENE: Use good personal hygiene. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco products. Clean contaminated clothing, shoes and protective equipment before reuse.

SECTION 5 -- PHYSICAL DATA

VAPOR PRESSURE: Less than 0.01 mm Hg @ 20 degrees C
SPECIFIC GRAVITY: .875 approx. (water=1)
DENSITY: 7.3 LB/Gal.
PERCENT VOLATILE: Negligible
EVAPORATION RATE: Not Available
APPEARANCE: Blue liquid
pH: Not applicable
WATER SOLUBILITY: Insoluble
VAPOR DENSITY: Not available
ODOR: Mild Petroleum, oil.

SECTION 6 – STABILITY

STABILITY: Stable
INCOMPATIBILITY: Avoid oxidizing agents.
POLYMERIZATION: Will not occur.
THERMAL DECOMPOSITION: Oxides of carbon.

SECTION 7 – SPILL OR LEAK PROCEDURES

SPILL PROCEDURES: Prevent entry into sewers and waterways. Pick up free liquid for recycle/disposal. Absorb small amounts of inert material for disposal.

WASTE DISPOSAL: Disposal should be in compliance with current federal, state, and local laws. Materials may become hazardous waste through use. Consider recycling.

SECTION 8 -- TRANSPORTATION AND LABELING

AW Hydraulic Oils

DOT SHIPPING: Not Regulated
DOT ID NUMBER: None
EPA HAZARDOUS SUBSTANCES: None
PRECAUTIONARY LABELS: In compliance with hazard and right-to-know requirements where applicable.
DOT HAZARD CLASS: Not Regulated

SECTION 9 -- SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS: Keep containers closed when not in use. Do not handle or store near high heat or flames. Avoid breathing oil mists, wash skin thoroughly with soap and water after handling.

The information presented herein has been compiled from sources considered to be dependable and is accurate to the best of Moraine Liquid Technologies, LTD knowledge; however, Moraine Liquid Technologies, LTD makes no warranty whatsoever, expressed or implied, of MERCHANTIBILITY or FITNESS FOR THE PARTICULAR PURPOSE, regarding the accuracy of such data or the results to be obtained from the use thereof. Moraine Liquid Technologies, Ltd assumes no responsibility for the injury to recipient or to third persons or for any damage to any property & recipient assumes all such risks.

Cargill™

Biodiesel
Material Safety Data Sheet

1. CHEMICAL PRODUCT

General Product Name:	Biodiesel
Synonyms:	Soy Methyl Ester (SME), Methyl Soyate, Rapeseed Methyl Ester (RME), Methyl Tallowate
Product Description:	Methyl esters from lipid sources
CAS Number:	Methyl Soyate: 67784-80-9; RME: 73891-99-3; Methyl Tallowate: 61788-71-2

2. COMPOSITION / INFORMATION ON INGREDIENTS

This product contains no hazardous materials.

3. HAZARDS IDENTIFICATION

Potential Health Effects:

EYE CONTACT:	May cause irritation. Irrigate eye with water for at least 15 to 20 minutes. Seek medical attention if symptoms persist.
SKIN CONTACT:	Prolonged or repeated contact is not likely to cause significant skin irritation. Material is sometimes encountered at elevated temperatures. Thermal burns are possible.
INHALATION:	Negligible unless heated to produce vapors. Vapors or finely misted materials may irritate the mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.
INGESTION:	No hazards anticipated from ingestion incidental to industrial exposure.

4. FIRST AID MEASURES

EYE CONTACT:	Irrigate eyes with a heavy stream of water for at least 15 to 20 minutes.
SKIN CONTACT:	Wash exposed areas of the body with soap and water.
INHALATION:	Remove from area of exposure, seek medical attention if symptoms persist.
INGESTION:	Give one or two glasses of water to drink. If gastro-intestinal symptoms develop, consult medical personnel. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point (Method Used):	130.0 C min (ASTM 93)
Flammability Limits:	None known
EXTINGUISHING MEDIA:	Dry chemical, foam, halon, CO_2 water spray (fog). Water stream may splash the burning liquid and spread fire.
SPECIAL FIRE FIGHTING PROCEDURES:	Treat as oil fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Oil soaked rags can cause spontaneous combustion if not handled properly. Before disposal, wash rags with soap and water and dry in well ventilated area. Firefighters should use self-contained breathing apparatus to avoid exposure to smoke and vapor.

6. ACCIDENTAL RELEASE MEASURES SPILL CLEAN-UP PROCEDURES

Remove sources of ignition, contain spill to smallest area possible. Stop leak if possible. Pick up small spills with absorbent materials such as paper towels, "Oil Dry", sand or dirt. Recover large spills for salvage or disposal. Wash hard surfaces with safety solvent or detergent to remove remaining oil film. Greasy nature will result in a slippery surface.

7. HANDLING AND STORAGE

Store in closed containers between 50°F and 120°F.

Keep away from oxidizing agents, excessive heat, and ignition sources.

Store and use in well ventilated areas.

Do not store or use near heat, spark, or flame, store out of sun.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

RESPIRATORY PROTECTION:	If vapors or mists are generated, wear a NIOSH approved organic vapor/mist respirator.
PROTECTIVE CLOTHING:	Safety glasses, goggles, or face shield recommended to protect eyes from mists or splashing. PVC coated gloves recommended to prevent skin contact.
OTHER PROTECTIVE MEASURES:	Employees must practice good personal hygiene, washing exposed areas of skin several times daily and laundering contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	pale yellow liquid	**Density:**	860 - 900 kg/m^3, 15 C—>
Odor:	mild odor	**Volatiles, % by Volume:**	<2
Boiling Point, 760 mm Hg:	>200 C	**Solubility**	
Melting Point:	<<-13	In H_2O: % by Volume:	Insoluble
Flash Point:	130 C (ASTM 93)	**Viscosity:**	3.5 - 5.0 mm2/s (40 C)
Vapor Pressure, mm Hg:	<2	**Evaporation Rate, Butyl Acetate = 1:**	<1
Vapor Density, Air = 1:	>1		

10. STABILITY AND REACTIVITY

GENERAL:	This product is stable and hazardous polymerization will not occur.
INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:	Strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS:	Combustion produces carbon monoxide, carbon dioxide along with thick smoke.

11. ECOLOGY

GENERAL:	This product is biodegradable.
ACUTE FISH TOXICITY:	LC_{50} > 100 mg RME / L
BACTERIA TOXICITY:	EC_{50} > 100 mg RME / L
IN PURIFICATION:	Consider water limit values.

12. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Waste may be disposed of by a licensed waste disposal company. Contaminated absorbent material may be disposed of in an approved landfill. Follow local, state and federal disposal regulations.

13. TRANSPORT INFORMATION

UN HAZARD CLASS: N/A

PROPER SHIPPING NAME: Fatty acid ester

NMFC (National Motor Freight Classification): IDENTIFICATION NUMBER: 144920

SHIPPING CLASSIFICATION: 85

14. REGULATORY INFORMATION:

OSHA STATUS: This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Sections 2 and 3.

TSCA STATUS: This product is listed on TSCA.

CERCLA (Comprehensive Response Compensation and Liability Act): NOT reportable.

SARA TITLE III (Superfund Amendments and Reauthorization Act):

Section 312 Extremely Hazardous Substances:	None
Section 311/312 Hazard Categories:	None
Section 313 Toxic Chemicals:	None

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste, (40 CFR 261.20-24).

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986. This product contains no chemicals known to the state of California to cause cancer.

16. OTHER INFORMATION:

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. Such information is to the best of the company's knowledge and believed accurate and reliable as of the date indicated. However, no representation, warranty or guarantee of any kind, express or implied, is made as to its accuracy, reliability or completeness and we assume no responsibility for any loss, damage or expense, direct or consequential, arising out of use. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

MATERIAL SAFETY DATA SHEET:BP 800

DATE OF ISSUE: 03/25/2003 **SUPERCEDES:** 12/30/2002

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms:
N/A

Trade Name & Synonyms:
BP 800

Chemical Family:
AQUEOUS CAUSTIC SOLUTION

Formula Mixture: X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:	Product Code Number	Emergency Phone Number
C Williamson/Chemist	0224	800-424-9300

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
SODIUM HYDROXIDE	CORROSIVE	2 MG/M3$ 1	2 MG/M3$ 2	2 MG/M3$ 1	1310-73-2
$ CEILING LIMIT					

SECTION III - PHYSICAL DATA

Boiling Point (f):	291-293°	**Specific Gravity (H20=1):**	1.53
Vapor Pressure (MM HG):	13	**Color:**	COLORLESS
Vapor Density (Air=1):	0.6	**Odor:**	ODORLESS
PH @ 100% :	14	**Clarity**	TRANSPARENT
% Volatile by Volume:	45-55	**Evaporation Rate (BU A/C=1):**	0.31
H20 Solubility:	COMPLETE	**Viscosity:**	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point:	Flammable Limits:	LEL:	UEL:
NON-FLAM / N/E	HYDROGEN GAS	4%	75%

Extinguishing Media:

Foam:X Alcohol Foam:X CO2:X Dry Chemical:X Water Spray:X Other:

Special Fire Fighting Procedures:

FIREFIGHTERS SHOULD WEAR A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. EXTINGUISHING MEDIA SHOULD BE CHOSEN BASED ON THE NATURE OF THE SURROUNDING FIRE. COOL FIRE-EXPOSED CONTAINERS WITH WATER SPRAY TO PREVENT BURSTING.

Unusual Fire and Explosion Hazards:

PROLONGED CONTACT WITH REACTIVE METALS, SUCH AS ALUMINUM, BRASS, BRONZE, CHROMIUM, MAGNESIUM, TIN, ZINC AND ALLOYS, CAN CAUSE THE FORMATION OF FLAMMABLE HYDROGEN GAS WHICH CAN FORM AN EXPLOSIVE MIXTURE WITH AIR.

NFPA Hazard Rating: **(0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)**

Health:3 Flammability:0 Instability:2 Special:

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
2 MG/M3 AS CEILING LIMIT 1.

Effects of Overexposure:

-Acute(Short Term Exposure)

SKIN CONTACT: CORROSIVE. CAUSES DEEP ULCERATIONS, SCARRING AND BURNS THAT ARE NOT IMMEDIATELY NOTICED OR PAINFUL. TEMPORARY HAIR LOSS MAY OCCUR AT BURN SITE. THE SEVERITY OF THESE EFFECTS DEPEND ON CONCENTRATION AND HOW SOON AFTER EXPOSURE THE AREA IS WASHED. EYE CONTACT: CORROSIVE. CAUSES BURNS, CORNEAL DAMAGE AND POSSIBLE BLINDNESS. INGESTION: CORROSIVE. CAUSES BURNS TO THE LIPS, MOUTH, THROAT, ESOPHAGUS AND STOMACH WITH NAUSEA AND PAIN. SYMPTOMS MAY INCLUDE VOMITING OF BLOOD. BLOOD LOSS THROUGH DAMAGED TISSUE CAN LEAD TO LOW BLOOD PRESSURE, SHOCK AND MAY BE FATAL. INHALATION: CAUSES BURNS TO THE RESPIRATORY TRACT, NOSE, MOUTH AND THROAT, WITH DISCOMFORT, NASAL DISCHARGE, SNEEZING, COUGHING AND CHEST PAIN. INHALATION OF MIST OR VAPORS FROM HEATED PRODUCT MAY CAUSE CHEMICAL PNEUMONITIS WHICH CAN CAUSE DAMAGE AND MAY BE FATAL.

-Chronic (Long Term Exposure)

CHRONIC SKIN CONTACT MAY PROMOTE DERMATITIS. CHRONIC INHALATION CONTACT MAY CAUSE ULCERATION OF THE NASAL PASSAGES. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA AND DERMATITIS. TARGET ORGANS: NONE KNOWN. THERE IS NO PRIMARY ROUTE OF ENTRY INTO THE BODY. THE PRIMARY ROUTES OF EXPOSURE ARE SKIN AND EYE CONTACT.

Primary Routes of Entry: Inhalation: Ingestion: Absorption:

Emergency and First Aid Procedures:

-Inhalation:

REMOVE FROM THE AREA TO FRESH AIR. IF NOT BREATHING, CLEAR THE AIRWAY AND START MOUTH TO MOUTH ARTIFICIAL RESPIRATION. GET IMMEDIATE MEDICAL ATTENTION.

-Eye Contact:

IMMEDIATELY RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING FOR AT LEAST 15 MINUTES. HOLD THE EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYES AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

-Skin Contact:

WASH AFFECTED AREAS WITH LARGE AMOUNTS OF SOAP AND WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET IMMEDIATE MEDICAL ATTENTION. WASH CLOTHING AND CLEAN SHOES BEFORE REUSE.

-Ingestion:

GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-Notes to Physician:

PROBABLE MUCOSAL DAMAGE MAY CONTRAINDICATE THE USE OF GASTRIC LAVAGE.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:

IARC: No **NTP:** No **OSHA:** No **ACGIH:** No **OTHER:** No

VOC CONTENT: 0% BY WEIGHT; 0% BY VOLUME; 0 G/L

SODIUM HYDROXIDE
ORL MSE LD50: 40 MG/KG 3.
ORL RBT LDLo: 500 MG/KG 3.
SKN RBT TCLo: 25 PPH 3.
SKN RBT SDT: 500 MG/24H SEVERE 3.
EYE RBT SDT: 1 MG/24H SEVERE 3.

SECTION VII - REACTIVITY DATA

Stability: Stable:X Unstable:

Conditions to Avoid: NONE KNOWN.

Incompatibility (Materials to Avoid):

ACETALDEHYDE, ACIDS, ACROLEIN, CHLORINATED OR FLUORINATED HYDROCARBONS, CHLORINE TRIFLUORIDE, HYDROQUINONE, LEATHER, MALEIC ANHYDRIDE, ORGANIC HALOGEN OR NITRO COMPOUNDS, PHOSPHOROUS PENTOXIDE, TETRAHYDROFURAN, WATER AND WOOL. PROLONGED CONTACT WITH REACTIVE METALS, SUCH AS ALUMINUM, BRASS, BRONZE, CHROMIUM, MAGNESIUM, TIN, ZINC, AND ALLOYS, CAN CAUSE THE FORMATION OF FLAMMABLE HYDROGEN GAS WHICH CAN FORM AN EXPLOSIVE MIXTURE WITH AIR.

HAZARDOUS CARBON MONOXIDE GAS CAN FORM UPON CONTACT WITH REDUCING SUGARS, FOOD AND BEVERAGE PRODUCTS.

Hazardous Decomposition Products:

HYDROGEN GAS.

Hazardous Polymerization: May Occur: Will Not Occur:X

Conditions to Avoid: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be Taken If Material is Released or Spilled:

WEAR APPROPRIATE PROTECTIVE CLOTHING. USE CARE AS SPILLS MAY BE SLIPPERY. DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. FLUSH AREA WITH WATER.

Waste Disposal Method(s):

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Neutralizing Agent:

USE DILUTE ACIDS SUCH AS HYDROCHLORIC ACID OR VINEGAR. ADD CAUTIOUSLY WHILE MIXING. WEAR APPROPRIATE PROTECTIVE CLOTHING.

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:

LOCAL VENTILATION IS RECOMMENDED TO CONTROL EXPOSURE FROM OPERATIONS THAT CAN GENERATE EXCESSIVE LEVELS OF MISTS. LOCAL VENTILATION IS PREFERRED, BECAUSE IT PREVENTS DISPERSION INTO WORK AREAS BY CONTROLLING IT AT ITS SOURCE.

Respiratory Protection:

RESPIRATORS SHOULD BE SELECTED BY AND USED UNDER THE DIRECTION OF A TRAINED HEALTH AND SAFETY PROFESSIONAL FOLLOWING REQUIREMENTS FOUND IN OSHA'S RESPIRATOR STANDARD (29 CFR 1910.134) AND ANSI'S STANDARD FOR RESPIRATORY PROTECTION (Z88.2-1992). FOR CONCENTRATIONS ABOVE THE TLV AND/OR PEL BUT LESS THAN 10 TIMES THESE LIMITS, A NIOSH APPROVED HALF-FACEPIECE RESPIRATOR EQUIPPED WITH APPROPRIATE CHEMICAL CARTRIDGES MAY BE USED. FOR CONCENTRATIONS GREATER THAN 10 TIMES THE TLV AND/OR PEL, CONSULT THE NIOSH RESPIRATOR DECISION LOGIC FOUND IN PUBLICATION NO. 87-116 OR ANSI Z88.2-1992.

Glove Protection:

NEOPRENE OR NITRILE RUBBER GLOVES SHOULD BE WORN. ENSURE COMPLIANCE WITH OSHA'S PERSONAL PROTECTIVE EQUIPMENT (PPE) STANDARD FOR HAND PROTECTION, 29 CFR 1910.138.

Eye Protection:

CHEMICAL GOGGLES AND A FACE SHIELD SHOULD BE WORN. ENSURE COMPLIANCE WITH OSHA'S PERSONAL PROTECTIVE EQUIPMENT (PPE) STANDARD FOR EYE AND FACE PROTECTION, 29 CFR 1910.133.

Other Protection:

WEAR PROTECTIVE CLOTHING WHEN HANDLING. A SAFETY SHOWER AND AN EYEWASH STATION SHOULD BE AVAILABLE.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors:X Outdoors: Heated: Refrigerated:

Minimum Temperature:35°F Maximum Temperature:120°F

Precautions to be taken in Handling and Storing:

ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. ALUMINUM EQUIPMENT SHOULD NOT BE USED FOR STORAGE OR TRANSFER. WHEN DILUTING WITH WATER, SLOWLY ADD CAUSTIC SOLUTION TO THE WATER. DO NOT ADD WATER TO CAUSTIC SOLUTION SINCE EXCESSIVE HEAT FORMATION WILL CAUSE BOILING AND SPATTERING. EMPTY CONTAINERS MAY CONTAIN PRODUCT RESIDUES WHICH MAY EXHIBIT THE HAZARDS OF THE PRODUCT. KEEP FROM FREEZING. IF PRODUCT FREEZES ALLOW IT TO SLOWLY WARM TO ROOM TEMPERATURE AND STIR THOROUGHLY BEFORE USING.

Other Precautions:

KEEP OUT OF REACH OF CHILDREN. READ THE ENTIRE LABEL BEFORE USING THE PRODUCT. FOLLOW THE LABEL DIRECTIONS.

SECTION XI - REGULATORY INFORMATION

Chemical Name	CAS Number	Upper % Limit

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. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 2002.
2. OSHA PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFOWeb, 2003.
ALL THE COMPONENTS OF THIS PRODUCT ARE IN COMPLIANCE WITH THE TOXIC SUBSTANCES CONTROL ACT (TSCA) AND ARE EITHER LISTED ON THE TSCA INVENTORY OR OTHERWISE EXEMPTED FROM LISTING. ----------IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TCC:TAGLIABUE CLOSED CUP, LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LIMIT, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD, MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOS:PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED, SDT:STANDARD DRAIZE TEST, ORL:ORAL, IHL:INHALATION, HMN:HUMAN

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.

CHEMAQUA, INC 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."

FILE NO.:
MSDS DATE: / /

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Buffer Solution, pH 7.0
SYNONYMS:	Buffer Solution, pH 7.0
PRODUCT CODES:	B1630
MANUFACTURER:	ChemProducts, Inc.
ADDRESS:	6310 SW Virginia Avenue Portland OR 97201
CHEMTREC PHONE:	800-424-9300
CHEMICAL NAME:	Buffer Solution, pH 7.0
CHEMICAL FAMILY:	Inorganic Solution
CHEMICAL FORMULA:	Water solution, (99+% H<2>O)
REVISION DATE:	1Jan96

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS#	APPR. %
Potassium Phosphate	7778-77-0	0-1%
Sodium Phosphate	7558-79-4	0-1%
Water	7732-18-5	99+%

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Handling care generally in keeping with safe laboratory practices is recommended.

APPEARANCE: Clear, odorless, colorless or yellow liquid.

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC):

SYMPTOMS OF EXPOSURE: May irritate eyes on contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Data not available.

ROUTES OF ENTRY: Inhalation, ingestion.

CARCINOGENICITY: The material is not listed (IARC, NTP, OSHA) as cancer causing agent.

SECTION 4: FIRST AID MEASURES

EMERGENCY FIRST AID: GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.

SKIN: Wash thoroughly with soap and water.

EYES: Immediately flush thoroughly with water for at least 15 minutes.

INHALATION: Remove to fresh air; give artificial respiration if breathing has stopped.

INGESTION: Get immediate medical attention; if conscious, give water freely.

06/12/2003 10:46 5032460360 5032460360 PAGE 01/04

FILE NO.:
MSDS DATE: / /

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT:	Noncombustible.			
FLAMMABLE LIMITS:	**LEL:**	N/A	**UEL:**	N/A
EXTINGUISHING MEDIA:	Use any suitable for adjacent material.			
FIRE FIGHTING PROCEDURES:	None indicated.			
FIRE & EXPLOSION HAZARDS:	None indicated.			

SECTION 6: ACCIDENTAL RELEASE MEASURES

SPILL RESPONSE:

Evacuate the area of all unnecessary personnel.
Wear suitable protective equipment listed under Exposure / Personal Protection.
Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards.
Contain the release and eliminate its source, if this can be done without risk.
Take up and containerize for proper disposal as described under Disposal.
Comply with Federal, State and local regulations on reporting releases. Refer to Regulatory Information for reportable quantity and other regulatory data.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE:

Store at controlled room temperature.
Do not get in eyes.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION AND RESPIRATORY PROTECTION:	Material should be handled or transferred in an approved fume hood or with adequate ventilation.
PROTECTIVE CLOTHING:	Protective gloves (Natural rubber, Neoprene, PVC or equivalent) should be worn to prevent skin contact.
EYE PROTECTION:	Safety glasses with side shields should be worn at all times.
WORK / HYGENIC PRACTICES:	Wash thoroughly after handling. Do not take internally. *Eye wash and safety equipment should be readily available.*

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT (C 760 mmHg):	100°C.
MELTING POINT (C):	N/A
SPECIFIC GRAVITY (H20 = 1):	1.000
VAPOR PRESSURE (mm Hg):	N/A
PERCENT VOLATILE BY VOL (%):	99+%
VAPOR DENSITY (AIR = 1):	N/A
EVAPORATION RATE (BuAc = 1):	N/A

06/12/2003 10:46 5032460360 PAGE 02/04

SOLUBILITY IN WATER (%):	Soluble.
APPEARANCE:	Clear, odorless, colorless or yellow liquid.

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable.
HAZARDOUS POLYMERIZATION:	Does not occur.
HAZARDOUS DECOMPOSITION:	None.
CONDITIONS TO AVOID:	None indicated.
MATERIALS TO AVOID:	None.

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICITY DATA:	None established.
TOXICOLOGICAL FINDINGS:	None.

Cited in Registry of Toxic Effects of Chemical Substances (RTECS)

SECTION 12: DISPOSAL CONSIDERATIONS

EPA WASTE NUMBERS:

TREATMENT: Material does not have an EPA Waste number and is not a listed waste, however consultation with a permitted waste disposal site (TSD) should be accomplished.

ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION 13: TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: Non-regulated.

SECTION 14: REGULATORY INFORMATION

TSCA INVENTORY: This product is a "Mixture". The CAS numbers of all components are listed on the TSCA Inventory.

SECTION 15: OTHER INFORMATION

COMMENTS: None.

NFPA HAZARD RATINGS:

HEALTH:	0
FLAMMABILITY:	0
REACTIVITY:	0

06/12/2003 10:46 5032460360 5032460360 PAGE 03/04

FILE NO.:
MSDS DATE: / /

SPECIAL HAZARDS:

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06/12/2003 10:46 5032460360 PAGE 04/04

Material Safety Data Sheet

Date: 01/10/2006
Product: 19501030 - F200

SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer: Calgon Carbon Corporation
P.O. Box 717
Pittsburgh, PA 15230-0717
Emergency Phone Number: (412) 787-6700
Date Prepared: 6/24/2002
Prepared By: S. Liller

Chemical Name and Synonyms: Carbon
Formula: C

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

Nonhazardous components are listed at 3% or greater; acute hazards are listed when present at 1% or greater and chronic hazards are listed when present at 0.01% or greater. This is not intended to be a complete compositional disclosure.

INGREDIENT	% (BY WEIGHT)	CAS#
CARBON	100	7440-44-0

SECTION III - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Black particulate solid, pellet or powder. Contact may cause eye irritation. Dust may be slightly irritating to eyes and respiratory tract.
CAUTION!! Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state and federal regulations.
POTENTIAL HEALTH EFFECTS:
Effects and Hazards of Eye Contact: The physical nature of the product may produce eye irritation.
Effects and Hazards of Skin Contact: The product is not a primary skin irritant. The primary skin irritation index (Rabbit) is 0.
Effects and Hazards of Inhalation (Breathing): The product is practically non-toxic through inhalation. The acute inhalation LC_{50} (Rat) is >64.4 mg/l (nominal concentration) for activated carbon.
Effects and Hazards of Ingestion (Swallowing): The product is non-toxic through ingestion. The acute oral LD_{50} (RAT) is >10g/kg.
Primary Routes of Entry: Inhalation, ingestion, skin contact, eye contact.
Chronic Effects: The effects of long-term, low-level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.
CARCINOGENICITY: NTP: N/A IARC: N/A OSHA REGULATED: NO

Material Safety Data Sheet

SECTION IV - FIRST AID MEASURES

Treatment for Eye Contact: Flush with plenty of water for at least 15 minutes.
Treatment for Skin Contact: Wash with soap and water.
Treatment for Inhalation (Breathing): N/A
Treatment for Ingestion (Swallowing): N/A

SECTION V - FIRE FIGHTING MEASURES

Flash Point: N/A
Limits Lel: N/A
Uel: N/A
Extinguishing Media: FLOOD WITH PLENTY OF WATER.
Special Firefighting Procedures: NONE
Unusual Fire and Explosion Hazards: Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire.
NFPA RATING: HEALTH = 0 REACTIVITY = 0 FLAMMABILITY = 1

SECTION VI - ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled: Sweep up unused carbon and discard in refuse container or repackage.
Waste Disposal Method: Dispose of unused carbon in refuse container. Dispose of in accordance with local, state, and federal regulations.

SECTION VII - HANDLING AND STORAGE

Precautions for Handling and Storage: CAUTION!! Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state, and federal or national regulations.
Other Precautions: Wash thoroughly after handling. Exercise caution in the storage and handling of all chemical substances.

Material Safety Data Sheet

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Guidelines:
OSHA PEL* 5 mg/M³ (Respirable)
ACGIH TLV* 10 mg/M³ (Total)
*PELs and TLVs are 8-hour TWAs unless otherwise noted.

Respiratory Protection: A NIOSH approved particulate filter respirator is recommended if excessive dust is generated.
Ventilation: Local Exhaust Ventilation: Recommended
Mechanical Ventilation: Recommended
Protective Gloves: Recommended
Eye Protection: Safety Glasses or Goggles Recommended
Other Protective Equipment: Not Required

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: N/A
Specific Gravity: 2.3 g/cc real density
Vapor Pressure: N/A
Melting Point: N/A
Vapor Density: N/A
Evaporation Rate: N/A
Solubility in Water: NEGLIGIBLE
Packing Density: 0.4 to 0.7 g/cc
Appearance and Odor: Black particulate solid, pellet, or powder

SECTION X - STABILITY AND REACTIVITY

Stability: STABLE
Conditions to avoid: NONE
Incompatibility (Materials to avoid): Strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc.
Hazardous Decomposition Products: Carbon monoxide may be generated in the event of a fire.
Polymerizing Conditions to Avoid: NONE

SECTION XI - TOXICOLOGICAL INFORMATION

See HEALTH EFFECTS SECTION III

SECTION XII - ECOLOGICAL INFORMATION

Not determined

Material Safety Data Sheet

SECTION XIII - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of unused carbon in refuse container. Dispose of in accordance with local, state, and federal or national regulations.

SECTION XIV - TRANSPORT INFORMATION

Proper Shipping Name: NOT REGULATED
Hazard Class: N/A
Identification Number: N/A
Packing Group: N/A
This product has been tested according to the United Nations *Transport of Dangerous Goods* test protocol for spontaneously combustible materials. It has been specifically determined that this product does not meet the definition of a self heating substance or any hazard class, and therefore is not a hazardous material and not regulated.

SECTION XV - REGULATORY INFORMATION

SARA TITLE III: N/A
TSCA: The ingredients of this product are on the TSCA Inventory List.
OSHA: Nonhazardous according to definitions of health hazard and physical hazard provided in the Hazard Communication Standard (29 CFR 1910.1200)
CANADA
WHMIS CLASSIFICATION: Not Classified
DSL#: 6798
EEC Council Directives relating to the classification, packaging and labeling of dangerous substances and preparations.
Risk (R) and Safety (S) phrases: May be irritating to eyes (R36).

SECTION XVI - OTHER INFORMATION

Intended Use: Generally used for treatment of liquids and gases.
While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALGON CARBON CORPORATION MAKES NO WARRANTY WITH RESPECT AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

***** END OF MATERIAL SAFETY DATA SHEET *****

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

Carbon Dioxide
Carbonic Anhydride,
Carbonic Acid

SECTION 2: HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS #	% W/W	*ACGIH ppm TLV	STEL	PEL	*OSHA ppm STEL	IDLH	OTHER
Carbon Dioxide	124-38-9	100	5,000	30,000	5,000	NE	50,000	(see below **)

**NIOSH REL: 5,000 ppm; 30,000 ppm STEL
**DFG MAK: 500 PPM

*ACGIH TLV for particulates not otherwise classified = 10; OSHA PEL for Particulates Not Otherwise Regulated; Total Dust = 15 Respirable Fraction = 5.
*NE = None Established

SECTION 3: PHYSICAL DATA

BOILING POINT: Sublimes.
VAPOR PRESSURE: Not Applicable.
VAPOR DENSITY: 1.52.
SOLUBILITY IN WATER: Soluble.
SPECIFIC GRAVITY: Approximately 1.3.
PERCENT VOLATILE BY VOLUME: Not Applicable.
EVAPORATION RATE: Not Applicable.
pH: (10% solution) Not Applicable.
APPEARANCE & COLOR: This material is an odorless, compressed gas.

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: Keep unused cylinders cool using a water spray. When involved in a fire cylinders may rupture violently, causing high-pressure release of gas. Incipient fire responders should wear protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

SECTION 5: HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: Carbon Dioxide 5,000 ppm.
OSHA PEL: Carbon Dioxide 5,000 ppm.
EFFECTS OF OVEREXPOSURE: This product may cause an oxygen deficient environment. Individuals breathing such an atmosphere may experience dizziness, drowsiness, unconsciousness, and/or death under some circumstances. Inhalation of carbon dioxide can affect the central nervous system and blood vessels as well as change the rate of respiration.
EMERGENCY FIRST-AID PROCEDURES:
SKIN EXPOSURE: If spilled on skin IMMEDIATELY begin decontamination with running water.
Remove exposed or contaminated clothing. If reddening or irritation occurs, victim and rescuers must seek immediate medical attention. In case of frostbite, place frostbitten part in warm water or wrap in blankets.
EYE EXPOSURE: If chemical irritates 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. This product is an odorless, colorless gas which can cause asphyxiation.

SECTION 6: REACTIVITY DATA

STABILITY DATE: Stable.
INCOMPATIBILITY: Upon contact with moisture, carbon dioxide can form carbonic acid. Carbon dioxide is also incompatible with chemically active metals such as sodium, potassium and titanium.
HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 7: SPILL OR LEAK PROCEDURES

SPILLS: Clear the affected area and respond wearing Self-Contained Breathing Appairatus. Monitor the surrounding area for oxygen content. The atmosphere must have at least 19.5% oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.
FOLLOW STATE AND LOCAL REGULATIONS FOR DISPOSAL OF LARGE NON-RECLAIMABLE SPILLS.

SECTION 8: SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not expected to be needed. Use supplied air respiratory protection if oxygen levels are below 19.5%.
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

ANSI Z400.1-1993 FORMAT MSDS AVAILABLE ON REQUEST

ConocoPhillips

Cat Cracked Clarified Oil /Gas Oil Mixture

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Cat Cracked Clarified Oil /Gas Oil Mixture

MSDS Code: 728060

Synonyms:
Clarified Oil +212
Clarified Oil -212
Clarified Oil LF
Clarified Oil F-200
Alliance - Carbon Black Feed Stock - 1264; Cat Cracked Clarified Oil-Dec Oil ..C20 - 1264;
Alliance - Slurry Oil
Billings - Clarified Oil; Decant Oil; Slurry Oil
Borger - Slurry Oil; Stream No. 116
Ferndale - Cat Cracked Clarified Oil - 1264; Slurry Oil; STB; Syn Tower Bottoms
Lake Charles - Clarified Oil; Decant Oil; Slurry Oil
LAR - Cat Cracked Clarified Oil; Cat Cracked Clarified Slurry Oil
LAR - Catalytic Cracked Clarified Oil; Decanted Oil Slurry; Slurry Oil
Ponca City - Clarified Oil; Decant Oil; Slurry Oil

Intended Use: Petroleum Intermediate Stream

Responsible Party:
ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information:
Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers:
Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

DANGER!
May Contain or Release Poisonous Hydrogen Sulfide Gas
Combustible Liquid and Vapor
Severe Skin Irritant
Possible Skin Cancer Hazard
Reproductive Hazard (Component)

NFPA

Appearance: Dark Brown
Physical Form: Liquid
Odor: Heavy petroleum

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 defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): No information available on acute toxicity. May contain or release poisonous hydrogen sulfide gas - see Other Comments.

Ingestion (Swallowing): Low to moderate degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the respiratory tract, irritation of the digestive tract, nausea, vomiting, diarrhea, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.
This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, kidney disorders, liver disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Cat Cracked Clarified Oil - Decanted Oil ..C20	64741-62-4	60-80
Cat Cracked Distillate, Heavy ..C15-35	64741-61-3	10-20
Cat Cracked Distillate, Intermediate ..C11-30	64741-60-2	10-20
Hydrogen Sulfide	7783-06-4	Variable (<1)

4. FIRST AID MEASURES

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

Skin: Immediately flush affected area(s) with large amounts of water while removing contaminated shoes, clothing, and constrictive jewelry. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse the affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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): If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on the left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestions of large amounts (more than 5 ounces in an adult) preferably under direction from a physician or poison center. Do not leave victim unattended and observe closely for adequacy of breathing.

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% NaNO2 solution (0.5 gm NaNO2 in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: This material is combustible and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). May create vapor/air explosion hazard if heated. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

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

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. Hazardous combustion/decomposition products may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Combustible. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. 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.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. In a tank, barge, or other closed container, the vapor space above materials that contain hydrogen sulfide (H_2S) may result in concentrations immediately dangerous to life or health (IDLH).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Cat Cracked Clarified Oil - Decanted Oil ..C20	TWA: 0.2 mg/m³ as Coal Tar Pitch Volatiles as Benzene Solubles TWA: 5mg/m³ STEL:10 mg/m³ as Oil Mist, if Generated	TWA: 0.2 mg/m³ as Coal Tar Pitch Volatiles as Benzene Solubles TWA: 5 mg/m³	—
Cat Cracked Distillate, Heavy ..C15-35	0.2 mg/m³ TWA as Coal Tar Pitch Volatiles as Benzene Solubles 100 mg/m³ as Diesel 5mg/m³ TWA 10 mg/m³ STEL as Oil Mist, if Generated	0.2 mg/m³ TWA as Coal Tar Pitch Volatiles as Benzene Solubles 5 mg/m³ TWA as Oil Mist, if Generated	—
Cat Cracked Distillate, Intermediate ..C11-30	0.2 mg/m³ TWA as Coal Tar Pitch Volatiles as Benzene Solubles 100 mg/m³ as Diesel 5mg/m³ TWA 10 mg/m³ STEL as Oil Mist, if Generated	0.2 mg/m³ TWA as Coal Tar Pitch Volatiles as Benzene Solubles 5 mg/m³ TWA as Oil Mist, if Generated	—
Hydrogen Sulfide	TWA: 10 ppm STEL: 15 ppm	Ceiling: 20 ppm	—

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. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of nitrile 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, nitrile apron and/or arm covers may be necessary.

Respiratory: Wear a positive pressure air supplied respirator in situations where there may be potential for airborne exposure to H2S above exposure limits. If exposure concentation is unknown or if conditions immediately dangerous to life or health (IDLH) exist, use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode.

A NIOSH certified air purifying respirator with an organic vapor cartridge in combination with a Type 95 (R or P) particulate filter may be used under conditions where H2S is not detected, and airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in pressure demand or other positive pressure mode 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 warrant a respirator's use.

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.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products. A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

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:	Dark Brown
Physical Form:	Liquid
Odor:	Heavy petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	Negligible @ 100°F / 38°C
Vapor Density (air=1):	> 10
Boiling Point/Range:	376-1299°F / 191-704°C
Melting/Freezing Point:	No data
Pour Point:	40-45°F / 4-7°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.96-1.06 @ 68°F (20°C)
Bulk Density:	8.42 lbs/gal
Evaporation Rate (nBuAc=1):	<1
Flash Point:	150 -290°F / 66 - 143°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.5
UEL (vol % in air):	7.0
Autoignition Temperature:	>450°F / >232°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7). Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield hydrogen sulfide, oxides of carbon, nitrogen and sulfur.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Cat Cracked Clarified Oil - Decanted Oil ..C20

Carcinogenicity: Application of catalytic cracked clarified oil to mouse skin, three times a week, for 10 months, resulted in an increased incidence of skin tumors. Catalytic cracked distillates have been identified as carcinogens by IARC.

Target Organs: Application of catalytic cracked clarified oil to mouse and rat skin, five times a week for 10 - 13 weeks or by gavage at 1000 mg/kg/day for 10 weeks, resulted in treatment-related effects in the liver (necrosis), bone marrow (erythroid hypoplasia and anemia), and thymus (atrophy). Limited evidence of toxicity was seen in the lymph nodes (reactive hyperplasia), and kidney (tubular degeneration).

Reproductive: In animal studies, oral ingestion and dermal application of catalytic cracked clarified oil demonstrated evidence of developmental toxicity and teratogenicity. A common pattern of external, visceral and skeletal malformations was observed after both oral ingestion and dermal application in five well conducted studies. Catalytic cracked clarified oil is not considered a selective developmental toxicant since malformations occurred only in the presence of excessive maternal toxicity.

Mutagenic Effects: Catalytic cracked clarified oil produced a positive mutagenic response in both in-vitro and in-vivo mutation assays using somatic cells. Negative results were obtained in in-vitro mutation assays using germ cells.

Cat Cracked Distillate, Heavy ..C15-35

Carcinogenicity: Application of heavy catalytic cracked distillate to mouse skin, three times a week for 18 months resulted in an increased incidence of skin tumors. Catalytically cracked distillates have been identified as a carcinogen by IARC.

Target Organs: Repeated dermal application of a similar material, light catalytic cracked distillate, at 30 mg/kg/day, 5 days a week, for 13 weeks, resulted in limited evidence of liver damage in rats (i.e., increased liver weight and changes in hepatic serum enzyme activity).

Cat Cracked Distillate, Intermediate ..C11-30

Carcinogenicity: Application of catalytic cracked distillates to mouse skin, three times a week for 18 months resulted in an increased incidence of skin tumors. Catalytically cracked distillates have been identified as a carcinogen by IARC.

Target Organs: Repeated dermal application of a similar material, light catalytic cracked distillate, at 30 mg/kg/day, 5 days a week, for 13 weeks, resulted in limited evidence of liver damage in rats (i.e. increased liver weight and changes in hepatic serum enzyme activity).

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Cat Cracked Clarified Oil - Decanted Oil ..C20	4.32 g/kg (Rat)	>2 g/kg (Rabbit)	No information available
Cat Cracked Distillate, Heavy ..C15-35	3.2 g/kg (Rat) based on similar material	>2 g/kg (Rabbit)	5.4 mg/l (Rat)
Cat Cracked Distillate, Intermediate ..C11-30	3.2 g/kg (Rat) based on similar material	>2 g/kg (Rabbit)	5.4 mg/L (Rat)
Hydrogen Sulfide	Not Applicable	Not Applicable	LC50 (rat) = 1500 mg/m^3/15 min

12. ECOLOGICAL INFORMATION

Not evaluated.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description: ***Shipping description is for bulk shipments only. Non-Bulk shipments are unregulated.***

If flash point is > 140° F (60° C) and < 200° F (93° C) and material is not intentionally heated and shipped above its actual flash point, shipping description is:
Petroleum distillates, n.o.s., Combustible liquid, UN1268, III

If intentionally heated and shipped at a temperature above the actual flash point, shipping description is:
Elevated temperature liquid, flammable, n.o.s., 3, UN3256, III (contains oil)

If intentionally heated and shipped at a temperature at or above 212° F (100° C) but not abve the actual flash point, shipping description is:
Elevated temperature liquid, n.o.s., 9, UN3257, III (contains oil)

If none of above conditions are met, material is unregulated except for requirements of 49 CFR Part 130 (contains oil).

Non-Bulk Package Marking: Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling: Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking: ***For UN1268:*** Combustible / 1268
For UN3256: Flammable / 3256 and HOT mark
For UN3257: None / 3257 & HOT mark ***or*** Class 9 / 3257 & HOT mark
Packaging - References: ***For UN1268:*** None; None; 49 CFR 173.241
For UN3256 and UN3257: None; None; 49 CFR 173.247
(Exceptions; Non-bulk; Bulk)
Hazardous Substance: See Section 15 for RQ's
Emergency Response Guide: 128

International Maritime Dangerous Goods (IMDG)

Shipping Description: ***Not regulated unless intentionally heated and shipped above its flash point or above 100° C. Flash point is above 60°C, cc.***
Note: Federal compliance requirements may apply. See 49 CFR 171.12.
For assistance with IMDG classification, call (800) 762-0942

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

UN/ID #: ***Not regulated. Flash point is above 60°C, cc***
Note: Federal compliance requirements may apply. See 49 CFR 171.11.

	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 contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

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

Acute Health: Yes
Chronic Health: Yes

Fire Hazard:	Yes
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):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Various Polycyclic Aromatic Hydrocarbons	Skin Cancer
Mineral Oils (Aromatic)	Skin Cancer

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

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	19-Jun-2007
Status:	Final
Product Code:	None
Revised Sections or Basis for Revision:	Shipping information (Section 14) Product Name / Synonyms (Section 1)
MSDS Code:	728060

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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 [redacted]

(000000-000000- -456C)

DATE OF ISSUE 2/05/2002 | SUPERSEDES 12/14/1999

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms

Trade Name & Synonyms
CHD-94

Chemical Family:
ACRYLATE

Formula Mixture --> X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:
L Boynton/Chemist

Product Code Number
456C

Emergency Phone Number
800-424-9300

SECTION II - HAZARDOUS INGREDIENTS
THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV		PEL		STEL	CAS #
SODIUM POLYACRYLATE	IRRITANT	N/E	1.	N/E	2.	N/E	9003-04-7

SECTION III - PHYSICAL DATA

Boiling Point (F):	213°	Specific Gravity (H20=1):	1.01
Vapor Pressure (MM HG):	16.42	Color:	LIGHT YELLOW
Vapor Density (Air=1):	0.6	Odor:	SLIGHT SWEET
PH @ 100% :	12.4	Clarity:	TRANSPARENT
% Volatile by Volume:	96.1	Evaporation Rate (BU A/C=1):	0.57
Solubility:	COMPLETE	Viscosity:	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point	Flammable Limits	LEL	UEL
>200°F / SETAFLASH	N/A	N/A	N/A

Extinguishing Media
X <--Foam X <--Alcohol Foam X <--CO2 X <--Dry Chemical X <--Water Spray X <--Other

Special Fire Fighting Procedures:
FIREFIGHTERS SHOULD WEAR A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. EXTINGUISHING MEDIA SHOULD BE CHOSEN BASED ON THE NATURE OF THE SURROUNDING FIRE.

Unusual Fire and Explosion Hazards:
SPILLED MATERIAL MAY BE SLIPPERY. CLOSED CONTAINERS MAY RUPTURE (DUE TO PRESSURE BUILDUP) WHEN EXPOSED TO EXTREME HEAT. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.

Aerosol Level (NFPA 30B): N/A

NFPA 704 Hazard Rating (0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)
1 <--Health 1 <--Flammability 0 <--Instability <--Special

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
NOT ESTABLISHED. I:

Effects of Overexposure:
-Acute (Short Term Exposure)
EYE CONTACT: CAUSES SEVERE IRRITATION SEEN AS TEARING, REDNESS AND A BURNING SENSATION. SKIN CONTACT: CAUSES SEVERE IRRITATION SEEN AS REDNESS, ITCHING AND A BURNING SENSATION. INHALATION: MAY CAUSE RESPIRATORY IRRITATION SEEN AS COUGHING AND SNEEZING. INGESTION: MAY CAUSE IRRITATION WITH POSSIBLE NAUSEA, VOMITING AND DIARRHEA.

-Chronic (Long Term Exposure)
NO HUMAN CHRONIC EFFECTS KNOWN. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA AND DERMATITIS. TARGET ORGANS: BONE ENDS. THERE IS NO PRIMARY ROUTE OF ENTRY INTO THE BODY. THE PRIMARY ROUTES OF EXPOSURE ARE SKIN AND EYE CONTACT.

Primary Routes of Entry: <--Inhalation <--Ingestion <--Absorption

Emergency and First Aid Procedures:
-Inhalation:
MOVE FROM THE AREA TO FRESH AIR. SEEK MEDICAL ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING BECOMES DIFFICULT.

-Eye Contact:
IMMEDIATELY RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING FOR AT LEAST 15 MINUTES. HOLD THE EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYES AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

SECTION V - HEALTH HAZARD DATA (Continued)

-Skin Contact:
WASH AFFECTED AREAS WITH LARGE AMOUNTS OF SOAP AND WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET IMMEDIATE MEDICAL ATTENTION. WASH CLOTHING AND CLEAN SHOES BEFORE REUSE.

-Ingestion:
GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. SEEK MEDICAL ATTENTION IF DISCOMFORT OCCURS.

-Notes to Physician:
THERE IS NO SPECIFIC ANTIDOTE. TREAT THE PATIENT SYMPTOMATICALLY.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:
IARC--> No NTP--> No OSHA--> No ACGIH--> No OTHER--> No

SODIUM POLYACRYLATE
EYE-RBT SDT: 2 MG MODERATE 3.
ORL-RAT LD50: >40 G/KG 1.
IHL-RAT TCLo: 10 MG/M3/6H/90-I 1.

SECTION VII - REACTIVITY DATA

Stability: X <--Stable <--Unstable
Conditions to Avoid:
NONE KNOWN. DO NOT STORE IN DIRECT SUNLIGHT.

Incompatibility (Materials to Avoid):
STRONG OXIDISING AGENTS SUCH AS CHLORINE BLEACH AND CONCENTRATED HYDROGEN PEROXIDE; STRONG ACIDS. AVOID DIRECT CONTACT WITH TIN, ZINC, COPPER, BRASS, BRONZE AND ALUMINUM.

Hazardous Decomposition Products:
OXIDES OF CARBON AND SODIUM.

Hazardous Polymerization: <--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:
WEAR APPROPRIATE PROTECTIVE CLOTHING. USE CARE AS SPILLS MAY BE SLIPPERY. VENTILATE THE AREA. DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. FLUSH AREA WITH WATER.

Waste Disposal Method(s):
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Neutralising Agent:
USE DILUTE ACIDS SUCH AS HYDROCHLORIC ACID OR VINEGAR. ADD CAUTIOUSLY WHILE MIXING. WEAR APPROPRIATE PROTECTIVE CLOTHING..

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:
GENERAL MECHANICAL VENTILATION IS NORMALLY ADEQUATE.

Respiratory Protection:
NONE REQUIRED UNDER NORMAL CONDITIONS OF USE. A NIOSH/MSHA APPROVED RESPIRATOR IN POORLY VENTILATED AREAS AND/OR FOR EXPOSURE WHERE MISTING EXISTS.

Glove Protection:
NEOPRENE OR NITRILE RUBBER GLOVES SHOULD BE WORN WHEN HANDLING.

Eye Protection:
CHEMICAL GOGGLES SHOULD BE WORN.

Other Protection:
WEAR PROTECTIVE CLOTHING WHEN HANDLING.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors--> X Outdoors--> Heated--> Refrigerated-->
Minimum Temperature: 45°F Maximum Temperature: 110°F

Precautions to be Taken in Handling and Storing:
ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER, OUT OF SUNLIGHT. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. KEEP FROM FREEZING. IF PRODUCT FREEZES ALLOW IT TO SLOWLY WARM TO ROOM TEMPERATURE AND STIR THOROUGHLY BEFORE USING.

Other Precautions:
KEEP OUT OF REACH OF CHILDREN. READ ENTIRE LABEL BEFORE USING PRODUCT. FOLLOW LABEL DIRECTIONS.

SECTION XI - REGULATORY INFORMATION

Chemical Name	CAS Number	Upper % Limit
None		

SECTION XI - REGULATORY INFORMATION (Continued)

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. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 2001.
2. OSHA PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFOdisc, 2001.

ALL COMPONENTS IN THIS PRODUCT CAN BE FOUND IN THE CURRENT TSCA INVENTORY.

IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TCC:TAGLIABUE CLOSED CUP, LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LIMIT, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD, MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOS: PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED, SDT:STANDARD DRAIZE TEST, ORL: ORAL, HMN: HUMAN, INH: INHALATION

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.

CHEMAQUA, INC 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.

MATERIAL SAFETY DATA SHEET

Emergency Telephone No: (360) 699-7392
Revision Date: 3/2002

SECTION I - SUBSTANCE IDENTIFICATION

Product Name: CGV, CGR, NGV, NGR, MGR, CEV
CAS Number: 7440-44-0 **Formula:** C **H.M.I.S. Rating:** H=1, F=1, R=1, PP=E
Chemical Name: Carbon, Activated Carbon, Charcoal, Activated Charcoal

SECTION II - HAZARDOUS INGREDIENTS

This material is 100% activated carbon. There are no established PEL, TWA or TLV values for this material. Caution should be taken for respirable dust. The ACGIH TWA for respirable dust is 2.5 mg/m^3. This product has no carcinogenic properties.

SECTION III - PHYSICAL DATA

Description: Colorless black solid, granule, pellet, or flake.
Vapor Pressure: N/A **Boiling Point:** N/A **Volatile Percent:** N/A
Vapor Density: N/A **Solubility:** Not soluble **Apparent Density:** 0.3 to 0.7 g/cc
Stability: Stable **Incompatibility:** Avoid contact with strong oxidizers.

SECTION IV - FIRE & EXPLOSION HAZARDS

Flash Point: N/A **Extinguishing Media:** Water, foam, CO_2, or dry chemical
Special Procedures: None **Decomposition Products:** CO may be formed in a fire
Unusual Fire & Explosion Hazards: Contact with strong oxidizers may result in fire

SECTION V - HEALTH DATA

Overexposure Effects: This product is non-toxic through ingestion. It is non-toxic through skin absorption. It is not a primary skin irritant. No sensitization effects are known. It is non-toxic through inhalation. Due to its physical properties, carbon dust may irritate the respiratory system and produce eye irritation.
First Aid: In case of eye contact, flush with water for at least 15 minutes. Contact a doctor immediately. For inhalation, remove the person from the area.

SECTION VI - SPILL OR LEAK PROCEDURES

Reportable Quantities: No EPA RQ for this product.
If Spilled or Leaked: Sweep/shovel up and discard or repackage.
Waste Disposal Method: Unused carbon may be disposed of in refuse container.

SECTION VII - HANDLING & STORAGE

Protective Gloves: Recommended. **Eye Protection:** Safety glasses/goggles recommended.
Other Protective Clothing: None required. **Ventilation:** Local exhaust to control dust.
Respiratory Protection: A high efficiency particulate filter is recommended for dust.
Work/Hygienic Practices: Wash thoroughly after handling.

SECTION VIII - SPECIAL PRECAUTIONS

Wet activated carbon removes oxygen from air causing a severe hazard to workers in confined spaces. Sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, in accordance with all local, state and federal regulations.

CLEAN ENVIRONMENTAL CONCEPTS, INC.
P.O. Box 898
Brush Prairie, WA 98606

While the information set forth herein is believed to be accurate as of the date above, Clean Environmental Concepts makes no warranty with respect thereto and disclaims all liability from reliance thereon.

MATERIAL SAFETY DATA SHEET:CHEM-AQUA 150

DATE OF ISSUE: 07/09/2004 **SUPERCEDES:** 09/29/2000

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms:
N/A

Trade Name & Synonyms:
CHEM-AQUA 150

Chemical Family:
PHOSPHATE/ACRYLATE BLEND

Formula Mixture: X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:	Product Code Number	Emergency Phone Number
L Boynton/Chemist	0586	800-424-9300

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
SODIUM POLYPHOSPHATES	IRRITANT	N/E 1	N/E 2	N/E	68915-31-1
SODIUM POLYACRYLATE	IRRITANT	N/E 1	N/E 2	N/E	9003-04-7

SECTION III - PHYSICAL DATA

Boiling Point (f):	212°	**Specific Gravity (H20=1):**	1.16
Vapor Pressure (MM HG):	15.0	**Color:**	COLORLESS-PALE PINK
Vapor Density (Air=1):	0.6	**Odor:**	SLIGHTLY SWEET
PH @ 100% :	7-8	**Clarity**	TRANSPARENT
% Volatile by Volume:	85	**Evaporation Rate (BU A/C=1):**	0.5
H20 Solubility:	COMPLETE	**Viscosity:**	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point:	Flammable Limits:	LEL:	UEL:
NON-FLAM / N/A	N/A	N/A	N/A

Extinguishing Media:

Foam:X Alcohol Foam:X CO2:X Dry Chemical:X Water Spray:X Other:

Special Fire Fighting Procedures:

FIREFIGHTERS SHOULD WEAR A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. EXTINGUISHING MEDIA SHOULD BE CHOSEN BASED ON THE NATURE OF THE SURROUNDING FIRE. COOL FIRE-EXPOSED CONTAINERS WITH WATER SPRAY TO PREVENT BURSTING. .

Unusual Fire and Explosion Hazards:

USE CARE AS SPILLS MAY BE SLIPPERY.

NFPA Hazard Rating: **(0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)**

Health:1 Flammability:1 Instability:0 Special:

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:

NOT ESTABLISHED.

Effects of Overexposure:

-Acute(Short Term Exposure)

EYE CONTACT: MAY CAUSE IRRITATION SEEN AS STINGING, TEARING, AND REDNESS. SKIN CONTACT: MAY CAUSE IRRITATION SEEN AS ITCHING AND REDNESS. INHALATION: MAY CAUSE RESPIRATORY IRRITATION SEEN

AS COUGHING AND SNEEZING. INGESTION: MAY CAUSE IRRITATION WITH POSSIBLE ABDOMINAL CRAMPS, NAUSEA, VOMITING, DIARRHEA, DECREASED BLOOD PRESSURE, DECREASED HEART RATE, OR COMA.

-Chronic (Long Term Exposure)

NO HUMAN CHRONIC EFFECTS KNOWN. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA, AND DERMATITIS. TARGET ORGANS: NONE KNOWN. THERE IS NO PRIMARY ROUTE OF ENTRY INTO THE BODY. THE PRIMARY ROUTES OF EXPOSURE ARE SKIN AND EYE CONTACT.

Primary Routes of Entry: Inhalation: Ingestion: Absorption:

Emergency and First Aid Procedures:

-Inhalation:

REMOVE FROM THE AREA TO FRESH AIR. SEEK MEDICAL ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING BECOMES DIFFICULT.

-Eye Contact:

RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING WITH PLENTY OF WATER FOR SEVERAL MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS.

-Skin Contact:

WASH AFFECTED AREAS WITH PLENTY OF SOAP AND WATER FOR SEVERAL MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS.

-Ingestion:

GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. SEEK MEDICAL ATTENTION IF DISCOMFORT OCCURS.

-Notes to Physician:

THERE IS NO SPECIFIC ANTIDOTE. TREAT THE PATIENT SYMPTOMATICALLY.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:

IARC: No **NTP:** No **OSHA:** No **ACGIH:** No **OTHER:** No

VOC CONTENT: 0% BY WEIGHT, 0% BY VOLUME, 0 G/L

SODIUM POLYPHOSPHATES
ORL-RAT LD50: 3053 MG/KG 3.
ORL-RAT LD50: 6600 MG/KG 4.
SKN-RBT LD50: >7940 MG/KG 4.
SKN-RBT: 0.0/8.0/24H; NON-IRRITATING 4.
EYE-RBT: 1.3/110.0; SLIGHTLY IRRITATING 4.

RATS FED THIS MATERIAL FOR ONE MONTH SHOWED DECREASED GROWTH, INCREASED KIDNEY, LUNG AND SPLEEN WEIGHT AND KIDNEY DAMAGE. RATS FED THIS MATERIAL FOR TWO YEARS ALSO SHOWED DECREASED WEIGHT GAIN, INCREASED KIDNEY WEIGHT AND KIDNEY CHANGES. 4.

SODIUM POLYACRYLATE
EYE-RBT SDT: 2 MG MODERATE 3.
ORL-RAT LD50: >40 G/KG 3.
IHL-RAT TCLo: 10 MG/M3/6H/4W-I 3.

SECTION VII - REACTIVITY DATA

Stability: Stable:X Unstable:

Conditions to Avoid: NONE KNOWN.

Incompatibility (Materials to Avoid):

STRONG OXIDIZING AGENTS SUCH AS CHLORINE BLEACH AND CONCENTRATED HYDROGEN PEROXIDE.

Hazardous Decomposition Products:

OXIDES OF CARBON AND PHOSPHOROUS.

Hazardous Polymerization: May Occur: Will Not Occur:X

Conditions to Avoid: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled:

WEAR APPROPRIATE PROTECTIVE CLOTHING. USE CARE AS SPILLS MAY BE SLIPPERY. SHUT OFF SOURCE OF LEAK. DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. FLUSH AREA WITH WATER.

Waste Disposal Method(s):

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

Neutralizing Agent:

N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:

GENERAL VENTILATION IS NORMALLY ADEQUATE. LOCAL VENTILATION IS RECOMMENDED TO CONTROL EXPOSURE FROM OPERATIONS THAT CAN GENERATE EXCESSIVE LEVELS OF MISTS. LOCAL VENTILATION IS PREFERRED, BECAUSE IT PREVENTS DISPERSION INTO WORK AREAS BY CONTROLLING IT AT ITS SOURCE.

Respiratory Protection:

RESPIRATORS SHOULD BE SELECTED BY AND USED UNDER THE DIRECTION OF A TRAINED HEALTH AND SAFETY PROFESSIONAL FOLLOWING REQUIREMENTS FOUND IN OSHA'S RESPIRATOR STANDARD (29 CFR 1910.134) AND ANSI'S STANDARD FOR RESPIRATORY PROTECTION (Z88.2-1992). FOR CONCENTRATIONS ABOVE THE TLV AND/OR PEL BUT LESS THAN 10 TIMES THESE LIMITS, A NIOSH APPROVED HALF-FACEPIECE RESPIRATOR EQUIPPED WITH APPROPRIATE CHEMICAL CARTRIDGES MAY BE USED. FOR CONCENTRATIONS GREATER THAN 10 TIMES THE TLV AND/OR PEL, CONSULT THE NIOSH RESPIRATOR DECISION LOGIC FOUND IN PUBLICATION NO. 87-116 OR ANSI Z88.2-1992.

Glove Protection:

NEOPRENE OR NITRILE RUBBER GLOVES IF REPEATED OR PROLONGED SKIN CONTACT IS LIKELY. ENSURE COMPLIANCE WITH OSHA'S PERSONAL PROTECTIVE EQUIPMENT (PPE) STANDARD FOR HAND PROTECTION, 29 CFR 1910.138.

Eye Protection:

SAFETY GLASSES WITH SIDE SHIELDS IF THE METHOD OF APPLICATION PRESENTS THE LIKELIHOOD OF EYE CONTACT. ENSURE COMPLIANCE WITH OSHA'S PERSONAL PROTECTIVE EQUIPMENT (PPE) STANDARD FOR EYE AND FACE PROTECTION, 29 CFR 1910.133.

Other Protection:

WEAR GENERAL-DUTY WORK CLOTHES AND SHOES. A SAFETY SHOWER AND AN EYEWASH STATION SHOULD BE AVAILABLE.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors:X Outdoors: Heated: Refrigerated:

Minimum Temperature:35°F Maximum Temperature:120°F

Precautions to be taken in Handling and Storing:

ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. KEEP FROM FREEZING. IF PRODUCT FREEZES ALLOW IT TO SLOWLY WARM TO ROOM TEMPERATURE AND STIR THOROUGHLY BEFORE USING.

Other Precautions:

KEEP OUT OF REACH OF CHILDREN. READ THE ENTIRE LABEL BEFORE USING THE PRODUCT. FOLLOW THE LABEL DIRECTIONS.

SECTION XI - REGULATORY INFORMATION

Chemical Name	CAS Number	Upper % Limit

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. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 2004.
2. OSHA PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFOWeb, 2004.
4. VENDOR'S MSDS.
ALL THE COMPONENTS OF THIS PRODUCT ARE IN COMPLIANCE WITH THE TOXIC SUBSTANCES CONTROL ACT (TSCA) AND ARE EITHER LISTED ON THE TSCA INVENTORY OR OTHERWISE EXEMPTED FROM LISTING. ----------

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IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TCC:TAGLIABUE CLOSED CUP, LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LIMIT, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD, MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOS:PARTICLES (INSOLUBLE) NOT OTHERWISE SPECIFIED, SDT:STANDARD DRAIZE TEST, ORL:ORAL, IHL:INHALATION, HMN:HUMAN

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.

CHEMAQUA, INC 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."

MATERIAL SAFETY DATA SHEET:CHEM-AQUA 777

DATE OF ISSUE: 01/23/2003 **SUPERCEDES:** 07/19/2002

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms:
N/A

Trade Name & Synonyms:
CHEM-AQUA 777

Chemical Family:
ALKALINE MIXTURE

Formula Mixture: X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:	Product Code Number	Emergency Phone Number
L Boynton/Chemist	0182	800-424-9300

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
SODIUM HYDROXIDE	CORROSIVE	2 MG/M3 C1	N/E 2	N/E	1310-73-2
SODIUM NITRITE	*	N/E 1	N/E 2	N/E	7632-00-0
SODIUM METABORATE TETRAHYDRATE	IRRITANT	N/E 1	N/E 2	N/E	10555-76-7
PHENOLPHTHALEIN	IRR/CARC	N/E 1	N/E 2	N/E	77-09-8

* IRRITANT/TOXIC/OXIDIZER
C CEILING LIMIT

SECTION III - PHYSICAL DATA

Boiling Point (f):	212°	**Specific Gravity (H20=1):**	1.10
Vapor Pressure (MM HG):	17.5	**Color:**	DARK VIOLET
Vapor Density (Air=1):	0.6	**Odor:**	ODORLESS
PH @ 100% :	12.4	**Clarity**	OPAQUE
% Volatile by Volume:	83	**Evaporation Rate (BU A/C=1):**	0.10
H20 Solubility:	COMPLETE	**Viscosity:**	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point:	Flammable Limits:	LEL:	UEL:
>200°F / SETAFLASH	HYDROGEN GAS	4%	75%

Extinguishing Media:

Foam:X Alcohol Foam:X CO2:X Dry Chemical:X Water Spray:X Other:X

Special Fire Fighting Procedures:

FIREFIGHTERS SHOULD WEAR A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. EXTINGUISHING MEDIA SHOULD BE CHOSEN BASED ON THE NATURE OF THE SURROUNDING FIRE. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS.

Unusual Fire and Explosion Hazards:

IF DRIED RESIDUES OF THIS PRODUCT ARE HEATED, THEY MAY RELEASE HYDROGEN GAS WHICH COULD CREATE AN EXPLOSION HAZARD.

NFPA Hazard Rating: **(0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)**

Health:2 Flammability:1 Instability:0 Special:

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:

COPPOR00000874

2 MG/M3 AS SODIUM HYDROXIDE CEILING LIMIT 1.

Effects of Overexposure:

-Acute(Short Term Exposure)

EYE CONTACT: CAUSES SEVERE IRRITATION SEEN AS STINGING, TEARING, REDNESS AND A BURNING SENSATION AND MAY CAUSE EYE DAMAGE. SKIN CONTACT: CAUSES SEVERE IRRITATION SEEN AS REDNESS, ITCHING AND A BURNING SENSATION. INHALATION: MAY CAUSE RESPIRATORY IRRITATION SEEN AS COUGHING AND SNEEZING. INHALATION OF LARGE AMOUNTS MAY CAUSE SYSTEMIC EFFECTS DUE TO ABSORPTION OF NITRITE BY LUNG TISSUE, CAUSING EFFECTS SIMILAR TO THOSE FROM INGESTION. INGESTION: MAY CAUSE IRRITATION SEEN AS NAUSEA, VOMITING AND DIARRHEA; MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS SUCH AS HEADACHE, WEAKNESS, FAINTING, NAUSEA AND LOW BLOOD PRESSURE. INGESTION OF LARGE AMOUNTS MAY CAUSE EFFECTS SUCH AS METHEMOGLOBINEMIA, CYANOSIS, MARKED DECREASE IN BLOOD PRESSURE LEADING TO COLLAPSE, COMA AND POSSIBLE DEATH.

-Chronic (Long Term Exposure)

OVEREXPOSURE MAY CAUSE METHEMOGLOBINEMIA (REDUCED OXYGEN-CARRYING CAPACITY OF BLOOD) WITH CYANOSIS (BLUISH DISCOLORATION OF SKIN) PROGRESSING TO DIZZINESS, INCOORDINATION, LOSS OF CONSCIOUSNESS, SHORTNESS OF BREATH AND INCREASED PULSE RATE. LONG-TERN INGESTION PRODUCED UNSPECIFIED PATHOLOGICAL CHANGES IN THE ADRENALS, BRAIN, HEART, KIDNEYS, LIVER, LUNGS AND SPLEEN. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA AND DERMATITIS. TARGET ORGANS: CENTRAL NERVOUS SYSTEM, HEART, LIVER, LUNGS, KIDNEYS, SPLEEN AND BLOOD-FORMING ORGANS.

Primary Routes of Entry: Inhalation:X Ingestion: Absorption:X

Emergency and First Aid Procedures:

-Inhalation:

REMOVE FROM THE AREA TO FRESH AIR. SEEK MEDICAL ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING BECOMES DIFFICULT.

-Eye Contact:

IMMEDIATELY RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING FOR AT LEAST 15 MINUTES. HOLD THE EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYES AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

-Skin Contact:

WASH AFFECTED AREAS WITH LARGE AMOUNTS OF SOAP AND WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET IMMEDIATE MEDICAL ATTENTION. WASH CLOTHING AND CLEAN SHOES BEFORE REUSE.

-Ingestion:

GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-Notes to Physician:

ABSORPTION OF THIS PRODUCT MAY LEAD TO THE FORMATION OF METHEMOGLOBIN WHICH, IN SUFFICIENT CONCENTRATION, CAUSES CYANOSIS. SINCE REVERSION OF METHEMOGLOBIN TO HEMOGLOBIN OCCURS SPONTANEOUSLY AFTER TERMINATION OF EXPOSURE, MODERATE DEGREES OF CYANOSIS NEED TO BE TREATED ONLY BY SUPPORTIVE MEASURES SUCH AS BED REST AND OXYGEN INHALATION. THOROUGH CLEANSING OF THE ENTIRE CONTAMINATED AREA OF THE BODY INCLUDING SCALP AND NAILS IS OF UTMOST IMPORTANCE. IF CYANOSIS IS SEVERE, INTRAVENOUS INJECTION OF METHYLENE BLUE, 1 MG/KG OF BODY WEIGHT, MAY BE OF VALUE. CYANOCOBALAMIN (VITAMIN B-12), 1 MG INTRAMUSCULARLY, WILL SPEED RECOVERY. INTRAVENOUS FLUIDS AND BLOOD TRANSFUSIONS MAY BE INDICATED IN VERY SEVERE EXPOSURES. TREAT AS A MODERATELY STRONG ALKALI EXPOSURE. FOR INGESTION OF LARGE AMOUNTS (GREATER THAN 8 GRAMS), MAINTAIN ADEQUATE KIDNEY FUNCTION AND FORCE FLUIDS. GASTRIC LAVAGE IS RECOMMENDED FOR SYMPTOMATIC PATIENTS ONLY. HEMODIALYSIS SHOULD BE RESERVED FOR MASSIVE ACUTE INGESTION OR PATIENTS WITH RENAL FAILURE. BORON ANALYSIS OF URINE OR BLOOD ARE ONLY USEFUL FOR DOCUMENTING EXPOSURE AND SHOULD NOT BE USED TO EVAULATE SEVERITY OF POISONING OR TO GUIDE TREATMENT.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:

IARC: Yes **NTP:** Yes **OSHA:** No **ACGIH:** No **OTHER:** Yes

SODIUM HYDROXIDE
SKN-RBT LD50: 1350 MG/KG 3.

ORL-RAT LD50: 300-500 MG/KG 3.
SKN-RBT: 500 MG/24H SEVERE 4.
EYE-RBT: 1 MG/24H SEVERE 4.

SODIUM NITRITE
ORL-HMN TDLo: 14 MG/KG 3.
ORL-HMN LDLo: 71 MG/KG 3.
ORL-RAT LD50: 120 MG/KG 4.
IHL-RAT LC50: 1.45 MG/L/4HR 4.
EYE-RBT SDT: 500 MG/24H MILD 3.

SODIUM METABORATE TETRAHYDRATE
ORL-RAT LD50: 2330 MG/KG 4.
SKN LD50: >2000 MG/KG (ESTIMATED) 4.
ANIMAL FEEDING STUDIES IN RATS, MICE AND DOGS DEMONSTRATED EFFECTS ON FERTILITY AND TESTES. STUDIES WITH THE CHEMICALLY RELATED BORIC ACID IN THE RAT, MOUSE AND RABBIT DEMONSTRATED DEVELOPMENTAL EFFECTS ON THE FETUS, INCLUDING FETAL WEIGHT LOSS AND MINOR SKELETAL VARIATIONS. 4.

PHENOLPHTHALEIN
ORL-HMN(MAN) TDLo: 29 MG/KG 3.
ORL-RAT LD50: >1 G/KG 3.
RECENT STUDIES PERFORMED BY NTP HAVE SHOWN THAT RATS FED EXTREMELY HIGH DOSES DURING A PERIOD OF 6 MONTHS TO 2 YEARS HAVE DEVELOPED LIVER, KIDNEY AND LYPMPH SYSTEM TUMORS. NTP CONCLUDED THAT PHENOLPHTHALEIN IS REASONABLY ANTICIPATED TO BE A HUMAN CARCINOGEN. GIVEN THE USE PATTERN OF THIS PRODUCT, THE RISK TO HUMANS IS INSIGNIFICANT IF STANDARD, WORK-HYGIENE PRACTICES ARE FOLLOWED. 5.

THERE IS INADEQUATE EVIDENCE IN HUMANS FOR THE CARCINOGENICITY OF PHENOLPHTHALEIN. THERE IS SUFFICIENT EVIDENCE IN EXPERIMENTAL ANIMALS FOR THE CARCINOGENICITY OF PHENOLPHTHALEIN. PHENOLPHTHALEIN IS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B). 6.

SECTION VII - REACTIVITY DATA

Stability: Stable:X Unstable:

Conditions to Avoid: NONE KNOWN.

Incompatibility (Materials to Avoid):

STRONG REDUCERS SUCH AS METAL HYDRIDES OR ALKALI METALS, ACIDS, ACTIVATED CARBON, AMMONIUM SALTS, CYANIDES AND AMINES. UNDER CERTAIN CONDITIONS, NITRITES MAY REACT WITH SECONDARY AMINES TO FORM CARCINOGENIC NITROSAMINES.

Hazardous Decomposition Products:

OXIDES OF CARBON AND NITROGEN.

Hazardous Polymerization: May Occur: Will Not Occur:X

Conditions to Avoid: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be Taken If Material is Released or Spilled:

WEAR APPROPRIATE PROTECTIVE CLOTHING. VENTILATE THE AREA. USE CARE AS SPILLS MAY BE SLIPPERY. DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. FLUSH AREA WITH WATER.

Waste Disposal Method(s):

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Neutralizing Agent:

USE DILUTE ACIDS SUCH AS HYDROCHLORIC ACID OR VINEGAR. ADD CAUTIOUSLY WHILE MIXING. WEAR APPROPRIATE PROTECTIVE CLOTHING.

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:

GENERAL VENTILATION IS NORMALLY ADEQUATE.

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Respiratory Protection:

A NIOSH/MSHA APPROVED RESPIRATOR IN POORLY VENTILATED AREAS OR WHERE MISTING EXISTS.

Glove Protection:

NEOPRENE OR NITRILE RUBBER GLOVES WHEN HANDLING.

Eye Protection:

CHEMICAL GOGGLES SHOULD BE WORN.

Other Protection:

WEAR PROTECTIVE CLOTHING WHEN HANDLING.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature:	Indoors:X	Outdoors:	Heated:	Refrigerated:

Minimum Temperature:35°F Maximum Temperature:120°F

Precautions to be taken in Handling and Storing:

ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. KEEP FROM FREEZING. IF PRODUCT FREEZES ALLOW IT TO SLOWLY WARM TO ROOM TEMPERATURE AND STIR THOROUGHLY BEFORE USING.

Other Precautions:

KEEP OUT OF REACH OF CHILDREN. READ THE ENTIRE LABEL BEFORE USING THE PRODUCT. FOLLOW THE LABEL DIRECTIONS.

SECTION XI - REGULATORY INFORMATION

Chemical Name	CAS Number	Upper % Limit
SODIUM NITRITE	7632-00-0	10

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. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 2002.
2. OSHA PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFODisc, 2002.
4. VENDOR'S MSDS.
5. NTP.
6. IARC.

ALL COMPONENTS IN THIS PRODUCT CAN BE FOUND IN THE CURRENT TSCA INVENTORY.

IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TCC:TAGLIABUE CLOSED CUP,
LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LIMIT, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD,
MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOS: PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED, SDT:STANDARD DRAIZE TEST, ORL: ORAL, HMN: HUMAN, IHL:INHALATION

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(000000-000000- -0716)

DATE OF ISSUE 10/29/1998 | SUPERSEDES 2/03/1995

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms
N/A

Trade Name & Synonyms
CHEM-AQUA 900 PLUS

Chemical Family:
S B

Formula Mixture --> X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:
R STOLLEY/CHEMIST

Product Code Number
0716

Emergency Phone Number
800-424-9300

SECTION II - HAZARDOUS INGREDIENTS
THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
SODIUM METABISULFITE	MIT/IRR	NOT EST. 1	NOT EST. 2		7681-57-4

SECTION III - PHYSICAL DATA

Boiling Point (F):	212	Specific Gravity (H20=1):	1.275
Vapor Pressure (MM HG):	18	Color:	PALE PINK
Vapor Density (Air=1):	0.6	Odor:	PUNGENT
PH @ 100% :	4.0	Clarity:	TRANSPARENT
% Volatile by Volume:	70	Evaporation Rate (BU A/C=1):	<1
H2O Solubility:	COMPLETE	Viscosity:	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point	Flammable Limits	LEL	UEL
NON-FLAM / N/A	N/A	N/A	N/A

Extinguishing Media
X <--Foam X <--Alcohol Foam X <--CO2 X <--Dry Chemical X <--Water Spray <--Other

Special Fire Fighting Procedures:
FIREFIGHTERS SHOULD WEAR A SELF CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. EXTINGUISHING MEDIA SHOULD BE CHOSEN BASED ON THE NATURE OF THE SURROUNDING FIRE.

Unusual Fire and Explosion Hazards:
SPILLED MATERIAL MAY BE SLIPPERY.

Aerosol Level (NFPA 30B): N/A

NFPA 704 Hazard Rating (0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)
1 <--Health 0 <--Flammability 0 <--Instability <--Special

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
NOT ESTABLISHED FOR MIXTURE.

Effects of Overexposure:
-Acute (Short Term Exposure)
EYE CONTACT: CAUSES IRRITATION SEEN AS TEARING AND REDNESS. PROLONGED CONTACT MAY CAUSE BURNS TO THE EYES. SKIN CONTACT: CAUSES IRRITATION SEEN AS ITCHING AND REDNESS. INHALATION: MIST MAY CAUSE IRRITATION SEEN AS COUGHING AND SNEEZING. INGESTION: MAY CAUSE GASTROINTESTINAL IRRITATION, MAY CAUSE IRRITATION TO THE MOUTH, ESOPHAGUS AND STOMACH. SYMPTOMS MAY INCLUDE NAUSEA, VOMITING, HEADACHE AND ABDOMINAL PAIN. INGESTION OF VERY LARGE DOSES BY SULFITE- SENSITIVE INDIVIDUALS MAY CAUSE ACUTE ASTHMA ATTACKS, BRONCHOCONSTRICTION, SWEATING, FLUSHED FACE, HIVES, RAPID HEART RATE, DECREASED BLOOD PRESSURE, ANAPHYLAXIS AND IN EXTREME CASES DEATH.

-Chronic (Long Term Exposure)
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY CONDITIONS SUCH AS ASTHMA AND EMPHYSEMA. TARGET ORGANS: RESPIRATORY SYSTEM. ALTHOUGH THERE IS NO PRIMARY ROUTE OF ENTRY INTO THE BODY, THE PRIMARY ROUTE OF EXPOSURE IS SKIN AND EYE CONTACT. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: ASTHMATIC INDIVIDUALS MAY BE HYPERSENSITIVE TO THIS MATERIAL. INHALATION OF MIST MAY AGGRAVATE ACUTE OR CHRONIC ASTHMA AND OTHER CHRONIC PULMONARY DISEASES. TARGET ORGANS: BLOOD-FORMING ORGANS UNDER CERTAIN CONDITIONS NITRITES MAY REACT WITH SECONDARY AMINES TO FORM CARCINOGENIC N- NITROSAMINES.

Primary Routes of Entry: <--Inhalation <--Ingestion X <--Absorption

Emergency and First Aid Procedures:
-Inhalation:
REMOVE FROM THE AREA TO FRESH AIR. SEEK MEDICAL ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING BECOMES DIFFICULT.

-Eye Contact:

SECTION V - HEALTH HAZARD DATA (Continued)

IMMEDIATELY RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING FOR AT LEAST 15 MINUTES. HOLD THE EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYES AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

-Skin Contact:
WASH AFFECTED AREAS WITH PLENTY OF SOAP AND WATER FOR SEVERAL MINUTES. REMOVE AND CLEAN CONTAMINATED CLOTHING AND SHOES. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS.

-Ingestion:
GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. GET IMMEDIATE MEDICAL ATTENTION IF DISCOMFORT OCCURS.

-Notes to Physician:
DUE TO THE POTENTIAL OF A SERIOUS REACTION TO SULFITE-SENSITIVE INDIVIDUALS THE PATIENT SHOULD BE CAREFULLY MONITORED AND APPROPRIATE SUPPORTIVE CARE GIVEN.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:
IARC--> No NTP--> No OSHA--> No ACGIH--> No OTHER--> No

SODIUM METABISULFITE:
ORL-RAT TDLO: 75MG/KG 3.
ORL-PIG TDLO: 5670/KG 3.
MUTATION DATA
100 MMOL/L-SALMONELLA TYPHIMURIUM 3.
HAMSTER OVARY- 18900/L 3.

SECTION VII - REACTIVITY DATA

Stability: X <--Stable <--Unstable
Conditions to Avoid:
TEMPERATURES ABOVE 221 F. STABILITY DIMINISHES WITH AGE.

Incompatibility (Materials to Avoid):
ACIDS, OXIDISING MATERIALS AND ALUMINUM.

Hazardous Decomposition Products:
WILL LIBERATE OXIDES OF SULFUR, SODIUM OXIDE AND SODIUM SULFIDE.

Hazardous Polymerization: <--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:
DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. USE CARE AS SPILLS MAY BE SLIPPERY.

Waste Disposal Method(s):
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

Neutralizing Agent:
N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:
GENERAL MECHANICAL VENTILATION IS NORMALLY ADEQUATE. LOCAL EXHAUST SHOULD BE EMPLOYED IF MISTING IS LIKELY.

Respiratory Protection:
NONE REQUIRED UNDER NORMAL CONDITIONS OF USE. A NIOSH/MSHA APPROVED RESPIRATOR IN POORLY VENTILATED AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV OR OSHA PEL OR WHERE MISTING EXISTS.

Glove Protection:
NEOPRENE RUBBER OR NITRILE GLOVES IF REPEATED OR PROLONGED SKIN CONTACT IS LIKELY.

Eye Protection:
SAFETY GLASSES WITH SIDE SHIELDS IF THE METHOD OF USE PRESENTS THE LIKELIHOOD OF EYE CONTACT.

Other Protection:
SAFETY SHOES OR RUBBER BOOTS.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors--> X Outdoors--> Heated--> Refrigerated-->
Minimum Temperature: 35°F Maximum Temperature: 120°F

Precautions to be Taken in Handling and Storing:
ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. KEEP FROM FREEZING. IF PRODUCT FREEZES WARM TO STANDARD ROOM TEMPERATURE SLOWLY AND STIR THOUROUGHLY BEFORE USING.

Other Precautions:
KEEP OUT OF REACH OF CHILDREN. READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

SECTION XI - REGULATORY INFORMATION

SECTION XI - REGULATORY INFORMATION (Continued)

Chemical Name	CAS Number	Upper % Limit
None		

These 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.

9. , call 1-800-527-9919 for additional information if you are a California customer.
SDS is not intended for users in the state of California.

SECTION XII - REFERENCES

1. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, 1997
2. OSHA-PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFODisc, 1998.

ALL COMPONENTS IN THIS PRODUCT CAN BE FOUND IN THE CURRENT TSCA INVENTORY.

IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TOC:TAGLIABUE CLOSEDCUP, LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACHGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LEVEL, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD, MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOC: PARTICULATES NOT OTHERWISE CLASSIFIED

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.

CHEMAQUA, INC 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.

TECHNICAL RESOURCES

COOPER Crouse-Hinds
DOWNLOAD| PRINT

MATERIAL SAFETY DATA SHEET (MSDS): CHICO A SEALING COMPOUND

1. PRODUCT IDENTIFICATION	
COMMON NAME:	Chico A Sealing Compound/Chico A3, Chico A4, Chico A05/Chico A200
CHEMICAL NAME:	Mixture
PRODUCT DESCRIPTION:	Sealing Compound
FORMULA:	Not defined
CAS #:	Mixture
DISTRIBUTOR	Cooper Industries/Crouse-Hinds LLC
ADDRESS:	P.O. Box 4999
CITY, STATE, ZIP CODE:	Syracuse, NY 13221-4999
INFORMATION TELEPHONE:	(315) 477-7000 **EMERGENCY TELEPHONE: CHEMTREC (800) 424-9300**

2. HAZARDOUS INGREDIENTS - COMPOSITION/INFORMATION			
COMPOUND	**PERCENTAGE RANGE**	**OSHA-PEL**	**ACGIH**
Fused Calcium Aluminate (Alumina Cement) CAS No.: 65997-16-2 RTECS: No Data	60 – 70%	15 mg/m^3 (total PNOR) 5 mg/m^3 (respirable PNOR)	10 mg/m^{3*} (inhal 3 mg/m^{3*} (respir
Plaster of Paris CAS No.: 26499-65-0 RTECS: TP0700000	30 – 35%	15 mg/m^3 (total particulate) 5 mg/m^3 (respirable particulate)	10 mg/m^{3*} (inhal 3 mg/m^{3*} (respir
Portland Cement CAS No.: 65997-15-1 RTECS: 77733	Less than 4%	15 mg/m^3 (total particulate) 5 mg/m^3 (respirable particulate)	10 mg/m^{3**} 1 mg/m^3 (inhalab (Notice of intend
Crystalline Silica (quartz) CAS No.: 14808-60-7	Less than 2%	10 mg/m^3/(% SiO_2 +2) (respirable)	0.05 mg/m^3 (resp fraction)

RTECS: VV7330000		30 mg/m^3/(% SiO_2 + 2) (total)	0.025 mg/m^3 (res fraction) (Notice of intende

* As of 2003, the ACGIH no longer publishes a TLV for inhalable or respirable particulate (not otherwise specified), but recommends that airborne concentrations be kept less than 10 mg/m^3 for biologically inert, insoluble, and poorly soluble inhalable particulates, and 3 mg/m^3 for respirable particulates.

** The value is for particulate matter containing no asbestos and less than 1% crystalline silica.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

May cause eye irritation and inflammation.

May cause skin irritation and dryness.

May cause upper respiratory irritation, coughing, laryngitis, and nasal congestion.

Repeated inhalation over time may affect the lungs, and may cause silicosis or lung cancer.

Ingestion of sufficient quantities may result in blockage or obstruction of the digestive tract.

POTENTIAL HEALTH EFFECTS

EYE: Dusts may cause eye irritation and inflammation (conjunctivitis).

SKIN: Powder may cause dryness and irritation with repeated contact. When mixed with water, this material expands and becomes warm or hot as it hardens. DO NOT attempt to make a cast enclosing any part of the body using this material, as heat may cause severe burns and expansion may result in decreased circulation that may require surgical removal of affected tissue or amputation of limb.

INGESTION: Product will harden inside the body. Ingestion of sufficient quantities can result in blockage or obstruction especially in the pyloric region of the digestive tract.

INHALATION: Inhalation of dusts may cause upper respiratory irritation, coughing, laryngitis, and nasal congestion. Repeated exposure over time may affect the lungs (see below).

CHRONIC: Repeated inhalation of dusts containing crystalline silica (as quartz) over time may cause progressive fibrotic lung disease (silicosis) and increase the risks of developing lung cancer.

CARCINOGENICITY: IARC: Yes* NTP: Yes* OSHA: No*

* Quartz is classified as "carcinogenic to humans" (Group 1) by IARC and as a substance "known to be a human carcinogen" (Group 2A) by NTP. Quartz should be treated as a confirmed carcinogen for hazard communication purposes

(OSHA 29 CFR Part 1910.1200(d)(4)).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Dusts may aggravate pre-existing eye, skin and respiratory conditions.

TARGET ORGANS: Eyes, skin, respiratory system.

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4. FIRST AID MEASURES

EYE: Flush eyes with lukewarm water for 15 minutes occasionally lifting the lower and upper lids. If irritation persists, seek medical attention.

SKIN: Rinse skin with water then wash with soap and water. Remove contaminated clothing. If irritation persists, seek medical attention.

INGESTION: If significant amounts are ingested, get immediate medical attention.

INHALATION: If large quantities of dust are inhaled, remove to fresh air. Give oxygen or artificial respiration if indicated. Seek medical attention.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES	No unusual fire hazards	
FLASH POINT:	Not applicable	
FLAMMABLE LIMITS:	LEL: Not applicable	UEL: Not applicable
NFPA HAZARD CLASSIFICATION:		
HEALTH: 2	**FLAMMABILITY: 0**	**REACTIVITY: 0**

EXTINGUISHING MEDIA: Use media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARDS: Non-flammable and non-combustible. Thermal decomposition at high temperatures may produce oxides of sulfur, and small amounts of other oxidation products.

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH-approved, full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Isolate area of spill. Do not walk through or otherwise scatter spilled materials. Use wet clean-up methods (wiping, water mists, etc.) or a vacuum equipped with a filter sufficient to prevent re-circulation of crystalline silica into the workplace. Do not use dry sweeping or compressed air to remove dusts from the workplace. Do not inhale dusts. Wear protective equipment appropriate for the level of exposure. Scrape up hardened material and wipe residue. DO NOT FLUSH PRODUCT INTO DRAINS AS PRODUCT CAN HARDEN AND BLOCK DRAIN.

7. HANDLING AND STORAGE

Keep product dry. Store in well-ventilated area, in closed containers. Minimize or eliminate dust creation during handling and storage procedures. Periodically clean work and storage areas to minimize dust accumulation. Use wet clean-up methods or a vacuum to remove dusts. Wear protective goggles, gloves,

long sleeves, and respiratory protection as necessary to prevent exposure. Storage and work areas should be periodically cleaned to minimize dust accumulation. Do not inhale dusts. Vacuum dusty clothing before removal. Launder work clothing separately and rinse washer after use.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

RESPIRATORY PROTECTION: Under normal working conditions with airborne exposures below acceptable exposure guidelines, none required. For airborne exposures above acceptable limits, wear NIOSH approved respiratory protection in accordance with OSHA 29 CFR 1910.134.

SKIN PROTECTION: Protective gloves and long sleeves are recommended.

EYE PROTECTION: Protective goggles.

ENGINEERING CONTROLS: Local exhaust ventilation used in combination with general ventilation as necessary to control air contaminants to at or below acceptable exposure guidelines.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Light gray powder
ODOR:	Odorless
BOILING POINT:	Not applicable
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (Air = 1):	Not applicable
SOLUBILITY IN WATER:	Slight
SPECIFIC GRAVITY (Water = 1):	3
MELTING POINT:	1300 – 1400 °C
pH:	Not available
% VOLATILE:	Not applicable

10. STABILITY AND REACTIVITY

STABILITY: Stable.

INCOMPATIBLE MATERIALS/CONDITIONS: Reacts in water to form gypsum.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition (above 1450 ?C) will produce toxic sulfur dioxide, metal oxides, calcium oxide, and other oxidation products.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

INHALATION: No data is available for this material.

INGESTION: Plaster of Paris oral LD_{50} (rat): greater than 5000 mg/kg. No other oral data is available for this material.

SKIN AND EYE: No data is available for this material.

OTHER: No other data is available for this material.

12. ECOLOGICAL INFORMATION

Not data is available for this material. Avoid exposure to environment whenever possible.

13. DISPOSAL CONSIDERATIONS

Recycle, reclaim, and dispose of in accordance with applicable local, state and federal regulations. Dispose per 40 CFR

Part 261 and 262. Never discharge directly into sewers or surface waters.

14. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME:	Not classified as hazardous by DOT.
DOT HAZARD CLASS:	Not classified as hazardous by DOT.
UN IDENTIFICATION NUMBER:	Not classified as hazardous by DOT.
DOT SHIPPING LABEL:	Not classified as hazardous by DOT.
DOT PACKING GROUP:	Not classified as hazardous by DOT.

15. REGULATORY INFORMATION

WHMIS CLASSIFICATION: D2B, D2A

TSCA INVENTORY: The components of this product are listed on the TSCA inventory.

EPCRA - The material is not subject to Form "R" reporting.

SARA TITLE III – SECTION 313 SUPPLIER NOTIFICATION: This product does not contain ingredients subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372.

Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA): This product does not contain ingredients subject to the report requirements of SARA 204 (CERCLA) and 302 (EHS).

CALIFORNIA PROPOSITION 65: This product contains an ingredient known to the State of California to cause cancer (quartz).

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16. OTHER INFORMATION

KEY:

ACGIH:	American Conference of Governmental Industrial Hygienists
CAS:	Chemical Abstracts Service
CERCLA:	Comprehensive Environmental Response, Cleanup, and Liabilities Act
CFR:	Code of Federal Regulations
DOT:	Department of Transportation
EHS:	Extremely Hazardous Substance
EPCRA:	Emergency Planning and Community Right-to-Know Act
IARC:	International Agency for Research on Cancer
LD_{50}/LC_{50}:	Lethal dose or lethal concentration killing 50% of the test population
LEL/UEL:	Lower or upper explosive limit
mg/kg:	Milligram of contaminant per kilogram of body weight
mg/m^3:	Milligrams of contaminant per cubic meter of air on a weight to volume basis
NIOSH:	National Institute for Occupational Safety and Health
NFPA:	National Fire Protection Association
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit
PNOR:	Particulate not otherwise regulated
PNOS:	Particulate not otherwise specified
RTECS:	Registry of Toxic Effects of Chemical Substances
SARA:	Superfund Amendments and Reauthorization Act
STEL:	Short Term Exposure Limit
TLV:	Threshold Limit Value (2005)
TSCA:	Toxic Substances Control Act
WHMIS:	Workplace Hazardous Materials Information System

DISCLAIMER

The information in this MATERIAL SAFETY DATA SHEET should be provided to all who will use, har transport, or otherwise be exposed to this material. This information has been prepared for the guida engineering, operations, and management, and for persons working with or handling this material. C Crouse-Hinds believes this information to be reliable and up-to-date as of the date of publication, but warranty that it is.

IF 1365

Revision Date: 6/14/05

Cooper Crouse-Hinds
P.O. Box 4999
Syracuse, NY 13221-4999

COOPER Crouse-Hinds

Phone: 315.477.5440
Fax: 315.477.5179
http://www.crouse-hinds.com

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MATERIAL SAFETY DATA SHEET

CLASS LV4 2,4-D PHENOXY HERBICIDE

MANUFACTURER: CENEX/LAND O'LAKES AGRONOMY CO.
ADDRESS: P.O. BOX 64089 INVER GROVE HEIGHTS, MN 55164-0089
EMERGENCY TELEPHONE NO: CALL CHEMTREC, DAY OR NIGHT: 1-800-424-9300
TELEPHONE NUMBER FOR INFORMATION: 1-800-232-3639

SECTION I – HAZARDOUS INGREDIENTS IDENTITY AND INFORMATION

HAZARDOUS COMPONENTS	OSHA PEL	ACGIH TLV	*OTHER LIMITS	CAS#	%
2,4-Dichlorophenoxy-acetic acid, iso-octyl esters	NDA	10 mg/m³	NDA	94-75-7	66.2
Inert ingredients					33.8

SECTION II – PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT: 161 °C — SP. GRAVITY (H20): 1.0412
VAPOR PRESSURE (mm Hg): NDA — MELTING POINT: NA
VAPOR DENSITY: NDA — EVAPORATION RATE: NDA
SOLUBILITY IN WATER: Slightly soluble (emulsifiable)
APPEARANCE AND ODOR: Amber liquid with slight phenolic odor.

SECTION III – FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): 160 °F TOC
FLAMMABLE LIMITS: Not determined.
EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, foam, water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus and full protective gear in confined areas of buildings.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Use water to keep fire-exposed containers cool. DO NOT USE WATER TO EXTINGUISH FIRE unless unavoidable to prevent spreading of material.

SECTION IV – REACTIVITY DATA STABILITY:

UNSTABLE: ☐ CONDITIONS TO AVOID:

STABLE: ☒ CONDITIONS TO AVOID: Avoid exposure to heat or flame.

INCOMPATIBILITY (MATERIALS TO AVOID): Acid, base, oxidizing materials.
HAZARDOUS DECOMPOSITION OR BY PRODUCTS: Noxious fumes (HCL) under fire conditions.

HAZARDOUS POLYMERIZATION:

MAY OCCUR: ☐ CONDITIONS TO AVOID:

WILL NOT OCCUR: ☒ CONDITIONS TO AVOID:

SECTION V – HEALTH HAZARD DATA

ROUTES OF ENTRY: Ingestion, dermal, inhalation.
HEALTH HAZARDS: EYES: Slight irritation. SKIN: Slight irritation, may burn skin. INGESTION: Harmful if swallowed, may cause gastrointestinal irritation. INHALATION: Slight irritation but not hazardous.
SIGNS AND SYMPTOMS OF EXPOSURE: Nausea, vomiting, abdominal cramps, diarrhea.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NDA

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Irrigate with water for at least 15 minutes. SKIN: Wash with soap and water for 25 minutes, wash contaminated clothing separately. INHALATION: Move victim to fresh air, apply artificial respiration if breathing has stopped. INGESTION: Do not induce vomiting. Give large amounts of water or milk.
IN ALL INSTANCES seek medical attention.

SECTION VI – PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb with inert material such as sand, clay, kitty litter, or sawdust. Large spills should be contained.
WASTE DISPOSAL METHOD: If wastes cannot be disposed of according to label instructions contact your State Pesticide or Environmental Control Agency or the hazardous waste representative at the nearest EPA for guidance.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Read label completely. Avoid contact with skin or eyes. Avoid breathing mist. Keep out of reach of children. Store away from fertilizers, food, seeds, and insecticides.
OTHER PRECAUTIONS: Wash thoroughly after use and before eating or smoking.

SECTION VII – CONTROL MEASURES–PROCESS AREA

RESPIRATORY PROTECTION: Not normally required during use.
VENTILATION: LOCAL EXHAUST: Required
PROTECTIVE GLOVES: Required
EYE PROTECTION: Safety glasses or goggles
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Long sleeved shirt or coveralls.
WORK/HYGIENIC PRACTICES: Wash thoroughly after use and before eating or smoking. Do not smoke or eat in work area.

SECTION VIII – REGULATORY COMPLIANCE

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERLA Section 102):
CHEMICAL - 2,4-Dichlorophenoxyacetic acid CAS #: 94-75-7
RQ: 100# (Equivalent amount of this product would be 26 gallons)

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304): CHEMICAL - 2,4-Dichlorophenoxyacetic acid
CAS #: 94-75-7 TPQ: 10,000#

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313): CHEMICAL - 2,4-Dichlorophenoxyacetic acid
CAS #:94-75-7 % BY WEIGHT IN PRODUCT: 44.0%

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312): CHEMICAL - 2,4-Dichlorophenoxyacetic acid
CAS #: 94-75-7

EPA HAZARD CLASSIFICATION CODE:

ACUTE HAZARD	CHRONIC HAZARD	FIRE HAZARD	PRESSURE HAZARD	REACTIVE HAZARD	NOT APPLICABLE
XX	XX	XX			

HAZARD RATING: NFPA
2 FIRE 2 TOXICITY 0 REACTIVITY 0 CORROSIVENESS

HAZARD RATING CODE:
0-None 1-Slight 2-Moderate 3-High U-Unknown

SECTION IX – TRANSPORTATION INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Material Incidents. DOT P 5800.5.

DOT IDENTIFICATION:
4/1 gallon and 2x2-1/2 gallons:
Not regulated
Freight description: Compound, weed killing, non-regulated

RQ:
100# 2,4-D
(Equivalent amount of this product would be 26 gallons)

30 gallons:
RQ, Other regulated substance, liquid, n.o.s., (2,4-D), 9, NA 3082, PG III

Bulk over 119 gallons:
RQ, Combustible liquid, n.o.s. (contains fuel oil), Combustible liquid, NA 1993, PG III, RQ, (2,4-D)

LABELING AND PLACARDING REQUIREMENTS

On Units Of More Than 119 Gallons:

WORDED: COMBUSTIBLE NUMERIC: 1993

OSHA REQUIRED LABEL INFORMATION:

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a tarpel, bill of lading or invoice accompanying this shipment. NOTE: Product label will contain additional non-OSHA related information.

DATE: January 10, 1996 SUPERSEDES: May 4, 1995

Revision: Format change.

The information herein was given in good faith but no warranty, expressed or implied was made. Consult Cenex/Land O'Lakes Agronomy Company for further information.

NA = NOT APPLICABLE NDA = NO DATA AVAILABLE

MATERIAL SAFETY DATA SHEET

Conoco Industrial Oil 150

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Conoco Industrial Oil 150
Synonyms: Conoco MSDS LUBC0054
Intended Use: Industrial oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: Conoco Lubricants
A Division of ConocoPhillips
600 N. Dairy Ashford
Houston, TX 77079-1175
For Additional MSDSs 800-762-0942
Technical Information: 800-255-9556

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) 356-3129

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear and bright, water white
Physical form: Liquid
Odor: Mild petroleum

NFPA Hazard Class:

```
Health:       1 (Slight)
Flammability: 1 (Slight)
Reactivity:   0 (Least)
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HMIS Hazard Class

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Health:          1 (Slight)
Flammability:    1 (Slight)
Physical Hazard: 0 (Least)
```

2. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous components identified per 29 CFR 1910.1200.

OTHER COMPONENTS	% WEIGHT	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Hydrotreated Distillate, Heavy Paraffin ..C20-50	100	(See: Oil Mist, If Generated)		

CAS# 64742-54-7

REFERENCE	EXPOSURE GUIDELINE		
	Limits	Agency	Type
Oil Mist, If Generated	5 mg/m3	ACGIH	TWA
CAS# None	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH
	5 mg/m3	NOHSC	TWA

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.

1%=10,000 PPM.

All components are listed on the TSCA inventory.

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). Not acutely 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): No harmful effects reported from ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: Inadequate evidence available for this material. See Section 11 for target-organ toxicity information of individual components, if any.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s)

thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties:
Flash Point: 420°F/216°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. 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, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. Use good personal hygiene practices.

Do not use this product or other hydrocarbon-based lubricants in non-diaphragm compressors that produce "breathing air" unless the outlet air is monitored continuously for carbon monoxide. These lubricants can produce carbon monoxide when subjected to high temperatures.

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.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).
Appearance: Clear and bright, water white
Physical State: Liquid
Odor: Mild petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: No Data
Freezing/Melting Point: No Data
Solubility in Water: Insoluble
Specific Gravity: 0.85
Percent Volatile: Nil
Evaporation Rate (nBuAc=1): <1
Viscosity: 5.5 cSt @100°C / 29-35 cSt @ 40°C
Bulk Density: 7.1-7.2 lbs/gal
Flash Point: 420°F / 216°C (COC)
Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Hydrotreated Distillate, Heavy Paraffin ..C20-50 (CAS# 64742-54-7)

Carcinogenicity: The International Agency for Research on Cancer (IARC) has concluded that severely hydrotreated mineral oils are not carcinogenic. This product meets the OSHA guidance for severe hydrotreating.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations

regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Not classified as hazardous

Note: Material is unregulated unless in container of 3500 gal or more then provisions of 49 CFR Part 130 apply for land shipment.

IMDG: Not regulated
IATA: Not regulated

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
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:

--None--

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):

--None Known--

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.

EPA (CERCLA) Reportable Quantity:

--None--

Canada - Domestic Substances List: Listed

WHMIS Class:
Not regulated
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 CPR.

16. OTHER INFORMATION

Issue Date: 05/29/03
Previous Issue Date: 03/14/02
Revised Sections: *New Format*

MSDS Number: 775730
Status: Final

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

Conoco Turbine Oil (All Grades)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Conoco Turbine Oil (All Grades)
Synonyms: Conoco Turbine Oil 100
Conoco Turbine Oil 32
Conoco Turbine Oil 46
Conoco Turbine Oil 68
Intended Use: Industrial oil
Chemical Family: Petroleum Hydrocarbon

Responsible Party: ConocoPhillips Lubricants
600 N. Dairy Ashford
Houston, Texas 77079-1175

Customer Service: 800-640-1956
Technical Information: 800-255-9556

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) 356-3219

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear yellow to brown
Physical Form: Liquid
Odor: Characteristic petroleum

NFPA 704 Hazard Class:
Health: 1 (Slight)
Flammability: 1 (Slight)
Instability: 0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

NON-HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Lubricant Base Oil (Petroleum) VARIOUS	99-100	5mg/m^3 TWA 10 mg/m^3 STEL	5 mg/m^3 TWA	2500 mg/m^3 IDLH	as Oil Mist, if Generated 5 mg/m^3 NOHSC TWA
Additives PROPRIETARY	0-1	NE	NE	NE	NE

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-83-7; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea, diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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

Flammable Properties:

Flash Point:	> 410°F / 210°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
OSHA Flammability Class:	Not applicable
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data

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. Vapors are heavier than air and can accumulate in low areas.

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

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. Use good personal hygiene practices.

"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.

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.

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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Clear yellow to brown
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data

pH:	Not applicable .
Vapor Pressure (mm Hg):	<1
Vapor Density (air=1):	>1
Boiling Point:	> 555°F / 291°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.858-0.897
Bulk Density:	7.17-7.42 lbs/gal
Viscosity cSt @ 100°C:	4.30-30.6
Viscosity cSt @ 40°C:	22-460
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	> 410°F / 210°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data
Decomposition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Lubricant Base Oil (Petroleum) - CAS: VARIOUS
Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and therefore none are listed as a carcinogen by NTP, IARC, or OSHA.

Acute Data:

Lubricant Base Oil (Petroleum) - CAS: VARIOUS
Dermal LD50 = >2 g/kg
LC50 = No information available
Oral LD50 = >5 g/kg

Additives - CAS: PROPRIETARY
Dermal LD50 = No information available
LC50 = No information available
Oral LD50 = No information available

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT Proper Shipping Description: Not Regulated

Note: Material is unregulated unless in container of 3500 gallons or more, then provisions of 49 CFR Part 130 apply for land shipment.

IMDG Shipping Description: Not regulated

ICAO/IATA Shipping Description: Not regulated

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

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

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
–None Known–

EPA (CERCLA) Reportable Quantity (in pounds):
–None Known–

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:
– 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):
– None Known –

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.

TSCA:
All components are listed on the TSCA inventory.

International Regulations:

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 CPR.

Domestic Substances List: Listed

16. OTHER INFORMATION

Issue Date:	15-Aug-2005
Previous Issue Date:	23-Jul-2003
Revised Sections or Basis for Revision:	Product name (Section 1) Composition (Section 2) Physical Properties (Section 9)
MSDS Code:	775805

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.

ConocoPhillips

Cutter Stock

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Cutter Stock
MSDS Number:	724380
Synonyms:	Ferndale - Cutter Stock - 1272 Ferndale - Fuel Oil Cutter Stock SFR - D207 Bottoms SFR - Sour Diesel Trainer - Cutter Stock - F108 Untreated Diesel
Intended Use:	Refinery Stream
Manufacturer/Supplier:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!

Severe Skin Irritant
Combustible Liquid and Vapor
Aspiration Hazard
May Contain or Release Poisonous Hydrogen Sulfide Gas
Possible Skin Cancer Hazard

NFPA

Appearance: Yellow brown to black
Physical Form: Liquid
Odor: Petroleum; Rotten egg / sulfurous

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 defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): May contain or release poisonous hydrogen sulfide gas - see Other Comments.

Ingestion (Swallowing): Low to moderate 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 digestive tract, irritation of the respiratory tract, nausea, vomiting, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, respiratory (asthma-like) disorders, liver disorders and pregnancy.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration*
Distillates (Petroleum), Light Vacuum ..C11-35	70592-77-7	0-100
Gas Oil, Intermediate ..C9-25	68814-87-9	0-100
Thermocracked Distillate, Heavy ..C15-36	64741-81-7	0-100
Thermocracked Distillate, Light ..C10-22	64741-82-8	0-100
Gas Oil, Full Range ..C11-50	68410-00-4	0-100
Hydrogen Sulfide	7783-06-4	Variable (<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: Immediately flush affected area(s) with large amounts of water while removing contaminated shoes, clothing, and constrictive jewelry. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse the affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek immediate medical attention. Wash contaminated clothing before reuse.

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

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% $NaNO_2$ solution (0.5 gm $NaNO_2$ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Combustible. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). May create vapor/air explosion hazard if heated. 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. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

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

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, 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 nitrogen and sulfur may also be formed.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Combustible. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical 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. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). May contain or release poisonous hydrogen sulfide gas. 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. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid breathing vapors or mists. Use only outdoors or in well-ventilated area. Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe storage: Keep container(s) tightly closed. This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from any 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

Component	US-ACGIH	OSHA	Other
Distillates (Petroleum), Light Vacuum ..C11-35	TWA: 5 mg/m³ STEL: 10 mg/m³ as Oil Mist, If Generated	TWA: 5 mg/m³ as Oil Mist, If Generated	TWA: 100 mg/m³ ConocoPhillips (Crude Oil as Vapor) ConocoPhillips Guidelines
Thermocracked Distillate, Heavy ..C15-36	TWA: 0.2 mg/m³ As Coal Tar Pitch Volatiles (as Benzene Solubles) 5 mg/m³ TWA As Oil Mist, If Generated	0.2 mg/m³ TWA As Coal Tar Pitch Volatiles (as Benzene Solubles) 5 mg/m³ TWA As Oil Mist, If Generated	---
Thermocracked Distillate, Light ..C10-22	TWA: 5 mg/m³ STEL: 10 mg/m³ as Oil Mist, if Generated	5 mg/m³ TWA as Oil Mist, if Generated	---
Hydrogen Sulfide	STEL: 15 ppm TWA: 10 ppm	Ceiling: 20 ppm	---

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. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile.

Respiratory Protection: Where there is potential for airborne exposure to hydrogen sulfide (H2S) above exposure limits, a NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used. Under conditions where hydrogen sulfide (H2S) is NOT detected, a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters 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).

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.

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:	Yellow brown to black
Physical Form:	Liquid
Odor:	Petroleum; Rotten egg / sulfurous
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<100
Vapor Density (air=1):	>1
Boiling Point/Range:	340-1000°F / 171-538°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.80-0.90 @ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Viscosity:	2.2 cp @ 60°F (16°C)
Evaporation Rate (nBuAc=1):	No data
Flash Point:	>140°F / >60°C
Test Method:	*Pensky-Martens Closed Cup* (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.3
UEL (vol % in air):	10.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling.

Conditions to Avoid: Avoid all possible sources of ignition.

Materials to Avoid (Incompatible Materials): strong oxidizing agents.

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

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Distillates (Petroleum), Light Vacuum ..C11-35

Carcinogenicity: This material has not been evaluated for skin carcinogenicity, but may contain low concentrations of polycyclic aromatic hydrocarbons, which are known to be a skin cancer hazard. Untreated vacuum distillates have been identified as a carcinogen by IARC.

Distillates (Petroleum), Light Vacuum ..C11-35

Reproductive: Dermal application of a similar material, vacuum tower condensate, to pregnant rats produced limited evidence of developmental toxicity. The effects seen included decreased fetal weight and increased resorptions. The results are classified as limited since maternal effects were not reported and/or recorded.

Gas Oil, Intermediate ..C9-25

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA.

Thermocracked Distillate, Heavy ..C15-36

Carcinogenicity: Repeated application of heavy thermocracked distillate to mouse skin resulted in an increased incidence of skin tumors. This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

Target Organs: Dermal application of heavy thermocracked distillate (heavy coker gas oil) to rats, 5 days a week for 13 weeks, resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity) and bone marrow toxicity (i.e., hypoplasia and decreased hemoglobin).

Reproductive: Dermal application of heavy thermocracked distillate (coker gas oil), to pregnant rats produced limited evidence of developmental toxicity. The effects seen included decreased fetal weight and increased resorptions. The results are classified as limited since effects are noted only in the presence of maternal toxicity.

Thermocracked Distillate, Light ..C10-22

Carcinogenicity: Application of a similar material, light catalytic cracked distillate, to mouse skin, two or three times a week (duration unspecified), resulted in an increased incidence of skin tumors. Light thermocracked distillate has not been identified as a carcinogen by NTP, IARC, or OSHA.

Target Organs: Dermal application of light thermocracked distillate to rats, 5 days a week for 13 weeks, resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity).

Gas Oil, Full Range ..C11-50

Carcinogenicity: A similar material, light gas oil, produced skin tumors in mice after repeated dermal applications. Full range gas oil has not been identified as a carcinogen by NTP, IARC, or OSHA.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Distillates (Petroleum), Light Vacuum ..C11-35	>5 g/kg (Rat) based on similar material	> 2g/kg (similar material)	No data
Thermocracked Distillate, Heavy ..C15-36	3.2 g/kg (Rat) based on similar material	>2 g/kg (Rabbit)	No data
Thermocracked Distillate, Light ..C10-22	3.2 - 6.8 g/kg (Rat) based on similar material	>2 g/kg (Rabbit) - similar material	2.7 - 4.8 mg/L (Rat), similar material
Hydrogen Sulfide	Not Applicable	Not Applicable	LC50 (rat) = 1500 mg/m^3/15 min

12. ECOLOGICAL INFORMATION

Not evaluated.

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.

Container contents should be completely used and containers should be emptied prior to discard.

14. TRANSPORTATION INFORMATION

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	*Shipping description is for bulk shipments only. Non-Bulk shipments are unregulated.* Petroleum distillates, n.o.s., Combustible liquid, UN1268, III
Non-Bulk Package Marking:	Not Regulated *[49 CFR 173.150(f)(2)]*
Non-Bulk Package Labeling:	Not Regulated *[49 CFR 173.150(f)(2)]*
Bulk Package/Placard Marking:	Combustible / 1268
Packaging - References:	None; None; 49 CFR 173.241 *(Exceptions; Non-bulk; Bulk)*
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128
Note:	*Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.*

International Maritime Dangerous Goods (IMDG)

Shipping Description:	*Not regulated. Flash point is above 60°C, cc.*
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. Flash point is above 60°C, cc*
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 contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

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

Acute Health:	Yes
Chronic Health:	Yes
Fire Hazard:	Yes
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):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Various Polycyclic Aromatic Hydrocarbons	Skin 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
B2 - Flammable Liquids
D2B

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

Issue Date:	02-Jul-2008
Status:	Final
Previous Issue Date:	20-May-2005
Revised Sections or Basis for Revision:	Format change Periodic review and update
MSDS Number:	724380

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-DFG = Deutsche Forschungsgemeinschaft; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; N/A = Not Applicable; N/D = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

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

BOSTIK FINDLEY

HAZARD RATINGS HMIS
Health 2
Flammability 1
Reactivity 0
PPE X

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product Name	D62492
MSDS Name	D-815 Direct Glue Down Seam Sealer (EX D15)
CAS Number	Mixture
Product Use	Carpet Edge Seaming Adhesive
Generic Description	DURABOND Solvent Based Adhesive
Manufacturer	BOSTIK FINDLEY, INC. 211 Boston Street Middleton , MA 01949 USA
24 Hour Emergency Assistance	Phone: 1-800-227-0332
General Assistance	Phone: 1-978-777-0100
MSDS Assistance	Phone: 1-978-777-0100

2 COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number	Percentage
METHYLENE CHLORIDE	75-09-2	40 - 70

3 HAZARDS IDENTIFICATION

Emergency Overview

This product is irritating to the eyes and skin. Dermatitis may be aggravated by exposure to this product. Primary Route of Exposure: Contact.

POTENTIAL HEALTH EFFECTS

SKIN CONTACT: This product is irritating to the skin. Prolonged or repeated contact with this product may dry and/or defat the skin or dermatitis.

Liquid may be absorbed through intact skin if contact is prolonged.

EYE CONTACT: This product is irritating to the eyes.

INHALATION: Vapors extremely harmful if inhaled. This product is irritating to the respiratory system. Higher concentrations may cause central nervous system depression. Effects may include dizziness, headaches, nausea, vomiting, numbness, tingling in arms and legs, rapid heartbeat. Prolonged exposure to high concentrations of vapors may lead to unconsciousness and death.

INGESTION: This product is harmful or fatal if swallowed. May cause nausea, vomiting, pain, stomach upset, and diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.

Target Organs

Eyes. Skin. Lungs. Central Nervous System. Kidneys and Liver.

4 FIRST AID MEASURES

Skin

For minor exposures, wash thoroughly with soap and clean water. In situations involving considerable skin contact, place the contaminated person in a deluge shower for at least 15 minutes. Remove contaminated clothing to prevent further skin exposure and dispose of properly. Get medical attention if irritation persists.

Eye

Immediately flush with plenty of water for at least 15 minutes, holding eyelids open at all times. Get medical attention immediately.

Inhalation

Not normally required. Remove to fresh air. If the affected person is not breathing, apply artificial respiration. Call a physician if symptoms develop or persist.

Ingestion

Do not induce vomiting. If person is conscious and can swallow, immediately give two glasses of water. Seek immediate medical attention. Do not give anything by month to an unconscious or convulsing person.

Medical Conditions Aggravated By Exposure

Dermatitis.

Notes To Physician

Adrenaline should never be given to persons who have been exposed to methylene chloride.

5 FIRE FIGHTING MEASURES

Extinguishing Media

Use dry chemical, carbon dioxide, or foam. Water spray (fog).

Dust Explosion Hazard

None Known

Sensitivity To Mechanical Impact

None Known

Sensitivity To Static Discharge

None Known

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

Flash Point	> 200 F (> 93 C)
Autoignition Point	1033 F (556 C)
Lower Explosive Limit	13 %
Upper Explosive Limit	23 %

6 ACCIDENTAL RELEASE MEASURES

Emergency Action

Appropriate safety measures and protective equipment should be used. See Section 8. Do not discharge to lakes, streams, ponds, or sewers.

Spill Or Leak Procedure

Large Quantities: Enclose with diking material to prevent seepage into natural bodies of water. Place into appropriate containers for disposal. Clean contaminated area with water to remove residue. Small Quantities: Soak up with absorbent material. Follow Steps 2 and 3 above.

Clean-Up Procedures

Follow the guidelines of 29CFR 1910.120 for dealing with a spill of any size. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill, including the material spilled, the quantity of the spill and the area in which the spill occurred.

7 HANDLING & STORAGE

For Commercial Use Only - Not Packaged or Labeled for Home Use!

Storage

Store in a cool, dry, well-ventilated area away from heat, ignition sources and direct sunlight. The boiling point of this product is approximately 104 degrees F. At temperatures close to or in excess to 104 F, extreme pressure may build up in containers. Allow containers to come to room temperature prior to opening.

Empty Container Precaution

Attention! Follow label warnings even after container is emptied since empty containers may retain product residues. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption, or where skin contact can occur.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Use local exhaust ventilation when vapors, mists, or dusts can be released in concentrations above the TLV. Suitable respiratory equipment should be used when insufficient ventilation or operational procedures demand it.

Eye Protection

Wear safety glasses with side shields.

Skin And Body Protection

Wear appropriate clothing to minimize skin contact with this product. Wear protective impervious gloves to minimize skin exposure.

Respiratory Protection

When respiratory protection is required, wear a NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

General

Eyewash fountains and emergency showers should be readily available. Use good industrial hygiene practices in handling this material.

Exposure Limits

ACGIH - Occupational Exposure Limits - TWAs

METHYLENE CHLORIDE	75-09-2	50 ppm TWA

OSHA - Vacated PELs - Ceiling Limits

METHYLENE CHLORIDE	75-09-2	1000 ppm Ceiling

OSHA - Vacated PELs - Time Weighted Averages

METHYLENE CHLORIDE	75-09-2	500 ppm TWA

9 PHYSICAL & CHEMICAL PROPERTIES

Boiling Point	104 F (40 C)
Vapor Pressure	350
Solubility in Water	1.3 %
pH	NA
Density	1.15 g/cc
Odor Threshold	200 to 300 ppm
Odor	Chloroform
Color	Tan/red
Physical State	Liquid
Freeze Protect	No

10 STABILITY & REACTIVITY

Stability/Incompatability

Stable under normal conditions.

Hazardous Reactions/Decomposition Products

Carbon monoxide, carbon dioxide, hydrogen chloride, phosgene and chloride gas.

Hazardous Polymerization

Will not occur.

Conditions To Avoid

Extreme heat. Freezing. Avoid Strong Oxidizers. Avoid contact with Strong Acids, Strong Bases and Strong Oxidizers. Avoid Strong Caustics, Aluminum and galvanized metals and reactives such as Lithium, Magnesium, Potassium, Sodium, and Zinc.

11 TOXICOLOGICAL INFORMATION

Ld50

NIOSH - Selected LD50s and LC50s

METHYLENE CHLORIDE	75-09-2	Inhalation LC50 Rat: 52 gm/m3; Inhalation LC50 Mouse: 14400 ppm/7H; Oral LD50 Rat: 1600 mg/kg

Carcinogenicity

IARC - Group 2B (Possibly carcinogenic to humans)

METHYLENE CHLORIDE	75-09-2	Monograph 71, 1999; Supplement 7, 1987; Monograph 41, 1986

NTP - Report on Carcinogens - Suspect Carcinogens

METHYLENE CHLORIDE	75-09-2	Suspect Carcinogen

OSHA - Possible Select Carcinogens

METHYLENE CHLORIDE	75-09-2	Present

12 ECOLOGICAL INFORMATION

VOC (Volatile Organic Compounds) 6 - 10 g/l

Ecotoxicological Information

No data available for this product.

13 DISPOSAL CONSIDERATIONS

We make no guarantee or warranty of any kind that the use or disposal of this product complies with all local, state, or federal laws. It is also the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.

Waste Disposal

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

14 TRANSPORT INFORMATION

Proper Shipping Name	Dichloromethane Solution
Hazard Class	6.1
UN/NA Code	1593
Packing Group	III

15 REGULATORY INFORMATION

This MSDS is prepared and distributed pursuant to the Federal Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

Federal Regulations

Components of this product have been checked against the non-confidential TSCA inventory by CAS Registry Number. Components not identified on this non-confidential inventory are either exempt from listing (i.e. polymers, hydrates) or are listed on the confidential inventory as declared by the supplier.

CERCLA/SARA - Hazardous Substances and their Reportable Quantities

METHYLENE CHLORIDE	75-09-2	1000 lb final RQ; 454 kg final RQ

Based on an evaluation of the components used, this product does contain hazardous ingredients identified as per 29 CFR 1910.1200.

State Regulations

If this product contains any ingredients listed under California Proposition 65, they will be noted below:

California - Prop. 65 - Cancer list

METHYLENE CHLORIDE	75-09-2	carcinogen; initial date 4/1/88

International Regulations

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS). Class D Division 2 Sub-division B. and Class D Division 2 Sub-division A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and contains all the information required by the Controlled Products Regulations.
DSL Status Not Determined. EINECS Status not determined.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES

Not Regulated

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard	Yes
Delayed Hazard	Yes
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No

SARA 313 TOXIC CHEMICALS

Not Regulated

WHMIS RATINGS

Compressed Gas		Flammable/Combustible	Oxidizer	Acutely Toxic
Other Toxic Effects	X	Bio Hazardous	Corrosive	Dangerously Reactive

16 OTHER INFORMATION

Disclaimer

The data in this MSDS has been compiled from publicly available sources. This data relates only to the designated product and not to the use of said product in combination with other materials. 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 which exist. Responsibility for proper precautions and safe use of the product lies with the user. All data in this MSDS is typical of the product as a whole, and does not represent any individual lot or batch, therefore, Bostik Findley, Inc. makes no warranty about the accuracy of the data herein and assumes no liability for the use of such data. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Issue Date 15-Aug-2002 **Supercedes** 01-Jul-2002

Prepared By Sue Brennan

MSDS Sections Reviewed and/or Updated

Chemical Product & Company Identification: Product & Company Identification

Physical & Chemical Properties: Physical & Chemical Properties

Regulatory Information: FEDERAL REGULATIONS

Toxicological Information: CARCINOGENICITY

Material Safety Data Sheet

Back

Trade Name: DOWTHERM SR-1 HEAT TRANSFER LIQUID **Manufacturer:** UNIVAR CANADA LTD

MSDS Code: LA1614 **Type of Chemical:** LIQUID

MSDS Date: 1/30/03

Notes:

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product ID: LA1614
Product Name: DOWTHERM SR-1

Synonyms: None
Chemical Family: None known
Application: Not available

Distributed By
Univar Canada Ltd
9800 Van Horne Way
Richmond BC
V6X 1W5

24 Hr Emergency Telephone Number CHEMTREC: 800-424-9300
Preparation date of MSDS: 01/30/2003

Prepared By:
The Safety, Health and Environmental Department of Univar Canada Ltd.

Telephone Number of Preparer in Canada: 1-866-686-4827
Univar USA Inc Corporate Office Number: 1-425-889-3400

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Hazardous Components

Ethylene Glycol
Cas # 107-21-1
Percent: >95
LD50/LC50:
Inhalation LC50 Rat: 10876 mg/kg
Oral LD50 Rat 4700 mg/kg
Oral LD50 Mouse: 5500 mg/kg
Dermal LD50 Rabbit: 9530 uL/kg

Non-Hazardous Components

Water
Cas # 7732-18-5
Percent: <3
LD50/LC50: Not available

Dipotassium Phosphate

Cas # 7758-11-4
Percent: <3
LD50/LC50: Not available

Notes: No additional remark

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Eye Contact:
May cause slight transient (temporary) eye irritation. Vapors or mists may cause eye irritation.

Skin Contact:
May cause mild skin irritation. May cause more severe response if skin is abraded. A single prolonged exposure is not likely to result in material absorbed through the skin in harmful amounts. Repeated skin exposure to large quantities may result in absorption of harmful amounts.

Inhalation:
At room temperatures, vapors are minimal due to low vapor pressure. If material is heated or mist is produced, concentration may be attained that are sufficient to cause irritation and other effects. May cause damage to naal and respiratory passages.

Ingestion:
Single dose oral toxicity is believed to be moderate. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis) and kidney failure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however swallowing amounts larger than that may cause serious injury, even death. May cause liver and kidney damage.

4. FIRST AID MEASURES

Eye Contact:
Flush with copious amounts of water.

Skin Contact:
Wash with soap and water. Get medical attention if irritation persists.

Inhalation:
Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

Ingestion:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconsicous person. Seek medical attention immediately.

Notes to Physican:
Treatment based on sound judgment of physican and individual reaction of patients

5. FIRE FIGHTING MEASURES

Flash Point: 111C 231.8F
Flash Point Method: Tag closed cup

Autoignition Temp: C-398 F-748.4
Flammable Limits in Air:
Lower: 3.2

Upper: Not applicable

Extinguishing Media: Use dry chemical, CO2, alcohol foam or water spray.

Special Exposure Hazards:
Water may be used to flush spills away from fire exposure and to dilute spills to non-flammable mixtures. If possible, contain fire run-off water. For large scale fires, direct water stream may cause violent frothing, but fine water spray may help control situation. Isolate and restrict area access. When using water spray, boil over may occur when the product temperatur reaches the boiling pointof water.

Special Protective Equipment:
Fire fighters should wear full protective clothing, including self-contained breathing apparatus.

NFPA Ratings for this product are : H - 1, F - 0, R - 0
HMIS Ratings for this product are: Not available

6. ACCIDENTAL RELEASE MEASURES

Procedure for Clean Up: Isolate spill and stop leak where safe. Small spills: soak up with absorbent material and scoop into containers. Large spill: prevent contamination of waterways. Dike and pump into suitable containers. Clean up residual with absorbent material and wash with water. Prevent spilled material from entering sewers, confined spaces, drains or waterways.

Personal Precautionary Meaures:
Wear appropriate protective equipment.

Environmentally Precautionary Measures
Keep out of sewers, storm drains, surface water and soil. Material is more dense than water and has infinite water solubility.

7. HANDLING AND STORAGE

Handling
Avoid body contact. Provide adequate ventilation. Above flash point vapour-air mixtures will bum within flammable limits. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Storage:
Keep container tightly closed.

8. EXPOUSRE CONTROLS/ PERSONAL PROTECTION

Engineering Controls:
In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits.

Respiratory Protection:
If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator.

Gloves:
Impervious gloves

Skin Protection:
Rubber boots. PVC coated apron or clothing.

Eyes:

Safety glasses with side shields. Face shield.

Other Personal Protection Data:
Ensure that eyewash stations and safety showers are proximal to the work station location.

Hazardous Components

Ethylene Glycol
Cas # 107-21-1
Percent: >95
ACGIH : =100 mg/m3 Ceiling (aerosol only)
OSHA: 50 ppm Ceiling; 125 mg/m3 Ceiling

Non-Hazardous Components

Water
Cas # 7732-18-5
Percent: <3
ACGIH: not available
OSHA: not available

Dipotassium Phosphate
Cas # 7758-11-4
Percent: <3
ACGIH: Not available
OSHA: Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Color: Clear
Odor: Glycol Odor
pH: Not available

Specific Gravity: 1.1295
Boiling Point: 163C 325.4F
Freezing Point: Not available

Vapor Pressure: 0.3 kPa
Vapor Density: >1
% Volatile by Volume: Not available
Evaporation Rate: Not available

Solubility: Not available
VOCs: Not available
Viscosity: Not available
Molecular Weight: Not available

10. STABILITY AND REACITIVTY

Chemical Stability: Stable
Hazardous Polymerization: Will not occur
Conditions to Avoid: None known
Materials to Avoid: Oxidizing Materials
Hazardous Decomposition Products: Carbon monoxide. Carbon dioxide
Additional Information: Not available

11. TOXICOLOGICAL INFORMATION

Principal Routes of Entry

Ingestion:
Single dose oral toxicity is believed to be moderate. Excessive exposures may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis) and kidney failure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing amounts larger than that may cause serious injury, even death. May cause liver and kidney damage.

Skin Contact:
May cause mild skin irritation. May cause more severe response if skin is abraded. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. Repeated skin exposure to large quantities may result in absorption of harmful amounts.

Inhalation:
At room temperature, vapors are minimal due to low vapor pressure. If material is heated or mist is produced, concentrations may be attained that are sufficient to cause irritation and other effects. May cause damage to nasal and respiratory passages.

Eye Contact:
May cause slight transient eye irritation. Vapors or mists may cause eye irritation.

Other

Acute Test of Product:
Acute Oral LD50: Not available
Acute Dermal LD50: Not available
Acute Inhalation LC50: Not available
Carcinogenicity:

Hazardous Components
Ethylene Glycol
Cas # 107-21-1
Percent: >95
ACGIH: A4 - Not classifiable as a Human Carcinogen (aerosol)

Non-Hazardous Components

Water
Cas # 7732-18-5
Percent: <3
ACGIH: Not listed

Dipotassium Phosphate
Cas # 7758-11-4
Percent: <3
ACGIH: Not listed

Carcinogenicity Comment: No additional information

Genotoxicity: Not available

Reproductive/ Developmental Toxicity:
Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Specifically, growth retardation and decreased litter size in rats and mice and decreased matting frequency in mice were observed.

Teratogenicity:
Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects.

Embryotoxicity: Not available
Mutagenicity: Not available

12. ECOLOGICAL INFORMATION

Hazardous Components

Ethylene Glycol
Cas # 107-21-1
Percent: >95
Ecotoxicity Fish Species Data:
LC50 (96 hr) rainbow trout: 41000 mg/L : 20C
LC50 (96 hr) bluegill: 27500 mg/L
LC50 (96 hr) goldfish: 27500 mg/L

Acute Crustaceans Toxicity: Not available
Ecotoxicity Freshwater Algae Data: Not available

Non-Hazardous Components

Water
Cas # 7732-18-5
Percent: <3
Ecotoxicity: Not available
Acute Crustaceans Toxicity: Not available
Ecotoxicity Freshwater Algae: Not available

Dipotassium Phosphate
Cas # 7758-11-4
Percent: <3
Ecotoxicity: Not available
Acute Crustaceans: Not available
Ecotixicity Freshwater algae: Not available

Other Information
Movement & Partitioning: Bioconcentration potential is low.
Degradation & Transformation: Biodegradation under aerobic static laboratory conditions is high (BOD or BOD28/ThOD greater than 40%)
Ecotoxicology: Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/L in most sensitive species)

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method:
Disposal of all wastes must be done in accordance with municipal, provinical and federal regulations.

Contaminated Packaging:
Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

US DOT:
NOT REGULATED
MARINE POLLUTANT: NO

ICAO/IATA:
IATA PROPER SHIPPING NAME: NOT REGULATED
IATA HAZARD CLASS: NOT APPLICABLE
UN/NA NUMBER: NOT APPLICABLE
PACKING GROUP: NOT APPLICABLE
IATA LABEL: NOT REGULATED
REMARKS: NO ADDITIONAL REMARK

IMDG:
IMDG PROPER SHIPPING NAME: NOT REGULATED
HAZARD CLASS: NOT APPLICABLE
PACKING GROUP: NOT APPLICABLE
EMS NO: NOT APPLICABLE
MFAG TABLE NO: NOT APPLICABLE
MARINE POLLUTANT: NO
IMDG FLASH POINT: NOT AVAILABLE
IMDG LABEL: NOT REGULATED
REMARKS: NO ADDITIONAL REMARK

TDG: CANADA
TDG PROPER SHIPPING NAME: NOT REGULATED
HAZARD CLASS: NOT APPLICABLE
UN NUMBER: NOT APPLICABLE
PACKING GROUP: NOT APPLICABLE
NOTE: NO ADDITIONAL REMARK
MARINE POLLUTANT: NO

15 REGULATORY INFORMATION

US TSCA Inventory Status: Listed
Canadian DSL Inventory Status: Listed
Canadian NDSL Inventory Status: Not listed

US Regulatory Rules:

Ethylene Glycol >95 107-21-1
Cercla/Sara Section 302: Not listed
SARA 311, 312 Hazard Class: final RQ = 5000 pounds (2270 kg)
Cercla/Sara - Section 313: from R reporting required for 1.0% de minimus concentration

Water <3 7732-18-5
Cercla/Sara Section 302: not listed
Sara 311, 312 Hazard class: not listed
Cercla/Sara Section 313: not listed

Dipotassium Phosphate <3 7758-11-4
Cercla/Sara Section 302: not listed
Sara 311, 312 Hazard Class: not listed
Cercla/Sara Section 313: not listed

California Proposition 65: not listed
MA right-to-know List: Listed
New Jersey Right To Know List: Listed
Pennsylvannia Right To Know List: Listed

Canada WHMIS Classification: D2A Very Toxic Materials

16. OTHER INFORMATION

Additional Information
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.

COPPOR00000923

PLASTI-KOTE CO., INC.
1000 LAKE ROAD
MEDINA, OHIO 44256
1-330-725-4511
1-800-255-3924 24 Hour Emergency Only

DATE PREPARED: 04/10/02
PRODUCT CLASS: AEROSOL SPRAY PAINT
SHIPPING NAME: CONSUMER COMMODITY
ORM-D INT'L UN NO.: 1950
NE = NONE ESTABLISHED
NA = NONE AVAILABLE

HAZARD RATING	HMIS		NFPA	
4 = SEVERE	HEALTH	1	HEALTH	2
3 = SERIOUS	FLAMMABILITY	4	FLAMMABILITY	4
2 = MODERATE	REACTIVITY	0	REACTIVITY	0
1 = SLIGHT	PERSONAL PROTECTION	E	OTHER	-
0 = MINIMAL				

SECTION II - HAZARDOUS INGREDIENTS

PRODUCT NAME :

ENGINE ENAMELS

	INGREDIENT	CAS NUMBER	ACGIH TWA PPM	OSHA PEL PPM	OTHER TLV PPM	VAPOR PRESSURE mmHg at 20 C	PRODUCT# 198 199 201 202 203 204 205 209 210 211 218 216 221 222 224 225 229 230 231 232 235 % (wt)	PRODUCT# LEAD 200 206 209 226 % (wt)	PRODUCT# ALUMINUM 207 223 % (wt)	PRODUCT# METALLIC 227 % (wt)	PRODUCT# PRIMER 228 % (wt)
	ACETONE	67-64-1	750	1000	—	180	30-40	35-45	15-25	40-45	25-35
	ALIPHATIC HYDROCARBON	8052-41-3	100	100	—	20			0-2		
	AROMATIC HYDROCARBON	64742-95-6	NE	NE	100	3	0-5				
	ETHYL ACETATE	141-78-6	400	400	—	69	0-4				
	ETHYL ALCOHOL	64-17-5	1000	1000	—	40	5-10	5-10			
	ETHYL 3-ETHOXY PROPIONATE	763-69-9	NE	NE	50	0.67	0-10	0-10		0-5	
	ISOPROPYL ALCOHOL	67-63-0	400	400	—	33	0-3	0-3		0-3	
*	LEAD CHROMATE - MOLYBDATE	12656-85-8	0.05mg/m3 as Pb as Cr					0-3			
*	METHYL ETHYL KETONE	78-93-3	200	200	—	70	0-3	0-3		0-7	
	METHYL ISOBUTYL KETONE	108-10-1	50	100	—	16				0-7	
	OXO ALCOHOL ESTER	88230-35-7	NE	NE	50	1.4				0-5	
	PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE	108-65-6	100	100	—	8.0		0-3			
	CARBON BLACK	1333-86-4	—	(1)	(1)	—	0-0.9				
	TITANIUM DIOXIDE	13463-67-7	—	(2)	(2)	—	0-10	0-2			
*	XYLENE	1330-20-7	100	100	—	6.1	5-10	5-10	35-50	5-10	20-35
	PROPANE-ISOBUTANE MIXTURE	68476-86-8	NE	1000	—		23	23	23-27	19	25

(1) 3.5 mg/m3 DUST (2) 10 mg/m3 DUST

* THIS CHEMICAL IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III.

SECTION III - PHYSICAL DATA

BOILING RANGE:	133° - 331° F	VAPOR DENSITY:	_X_ Heavier ___ Lighter than air
MELTING POINT:	Estimated min. 1500° F	WEIGHT PER GALLON:	7.8 - 8.0 (PAINT)
VAPOR PRESSURE:	Unknown for products.	SPECIFIC GRAVITY :	(H2O- =1): < 1
SOLUBILITY IN WATER:	Slight to moderate	EVAPORATION RATE:	__ Faster _X_ Slower than ether
APPEARANCE AND ODOR:	Typical solvent paint	EVAPORATION RATE:	
PERCENT VOLATILE BY VOLUME: 50-80		(Butyl Acetate = 1) Section 1 products = 1	

See Section II for volatile, hazardous components. Propellants = 1 (Propellant faster)

Continue on page 2

FROM PK CUST SRV (THU) 5 29 2003 16:40/ST. 16:36/NO. 5112072340 P 2

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION: OSHA: IA FLASH POINT: 0° F (-18° C) TCC
(EXTREMELY FLAMMABLE) UNIFORM FIRE CODE: LEVEL 3 AEROSOL (Propellant = -100° F)
EXTINGUISHING MEDIA: ALCOHOL FOAM, CO2, DRY CHEMICAL LEL 1.0

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Closed containers may explode and/or autoignite when exposed to extreme heat, vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, welding, electric motors or other locations distant from material handling point.

SPECIAL FIRE FIGHTING PROCEDURES:

Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable use self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode.

SECTION V - HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: _X_ INHALATION _X_ SKIN ___ INGESTION _X_ EYES

CARCINOGENICITY: _X_ NTP _X_ IARC ___ OSHA

Contains ethylbenzene as a component of xylene. Ethylbenzene is classified by IARC as possibly carcinogenic to humans based on animal data; however there is inadequate evidence for cancer in exposed humans.

* LEAD CHROMATE IN PART NUMBERS INDICATED IN SECTION II *

SYMPTOMS OF OVEREXPOSURE:

ACUTE:
- BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS AND EVEN ASPHYXIATION.
- EYE CONTACT - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.
- SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, DIARRHEA.
- SKIN CONTACT - CAN CAUSE IRRITATION. PROLONGED CONTACT CAN CAUSE DRYNESS AND CRACKING OF SKIN.

CHRONIC: None known for product(s) in Section 1.

REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. SEVERE OVEREXPOSURE IN LABORATORY ANIMALS HAS ALSO CAUSED LIVER ABNORMALITIES AND DAMAGE TO KIDNEYS, LUNGS, AND SPLEEN, HEART AND ADRENALS. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL. PROLONGED OVEREXPOSURE TO LEAD CAN SEVERELY DAMAGE RED BLOOD CELL FORMATION, KIDNEYS, AND NERVOUS SYSTEM.

MEDICAL CONDITIONS: Generally Aggravated By Exposure - Can cause respiratory and/or skin reaction.

FIRST AID-EMERGENCY PROCEDURES:

1. IF BREATHED - REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING IS STOPPED, GIVE ARTIFICIAL RESPIRATION AND SEEK MEDICAL HELP.
2. IF IN EYES - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET PROMPT MEDICAL ATTENTION.
3. IF SWALLOWED - DO NOT INDUCE VOMITING (ASPIRATION OF MATERIAL INTO LUNGS CAN CAUSE PNEUMONITIS, WHICH CAN BE FATAL). KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION / POISON CONTROL CENTER.
4. IF ON SKIN - WASH WITH SOAP AND WATER OR VARIOUS HAND CLEANERS, AND WASH CLOTHING.

SECTION VI - REACTIVITY DATA

STABILITY: ___ UNSTABLE __X__ STABLE HAZARDOUS POLYMERIZATION: ___ MAY OCCUR __X__ WILL NOT OCCUR

CONDITIONS TO AVOID: Heat, Sparks and open flame.

INCOMPATIBILITY (Materials to avoid): Avoid contact with strong oxidizing agents and heat.

HAZARDOUS DECOMPOSITION: May form toxic materials, carbon dioxide / carbon monoxide, various hydrocarbons, nitrogen compounds, etc., when burned.

CONDITIONS TO AVOID: Not applicable.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ELIMINATE ALL IGNITION SOURCES, VENTILATE AREA, ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO A CLOSED CONTAINER.

WASTE DISPOSAL METHOD: MATERIAL COLLECTED ON ABSORBENT MATERIAL MAY BE DEPOSITED IN A POSTED TOXIC SUBSTANCE LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT PUNCTURE OR INCINERATE. DO NOT STORE IN AREAS ABOVE 120° F (49° C). OR IN DIRECT SUNLIGHT, OR NEAR HEAT OR OPEN FLAMES.

STORAGE CATEGORY: STORE LARGE QUANTITIES IN BUILDING PROTECTED FOR STORAGE OF FLAMMABLE LIQUIDS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: FOR CASUAL / OCCASIONAL USE - TO AVOID BREATHING VAPORS OR SPRAY MIST, OPEN WINDOWS AND DOORS OR USE OTHER MEANS TO ENSURE FRESH AIR ENTRY DURING APPLICATION AND DRYING. IF YOU EXPERIENCE EYE WATERING, HEADACHE, OR DIZZINESS, INCREASE FRESH AIR, WEAR RESPIRATORY PROTECTION (NIOSH/MSHA APPROVED), OR LEAVE THE AREA.

VENTILATION: FOR REGULAR / CONTINUOUS USE - PROVIDE SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV'S IN SECTION II.

PROTECTIVE GLOVES: WEAR CHEMICAL RESISTANT GLOVES, SUCH AS NEOPRENE. IF SKIN CONTACT IS TO BE AVOIDED.

EYE PROTECTION: CHEMICAL SPLASH GOGGLES, IN COMPLIANCE WITH OSHA REGULATIONS, ARE ADVISED.

OTHER EQUIPMENT: WHERE SPECIAL OR UNUSUAL CONDITIONS EXIST, SEEK THE EXPERT ASSISTANCE OF AN INDUSTRIAL HYGIENIST.

WORK/HYGIENIC PRACTICES: WASH HANDS BEFORE EATING OR USING WASHROOM. AS WITH ALL CHEMICALS, MINIMIZE PERSONAL CONTACT.

THE INFORMATION CONTAINED ABOVE IS BELIEVED TO BE ACCURATE, BUT IS NOT WARRANTED. RECIPIENTS ARE ADVISED TO CONFIRM

FROM PK CUST SRV (THU) 5 29 2003 16:41/ST. 16:36/NO. 5112072340 P 3

ConocoPhillips

MATERIAL SAFETY DATA SHEET

Ethanol, for Gasoline Blending

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Ethanol, for Gasoline Blending
Synonyms:	Denatured Anhydrous Ethanol Denatured Fuel Ethanol Ethanol for Fuel Blending Ethanol for Gasoline Ethanol, Denatured Ethyl Alcohol, Denatured
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
MSDS Information:	800-762-0942 MSDS@conocophillips.com

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) 356-3129

Health Hazards/Precautionary Measures: Cancer hazard. Contains benzene. Causes eye and skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with ventilation adequate to keep exposure below recommended limits, if any. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Extremely flammable liquid and vapor. Vapor can cause flash fire. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Gasoline or alcohol

NFPA 704 Hazard Class:

Health:	2 (Moderate)
Flammability:	4 (Extreme)
Instability:	0 (Least)

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component	**Concentration (wt %)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Ethanol 64-17-5	95-98	1000 ppm TWA 1880 mg/m^3 TWA	1000 ppm TWA 1900 mg/m^3 TWA	NE	—
Gasoline NONE	2-5	300 ppm TWA 890 mg/m^3 TWA 500 ppm STEL 1480 mg/m^3 STEL	NE	NE	—
Benzene 71-43-2	0-0.2	0.5 ppm TWA-SKIN 2.5 ppm STEL-SKIN	1 ppm TWA ppm STEL	500 ppm IDLH	—

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.

1%=10,000 PPM.
NE=Not Established

Contains benzene. If exposure concentrations exceed the 0.5 ppm action level, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028). Also see Section 4.

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Eye irritant. Contact may cause stinging, watering, redness, and swelling.

Skin: Skin irritant. Contact may cause redness, itching, burning, and skin damage. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin, leading to dermatitis (inflammation). Contact may result in skin absorption but symptoms of toxicity are not anticipated by this route alone under normal conditions of use.

Inhalation (Breathing): Low to moderate 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 respiratory tract, irritation of the digestive tract, nausea, vomiting, flushing, blurred vision, drunkenness, stupor, tremors, respiratory failure, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), unconsciousness, convulsions, death.

Cancer: This material is a known cancer hazard (see Sections 11 and 15).

Target Organs: Overexposure may cause injury to the central nervous system, stomach, male reproductive system, heart.

Developmental: Potential hazard to the fetus (see Section 11).

Other Comments: Most adverse health effects associated with ethanol, a component of this material, are related to the chronic ingestion of alcoholic beverages. Alcoholism has been associated with liver, stomach, heart, and nervous system damage, cancer, adverse reproductive effects, and effects on the developing fetus. Many of these effects may be related to metabolic changes that result from constantly high blood levels of alcohol. This exposure pattern is significantly different from that of persons handling industrial ethanol in the workplace or from refueling cars with gasoline containing ethanol.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as Solvent or Painters' Syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include central nervous system disorders, liver disorders, male reproductive disorders and heart disorders.

4. FIRST AID MEASURES

Eye: Move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek medical attention. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. Seek medical attention.

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek 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 medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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.

Notes to Physician:

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	-5°F/-21°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
OSHA Flammability Class:	Flammable Liquid
LEL (vol % in air):	3.3
UEL (vol % in air):	19.0
Autoignition Temperature:	425°F / 218°C

Unusual Fire & Explosion Hazards: This material is extremely flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

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

Extremely flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical 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 absorbent material.
Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended.

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 discharge. The use of explosion-proof electrical 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 as 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).

Wash thoroughly after handling. 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.

"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.

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 any 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 concentrations below the established exposure limits (see Section 2), additional engineering controls 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 may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

If benzene values equal or exceed applicable exposure limits the use of respiratory protection should comply with the requirements in OSHA 29 CFR 1910.1028-Benzene.

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.

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Gasoline or alcohol
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure (mm Hg):	45
Vapor Density (air=1):	>1
Boiling Point/Range:	165-175°F / 74-79°C
Melting/Freezing Point:	<-173°F / <-114°C
Solubility in Water:	Miscible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.79 lbs/gal
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	3.20
Flash Point:	-5°F/-21°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	3.3
UEL (vol % in air):	19.0
Autoignition Temperature:	425°F / 218°C
Decomposition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Extremely 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 oxidizing agents.

Hazardous Decomposition Products: Combustion can yield carbon dioxide and carbon monoxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Ethanol 64-17-5

Carcinogenicity: Ingestion of alcoholic beverages has been classified by IARC as "carcinogenic to humans" (Group 1). Occupational exposures to ethanol and exposures other than by ingestion (i.e., dermal and inhalation) have not been associated with cancer in humans.

Target Organs: Chronic alcoholism has been associated with damage to the liver in humans (e.g., cirrhosis of the liver). Excessive consumption of alcoholic beverages has also been associated with adverse effects on the central nervous system, digestive system, cardiovascular system, and the reproductive system including reduced sperm count and motility and loss of libido in men, abnormal menstrual function, and decreased plasma estradiol and progesterone levels in women.

Developmental: Excessive consumption of alcoholic beverages during pregnancy has been associated with effects on the developing fetus referred to collectively as the fetal alcohol syndrome. The effects most frequently manifested include psychomotor dysfunction, growth retardation and a characteristic cluster of facial anomalies.

Mutagenic Effects: Excessive consumption of alcoholic beverages has been associated with chromosomal aberrations in white blood cells. Depending on the animal species being tested, ethanol may produce chromosomal damage, DNA damage and mutation in both somatic and germ cells.

Gasoline NONE

Carcinogenicity: Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by IARC. Because solvent extracts of gasoline exhaust particulates caused skin cancer in laboratory animals, IARC has categorized gasoline engine exhaust as a possible human cancer hazard.

Target Organs: A two year inhalation study of wholly vaporized unleaded gasoline produced nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules, and necrosis and hyperplasia of surrounding cells. Follow-up studies suggest that these changes are unique to the male rat. Although prolonged exposure to n-hexane, a component of gasoline, has resulted in adverse male reproductive effects in experimental animal studies, no adverse male reproductive effects were found in studies conducted with gasoline.

Developmental: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation.

Benzene 71-43-2

Carcinogenicity: Benzene is known to cause cancer of the blood-forming organs in humans, including acute myelogenous leukemia. It has been identified as a human carcinogen by NTP, IARC and OSHA.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Developmental: Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body weight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.

Mutagenic Effects: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

Acute Data:

Ethanol 64-17-5
Dermal LD50= 9.4 ml/kg (Rabbit)
Inhalation LC50= 20,000 ppm/10 hr. (Rat)
Oral LD50= 6.2-13.7 g/kg (Rat); LD50 = 6300 mg/kg (Rabbit)
Gasoline NONE
Dermal LD50= >5 ml/kg (Rabbit)
Inhalation LC50= 300g/m^3/5M (rat, mouse, g.pig)
Oral LD50= 18.75 ml/kg. (Rat)
Benzene 71-43-2
Dermal LD50= > 9400 mg/kg (Rabbit)
Inhalation LC50= 10000 ppm/7hr. (Rat)
Oral LD50= 930 mg/kg (Rat)

12. ECOLOGICAL INFORMATION

Not evaluated.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA "characteristic" hazardous waste due to the characteristic(s) of ignitability (D001). If the spilled or released material impacts soil, water, or other media, characteristic testing of the contaminated materials may be required prior to their disposal. 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 than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT

Shipping Description: Alcohols, n.o.s., 3, UN1987, II, **
Non-Bulk Package Marking: Alcohols, n.o.s., UN1987
Non-Bulk Package Labeling: Flammable liquid
Bulk Package/Placard Marking: Flammable Liquid/1987
Packaging - References (Exceptions, Non-Bulk, Bulk): 49 CFR 173.150, 173.202, 173.242
Hazardous Substance: None
Emergency Response Guide: 127
Note: ** Enter "RQ (name/s of hazardous substance/s)" if amount/s of hazardous substance/s in a single packaging ≥ the reportable quantity.

IMDG

Shipping Description: UN1987, Alcohols, n.o.s. (ethanol, <5% gasoline), 3, II, (-21°C)
Non-Bulk Package Marking: Alcohols, n.o.s. (ethanol, <5% gasoline), UN1987
Labels: Flammable liquid
Placards/Marking (Bulk): Flammable/1987
Packaging - Non-Bulk: P001
EMS: F-E, S-D

ICAO/IATA

UN/ID #: UN1987
Proper Shipping Name: Alcohols, n.o.s., (ethanol, <5% gasoline)
Hazard Class/Division: 3
Packing Group: II
Subsidiary risk: None
Non-Bulk Package Marking: Alcohols, n.o.s., (ethanol, <5% gasoline), UN1987
Labels: Flammable liquid
ERG Code: 3L

		Cargo Aircraft Only	
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L

15. REGULATORY INFORMATION

U.S. Regulations:

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

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Benzene.....71-43-2.....0-0.2%

EPA (CERCLA) Reportable Quantity (in pounds):
Benzene.....71-43-2.....10

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:
– 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):

Benzene -- Cancer, Developmental and Reproductive Toxicant
Unleaded Gasoline (wholly vaporized) -- 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.

TSCA:
All components are listed on the TSCA inventory.

International Regulations:

Canadian Regulations:

Domestic Substances List: Listed

WHMIS Hazard Class:
B2 - Flammable Liquids
D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	01-May-2006
Previous Issue Date:	1/1/2002
Product Code:	Multiple
Revised Sections or Basis for Revision:	Periodic review and update
Previous Product Code:	Multiple
MSDS Code:	404070

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CPA02166

MATERIAL SAFETY DATA SHEET

3M
3M Center
St. Paul, Minnesota
55144-1000
1-800-364-3577 or (651) 737-6501 (24 hours)

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DIVISION: 3M SPECIALTY MATERIALS
TRADE NAME:
FC-203 LIGHT WATER(TM) AFFF 3% FP
ID NUMBER/U.P.C.:

98-0211-0185-6	- - -	98-0211-7297-2	00-51135-10678-5
98-0280-1047-2	00-51135-09648-2	98-0280-1048-0	00-51135-09649-9
CF-1206-0209-3	- - -	CF-1206-0210-1	- - -
CF-1206-0975-9	- - -	CG-7900-7586-7	- - -
XF-0008-0069-8	- - -	XF-0008-0070-6	- - -
ZF-0002-0030-1	- - -	ZF-0002-0031-9	- - -
ZF-0002-0093-9	- - -	ZF-0002-0121-8	- - -
ZF-0002-0229-9	- - -	ZF-0002-0402-2	- - -
ZF-0002-0410-5	- - -	ZF-0002-0434-5	- - -
ZF-0002-0720-7	- - -	ZF-0002-1127-4	- - -

ISSUED: October 24, 2000
SUPERSEDES: October 05, 2000
DOCUMENT: 10-3814-0

1. INGREDIENT	C.A.S. NO.	PERCENT
WATER	7732-18-5	36 - 40
DIETHYLENE GLYCOL BUTYL ETHER	112-34-5	35
ETHYLENE GLYCOL	107-21-1	20
RESIDUAL ORGANIC FLUOROCHEMICALS	Mixture	Unknown
ALKYL SULFATE SALTS(2) +(5153P, 5165P)	TradeSecret	1 - 5
AMPHOTERIC FLUOROALKYLAMIDE DERIVATIVES(2) +(5129P)	TradeSecret	1 - 5
PERFLUOROALKYL SULFONATE SALTS(5) +(5141P)	TradeSecret	1 - 5
TOLYL TRIAZOLE	29385-43-1	0.05

The components of this product are in compliance with the chemical notification requirements of TSCA. All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

New Jersey Trade Secret Registry (EIN) 04499600-+

This product contains the following toxic chemical or chemicals subject to

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

1. INGREDIENT	C.A.S. NO.	PERCENT

the reporting requirements of Section 313 of Title III of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR Part 372:
DIETHYLENE GLYCOL BUTYL ETHER
ETHYLENE GLYCOL

2. PHYSICAL DATA

BOILING POINT:..... ca. 100 C (Initial)
VAPOR PRESSURE:..... ca. 14.3 mmHg Calc. @ 20 C
VAPOR DENSITY:..... ca. 1.21 Air=1 Calc. @ 20 C
EVAPORATION RATE:..... < 1 BuOAc=1
SOLUBILITY IN WATER:..... Miscible
SPECIFIC GRAVITY:..... ca. 1.05 Water=1
PERCENT VOLATILE:..... 93 %
pH:..... ca. 8.5
VISCOSITY:..... N/D
MELTING POINT:..... N/A

APPEARANCE AND ODOR:
Clear, amber colored liquid.

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... None (Setaflash CC)
FLAMMABLE LIMITS - LEL:..... N/A
FLAMMABLE LIMITS - UEL:..... N/A
AUTOIGNITION TEMPERATURE:..... N/A

EXTINGUISHING MEDIA:
Product is a fire-extinguishing agent.

SPECIAL FIRE FIGHTING PROCEDURES:
Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS:
See Hazardous Decomposition section for products of combustion.

NFPA HAZARD CODES: HEALTH: 1 FIRE: 0 REACTIVITY: 0
UNUSUAL REACTION HAZARD: none

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:
None known.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Hydrogen Fluoride, Toxic Vapors, Gases or Particulates

Thermal decomposition of usage concentrations does not present a hazard.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Ventilate area. Contain spill. Cover with absorbent material. Collect spilled material. Clean up residue with water. Place in a closed container.

RECOMMENDED DISPOSAL:
Slowly discharge spent solutions and small quantities (less than 5 gal.(19 L)) to a wastewater treatment system. Reduce discharge rate if foaming occurs. Large quantities may adversely affect biological wastewater treatment systems. Incinerate large quantities in an industrial or commercial incinerator. Combustion products will include HF.

ENVIRONMENTAL DATA:
Chemical Oxygen Demand (COD) = 1.1g/g; 20-day Biochemical Oxygen Demand (B0D20) = 1.1 g/g; BOD20/COD = 1.00; Fathead minnow Pimephales promelas) Static 96-hr LC50 = 750 mg/L; Rainbow trout (Oncorhyncus mykiss) Static 96-hr LC50 = 1300 mg/L; Water flea (Daphnia magna) Static 48-hr LC50 = 1600 mg/L (1300-2100 mg/L); Scud (Gammarus fasciatus) Static 48-hr LC50 = 1100 mg/L (840-1300 mg/L); Eastern Oyster embro-larvae (Crassostrea virginica) 48-hr EC50 = 47 mg/L (10-234 mg/L); Common mummichog (Fundulus heteroclitus) 48-hr LC50 = 2500 mg/L (1700-3600 mg/L); Grass Shrimp (Palaemonetes pugio) 96-hr LC50 = 510 mg/L (360-710 mg/L); Activated Sludge Respiration IC50 = >1000 mg/L; The TTC (2,5,5-Triphenyltetrazolium Chloride) test showed no enzyme inhibition of concentrations up to 1000 mg/L.

REGULATORY INFORMATION:
Volatile Organic Compounds: 578 gms/liter South Coast Air Quality Mgmt Dist Method Calc. @ 20 C.
VOC Less H20 & Exempt Solvents: N/A.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

5. ENVIRONMENTAL INFORMATION (continued)

Since regulations vary, consult applicable regulations or authorities before disposal. In the event of an uncontrolled release of this material, the user should determine if the release qualifies as a reportable quantity. U.S. EPA Hazardous Waste Number = None (Not U.S. EPA Hazardous).

The components of this product are in compliance with the chemical registration requirements of: TSCA, EINECS, CDSL, AICS, MITI, KTCCL.

OTHER ENVIRONMENTAL INFORMATION:
This product contains one or more organic fluorochemicals that have the potential to resist degradation and persist in the environment.

EPCRA HAZARD CLASS:
FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:
Flush skin with large amounts of water. If irritation persists, get medical attention.

INHALATION:
If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:
If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact with vapor, spray, or mist. Wear vented goggles.

SKIN PROTECTION:
Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

7. PRECAUTIONARY INFORMATION (continued)

RECOMMENDED VENTILATION:
If exhaust ventilation is not adequate, use appropriate respiratory protection. Provide ventilation adequate to control vapor concentrations below recommended exposure limits and/or control spray or mist.

RESPIRATORY PROTECTION:
Avoid breathing of airborne material. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half-mask organic vapor respirator with dust/mist prefilter.

PREVENTION OF ACCIDENTAL INGESTION:
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Wash hands after handling and before eating.

RECOMMENDED STORAGE:
Store away from areas where product may come into contact with food or pharmaceuticals. Store at temperatures below 120 degrees F (49 degrees C). Store at temperatures above 32 degrees F (0 degrees C). Keep container closed when not in use. Keep container in well-ventilated area.

FIRE AND EXPLOSION AVOIDANCE:
Keep container tightly closed. Nonflammable.

OTHER PRECAUTIONARY INFORMATION:
No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of the hazardous decomposition products mentioned in the Reactivity Data section of this MSDS.

HMIS HAZARD RATINGS: HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0
PERSONAL PROTECTION: X (See precautions, section 7.)

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
WATER	NONE	NONE	NONE	NONE	
DIETHYLENE GLYCOL BUTYL ETHER	35	PPM	TWA	CMRG	
ETHYLENE GLYCOL	50	PPM	CEIL	OSHA	
ETHYLENE GLYCOL	100	MG/M3	CEIL	ACGIH	
	Aerosol				
RESIDUAL ORGANIC FLUOROCHEMICALS	0.1	MG/M3	TWA	3M	Y
ALKYL SULFATE SALTS(2) +(5153P, 5165P)	NONE	NONE	NONE	NONE	
AMPHOTERIC FLUOROALKYLAMIDE DERIVATIVES(2) +(5129P)	NONE	NONE	NONE	NONE	

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

EXPOSURE LIMITS (continued)

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
PERFLUOROALKYL SULFONATE SALTS(5)					
+(5141P).....	0.1	MG/M3	TWA	3M	Y
TOLYL TRIAZOLE.....	NONE	NONE	NONE	NONE	

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- 3M: 3M Recommended Exposure Guidelines
- ACGIH: American Conference of Governmental Industrial Hygienists
- CMRG: Chemical Manufacturer Recommended Exposure Guidelines
- OSHA: Occupational Safety and Health Administration

- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
Mild Eye Irritation: signs/symptoms can include redness, swelling, pain, and tearing.

SKIN CONTACT:
Mild Skin Irritation (after prolonged or repeated contact): signs/symptoms can include redness, swelling, and itching.

INHALATION:
Single overexposure, above recommended guidelines, may cause:

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

IF SWALLOWED:
Animal studies conducted on organic fluorochemicals which are present in this product indicate effects including liver disturbances, weight loss, loss of appetite, lethargy, and neurological, pancreatic, adrenal and hematologic effects. There are no known human health effects from anticipated exposure to these organic fluorochemicals when used as intended and instructed.

Ingestion may cause:

Kidney Effects: signs/symptoms can include reduced urine volume,

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8. HEALTH HAZARD DATA (continued)

blood in urine and back pain.

Aspiration Pneumonitis: signs/symptoms can include coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.

WHILE THE FOLLOWING EFFECTS ARE ASSOCIATED WITH ONE OR MORE OF THE INDIVIDUAL INGREDIENTS IN THIS PRODUCT AND ARE REQUIRED TO BE INCLUDED ON THE MSDS BY THE U.S. OSHA HAZARD COMMUNICATION STANDARD, THEY ARE NOT EXPECTED EFFECTS DURING FORESEEABLE USE OF THIS PRODUCT.

Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue, blurred vision, slurred speech, giddiness, tremors and convulsions.

OTHER HEALTH HAZARD INFORMATION:
A Product Toxicity Summary Sheet is available.

This product contains one or more organic fluorochemicals that have the potential to be absorbed and remain in the body for long periods of time, either as the parent molecule or as metabolites, and may accumulate with repeated exposures. There are no known human health effects from anticipated exposure to these organic fluorochemicals when used as intended and instructed.

The presence of organic fluorochemicals in the blood of the general population and subpopulations, such as workers, has been published dating back to the 1970's. 3M's epidemiological study of its own workers indicates no adverse effects.

SECTION CHANGE DATES

PRECAUTIONARY INFO. SECTION CHANGED SINCE October 05, 2000 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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3M General Offices
3M Center
St. Paul, Minnesota 55144-1000
612/733-1110
Duns No.: 00-617-3082

08-22
9106

MATERIAL SAFETY
DATA SHEET

3M

DIVISION: INDUSTRIAL CHEMICAL PRODUCTS DIVISION
TRADE NAME:
FC-602 LIGHT WATER Brand ATC Plus

3M I.D. NUMBER: CF-1206-0960-1 CF-1206-0961-9 CF-1206-0965-0 CG-7900-7591-7
GF-1000-0045-4 ZF-0002-0089-7 ZF-0002-0178-8 ZF-0002-0199-4
ZF-0002-0318-0 ZF-0002-0319-8 98-0211-4114-2 98-0211-4115-9

ISSUED: AUGUST 31, 1992
SUPERSEDES: MARCH 11, 1992
DOCUMENT: 10-4146-6

1. INGREDIENT

INGREDIENT	C.A.S. NO.			PERCENT
WATER	7732-18-5			61
ETHYLENE GLYCOL	107-21-1			20
ETHANOL,2-(2-BUTOXYETHOXY)-	112-34-5			12
FLUORDALKYL SURFACTANT +(5133P)	TradeSecret	0.1	-	5.0
SYNTHETIC DETERGENT +(5156P)	TradeSecret			1
FLUOROCHEMICAL SURFACTANT +(5145P)	TradeSecret	0.1	-	5.0
SYNTHETIC DETERGENT +(5147P)	TradeSecret			1
THICKENER +(5126P)	TradeSecret		<	1
THICKENER +(5122P)	TradeSecret			0.1

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS 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:
ETHYLENE GLYCOL
ETHANOL,2-(2-BUTOXYETHOXY)-

2. PHYSICAL DATA

BOILING POINT:	ca. 93.00 C (Initial)
VAPOR PRESSURE:	ca. 27.6000 mmHg Calc. @ R.T.
VAPOR DENSITY:	ca. 0.69 Air = 1 Calc. @ R.T.
EVAPORATION RATE:	< 1.00 Butyl Acetate = 1
SOLUBILITY IN WATER:	Miscible
SP. GRAVITY:	ca. 1.060 Water = 1
PERCENT VOLATILE:	ca. 93.00 %
VOLATILE ORGANICS:	339 gms/liter
VOC LESS H2O & EXEMPT SOLVENT	965 gms/liter
pH:	ca. 8.50
VISCOSITY:	N/D
MELTING POINT:	N/A
APPEARANCE AND ODOR:	Opaque, amber viscous liquid.

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	None (Setaflash CC)
FLAMMABLE LIMITS - LEL:	N/A
FLAMMABLE LIMITS - UEL:	N/A
AUTOIGNITION TEMPERATURE:	N/A

EXTINGUISHING MEDIA:
Product is a fire-extinguishing agent.

Abbreviations: N/D - Not Determined N/A - Not Applicable

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08-22
9107

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DATA SHEET

3. FIRE AND EXPLOSION HAZARD DATA (continued)

SPECIAL FIRE FIGHTING PROCEDURES:
Not applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS:
See Hazardous Decomposition section for products of combustion.

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
Not applicable.
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide Hydrogen Fluoride
Thermal decomposition of usage concentrations does not present a hazard.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Cover with absorbent material. Collect spilled material. Clean up residue with water. Place in an approved metal container, and seal.

RECOMMENDED DISPOSAL:
Blend spent solutions and small product quantities, generally <5 gal., to a wastewater treatment system. Reduce discharge rate if foaming occurs. Mix with flammable material and incinerate in an industrial or commercial incinerator. Combustion products will include HF. Disposal alternative: Dispose of completely absorbed waste product in a facility permitted to accept chemical wastes. Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste No.: None

ENVIRONMENTAL DATA:
No data available.

SARA HAZARD CLASS:
FIRE HAZARD: No **PRESSURE:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:
Flush skin with large amounts of water. If irritation persists, get medical attention.

INHALATION:
If signs/symptoms occur, remove person to fresh air. If

AUG-06-2003 WED 10:56 AM LAB FAX NO. 5032481595 P. 07/20

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MATERIAL SAFETY
DATA SHEET

6. SUGGESTED FIRST AID (continued)

signs/symptoms continue, call a physician.

IF SWALLOWED:
Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact with vapor, spray, or mist. Wear vented goggles.

SKIN PROTECTION:
Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber.

VENTILATION PROTECTION:
Use with adequate dilution ventilation.

RESPIRATORY PROTECTION:
Avoid inhalation of vapors, mists or spray. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half-mask organic vapor respirator with dust/mist prefilter.

PREVENTION OF ACCIDENTAL INGESTION:
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Wash hands after handling and before eating.

RECOMMENDED STORAGE:
Store in a cool place. Store away from heat. Store out of direct sunlight. Keep container dry. Keep container in well-ventilated area.

FIRE AND EXPLOSION AVOIDANCE:
Keep container tightly closed.

EXPOSURE LIMITS

INGREDIENTS	VALUE	UNIT	TYPE	AUTH	SKIN*
WATER	NONE	NONE	NONE	NONE	
ETHYLENE GLYCOL	50	ppm	CEIL	OSHA	
ETHYLENE GLYCOL	125	mg/m3	CEIL	OSHA	
ETHYLENE GLYCOL	50	ppm as vapor and mist	CEIL	ACGIH	
ETHYLENE GLYCOL	127	mg/m3 as vapor and mist	CEIL	ACGIH	
ETHANOL,2-(2-BUTOXYETHOXY)-	55	ppm	TWA	CMRG	
FLUOROALKYL SURFACTANT +(5153P)	NONE	NONE	NONE	NONE	
SYNTHETIC DETERGENT +(5156P)	NONE	NONE	NONE	NONE	
FLUOROCHEMICAL SURFACTANT +(5145P)	0.1	mg/m3	TWA	3M	Y

Abbreviations: N/D - Not Determined N/A - Not Applicable

AUG-06-2003 WED 10:56 AM LAB FAX NO. 5032481595 P. 08/20

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Duns No.: 00-617-3082

08-22
9109

MATERIAL SAFETY
DATA SHEET

3M

7. PRECAUTIONARY INFORMATION (continued)

EXPOSURE LIMITS

INGREDIENTS	VALUE	UNIT	TYPE	AUTH	SKIN*
SYNTHETIC DETERGENT +(5147P)	NONE	NONE	NONE	NONE	
THICKENER +(5126P)	NONE	NONE	NONE	NONE	
THICKENER +(5122P)	15	mg/m3	TWA	OSHA	
THICKENER +(5122P)	10	mg/m3	TWA	ACGIH	

* SKIN NOTATION: Listed substances indicated with "Y" under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- OSHA: Occupational Safety and Health Administration
- 3M: 3M Medical Department Guideline
- CMRG: Chemical Manufacture Recommended Guidelines
- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
Mild Eye Irritation: signs/symptoms can include redness, swelling, pain, and tearing.

SKIN CONTACT:
Mild Skin Irritation: signs/symptoms can include redness, swelling, and itching.

Prolonged or repeated exposure may cause:

May be absorbed through the skin in harmful amounts.

INHALATION:
Single overexposure, above recommended guidelines, may cause:

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

Prolonged or repeated overexposure, above recommended guidelines, may cause:

Blood disorders: signs/symptoms can include prolonged weakness and fatigue.

Bone Marrow Depression: signs/symptoms can include prolonged

Abbreviations: N/D - Not Determined N/A - Not Applicable

AUG-06-2003 WED 10:58 AM LAB FAX NO. 5032481586 P. 09/20

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612/733-1110
Duns No.: 00-617-3082

08-22
9110

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DATA SHEET

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8. HEALTH HAZARD DATA (continued)

weakness and fatigue.

Kidney Effects: signs/symptoms can include reduced urine volume, blood in urine and back pain.

Liver Effects: signs/symptoms can include yellow skin(jaundice) and tenderness of upper abdomen.

Pulmonary Edema: signs/symptoms can include coughing, congestion, difficulty breathing, which can result in respiratory failure and death.

IF SWALLOWED:
Ingestion is not a likely route of exposure to this product.

Swallowing a relatively large amount of this material is unlikely to produce serious illness or death.

OTHER HEALTH HAZARD INFORMATION:
A 3M Product Toxicity Summary Sheet is available.

SECTION CHANGE DATES

HEADING	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
INGREDIENTS	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
FIRE & EXP. DATA	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
REACTIVITY DATA	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
FIRST AID	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
PRECAUT. INFO.	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE
HEALTH HAZD. DATA	SECTION CHANGED SINCE	MARCH 11, 1992 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

AUG-06-2003 WED 10:57 AM LAB FAX NO. 6032481585 P. 10/20

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Firebird AW 32, 46, 68

MSDS Number: 721010

Synonyms: 76 Firebird AW 32
76 Firebird AW 46
76 Firebird AW 68

Intended Use: Hydraulic Fluid

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers: Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Clear Yellow
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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). 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: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Re-Refined Lubricating Oil, Hydrotreated	VARIOUS	50-60
Lubricant Base Oil (Petroleum)	VARIOUS	40-50
Additives	PROPRIETARY	<1

The re-refined base oil for this product can be a mixture of the following highly re-refined petroleum streams: CAS 64742-58-1; CAS 68476-77-7

4. FIRST AID MEASURES

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

Skin: 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. 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: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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, 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 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.

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. The use of explosion-proof electrical 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. 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 with minimal risk. 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. 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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: 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.

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.

"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.

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Re-Refined Lubricating Oil, Hydrotreated	TWA: 5mg/m³ STEL: 10 mg/m³ as Oil Mist, if generated	TWA: 5 mg/m³ as Oil Mist, if generated	—
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.

Personal Protective Equipment (PPE):

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

Respiratory: 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other 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 Yellow
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:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.87 - 0.88 @ 60°F (15.6°C)
Bulk Density:	7.25 - 7.33 lbs/gal
Viscosity:	32 - 68 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>388°F / >198°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
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 storage and handling.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon monoxide, oxides of nitrogen, sulfur, phosphorus and zinc.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Re-Refined Lubricating Oil, Hydrotreated

Carcinogenicity: This material has been highly refined by a variety of processes including hydrotreating to remove aromatics and improve performance characteristics. It is not listed as a carcinogen by NTP, IARC, or OSHA.

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 Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Re-Refined Lubricating Oil, Hydrotreated	>5 gkg (rat)	>2 g/kg (rat)	No Data
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data

12. ECOLOGICAL INFORMATION

Lubricant oil basestocks are complex mixtures of hydrocarbons (primarily branched chain alkanes and cycloalkanes) ranging in carbon number from C15 to C50. The aromatic hydrocarbon content of these mixtures varies with the severity of the refining process. White oils have negligible levels of aromatic hydrocarbons, whereas significant proportions are found in unrefined basestocks. Olefins are found only at very low concentrations. Volatilization is not significant after release of lubricating oil basestocks to the environment due to the very low vapor pressure of the hydrocarbon constituents. In water, lubricating oil basestocks will float and will spread at a rate that is viscosity dependent. Water solubilities are very low and dispersion occurs mainly from water movement with adsorption by sediment being the major fate process. In soil, lubricating oil basestocks show little mobility and adsorption is the predominant physical process.

Both acute and chronic ecotoxicity studies have been conducted on lubricant base oils. Results indicate that the acute aquatic toxicities to fish, Daphnia, Ceriodaphnia and algal species are above 1000 mg/l using either water accommodated fractions or oil in water dispersions. Since lubricant base oils mainly contain hydrocarbons having carbon numbers in the range C15 to C50, it is predicted that acute toxicity would not be observed with these substances due to low water solubility. Results from chronic toxicity tests show that the no observed effect level (NOEL) usually exceeds 1000 mg/l for lubricant base oils with the overall weight of experimental evidence leading to the conclusion that lubricant base oils do not cause chronic toxicity to fish and invertebrates.

Large volumes spills of lubricant base oils into water will produce a layer of undissolved oil on the water surface that will cause direct physical fouling of organisms and may interfere with surface air exchange resulting in lower levels of dissolved oxygen. Petroleum products have also been associated with causing taint in fish even when the latter are caught in lightly contaminated environments. Highly refined base oils sprayed onto the surface of eggs will result in a failure to hatch.

Extensive experience from laboratory and field trials in a wide range of crops has confirmed that little or no damage is produced as a result of either aerosol exposure or direct application of oil emulsion to the leaves of crop plants. Base oils incorporated into soil have resulted in little or no adverse effects on seed germination and plant growth at contamination rates up to 4%.

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: Federal compliance requirements may apply. See 49 CFR 171.12.

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:	—	—	—

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

Issue Date: 13-Mar-2008
Status: Final
Previous Issue Date: 04-Mar-2008

16. OTHER INFORMATION

Revised Sections or Basis for Revision:

Product Name / Synonyms (Section 1)
NFPA ratings (Section 2)
Environmental hazards (Section 12)
Regulatory information (Section 15)

MSDS Number: 721010

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

LINCOLN® ELECTRIC

Date:	12/1/04	MSDS No.:	US-M205
Trade Name:	Fleetweld 5P		
Sizes:	All		
Supersedes:	12/1/01		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E6010

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard. All materials are listed on the TSCA inventory.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Cellulose and other carbohydrates	65996-61-4	5	10*	10*
Silicates and other binders	1344-09-8	< 5	10*	10*
Titanium dioxides (as Ti)*****	13463-67-7	< 5	10	15
Iron	7439-89-6	< 5	10*	10*
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	1	0.2	1.0(c)
Magnesite	1309-48-4	1	10	15
Mineral silicates	1332-58-7	0.5	5**	5**
Iron oxides (as Fe)	65996-74-9	< 0.5	5	10
Limestone and/or calcium carbonate	1317-65-3	< 0.5	10	15
Graphite	7782-42-5	< 0.5	2.0	2.5
Carbon steel core wire	7439-89-6	85	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

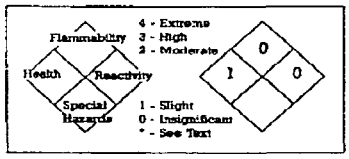
(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter. Values are those proposed by OSHA in 1989. Present PEL is 5.0 milligrams per cubic meter (ceiling value).

SECTION III - HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI. Product is inert, no special handling or spill procedures required. Not regulated by DOT.

(CONTINUED ON SIDE TWO)

Product:	**Fleetweld 5P**
Date:	**12/1/04**



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOS - (Not Otherwise Specified) is 6 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of manganese, silicon and sodium.

Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted. No applicable ecological information available.

Date:	12/1/01	MSDS No.:	US-M210
Trade Name:	Fleetweld 5P+		
Sizes:	All		
Supersedes:	3/22/99		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E6010

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Cellulose and other carbohydrates	65996-61-4	5	10*	10*
Silicates and other binders	1344-09-8	< 5	10*	10*
Iron	7439-89-6	< 5	10*	10*
Titanium dioxides (as Ti)*****	13463-67-7	< 5	10	15
Limestone and/or calcium carbonate	1317-65-3	< 5	10	15
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	1	0.2	1.0(c)
Iron oxides (as Fe)	65996-74-9	< 0.5	5	10
Carbon steel core wire	7439-89-6	85	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

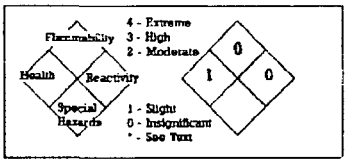
(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

SECTION III - FIRE AND EXPLOSION HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product:	**Fleetweld 5P+**
Date:	**12/1/01**



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of manganese, silicon, sodium and titanium.

Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII
CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

Initial Preparation Date: *8/16/90*
Last Review Date: *6/5/03*

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTITY: FULL FORCE® ANTIFREEZE & COOLANT

1. CHEMICAL PRODUCT & COMPANY INFORMATION

OLD WORLD INDUSTRIES, INC.
4065 COMMERCIAL AVENUE
NORTHBROOK, ILLINOIS 60062
PHONE: 847-559-2000
EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Material	*CAS#*	*% by Wt*	*TLV (ACGIH)* *PEL (OSHA)*	*Hazard*
Ethylene Glycol	107-21-1	90 - 95	50 ppm	Toxic
Diethylene Glycol	111-46-6	0 - 5	None	WHMIS: Not hazardous
Dipotassium Phosphate	7758-11-4	1 - 2	None	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Slight odor.	*May be fatal if swallowed.*	*Vapors can cause eye irritation.*

Lowest Known LD50 (Oral)	107-21-1	5840 mg/kg (Rats)
Lowest Known LD50 (Skin)	107-21-1	9530 mg/kg (Rabbits)

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HAZARD RATING SYSTEM

NFPA: HEALTH: 1	**FLAMMABILITY: 1**	**REACTIVITY: 0**
HMIS: HEALTH: 2	**FLAMMABILITY: 1**	**REACTIVITY: 0**

KEY: 0 – Minimal 1 – Slight 2 - Moderate 3 - Serious 4 - Severe

POTENTIAL HEALTH EFFECTS

Routes of Exposure: Inhalation, Ingestion, Skin Contact/Absorption, Eye Contact

Eye: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely. Vapors or mists may cause eye irritation.

Skin: Prolonged or repeated exposure not likely to cause significant skin irritation. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated skin exposure may result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potential lethal amounts.

Ingestion: Single dose oral toxicity is considered to be moderate. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing amounts larger than that may cause serious injury, even death.

Inhalation: At room temperature, exposures to vapors are minimal due to physical properties; higher temperatures may generate vapor levels sufficient to cause adverse effects.

Systemic (Other Target Organ) Effects: Repeated excessive exposures may cause severe kidney and also liver and gastrointestinal effects. Signs and symptoms of excessive exposure may be central nervous system effects. Signs and symptoms of excessive exposure may be nausea and/or vomiting. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Observations in animals include formation of bladder stones after repeated oral doses of ethylene glycol. Reports of kidney failure and death in burn patients suggest the ethylene glycol may have been a factor. The use of topical applications containing this material may not be appropriate in severely burned patients or individuals with impaired renal function.

Cancer Information: Based on data from long-term animal studies, ethylene glycol is not believed to pose a carcinogenic risk to man.

Teratology (Birth Defects): Exposure to ethylene glycol has caused birth defects in laboratory animals only at doses toxic to the mother.

Reproductive Effects: Ethylene glycol has not interfered with reproduction in animal studies except at very high doses.

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4. FIRST AID MEASURES
Ensure physician has access to this MSDS.

TREATMENT

Eyes: Immediately flush eyes with large amounts of water for 15 minutes, lifting lower and upper lids. Get medical attention as soon as possible. Contact lenses should never be worn when working with this chemical.

Skin: Flush area of skin contact immediately with large amounts of water for at least 15 minutes while removing contaminated clothing. If irritation persists after flushing, get medical attention promptly. Wash clothing before re-use.

Inhalation: If inhaled, immediately remove victim to fresh air and call ***emergency medical care.*** If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: Obtain medical attention immediately. If patient is fully conscious, give two glasses of water. Do not induce vomiting. If medical advice is delayed, and if the person has swallowed a moderate volume of material (a few ounces), then give three to four ounces of hard liquor, such as whisky. For children, give proportionally less liquor, according to weight.

Notes to Physician:
It is estimated that the lethal oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenate to various metabolites including glyceraldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression, and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100-150 mg/dl, and should be achieved by a rapid loading dose and maintained by intravenous infusion. For severe and/or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentration greater than 25 md/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use is 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases, which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures, and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and then 15 mg/kg every 12 hours until ethylene glycol concentrations are below 20 mg/100 ml. Slow intravenous infusion is required. Since 4-methyplyrozole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

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Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing and dysphasia.

5. FIRE FIGHTING MEASURES

Flammable Properties
Flash Point: 119°C (247°F)
Method Used: Setaflash
Autoignition Temperature: Autoignition temperature for ethylene glycol is 398°C (748°F).

Flammability Limits - % of vapor concentration at which product can ignite in presence of spark.
Lower Flammability Limit: 3.2%
Upper Flammability Limit: 15.3%

Hazardous Combustion Products: Hazardous combustion products may include and are not limited to carbon monoxide, carbon dioxide and trace amounts of aldehydes and organic acids. When available oxygen is limited, as in a fire or when heated to very high temperatures by a hot wire or plate, carbon monoxide and other hazardous compounds such as aldehydes might be generated.

Extinguishing Media: Water fog or fine spray. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Carbon dioxide. Dry chemical. Do not use direct water stream. May spread fire.

Fire Fighting Instructions: No fire and explosion hazards expected under normal storage and handling conditions (i.e. ambient temperatures). However, ethylene glycol or solutions of ethylene glycol and water can form flammable vapors with air if heated sufficiently. Keep people away. Isolate fire area and deny unnecessary entry.

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).

6. ACCIDENTAL RELEASE MEASURES

Protect People: Material is moderately toxic when ingested. Take adequate precautions to keep people, especially children away from spill site. PVC-coated rubber gloves and monogoggles or faceshield can be used during cleanup of spill site. Product on surfaces can cause slippery conditions. Practice reasonable care and cleanliness. Avoid breathing spray mists if generated. Keep out of reach of children. Product may become a solid at temperatures below -18°C (0°F). Do not store near food, foodstuffs, drugs or potable water supplies.

Protect the Environment: Do not dump used product or diluted material into sewers, on the ground, or into any body of water.

Cleanup: Small spills: Soak up with absorbent material. Large spills: Dike and pump into suitable containers for disposal. Ensure compliance with all applicable statues that require notification of appropriate government officials.

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7. *HANDLING AND STORAGE*

Steps to be Taken in Case Material is Released or Spilled: Eliminate all sources of ignition in vicinity of the spilled or released fluid.

Other Precautions: Use normal precautions in handling any combustible liquid. Keep container closed when not in use. Store away from heat or open flame. Product on surfaces can cause slippery conditions. Practice reasonable care and cleanliness. Avoid breathing spray mists if generated. Keep out of reach of children. Product may become a solid at temperatures below -18°C (0°F). Do not store near food, foodstuffs, drugs or potable water supplies.

8. *EXPOSURE CONTROLS / PERSONAL PROTECTION*

Respiratory Protection: Respiratory protection is required if airborne concentration exceeds TLV. At any detectable concentration any self-contained breathing apparatus with a full facepiece and operated in a pressure-demand or other positive pressure mode or any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

Escape: Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister or any appropriate escape-type self-contained breathing apparatus.

Skin Protection: Protective gloves recommended when prolonged skin contact cannot be avoided. Polyethylene; Neoprene; Nitrile; Polyvinyl alcohol; Natural Rubber, Butyl Rubber. Safety shower should be available.

Eye Protection: Safety goggles and face shield. Emergency eyewash should be available. Contact lenses should not be worn when working with this chemical.

Engineering Controls: Use general or local exhaust ventilation to meet TLV requirements.

Process Hazard: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure or sudden ingress of air into vacuum equipment may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

EXPOSURE LIMITS

Component	Exposure Limits	Skin Form
Ethylene glycol	100 mg/m3 CEILING ACGIH	Aerosol
Ethylene glycol	125 mg/m3 CEILING OSHA-vacated	
	50 ppm CEILING OSHA – vacated	
	100 mg/m3 CEILING UCC	Aerosol and Vapor
Diethylene glycol	50 ppm TWA8 AIHA WEEL	Aerosol and Vapor
Diethylene glycol	10 mg/m3 TWA8 AIHA WEEL	Aerosol

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

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A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

9. PHYSICAL / CHEMICAL PROPERTIES

Boiling Range:	171 - 175°C (339 - 348°F)
Freeze Point:	-18°C (0°F)
Specific Gravity (Water =1):	1.12
Pounds/Gallons:	9.3
Vapor Pressure (mm of Hg) @ 20C:	<0.1
Vapor Density (air=1):	2.1
Water Solubility:	Complete
Evaporation Rate (BuAc = 1):	Nil
% Volatile By Volume:	97.0
Appearance:	Green
Odor:	Mild
pH (50% Water Solution):	10.5-11.0

10. STABILITY & REACTIVITY DATA

Stability:	Stable
Conditions to Avoid:	Keep away from flame
Incompatibility (Materials to Avoid):	Strong acid or oxidizing agents
Hazardous Decomposition Products:	Incomplete combustion may produce CO gas
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

Skin: The dermal LD50 has not been determined.

Ingestion: The lethal dose in humans is estimated to be 100 ml (3 ozs.). The oral LD50 for rats is in the 6000-13,000-mg/kg range.

Significant Data with Possible Relevance to Humans: Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to asses the effects of exposure of pregnant rats and made to aerosis at concentrations of 150, 1000 and 25000 mg/m3 for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol percutaneous absorption of ethylene glycol from contaminated skin, or swallowing ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 25000 mg/m3) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m3). The no-effects concentration (based on maternal toxicity) was 500 mg/m3.

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In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity. The major route for producing developmental toxicity is perorally. Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence or a different pattern of tumors compared with untreated controls. The absence of carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

A chronic dietary feeding study of diethylene glycol with rats showed mild kidney injury at 1%, while concentrations of 2% and 4% caused more marked kidney injury. In addition, at 2% and 4% of diethylene glycol in the diet, some rats developed benign papillary tumors in the urinary bladder. These have been attributed to the presence of urinary bladder calcium oxalate stones. No evidence for carcinogenicity was found with a chronic skin-painting study with diethylene glycol in mice. The absence of a direct chemical carcinogenic effect addords with the results in vitro genotoxicity studies that show that it does not produce mutagenic or clastogenic effects. A feeding study employing up to 5.0% diethylene glycol in the diet failed to produce any teratogenic effects. In a mouse continuous breeding study with large doses of diethylene glycol in drinking water, there was evidence for reproductive toxicity at 3.5% (equivalent to 6.1 g/kg/day) as reduced number of litter, live pups per litter and live pup weight. No such effects were seen at 1.75% (approximately 3.05 g/kg/day). The relevance of these very high dosages to human health is uncertain. Pregnant rats receiving undiluted diethylene glycol by gavage over the period of organogenesis had toxic effects at 4.0 and 8.0 ml/kg/day as mortality, decreased body weight, decreased food consumption increased water consumption and increased liver and kidney weights. Fetotoxicity was seen only at these maternally toxic dosages. Decreased fetal body weight occurred at 8.0 ml/kg/day, and increased skeletal variants at 4.0 and 8.0 ml/kg/day. No embryotixic or teratogenic effects were seen. Neither maternal toxicity nor fetotoxicity occurred at 1.0 ml/kg/day. In a study with mice also receiving undiluted diethylene glycol over the period of organogenesis, maternal toxicity occurred at 2.5 and 10.0 ml/kg/day, but not at 0.5 ml/kg/day. Definitive developmental toxicity was not seen in this species. An acute nose-only exposure (four hours) to a respirable aerosol (2.83 – 2.52 microns) of diethylene glycol at a mean concentration of 5.08 mg/l produced no signs of toxicity or irritancy.

ACUTE TOXICITY

Peroral: Based on ethylene glycol, polyester grade:
Rat – Males: LD50 = 0.9 (8.98 – 13.3) g/kg

Peroral:
Rat – Females: LD50 = 9.85 (7.15 – 13.6) g/kg

Peroral: Combined effects for males and females
Time to Death: 1 to 6 days

Major Signs: Uncoordinated gait, hypoactivity, slow breathing, lacrimation, piloerection, blood in urine and red crust on the perinasal fur

Gross Pathology – Decedents: Blood in urine, congested lungs, distended and hemorrhaged urinary bladders, distended gas-filled intestines, discoloration of the stomach with thinning of the wall.

Gross Pathology – Survivors: Blood in urine, misshapen spleen, raised areas in the lung, clear fluid in the uterus.

COPPOR00000965

Percutaneous:
Rabbit = 24 ml/kg; 24 h occluded

Mortality: 0/4

Major Signs: Marked erythema at application site

Gross Pathology: No information available

Inhalation: Saturated Vapor Study, rat, 8-hour exposure dynamic generation method
Mortality: 0/6

Inhalation: Mist/Vapor Study, rat, at 170°C, 8-hour exposure
Mortality: 0/6

Inhalation: Aerosol Studies, rat, 8-hour exposure = 10000
Mortality: 0/6

Irritation:
Skin: Based on ethylene glycol, polyester grade:
Rabbit – 24-hour occluded contact; 0.5 ml
Results: Minor erythema and edema

Eye: Based on ethylene glycol, polyester grade:
Rabbit – 0.1 ml
Results: Minor transient iritis, conjunctival irritation with discharge

Repeated Exposure: Based on ethylene glycol, polyester grade:
In a 7-day dietary study with rats, a significant increase in kidney weights in females was observed at 5.0 gm/kg. The NOEL was 2.5 gm/kg.

Based on ethylene glycol, polyester grade: In a 90-day dietary study with dogs, repeated exposures to 2.5 gm/kg resulted in acute renal failure and deaths. The NOAEL was 1.0 gm/kg.

Sensitization (Animal and Human Studies): Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material.

Reproductive Toxicity: Based on ethylene glycol, polyester grade: A three-generation study indicated that ethylene glycol did not affect reproductive parameters at dietary concentrations up to 1.0/gm/kg/day in any generation.

Chronic Toxicity and Carcinogenicity: Based on ethylene glycol, polyester grade: In a 24-month dietary study with rats, increased mortality in males was observed at the highest dose, 1.0 gm/kg/day. There were multiple signs: mineralization of several organs, including the cardiac vessels, cardiac muscle, vas deferens, stomach and pulmonary vessels; cellular hyperplasia of the parathyroids, hemosiderosis of the spleen, myocardial fibrosis, portal fibrosis of the liver, bile duct hyperplasia and hydronephrosis and oxylate nephrosis of the kidneys. Ethylene glycol was not oncogenic. Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence or a different pattern of tumors compared with untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

COPPOR00000966

Genetic Toxicology

In Vitro: Ethylene glycol was devoid of genotoxic activity in an Ames test, forward gene mutation and sister chromatid exchange (SCE) studies in Chinese Hamster Ovary (CHO) cells and an in vitro cytogenetics study.

Pharmacokinetics and Metabolism

In Vivo: Ethylene glycol by three different routes (intravenous, peroral and percutaneous) demonstrates apparent first-order pharmacokinetic behavior for the disposition in and the elimination from the plasma. Dose-dependent changes occur for the elimination of metabolites in the urine and as $14CO^2$ after single doses for the intravenous and peroral, but not the percutaneous route. The hypothesis from literature sources exists that developmental toxicity is caused by a metabolite of ethylene glycol, called glycolic acid, and not parent ethylene glycol. Under most conditions of ethylene glycol exposure, the glycolic acid metabolite is present in the blood in very low levels. However, it can become the major metabolite following large doses of ethylene glycol due to saturation of glycolic acid oxidation and/or elimination. When levels of this acidic metabolite exceed the capacity of maternal blood buffers to neutralize it, a maternal metabolic acidosis ensues, which has been hypothesized to be the true agent responsible for ethylene glycol induced developmental toxicity. Research suggests that ethylene glycol developmental toxicity is due to a dose-rate dependent toxicokinetic shift leading to glycolate accumulation and metabolic acidosis.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or Log Kow less than 3). Log octanol/water partition coefficient (log Kow) is -1.36. Henry's Law Constant (H) is 6.0E-08 atm-m3/mol. Bioconcentration factor (BCF) is 10 in golden orfe.

Degradation & Transformation: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD greater than 40%). 5-Day biochemical oxygen demand (BOD5) is 0.78 p/p. 10-Day biochemical oxygen demand (BOD10) is 1.06 p/p. 20-Day biochemical oxygen demand (BOD20) is 1.15 p/p. Theoretical oxygen demand (ThOD) is calculated to be 1.29 p/p. Biodegradation may occur under both aerobic and anaerobic conditions (in either the presence or absence of oxygen). Inhibitory concentration (IC50) in OECD "Activated Sludge, Respiration Inhibition Test" (Guideline # 209) is < 1000 mg/L. Degradation is expected in the atmospheric environment within days to weeks.

Ecotoxicology: Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/L in most sensitive species). Acute LC50 for fathead minnow (Pimephales promelas) is 51000 mg/L. Acute LC50 for bluegill (Lepomis macrochirus) is 27549 mg/L. Acute LC50 for rainbow trout (Oncorhynchus mykiss) is about 18000-46000 mg/L. Acute LC50 for guppy (Poecilia reticulata) is 49300 mg/L. Acute LC50 for water flea (Daphnia magna) is 46300-51100 mg/L. Acute LC50 for the cladoceran Ceriodaphnia dubia is 10000-25800 mg/L. Acute LC50 for crayfish is 91430 mg/L. Acute LC50 for brine shrimp (Artemia salina) is 20000 mg/L. Acute LC50 for golden orfe (Leuciscus idus) is greater than 10000 mg/L. Acute LC50 for goldfish (Carassius auratus) is greater than 5000 mg/L. Growth inhibition EC50 for green alga Selenastrum capricornutum is 9500-13000 mg/L.

COPPOR00000967

The following information is applicable to the major component, ethylene glycol:

BOD (% Oxygen Consumption)

Day 5	Day 10	Day 15	Day 20	Day 30
5 – 62%	53 – 88%		72 – 99%	

STURM (% Carbon Dioxide Evolved)

Day 5	Day 10	Day 15	Day 28
			90%

Closed Bottle BOD (% Oxygen Consumption)

Day 5	Day 10	Day 15	Day 28
			31 – 88%

ECOTOXICITY

Toxicity to Micro-Organisms

Bacterial inhibition
IC50
Result Value: > 10000 mg/l

Toxicity to Aquatic Invertebrates

Cladoceran; 48 h; LC50
Result Value: > 10000 mg/l

Toxicity to Fish

Fathead Minnow; 94 h; LC50
Result Value: 70000 mg/l

FURTHER INFORMATION

Chemical Oxygen Demand (COD): Measured 1.29 mg/mg

Theoretical Oxygen Demand (THOD): Calculated 1.30 mg/mg

Octanol/Water Partition Coefficient: Measured –1.36

13. DISPOSAL CONSIDERATIONS

DO NOT discharge to sewer. Wear appropriate personal protection. Take up with sand, vermiculite, or similar inert material. Dispose in accordance with federal, state and local regulations.

COPPOR00000968

14. TRANSPORT INFORMATION

TDG – CANADA
Small Container
Proper Shipping Name: Not regulated

Large Container
Proper Shipping Name: Not regulated

U.S. DEPARTMENT OF TRANSPORTATION
Non-Bulk
Proper Shipping Name: ETHYLENE GLYCOL

Bulk
Proper Shipping Name: Environmentally Hazardous Substance, LIQUID N.O.S. (ETHYLENE GLYCOL)
Technical Name: ETHYLENE GLYCOL
ID Number: UN 3082
Hazard Class: 9
Packing Group: PG III
Reportable Quantity: 5,000 lb.

IATA
Non-Bulk
Proper Shipping Name: Ethylene Glycol
Not Regulated by IATA

15. REGULATORY INFORMATION

THIS PRODUCT CONTAINS COMPONENT(S) CITED ON THE FOLLOWING REGULATIONS.

Chemical Name	*Cas Number*
Ethylene Glycol	107-21-1

WHMIS Information: D2A - material has potential toxic effects. Material is teratogenic, embryotoxic or fetotoxic. Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

Hazardous Products Act Information – Hazardous Ingredients:
This product contains the following ingredients, which are Controlled Products and/or are on the Ingredient Disclosure List (Canadian HPA Section 13 and 14):

Component	*CAS #*	*Amount*
Ethylene glycol	107-21-1	<=100.0000%

Hazardous Products Act Information – CPR Compliance:
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.

CEPA – Domestic Substances List (DSL):

COPPOR00000969

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

United States - TSCA Inventory: Listed

Water Standards: No data available

Atmospheric Standards: Clean Air Act (1990) - List of Hazardous Air Contaminants: listed

CERCLA: Reportable Quantity (RQ): 5,000 pounds (532 gallons)

SARA Title III: Section 311/312 - Categories: Acute hazard; chronic hazard

Section 312 - Inventory Reporting: Ethylene glycol is subject to Tier I and/or Tier II annual inventory reporting.

Section 313 - Emission Reporting: Ethylene glycol is subject to Form R reporting requirements.

Section 302 - Extremely Hazardous Substances: Ethylene glycol is not listed.

State Right-To-Know:

California - Exposure Limits - Ceilings:	vapor-50 ppm ceiling; 125 mg/m3 ceiling
Director's List of Hazardous Substances:	listed
Florida - Hazardous Substances List:	listed
Massachusetts - Right-to-Know List:	listed
Minnesota - Haz. Subs. List:	listed (particulate and vapor)
New Jersey - Right-to-Know List (Total):	Present greater than 1.0%
Pennsylvania Right-to-Know List:	environmental hazard

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986): This product contains the following chemical(s) known to the State of California to cause cancer:

Component	***CAS #***	***Amount***
1,4 – Dioxane	123-91-1	<=0.0086%
Acetaldehyde	75-07-0	<=0.1000PPM

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986): This product contains the following chemical(s) known to the State of California to cause birth defects and/or other reproductive harm.

Component	***CAS #***	***Amount***
Ethylene glycol monomethyl ether	109-86-4	<=0.0009%

California SCAQMD Rule 443.1 (South Coast Air Quality Management District Rule 443.1, Labeling of Materials Containing Organic Solvents):

VOC: Vapor pressure 0.06 mmHg at 20°C
1113.38 g/l

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16. OTHER INFORMATION

Contact: Thomas Cholke Phone: (847) 559-2225

Old World Industries, Inc. makes no warranty, representation or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of this product. Since actual use by others is beyond our control, no warranty, expressed or implied, is made by Old World Industries, Inc. as to the effects of such use, the results to be obtained or the safety and toxicity of this product, nor does Old World Industries, Inc. assume liability arising out of the use by others of this product referred to herein. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

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MATERIAL SAFETY DATA SHEET

ELF ATOCHEM NORTH AMERICA

FLUOROCHEMICALS
THREE PARKWAY
PHILADELPHIA, PA 19102

EMERGENCY PHONE NUMBERS

BUSINESS HRS:	215-587-7779
OTHER HOURS:	215-587-7513
OTHER HOURS:	800-424-9300
CHEMTREC:	800-424-9300

PRODUCT IDENTIFICATION

PRODUCT NAME: CAS NO: 75-63-8 HALON 1301
SYNONYMS: FOREX 1301
CHEMICAL NAME: BROMOTRIFLUOROMETHANE
MOLECULAR FORMULAR: $CBRF_3$
CHEMICAL FAMILY: HALOGENATED HYDROCARBONS

INGREDIENTS ---HAZARD CLASSIFICATION

COMPONENTS – HAZARDOUS:	CAS NO.:	%	COMMENTS:
BROMOTRIFLUOROMETHANE	75-63-8	100.0	OSHA FINAL LIMITS: TWA-1, 000PPM; 6,100MG/M3 ACGIH TLV(S): TWA-1, 000PPM; 6,090MG/M3 HMIS=1-0-0-H *LISTED SARA SECTION 313*

SHIPPING INFORMATION

BROMOTRIFLUOROMETHANE, 2.2 (NONFLAMMABLE GAS), UN 1009

PHYSICAL PROPERTIES

BOILING POINT / RANGE:	MELTING POINT:	FREEZING POINT:
-58°C (-72.4°F)	N/A	-168°C (-270.4°F)
MOLECULAR WEIGHT:	SPECIFIC GRAVITY: (H2O=1):	VAPOR PRESSURE (MM HG):
148.9	1.54 @ 25°C	220 PSIG @ 20°C
VAPOR DENSITY (AIR=1):	SOLUBILITY IN H2O:	% VOLATILES BY VOLUME:
5.14	NEGLIGIBLE	100.0

APPEARANCE AND ODOR:
CLEAR, LIQUIFIED GAS WITH SLIGHT ETHEREAL (ETHER-LIKE) ODOR

FIRE AND EXPLOSION DATA

FLASH POINT:	FLAMMABLE LIMITS:	AUTOIGNITION TEMP:
NONFLAMMABLE	LOWER: N/A - UPPER: N/A	N/E

EXTINGUISHING MEDIA:
USE EXTINGUISHING MEDIA APPROPRIATE TO SURRONDING FIRE CONDITIONS.

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SPECIAL FIRE FIGHTING PROCEDURES:

IN THE EVENT OF FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACE PIECE, OPERATED IN THE POSITIVE PRESSURE MODE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

MOVE CONTAINER FROM THE FIRE AREA, IF POSSIBLE, COOL FIRE EXPOSED CONTAINERS WITH WATER WELL AFTER THE FIRE IS OUT TO PREVENT POSSIBLE EXPLOSIONS.

REACTIVITY DATA

STABILITY:	CONDITIONS CONTRIBUTING TO INSTABILITY:
STABLE	THERMAL DECOMPOSITION

THERMAL DECOMPOSITION DUE TO EXPOSURE TO HEAT OR FIRE.

INCOMPATABILITY – AVOID CONTACT WITH:

STRONG ALKALIS

AVOID CONTACT WITH ALKALINE EARTH METALS, ALKALIS, POWERED ALUMINUN, ZINC,. AND BERYLLIUM SINCE THEY MAY REACT WITH OR ACCELERATE DECOMPOSITION OF THIS MATERIAL.

HAZARDOUS DECOMPOSITION THERMAL AND OTHER:

IRRITATING AND / OR TOXIC GASES DUE TO DECOMPOSITION OF THE PRODUCT MAY BE GENERATED DURING A FIRE. THESE INCLUDE HYDROBROMIC, HYDROCHLORIC, AND HYDROFLUORIC ACIDS, POSSIBLY FREE HALIDES AND CARBONYL HALIDES.

CONDITIONS TO AVOID:

HEAT / FLAMES

EXPOSURE TO FLAMES OR HOT SURFACES ABOVE 850°F.

TOXICITY

ROUTE:	ANIMAL:	DATA:
ORAL	N/A	N/E
DERMAL	N/E	N/E. SEE TOXICITY COMMENTS
INHALATION	RAT	LC 50= 416 GM / KG

TOXIC EFFECTS / ROUTES OF ENTRY

- EYE EFFECTS: IRRITANT
  VAPOR IS IRRITATING TO EYES. LIQUID IS IRRITATING TO EYES AND MAY CAUSE TISSUES TO FREEZE.
- SKIN EFFECTS: IRRITANT
  CONTACT WITH LIQUID CAN CAUSE FROSTBITE.

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OTHER TOXIC EFFECTS:

THIS PRODUCT DOES NOT CONTAIN ANY COMPONENTS LISTED BY NTP, IARC, OR OSHA AS CARCINOGENS.

TARGET ORGAN TOXIN:

TARGET ORGANS AFFECTED BY EXPOSURE TO THIS MATERIAL ARE: EYES, SKIN, CENTRAL NERVOUS SYSTEM, RESPIRATORY SYSTEM, AND HEART.

TOXICITY COMMENTS:

- MILDLY TOXIC BY INHALATION, AFFECTING THE CENTRAL NERVOUS SYSTEM. AT CONCENTRATIONS >20,000 PPM, IRREGULARITIES IN THE CENTRAL NERVOUS SYSTEM AND CARDIAC MUSCLE ARE EXHIBITED.
- EARLY HUMAN EXPERIENCE INDICATED THAT HIGH VAPOR CONCENTRATIONS (>20%) MAY CAUSE CONFUSION, PULMONARY IRRITATION, TREMORS, AND RARELY COMA; BUT THAT THESE EFFECTS ARE GENERALLY TRANSIENT.
- EXCESSIVE SKIN CONTACT WITH LIQUID FLUOROCARBONS SHOULD BE MINIMIZED TO PREVENT DEFATTING OF SKIN.
- NO EFFECTS FROM CHRONIC EXPOSURE ARE KNOWN.

HEALTH HAZARD INFORMATION

PERMISSIBLE EXPOSURE LIMITS

PERMISSIBLE EXPOSURE LIMITS ARE LISTED IN THE "INGREDIENTS" SECTION.

EMERGENCY FIRST AID

INGESTION:

N/A – PRODUCT IS A GAS AT AMBIENT CONDITIONS.
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSIOUS PERSON.

DERMAL:

REMOVE CONTAMINATED CLOTHING AND SHOES. WASH AFFECTED AREA FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

EYE CONTACT:

IMMEDIATELY FLUSH WITH PLENTY OF CLEAN WATER FOR LEAST 15 MINUTES. GET MEDICAL ATTENTION.

INHALATION:

- IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.
- NOTE TO PHYSICIANS: PRODUCT IS AN ASPHYXIANT AND MAY INDUCE CARDIAC MUSCLE SENSITIZATION TO EPINEPHRINE-LIKE COMPOUNDS. DO NOT GIVE ADRENALIN OR SIMILAR SYMPATHOMIMATIC DRUGS.

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SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:

LOCAL EXHAUST USE WITH ADEQUATE VENTILATION

USE WITH ADEQUATE VENTILATION. WHERE VENTILATION IS INADEQUATE, USE A LOCAL EXAUST SYSTEM TO REMOVE VAPORS.

EYE: GOGGLES:

SPLASH-PROOF GOGGLES WITH SIDE SHIELDS ARE REQUIRED FOR ANY TYPE OF HANDLING.

HAND GLOVE TYPE:

USE NITRILE OF NATURAL RUBBER GLOVES

RESPIRATOR TYPE: SELF-CONTAINED SUPPLIED AIR

IN INADEQUATELY VENTILATED AREAS, A NIOSH / OSHA APPROVED (TC-19C) SUPPLIED AIR RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS IS REQUIRED.

OTHER PROTECTIVE EQUIPMENT:

WEAR IMPERVIOUS BODY COVERING (RUBBER APRON) AND BOOTS WHERE SPILLS OR SPLASHING OCCUR. A FACE SHIELD IS ALSO RECOMMENDED.

SPECIAL HANDLING AND STORAGE CONDITIONS

MINIMIZE VAPORIZATION BY SEALING IN A TIGHTLY CLOSED CONTAINER, STORE IN A COOL, WELL-VENTILATED AREA. KEEP AWAY FROM HEAT, SPARKS, AND FLAMES. AVOID EYE AND SKIN CONTACT. WHEN TRANSFERRING FROM CONTAINERS, GROUND AND BOND BOTH CONTAINERS. DO NOT DROP, REUSE. OR REFILL CONTAINER. DO NOT CUT, GRIND, OR WELD ON OR NEAR CONTAINER DUE TO POSSIBLE TOXIC FUME GENERATION.

SPILL MANAGEMENT

VENTILATE THE AREA AND REMOVE ALL IGNITION SOURCES. CONTAIN THE SPILL BY BUILDING A DIKE USING ABSORBENT MATERIAL. COLLECT THE REMAINDER OF THE SPILL WITH ABSORBENT MATERIAL AND PLACE INTO A DRUM APPROVED FOR WASTE DISPOSAL. FLUSH AREA WITH WATER.

DISPOSAL PROCEDURE

- RECOVERED MATERIAL CAN BE INCINERATED IN A FURNACE WHERE PERMITTED, OBSERVING ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
- CONSULT FEDERAL, STATE, OR LOCAL AUTHORITIES FOR PROPER DISPOSAL PROCEDURES.

N/A – NOT APPLICABLE N/E – NOT ESTABLISHED

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ADDITIONAL INFORMATION

SARA HAZARD NOTIFICATION: THIS PRODUCT CONTAINS A SUBSTANCE WHICH IS DEFINED AS TOXIC CHEMICAL UNDER, AND SUBJECT TO THE REPORTING REQUIREEMENTS OF, SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND TITLE 40 CFR PART 372. SEE INGREDIENTS-HAZARD CLASSIFICATION SECTION FOR LISTED CHEMICAL.

MSDS PREPARED BY TECHNICAL SERVICES

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, ATOCHEM MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

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MATERIAL SAFETY DATA SHEET

Hector® Oil (All Grades)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Synonyms: Steam cylinder oil, ISO VG 180S, 460S, 630S
Formula: Mixture
Chemical Family: Hydrocarbon
CAS Number: Mixture
SAP Code: 1012795; 1012797; 1012799
Product Code: 80710; 80730; 80750
MSDS Number: US036770
NFPA Ratings: Health 0, Flammability 1 , Reactivity 0
HMIS Ratings: Flammability 1, Reactivity 0, Health 0
Intended Use(s): Industrial Worm Gear Oil

The intended use of this product is indicated above, if any additional use is known please contact us at the Technical Information number listed below.

Manufactured By:
Phillips 66 Company
A Division of Phillips Petroleum Company
Bartlesville, Oklahoma 74004

Phone Numbers
Emergency: (918) 661-8118
Technical Information: (800) 766-0050
For Additional MSDSs: (918) 661-5974

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Specification and CAS #	Weight % In Product	ACGIH TLV (TWA)	ACGIH Short Term Exposure Limit	ACGIH Ceiling Limits	ACGIH Skin Designation	OSHA Final PEL (TWA)	OSHA - Final PELs - Ceiling Limits	OSHA - Final PELs - Skin Notation
Solvent refined residuum 64742-01-4	0 to 80	NE	NE	NE	NE	NE	NE	NE
Base stock 64741-88-4	0 to 50	NE	NE	NE	NE	NE	NE	NE
Solvent deasphalted residual oil 64741-95-3	0 to 50	NE	NE	NE	NE	NE	NE	NE
Residual oils (petroleum), hydrotreated 64742-57-0	0 to 50	NE	NE	NE	NE	NE	NE	NE
Inedible lard oil 8016-28-2	0 to 10	NE	NE	NE	NE	NE	NE	NE
Acrylic copolymers 63197-48-8	0 to 1	NE	NE	NE	NE	NE	NE	NE

See Section 8 for additional Exposure Limits.

3. HAZARDS IDENTIFICATION

Emergency Overview

Non-Hazardous. Pressure Injection.

Potential Acute Health Effects

Eye Contact: May cause mild irritation.

Skin Contact: May cause mild irritation with prolonged or repeated contact.

Inhalation: No acute effects expected due to low vapor pressure.

Ingestion: Practically non-toxic (LD50 > 15 gm/kg).

Subchronic and Chronic Effects:

Prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as lung inflammation. This condition usually causes no symptoms.

Aggravated Medical Conditions: Skin Disorders

4. FIRST AID MEASURES

Eye Contact: Flush eyes with running water. If irritation or adverse symptoms develop, seek medical attention.

Skin Contact: Wash skin with soap and water. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Remove from exposure. If illness or adverse symptoms develop, seek medical attention.

Ingestion: If illness or adverse symptoms develop, seek medical attention.

Notes To Physician: For injection injuries, immediate medical treatment is required. Physicians may call the emergency number (918) 661-8118.

5. FIRE FIGHTING MEASURES

Flash Point:	480-515F (249-268C)
FP Method:	COC
Ignition Temperature:	730-755F (387-401C) Estimated
Flammable Limits (% by Volume in Air)	
Lower Exposure Limit -	Not Established
Upper Exposure Limit -	Not Established

Fire Extinguishing Media: Dry chemical, foam or carbon dioxide (CO2), water

Fire Fighting Procedures: Evacuate area and fight fire from a safe distance. Shut off source, if possible. Use NIOSH approved self-contained breathing apparatus and other protective equipment and/or garments described in Section 8 if conditions warrant. Use water spray to cool nearby containers and structures exposed to fire.

Fire and explosion hazards: Can be made to burn (flash point greater than 200F).

6. ACCIDENTAL RELEASE MEASURES

Sweep or gather up material and place in proper container for disposal or recovery.

7. HANDLING AND STORAGE

Avoid contact with eyes, skin or clothing. Avoid breathing vapors, mist, fume or dust. Use with adequate ventilation. Wear protective equipment and/or garments described in Section 8 if exposure conditions warrant. Launder contaminated clothing before reuse. Store in closed container. Store in well-ventilated area.

If pressure injected under the skin, can cause gangrene if not treated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection: Wear safety glasses.

Respiratory Protection: For concentrations exceeding an applicable exposure limit, use NIOSH approved air purifying respirator equipped with P95 filters, for particulate with time weighted average exposure limit not less than 0.5 mg/M3.

Skin Protection: Use gloves resistant to the material(s) contained in this product.

Ventilation: Use adequate ventilation to control concentrations below applicable exposure limits.

Other Personal Protection: Personal protection information shown in Section 8 is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

Exposure Limits: OSHA PEL and ACGIH TLV for oil mists is 5 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Dark
Odor:	Mild
Odor Threshold (ppm):	Unknown
Boiling Point:	Not Determined
Melting/Freeze Point:	Not Established
Vapor Pressure:	<0.0001 mm Hg @ 68F (20C)
Vapor Density (Air=1):	> 15
Specific Gravity @ 20 C (Water=1):	0.88 - 0.91 @ 60F (16C)
Percent Volatile by Volume:	*Negligible*
Evaporation Rate (Butyl Acetate=1):	Negligible
Water Solubility:	Negligible
Viscosity:	184-475 cSt @ 104F (40C)

10. STABILITY AND REACTIVITY

Stability: Stable

Hazardous Polymerization: Will Not Occur

Incompatability (Materials to Avoid): Oxygen and strong oxidizing agents.

Hazardous Decomposition Products: Carbon oxides and various hydrocarbons are formed when burned.

11. TOXICOLOGICAL INFORMATION

Other Health Effects:

Continuous skin contact with used motor oils has caused skin cancer in laboratory animals. Avoid prolonged skin contact with used motor oil.

Pressurized injection of product under the skin can lead to seriously inflammed tissue. If left untreated injury can become gangrenous.

These products may contain 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).

12. ECOLOGICAL INFORMATION

No data at this time.

13. DISPOSAL CONSIDERATIONS

Disposal should be made in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT Shipping Description:	Not Regulated
IMDG Shipping Description:	Not Regulated
ICAO/IATA Proper Shipping Name:	Not Regulated

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories)

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

Solvent refined residuum 0 to 80 **64742-01-4**
Regulated Substance on TSCA Inventory: Listed
Canada - Domestic Substances List: Listed

Base stock 0 to 50 **64741-88-4**
Regulated Substance on TSCA Inventory: Listed
Canada - Domestic Substances List: Listed

Solvent deasphalted residual oil 0 to 50 **64741-95-3**
Regulated Substance on TSCA Inventory: Listed
Canada - Domestic Substances List: Listed

Residual oils (petroleum), hydrotreated 0 to 50 **64742-57-0**

Regulated Substance on TSCA Inventory: Listed
Canada - Domestic Substances List: Listed

Inedible lard oil 0 to 10 **8016-28-2**
Regulated Substance on TSCA Inventory: Listed
Pennsylvania Right to Know List: Listed
Canada - Domestic Substances List: Listed

Acrylic copolymers 0 to 1 **63197-48-8**
Regulated Substance on TSCA Inventory: Listed
Canada - Domestic Substances List: Listed

16. OTHER INFORMATION

Revision Summary: Section 3 - Format Change.

Preparer: Health, Environment and Safety Department
Date Prepared: 05/11/2001
Supersedes: 04/27/2001

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MATERIAL SAFETY DATA SHEET

700-C-685
03 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER	DATE OF PREPARATION	HMIS CODES	
		Health	3
700-C-685	30-SEP-07	Flammability	1
		Reactivity	0

PRODUCT NAME
High Solids Epoxy (Part B), Catalyst

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 for Chemical Emergency ONLY (spill, leak,
(800) 424-9300 fire, exposure, or accident)

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
38	100-51-6	Phenylmethanol		
		ACGIH TLV	Not Available	0.15 mm
		OSHA PEL	Not Available	
3	112-57-2	Tetraethylene Pentamine		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
15	694-83-7	1,2-Cyclohexanediamine		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
23	Proprietary	Polyamine		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
20	Proprietary	Polyamidoamine		
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

Continued on page 2

EFFECTS OF OVEREXPOSURE

EYES: Causes burns.
SKIN: Causes burns.
INHALATION: Causes burns of the upper respiratory system.

In a confined area vapors in high concentration may cause headache, nausea or dizziness.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to nervous systems.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

May cause allergic skin reaction in susceptible persons or skin sensitization.

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 IMMEDIATELY.

SKIN: Wash affected area thoroughly with soap and water. If irritation persists or occurs later, get medical attention. 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
200 F PMCC	N.A.	N.A.

FLAMMABILITY CLASSIFICATION

Not Applicable

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.

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

DOL Storage Class IIIB

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.

Do not get in eyes, or on skin or clothing. Do not breathe vapor or 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

To prevent skin contact, wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

To prevent eye contact, wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use barrier cream on exposed skin.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Continued on page 4

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	8.53 lb/gal 1022 g/l
SPECIFIC GRAVITY	1.03
BOILING POINT	396 - 405 F 202 - 207 C
MELTING POINT	Not Available
VOLATILE VOLUME	37 %
EVAPORATION RATE	Slower than ether
VAPOR DENSITY	Heavier than air
SOLUBILITY IN WATER	N.A.

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

3.27 lb/gal	392 g/l	Less Water and Federally Exempt Solvents
3.27 lb/gal	392 g/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

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
100-51-6	Phenylmethanol				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
112-57-2	Tetraethylene Pentamine				
		LC50	RAT	4HR	Not Available
		LD50	RAT		205 mg/kg
694-83-7	1,2-Cyclohexanediamine				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
Proprietary	Polyamine				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
Proprietary	Polyamidoamine				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Continued on page 5

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

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.

Afton CHEMICAL

Material Safety Data Sheet

HiTEC 6476 Gasoline Fuel Additive

MSDS No. H6476

HiTEC is a trademark owned by Afton Chemical Corporation or one of its subsidiaries.

1. Product and Company Identification

Product Use Petrochemical Industry: Fuel additive.

CAS No. Mixture.

Validation Date 11 June 2004

In Case of Emergency

1-800-403-0044 (US & Canada)
1-804-648-7727 (International)
32-2-507-20-64 (Europe)

Manufacturer / Supplier

Afton Chemical Corporation
500 Spring St.
Richmond, VA 23219
1-804-788-5800

Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44 1344-304141

2. Composition and Information on Ingredients

Note: See section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

Substance/Preparation : Preparation

Ingredient Name	CAS No.	Conc. (% w/w)	EU Classification	WHMIS Regulated?
Solvent naphtha (petroleum), light aromatic	64742-95-6	30-60	R10 Xn; R65 Xi; R37 R66, 67 N; R51/53	Yes.
Polyolefin alkyl phenol alkyl amine	Proprietary	20-30	Xi; R36/38	Yes.
Benzene, 1,2,4-trimethyl-	95-63-6	20-30	R10 Xn; R20 Xi; R36/37/38 N; R51/53	Yes.
Benzene, 1,3,5-trimethyl-	108-67-8	5-9.9	R10 Xi; R37	Yes.
N-Propylbenzene	103-65-1	5-9.9	R10 Xi; R37/38, 41	Yes.
Xylene	1330-20-7	1-4.9	R10 Xn; R20/21 Xi; R38	Yes.
Cumene	98-82-8	1-4.9	R10 Xn; R65 Xi; R37 N; R51/53	Yes.
2-Ethyl hexanol	104-76-7	1-4.9	Xi; R36/38	Yes.
Benzene, 1,2,3-trimethyl-	526-73-8	1-4.9	R10 Xi; R38, 41	Yes.
Solvent naphtha (petroleum), heavy aromatic	64742-94-5	0.1-0.5	Xn; R65 R66, 67 N; R51/53	Yes.

3. Hazards Identification

Notice to Reader

Afton operates a world-wide system for hazard communication. Some hazards shown in Section 3 may apply to non-EU countries and may not result in classification and labeling in the EU. Please see Section 2 and 15 for country specific classification information, and Section 11 for additional details.

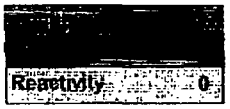
The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Primary Hazards and Critical Effects : WARNING!
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.

Physical/Chemical Hazards : Flammable.

Environmental Hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

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



4. First Aid Measures

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : DO NOT induce vomiting. If affected person is fully conscious, give one glass of water to drink. Never give anything by mouth to an unconscious person. Get immediate medical attention.

Skin Contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately.

Eye Contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

5. Fire-Fighting Measures

Extinguishing Media : In case of fire, use water spray (fog), foam, dry chemicals, or CO2.

Fire-Fighting Procedures : Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Fire/Explosion Hazards : FLAMMABLE LIQUID AND VAPOR. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous Decomposition Products : These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).

Flash point : Closed cup: 44°C (111.2°F). (Pensky-Martens. Minimum)

6. Accidental Release Measures

Personal Precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5). Do not touch or walk through spilled material.

Environmental Precautions and Clean-up Methods : If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways.

Note: See section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and Storage

Handling : Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Avoid prolonged contact with eyes, skin, and clothing. Do not ingest. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Storage : Store in a segregated and approved area. Keep container in a well-ventilated place. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure Controls and Personal Protection

Engineering Controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protective Equipment

Respiratory System : Use an approved, properly fitted, powered-air purifying respirator or respirator of equivalent or greater protection.

Skin and Body : Where contact is likely, wear chemical resistant gloves, a chemical resistant suit, and boots. Additional body garments should be used based upon the task being performed.

Hands : Use chemical resistant, impervious gloves.

Eyes : Safety goggles are considered minimum protection. Goggles with a face shield may be necessary depending on quantity of material and conditions of use.

Occupational Exposure Limits

Ingredient Name	OEL United States	OEL Canada	OEL Europe
Benzene, 1,2,4-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm
Solvent naphtha (petroleum), light aromatic	**OSHA (United States).** TWA: 500 ppm 8 hour(s).	Not available.	Not available.
Benzene, 1,2,3-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
Benzene, 1,3,5-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm
Xylene	**ACGIH (United States, 1998).** TWA: 100 ppm STEL: 150 ppm **OSHA (United States).** TWA: 100 ppm	TWA: 100 STEL: 150	**EH40 (UK) (Europe, 2002).** Skin TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s).
Cumene	**ACGIH (United States, 1994).** Skin TWA: 50 ppm **OSHA (United States, 1989).** Skin TWA: 50 ppm	TWA: 50 ppm	**EH40 (UK) (Europe).** Skin TWA: 25 ppm TWA: 125 mg/m³ 8 hour(s). STEL: 250 mg/m³ 15 minute(s).

9. Physical and Chemical Properties

Physical State and Appearance : Liquid.

Color : Amber. (Light.)

Odor : Amine like.

Specific Gravity : 0.915 at 15.6/15.6°C (target).

Solubility : Insoluble in cold water.

Viscosity : 11 cSt at 40°C (target).

Flash Point : Closed cup: 44°C (111.2°F). (Pensky-Martens. Minimum)

10. Stability and Reactivity

Stability : The product is stable.

Materials to avoid : Strong oxidizing and reducing agents.

Conditions to avoid : High temperatures, sparks, and open flames.

11. Toxicological Information

Routes of Entry : Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Target Organs : Contains material which may cause damage to the following organs: blood, kidneys, lungs, liver, heart, gastrointestinal tract, upper respiratory tract, immune system, skin, eyes, central nervous system (CNS).

Acute Effects

Inhalation : Irritating to respiratory system.

Ingestion : Aspiration hazard if swallowed- can enter lungs and cause damage.

Skin Contact : Irritating to skin.

Eye Contact : Irritating to eyes.

Chronic Effects

Adverse Effects : **trimethylbenzenes:** Adverse symptoms may include: This product contains trimethylbenzene. Literature data indicate that long-term inhalation exposure causes blood effects in laboratory animals..
petroleum distillates: Adverse symptoms may include: Fetotoxic effects have been observed in the offspring of rats exposed by inhalation to Solvent Naptha (petroleum) light aromatic by inhalation, in the presence of slight maternal toxicity. .
trimethylbenzenes: Adverse symptoms may include: This product contains trimethylbenzene. Literature data indicate that long-term inhalation exposure causes blood effects in laboratory animals..
XYLENE: Adverse symptoms may include: Central nervous system, liver, kidneys, and blood effects by inhalation and heart beat irregularity (arrythmia) and heart beat - increase. High exposures to xylene in some animal studies, often at levels toxic to the mother, affected embryo/fetal development. The significance of this finding to humans is not known..
2-ETHYL HEXANOL: Adverse symptoms may include: liver, kidneys, lungs, and heart effects by dermal route and immune system effects by ingestion route.

Carcinogenic Effects : Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

Toxicity Data

Ingredient Name	Test	Result	Route	Species
Solvent naphtha (petroleum), light aromatic	LD50	8400 mg/kg	Oral	Rat
Xylene	LD50	4300 mg/kg	Oral	Rat
	LD50	>14100 mg/kg	Dermal	Rabbit
	LC50	5000 to 6500 ppm (4 hours)	INHALATION	Rat
Cumene	LD50	1400 mg/kg	Oral	Rat
	LD50	12750 mg/kg	Oral	Mouse
	LD50	10578 mg/kg	Dermal	Rabbit
	LC50	8000 ppm (4 hours)	INHALATION	Rat
N-Propylbenzene	LD50	6040 mg/kg	Oral	Rat
2-Ethyl hexanol	LD50	2000 to 5000 mg/kg	Oral	Rat
	LD50	2000 to 3800 mg/kg	Oral	Mouse
	LD50	1900 mg/kg	Oral	Guinea pig
	LD50	1970 mg/kg	Dermal	Rabbit
	LC50	>227 ppm (6 hours)	INHALATION	Rat

Other Information : Not available.

12. Ecological Information

Environmental Hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Based on calculation.

Environmental Fate : This product contains components which may be persistent in the environment.

13. Disposal Consideration

Waste Handling and Disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional Information
DOT Classification	NA1993	Combustible liquid, n.o.s. (Xylene , petroleum distillates)	Combustible Liquid.	III		-
TDG Classification	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		
ADR/RID Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		Hazard Identification Number 30
IMDG Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		-
IATA-DGR Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		-

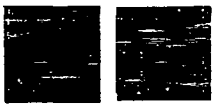
Notice to Reader

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions.

15. Regulatory Information

EU Regulations

Hazard Symbol(s) :



Irritant. Dangerous for the environment

Risk Phrases : R10- Flammable.
R36/37/38- Irritating to eyes, respiratory system and skin.
R67- Vapors may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases : S16- Keep away from sources of ignition - No smoking.
S23- Do not breathe vapor.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of [***].
S57- Use appropriate containment to avoid environmental contamination.

US Regulations : SARA 313 toxic chemical notification and release reporting: trimethylbenzenes 10-30%; XYLENE 1-5%; CUMENE 1-5%

: SARA 311/312 MSDS distribution - chemical inventory - hazard identification:Fire hazard,Immediate (Acute) Health Hazard,Delayed (Chronic) Health Hazard.

State : California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Naphthalene; BENZENE

Canadian Regulations

WHMIS (Classification) : Not determined.

International Inventory Status

United States	: All components on TSCA Inventory
Canada	: All components on DSL
Europe	: All components on EINECS
Japan	: All components on MITI or MOL
Australia	: One or more components not found on NICNAS
Korea	: One or more components not found on ECL
China	: All components on IECSC
Philippines	: All components on PICCS

16. Other Information

PREPARATION INFORMATION

Validated by _HS&E Department (Tel: +1 804 788 5800) on 6/11/2004.

Version : 1

Date of Printing : 6/11/2004.

Indicates information that has changed from previously issued version.

Notice to Reader

This information and these recommendations are offered in good faith and believed to be correct as of the date hereof. Information and recommendations are supplied upon the condition that the recipients will make their own decision as to safety and suitability for their purposes. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature, are made with respect to the product or the information and recommendations. Afton makes no representation as to completeness or accuracy. In no event will Afton be responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.

ADDRESS CONTACT INFORMATION

In the United States and Canada:
Afton Chemical Corporation
500 Spring Street
Richmond, Virginia
USA 23219-2183
Telephone number: 804-788-5800

In Singapore:
Afton Chemical Asia Pacific Company
111 Somerset Road #13 - 03
Singapore 238164
Telephone number: 65-6732-0822

In Australia:
Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
Business Hours: 9:00am - 5:00pm

In Europe:
Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44-1344-304141

In Japan:
Afton Chemical Japan Corporation
Sumitoma Fudousan Sanbancho Bldg. 5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

***** END OF MSDS *****

Material Safety Data Sheet

HiTEC 6476A Fuel Additive

MSDS No. H6476A

HiTEC is a trademark owned by Afton Chemical Corporation or one of its subsidiaries.

1. Product and Company Identification

Product Use Petrochemical industry: Fuel additive.

CAS No. Mixture.

Validation Date 18 June 2004

In Case of Emergency

1-800-403-0044 (US & Canada)
1-804-649-7727 (International)
32-2-507-20-64 (Europe)

Manufacturer / Supplier

Afton Chemical Corporation
500 Spring St.
Richmond, VA 23219
1-804-788-5800

Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44 1344-304141

2. Composition and Information on Ingredients

Note: See section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

Substance/Preparation : Preparation

Ingredient Name	CAS No.	Conc. (% w/w)	EU Classification	WHMIS Regulated?
Solvent naphtha (petroleum), light aromatic	64742-95-6	30-60	R10 Xn; R65 Xi; R37 R66, 67 N; R51/53	Yes.
Polyolefin alkyl phenol alkyl amine	Proprietary	20-30	Xi; R36/38	Yes.
Benzene, 1,2,4-trimethyl-	95-63-6	10-19.9	R10 Xn; R20 Xi; R36/37/38 N; R51/53	Yes.
Benzene, 1,3,5-trimethyl-	108-67-8	5-9.9	R10 Xi; R37	Yes.
N-Propylbenzene	103-65-1	5-9.9	R10 Xi; R37/38, 41	Yes.
Xylene	1330-20-7	1-4.9	R10 Xn; R20/21 Xi; R38	Yes.
2-Ethyl hexanol	104-76-7	1-4.9	Xi; R36/38	Yes.
Cumene	98-82-8	1-4.9	R10 Xn; R65 Xi; R37 N; R51/53	Yes.
Benzene, 1,2,3-trimethyl-	526-73-8	1-4.9	R10 Xi; R38, 41	Yes.
Solvent naphtha (petroleum), heavy aromatic	64742-94-5	0.1-0.5	Xn; R65 R66, 67 N; R51/53	Yes.

3. Hazards Identification

Notice to Reader

Afton operates a world-wide system for hazard communication. Some hazards shown in Section 3 may apply to non-EU countries and may not result in classification and labeling in the EU. Please see Section 2 and 15 for country specific classification information, and Section 11 for additional details.

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Primary Hazards and Critical Effects : WARNING!
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.

Physical/Chemical Hazards : Flammable.

Environmental Hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

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

Health	1
	*
Reactivity	0

4. First Aid Measures

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : DO NOT induce vomiting. If affected person is fully conscious, give one glass of water to drink. Never give anything by mouth to an unconscious person. Get immediate medical attention.

Skin Contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

5. Fire-Fighting Measures

Extinguishing Media : In case of fire, use water spray (fog), foam, dry chemicals, or CO2.

Fire-Fighting Procedures : Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Fire/Explosion Hazards : FLAMMABLE LIQUID AND VAPOR. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous Decomposition Products : These products are carbon oxides (CO, CO2).

Flash point : Closed cup: 44°C (111.2°F). (Pensky-Martens. Minimum)

6. Accidental Release Measures

Personal Precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5). Do not touch or walk through spilled material.

Environmental Precautions and Clean-up Methods : If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways.

Note: See section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and Storage

Handling : Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Avoid prolonged contact with eyes, skin, and clothing. Do not ingest. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Storage : Store in a segregated and approved area. Keep container in a well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure Controls and Personal Protection

Engineering Controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protective Equipment

Respiratory System : Use appropriate respiratory protection if there is the potential to exceed the exposure limit(s).

Skin and Body : Where contact is likely, wear chemical resistant gloves, a chemical resistant suit, and boots. Additional body garments should be used based upon the task being performed.

Hands : Use chemical resistant, impervious gloves.

Eyes : Safety goggles are considered minimum protection. Goggles with a face shield may be necessary depending on quantity of material and conditions of use.

Occupational Exposure Limits

Ingredient Name	OEL United States	OEL, Canada	OEL, Europe
Solvent naphtha (petroleum), light aromatic	OSHA (United States). TWA: 500 ppm 8 hour(s).	Not available.	Not available.
Benzene, 1,2,4-trimethyl-	ACGIH (United States, 1999). TWA: 25 ppm	TWA: 25 ppm	EH40 (UK) (Europe). TWA: 25 ppm
Xylene	ACGIH (United States, 1996). TWA: 100 ppm STEL: 150 ppm OSHA (United States). TWA: 100 ppm	TWA: 100 STEL: 150	EH40 (UK) (Europe, 2002). Skin TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s).
Cumene	ACGIH (United States, 1994). Skin TWA: 50 ppm OSHA (United States, 1989). Skin TWA: 50 ppm	TWA: 50 ppm	EH40 (UK) (Europe). Skin TWA: 25 ppm TWA: 125 mg/m³ 8 hour(s). STEL: 250 mg/m³ 15 minute(s).
Benzene, 1,2,3-trimethyl-	ACGIH (United States, 1999). TWA: 25 ppm	TWA: 25 ppm	ACGIH (United States, 1999). TWA: 25 ppm
Benzene, 1,3,5-trimethyl-	ACGIH (United States, 1999). TWA: 25 ppm	TWA: 25 ppm	EH40 (UK) (Europe). TWA: 25 ppm

9. Physical and Chemical Properties

Physical State and Appearance : Liquid.

Specific Gravity : 0.9152

Solubility : Insoluble in cold water.

Viscosity : 11 cSt @ 40°C

Flash Point : Closed cup: 44°C (111.2°F). (Pensky-Martens. Minimum)

10. Stability and Reactivity

Stability : The product is stable.

Materials to avoid : Strong oxidizing and reducing agents.

Conditions to avoid : High temperatures, sparks, and open flames.

11. Toxicological Information

Routes of Entry : Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Target Organs : Contains material which may cause damage to the following organs: blood, kidneys, lungs, liver, heart, gastrointestinal tract, upper respiratory tract, immune system, skin, eyes, central nervous system (CNS).

Acute Effects

Inhalation : Irritating to respiratory system.

Ingestion : Aspiration hazard if swallowed- can enter lungs and cause damage. Does not meet EU classification criteria.

Skin Contact : Irritating to skin.

Eye Contact : Irritating to eyes.

Chronic Effects

Adverse Effects

: **petroleum distillates:** Adverse symptoms may include: Fetotoxic effects have been observed in the offspring of rats exposed by inhalation to Solvent Naptha (petroleum) light aromatic by inhalation, in the presence of slight maternal toxicity. . **trimethylbenzenes:** Adverse symptoms may include: This product contains trimethylbenzene. Literature data indicate that long-term inhalation exposure causes blood effects in laboratory animals.. **XYLENE:** Adverse symptoms may include: Central nervous system, liver, kidneys, and blood effects by inhalation and heart beat irregularity (arrythmia) and heart beat - increase. High exposures to xylene in some animal studies, often at levels toxic to the mother, affected embryo/fetal development. The significance of this finding to humans is not known. **2-ETHYL HEXANOL:** Adverse symptoms may include: liver, kidneys, lungs, and heart effects by dermal route and immune system effects by ingestion route.

Carcinogenic Effects : Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

Toxicity Data

Ingredient Name	Test	Result	Route	Species
Solvent naphtha (petroleum), light aromatic	LD50	8400 mg/kg	Oral	Rat
Xylene	LD50	4300 mg/kg	Oral	Rat
	LD50	>14100 mg/kg	Dermal	Rabbit
	LC50	5000 to 8500 ppm (4 hours)	INHALATION	Rat
Cumene	LD50	1400 mg/kg	Oral	Rat
	LD50	12750 mg/kg	Oral	Mouse
	LD50	10578 mg/kg	Dermal	Rabbit
	LC50	8000 ppm (4 hours)	INHALATION	Rat
N-Propylbenzene	LD50	6040 mg/kg	Oral	Rat
2-Ethyl hexanol	LD50	2000 to 5000 mg/kg	Oral	Rat
	LD50	2000 to 3800 mg/kg	Oral	Mouse
	LD50	1900 mg/kg	Oral	Guinea pig
	LD50	1970 mg/kg	Dermal	Rabbit
	LC50	>227 ppm (6 hours)	INHALATION	Rat

Other Information : Not available.

12. Ecological Information

Environmental Hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Based on calculation.

Environmental Fate : This product contains components which may be persistent in the environment.

13. Disposal Consideration

Waste Handling and Disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional Information
DOT Classification	NA1993	Combustible liquids, n.o.s. (xylene, petroleum distillates)	Combustible Liquid.	III		-
TDG Classification	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		
ADR/RID Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		Hazard Identification Number 30
IMDG Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		-
IATA-DGR Class	UN1993	FLAMMABLE LIQUIDS, N.O.S. (xylene, petroleum distillates)	3	III		-

Notice to Reader

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions.

15. Regulatory Information

EU Regulations

Hazard Symbol(s) :

Irritant, Dangerous for the environment

Risk Phrases : R10- Flammable.
R36/37/38- Irritating to eyes, respiratory system and skin.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases : S16- Keep away from sources of ignition - No smoking.
S23- Do not breathe vapor.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of water.
S57- Use appropriate containment to avoid environmental contamination.

Additional Warning Phrases : Not applicable.

US Regulations : SARA 313 toxic chemical notification and release reporting: trimethylbenzenes 10-20%; XYLENE 1-5%; CUMENE 1-5%

: SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

State : California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Naphthalene; BENZENE

Canadian Regulations

WHMIS (Classification) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).

International Inventory States

United States	: All components on TSCA inventory
Canada	: All components on DSL
Europe	: All components on EINECS
Japan	: All components on MITI or MOL
Australia	: One or more components not found on NICNAS
Korea	: One or more components not found on ECL
China	: All components on IECSC
Philippines	: All components on PICCS

16. Other Information

PREPARATION INFORMATION

Validated by _HS&E Department (Tel: +1 804 788 5800) on 6/18/2004.

Version : 1.00

Date of Printing : 7/13/2004.

☑ **Indicates information that has changed from previously issued version.**

Notice to Reader

This information and these recommendations are offered in good faith and believed to be correct as of the date hereof. Information and recommendations are supplied upon the condition that the recipients will make their own decision as to safety and suitability for their purposes. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature, are made with respect to the product or the information and recommendations. Afton makes no representation as to completeness or accuracy. In no event will Afton be responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.

ADDRESS CONTACT INFORMATION

In the United States and Canada:
Afton Chemical Corporation
500 Spring Street
Richmond, Virginia
USA 23219-2183
Telephone number: 804-788-5800

In Singapore:
Afton Chemical Asia Pacific Company
111 Somerset Road #13 - 03
Singapore 238164
Telephone number: 65-6732-0822

In Australia:
Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
Business Hours: 9:00am - 5:00pm

In Europe:
Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44-1344-304141

In Japan:
Afton Chemical Japan Corporation
Sumitoma Fudousan Sanbancho Bldg. 5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

***** END OF MSDS *****

Hydraulic Oil AW/D (All Grades)

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Hydraulic Oil AW/D (All Grades)
MSDS Number:	721160
Synonyms:	76 Hydraulic Oil AW/D 32 76 Hydraulic Oil AW/D 46 76 Hydraulic Oil AW/D 68 76 Hydraulic Oil AW/D 100 76 Hydraulic Oil AW/D 150
Intended Use:	Industrial Oil
Manufacturer/Supplier:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
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: Orange to dark 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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). 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: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	>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): 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: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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, 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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical 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. 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. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: 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.

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.

"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.

Conditions for safe storage: Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Storage temperatures above 113°F may lead to thermal decomposition, resulting in the generation of hydrogen sulfide and other sulfur containing gases. Keep container(s) tightly closed. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

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:	Orange to dark amber
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:	<-5.8°F / <-21°C
Pour Point:	<-5.8°F / <-21°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.87 @ 60°F (15.6°C)
Bulk Density:	7.3 lbs/gal
Viscosity:	6 - 15.5 cSt @ 100°C; 30 - 170 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>302°F / >150°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 storage and handling.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): 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 Data:

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 Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data

12. ECOLOGICAL INFORMATION

Lubricant oil basestocks are complex mixtures of hydrocarbons (primarily branched chain alkanes and cycloalkanes) ranging in carbon number from C15 to C50. The aromatic hydrocarbon content of these mixtures varies with the severity of the refining process. White oils have negligible levels of aromatic hydrocarbons, whereas significant proportions are found in unrefined basestocks. Olefins are found only at very low concentrations. Volatilization is not significant after release of lubricating oil basestocks to the environment due to the very low vapor pressure of the hydrocarbon constituents. In water, lubricating oil basestocks will float and will spread at a rate that is viscosity dependent. Water solubilities are very low and dispersion occurs mainly from water movement with adsorption by sediment being the major fate process. In soil, lubricating oil basestocks show little mobility and adsorption is the predominant physical process.

Both acute and chronic ecotoxicity studies have been conducted on lubricant base oils. Results indicate that the acute aquatic toxicities to fish, Daphnia, Ceriodaphnia and algal species are above 1000 mg/l using either water accommodated fractions or oil in water dispersions. Since lubricant base oils mainly contain hydrocarbons having carbon numbers in the range C15 to C50, it is predicted that acute toxicity would not be observed with these substances due to low water solubility. Results from chronic toxicity tests show that the no observed effect level (NOEL) usually exceeds 1000 mg/l for lubricant base oils with the overall weight of experimental evidence leading to the conclusion that lubricant base oils do not cause chronic toxicity to fish and invertebrates.

Large volumes spills of lubricant base oils into water will produce a layer of undissolved oil on the water surface that will cause direct physical fouling of organisms and may interfere with surface air exchange resulting in lower levels of dissolved oxygen. Petroleum products have also been associated with causing taint in fish even when the latter are caught in lightly contaminated environments. Highly refined base oils sprayed onto the surface of eggs will result in a failure to hatch.

Extensive experience from laboratory and field trials in a wide range of crops has confirmed that little or no damage is produced as a result of either aerosol exposure or direct application of oil emulsion to the leaves of crop plants. Base oils incorporated into soil have resulted in little or no adverse effects on seed germination and plant growth at contamination rates up to 4%.

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)

14. TRANSPORTATION INFORMATION

UN/ID #: *Not regulated*

	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:
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

Issue Date:	07-Jul-2008
Status:	Final
Previous Issue Date:	01-Jul-2005
Revised Sections or Basis for Revision:	NFPA ratings (Sections 2&5)
MSDS Number:	721160

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-DFG = Deutsche Forschungsgemeinschaft; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; N/A = Not Applicable; N/D = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

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.

Injex Pro 2-Cycle Motor Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Injex Pro 2-Cycle Motor Oil
MSDS Code:	717910
Intended Use:	2-Cycle Engine Oil
Responsible Party:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	888-766-7676
Technical Information:	800-255-9556
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Purple
Physical Form: Liquid
Odor: Characteristic 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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation).No harmful effects from skin absorption are expected.

Inhalation (Breathing): Expected to have a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea, vomiting, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

Component	CAS	Concentration (wt %)
Hydrotreated Distillate, Light ..C9-16	64742-47-8	26 - 27

NON-HAZARDOUS COMPONENTS

Component	CAS	Concentration (wt %)
Additives	PROPRIETARY	35 - 36
Lubricant Base Oil (Petroleum)	VARIOUS	38 - 39

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, 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. Seek immediate 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: 1 **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. Vapors are heavier than air and can accumulate in low areas.

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

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.

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.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Immediate cleanup of any spill is recommended. Notify fire authorities and appropriate federal, state, and local agencies. 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practices.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Hydrotreated Distillate, Light C9-16	200 mg/m³ TWA - SKIN (as total hydrocarbon vapor) based on Kerosene 8008-20-6	—	—
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.

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of gloves impervious to the specific material handled, such as nitrile, is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Purple
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	< 1
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	<-38°F / <-39°C
Solubility In Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.88 @ 60°F (15.6°C)
Bulk Density:	7.3 lbs/gal
Viscosity:	9.7 cSt @ 100°C; 62 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	No data
Flash Point:	244°F / 118°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
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 storage and handling conditions of temperature and pressure.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7). Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents, strong acids and strong bases.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and/or dewaxing to remove aromatics and improve performance characteristics. They contain low concentrations of PAH's and none have been identified as a carcinogen by NTP, IARC or OSHA.

Hydrotreated Distillate, Light ..C9-16

Carcinogenicity: Prolonged and repeated skin exposure of mice to certain middle distillate streams has resulted in dermatitis, which has been associated with the promotion of skin tumors via a non-genotoxic mechanism. This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No Data
Hydrotreated Distillate, Light ..C9-16	> 5g/kg (Rat) based on Kerosene	>2g/kg (Rabbit)	>5mg/L (4-hr., Rat)

12. ECOLOGICAL INFORMATION

Not evaluated.

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: Additional Federal compliance requirements may apply. See 49 CFR 171.12.

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

UN/ID #: Not regulated
Note: Additional Federal compliance requirements may apply. See 49 CFR 171.11.

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

15. REGULATORY INFORMATION

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 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):

Naphthalene -- 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 CPR.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are listed on the US TSCA Inventory.
All components are listed on the Canadian DSL.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	16-Feb-2007
Status:	Final
Revised Sections or Basis for Revision:	Periodic review and update
MSDS Code:	717910

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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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Material Safety Data Sheet

OSHA / ANSI Z400.1-2004 Compliant

Ciba

Date / Revised: 03-07-2007 Release: 1.0

Product: IRGAMET 39

NFPA Hazard codes:

Health: 2	Fire: 1	Reactivity: 0	Special:

HMIS III rating

Health: 2	Flammability: 1	Physical hazard: 0	Personal protection: X

HMIS Note: * Indicates possible chronic health effects.

1. Identification of the Substance/Preparation and of the Company/Undertaking

Company Information

Company: Ciba Specialty Chemicals Corporation
540 White Plains Road
P.O. Box 2005
Tarrytown, NY 10591-9005
U.S.A.
Customer Service / Product Information: 1-800-474-4731
MSDS Request Line: 1-800-431-2360

Emergency information

Emergency 24-Hour Health/Environmental Phone: (24h) +1-800-873-1138

CHEMTREC: (800) 424-9300 (24hrs) or (703) 527-3887

Product information

Product: IRGAMET 39

Use: Lubricants additive.

2. Hazards Identification

Emergency overview

Signal word:	CAUTION !
Colour:	colourless
Appearance:	liquid
State of matter:	liquid
Odour:	Slightly amine
Health:	This product can cause skin irritation and skin sensitization.
Physical/Chemical hazards:	None Expected

Potential health effects

Primary routes of entry:

Ingestion, Skin, Inhalation, Eyes

Potential environmental effects

This product is toxic to aquatic organisms. Releases to the environment are to be avoided.

3. Composition/Information on Ingredients

Chemical name	CAS Number	Content (Weight)	Hazardous
N,N-bis(2-Ethylhexyl)-ar-methyl-1H-benzotriazole-1-methanamine	94270-86-7	60.0 - 100.0 %	Y

COPPOR00001012

This material is classified as hazardous under OSHA regulations.

4. First-aid Measures

Inhalation:

Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult, give oxygen and get immediate medical attention.

Skin:

After contact with skin, wash immediately with plenty of water and soap.
Get medical attention if irritation occurs.

Eyes:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Ingestion:

Do not induce vomiting. If vomiting occurs naturally, have casualty lean forward to reduce the risk of aspiration.
Seek medical attention immediately.

Notes to physician:

May aggravate pre-existing skin conditions, allergies and eczema. Treat symptomatically.

5. Fire-fighting Measures

Suitable extinguishing media:

carbon dioxide, dry powder, foam

Hazardous combustion products:

Burning may produce toxic combustion products.

Hazards during fire-fighting:

Standard procedure for chemical fires.

Protective equipment for fire-fighting:

Wear self-contained breathing apparatus and chemical-protective clothing.

6. Accidental Release Measures

Cleanup:

Pick up with inert absorbent material (e.g. sand, earth etc.).
Place into approved waste containers.
Wear suitable protective equipment.
Should not be released into the environment.

7. Handling and Storage

Handling

General advice:

As with all industrial chemicals, use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale. Do not taste or swallow. Use only with adequate ventilation.

Protection against fire and explosion:

No physical hazards determined at this time. Handle this liquid with care and follow standard industrial practices.

Storage

General advice:

Keep container tightly closed in a dry, cool and well-ventilated place.

> for industrial use only <

8. Exposure Controls and Personal Protection

Engineering Controls:

Work in well ventilated areas. Do not breathe vapors or mist.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified respirator as necessary.

Eye protection:

Tightly fitting safety goggles (splash goggles) (EN 166)

Body protection:

Wear chemical resistant gloves and protective clothing.

General safety and hygiene measures:

There are no OSHA or ACGIH exposure guidelines available for component(s) in this product.
Eye wash station and safety shower should be available in immediate work area., Select additional protective equipment based upon potential for exposure.

9. Physical and Chemical Properties

Colour:	colourless	
Form:	liquid	
State of matter:	liquid	
Odour:	Slightly amine	
pH value:	7.0	(20 - 25 °C) (as suspension)
Evaporation rate:		Not tested
Flammability:	Not tested	
Flash point:	> 150 °C	(DIN 51376)
Self-ignition temperature:	280 °C	
		Not tested
Melting point:	-30 °C	
Boiling point:	271 °C	
Vapour pressure:	approx. 0.001 Pa	(20 °C)
Density:	0.94 - 0.96 g/cm3	(25 °C)
Vapour density:		Not tested
Partitioning coefficient n-octanol/water (log Pow):	> 6	(20 - 25 °C)
Viscosity, kinematic:	70 - 90 mm2/s	(40 °C)
% Volatiles:	0.5 %	
Solubility in water:	< 0.1 g/l	(23 °C)
Solubility in other solvents:		Not tested
Autoignition:	240 °C	(DIN 51794)
Decomposition temperature:	250 °C	(Isoperibol (Lütolf))
	250 °C	(Temperature program (Lütolf))

10. Stability and Reactivity

Stability:

Stable.

Conditions to avoid: None known.

Substances to avoid: Strong oxidizing agents, strong acids, strong bases.

Possibility of Hazardous Reactions: No hazardous reactions known.

Hazardous decomposition products: Hazardous decomposition products: No decomposition expected under normal storage conditions.

11. Toxicological Information

Acute oral toxicity:

LD50 / oral: 3,300 mg/kg

Acute inhalation toxicity:

Not determined.

Acute dermal toxicity:

dermal:

Not determined.

Skin irritation:

: Irritant.

(Rabbits)

Eye irritation:

(Rabbits) Not an irritant

Skin Sensitization:

(Guinea Pig) Optimization Test: Moderate skin sensitizer. Dermal challenge: Negative. (Guinea pig) Maximization test: (8/20 positive)

Subacute toxicity:

not determined

Chronic toxicity:

not determined

Subchronic Toxicty:

not determined

Genetic toxicity:

Non-mutagenic.

Carcinogenicity:

None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity:

not determined

Developmental toxicity/teratogenicity:

not determined

12. Ecological Information

Toxicity to fish:

Brachydanio rerio/96 h/LC50: 1.3 mg/l (OECD Guide-line 203)

Toxicity to aquatic invertebrates:

Daphnia magna/24 h/EC50: 1.4 mg/l (OECD 202)

Toxicity to aquatic plants:

Not tested

Toxicity to microorganisms:

activated sludge/3 h/IC50: 69 mg/l (OECD 209)

Biodegradation:

Test method:	OECD 301B
Evaluation:	Not biodegradable.

13. Disposal Considerations

Waste disposal of substance:

Dispose of in accordance with national, state and local regulations.

Resource Conservation and Recovery Act (RCRA): Not a hazardous waste under RCRA (40 CFR 261).

14. Transport Information

U.S. Department of Transportation

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

Road transport:

Special shipping information: Not classified as a dangerous good under transport regulations.

Air transport:

Special shipping information: Not classified as a dangerous good under transport regulations.

Inland-waterway transport:

Special shipping information: Not classified as a dangerous good under transport regulations.

15. Regulatory Information

Canada: Domestic Substances List (DSL):	All components either exempt or listed on the DSL
US: Toxic Substances Control Act (TSCA):	All component(s) comprising this product are either exempt or listed on the TSCA inventory

United States - Regulations

SARA Section 311/312 Hazard Communication Standard:

Acute Health:	Y	Fire:	N
Chronic Health:	N	Reactivity:	N
		Sudden release of pressure:	N

SARA Reportable Quantities:

No components listed.

SARA Section 313 Toxic Chemical List:

No components listed.

OSHA hazard category:

This material is classified as hazardous under OSHA regulations.

Toxic Substances Control Act (TSCA) Significant New Use Rule (SNUR):

This product is not subject to a Significant New Use Rule (SNUR).

Toxic Substances Control Act (TSCA) Section 5(e) Consent Orders:

This product is not subject to a Section 5(e) Consent Order.

Toxic Substances Control Act (TSCA) Section 5(f):

This product is not subject to a Section 5(f)/6(a) rule.

Toxic Substances Control Act (TSCA) Section 12(b) Export Notification:

No components listed.

Clean Air Act - Hazardous Air Pollutants (HAP):

This product does not contain any Hazardous Air Pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

Clean Air Act 111 - Volatile Organic Compounds (VOC):

This product does not contain any SOCMI Intermediate or Final VolatileOrganic Compounds (VOC), as defined by the U.S. Clean Air Act Section 111 (40 CFR 60.489).

Clean Air Act 602 - Ozone Depleting Substances (ODS):

This product neither contains, nor was manufactured with, a Class I or Class II ozone depleting substance (ODS), as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App. A+B).

Clean Water Act - Priority Pollutants (PP):

This product does not contain any priority pollutants listed under the U.S. Clean Water Act Section 307(2)(1) Priority Pollutant List (40 CFR 401.15).

Pennsylvania Right to Know:

This product does not contain any components that are subject to the Pennsylvania Right-To-Know disclosure requirement.

California Proposition 65 - Chemicals Known to the State to Cause Reproductive Toxicity:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

International Regulations

Chemical Weapons Convention:

This product does not contain any component(s) listed under the Chemical Weapons Convention Schedule of Chemicals.

16. Other Information

Disclaimer:

The information contained herein is based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to such data or information. The user is responsible for determining whether the product is suitable for its intended conditions of use.

END OF DATA SHEET

ISO9001:2000 Certified

Material Safety Data Sheet

Isopropyl alcohol

Section 1 - Chemical Product and Company Identification

MSDS Name:

Isopropyl alcohol

Catalog Numbers:

LC15750, LC15755, LC15760

Synonyms:

Isopropanol, 2-propanol, sec-propanol

Company Identification:

LabChem, Inc.
200 William Pitt Way
Pittsburgh, PA 15238

Company Phone Number:

(412) 826-5230

Emergency Phone Number:

(800) 424-9300

CHEMTREC Phone Number:

(800) 424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
7732-18-5	Water	balance
67-63-0	Isopropyl alcohol	50-100

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Colorless
Warning! Flammable liquid. May form explosive peroxides. May cause respiratory and digestive tract irritation. Causes eye irritation. May cause skin irritation. May cause central nervous system depression. May cause kidney damage. May cause respiratory and/or cardiac paralysis resulting in suffocation. (Flash Point: 53°F. - for LC15750)
Target Organs: kidneys, central nervous system.

Potential Health Effects

Eye:

Causes irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury.

Skin:

May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. May cause irritation with pain and stinging, especially if the skin is abraded.

Ingestion:

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation:

Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Inhalation of vapor may cause respiratory tract irritation.

Chronic:

Prolonged or repeated skin contact may cause defatting and dermatitis. May cause allergic skin reaction in some individuals.

Section 4 - First Aid Measures

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until chemical is gone. Get medical aid at once.

Skin:

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion:

Give conscious victim 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid at once.

Inhalation:

Get medical aid at once. Move victim to fresh air immediately. Give artificial respiration if necessary. If breathing is difficult, give oxygen.

Notes to Physician:

Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. This chemical poses an explosion hazard. Flammable Liquid. May form explosive peroxides. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media:

Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. For small fires, use carbon dioxide, dry chemical, dry sand, or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

Autoignition Temperature:

810°F (432.22°C)

Flash Point:

53°F (11.67°C) - for LC15750

NFPA Rating:

CAS# 7732-18-5: Not published.
CAS # 67-63-0 health-1; flammability-3; reactivity-0

Explosion Limits:

Lower: 2.5 at 79°F Upper: 12.1 at 150°F

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spills with absorbent (vermiculite, sand, fuller's earth) and place in plastic bags for later disposal. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name:	ACGIH	NIOSH	OSHA
Water	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Isopropyl alcohol	(400 ppm) TWA:(500ppm) STEL	400 ppm TWA; 980 mg/m3 TWA	400 ppm TWA: 980 mg/m3 TWA:

OSHA Vacated PELs

Isopropyl alcohol: 400 ppm TWA; 980 mg/m3 TWA

Personal Protective Equipment

Eyes:

Provide an eye-wash fountain in the immediate work area. Do not wear contact lenses when working with chemicals.

Skin:

Wear water impervious gloves, apron, and/or clothing.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Provide local exhaust or process enclosure to meet Permissable Exposure Limits (PEL).

Section 9 - Physical and Chemical Properties

Physical State:	Liquid
Color:	Colorless
Odor:	Solvent odor
pH:	No information found.
Vapor Pressure:	96 mm Hg
Vapor Density:	2.1 (air=1)
Evaporation Rate:	2.3 (n-butyl acetate=1)
Viscosity:	2.1 cP at 77 F
Boiling Point:	82°C (179.60°F)
Freezing/Melting Point:	-90°C (-130.00°F)
Decomposition Temperature:	No information found.
Solubility in water:	No information found.
Specific Gravity/Density:	0.78 (water=1)
Molecular Formula:	C_3H_8O
Molecular Weight	60.0554

Section 10 - Stability and Reactivity

Chemical Stability:

Stable. This material may be sensitive to peroxide formation.

Conditions to Avoid:

Incompatible materials, light, ignition sources.

Incompatibilities with Other Materials

This material has been reported to be susceptible to autoxidation and therefore should be classified as peroxidizable..

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide, acrid smoke and fumes.

Hazardous Polymerization

Has not been reported.

Section 11 - Toxicological Information

RTECS:

CAS# 7732-18-5: ZC0110000.
CAS# 67-63-0: NT8050000.

LD50/LC50:

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg.
CAS# 67-63-0:
Oral, mouse: LD50 = 3600 mg/kg
Oral, rabbit: LD50 = 6410 mg/kg
Oral, rat: LD50 = 5045 mg/kg
Skin, rabbit: LD50 = 12800 mg/kg.

Carcinogenicity:

CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.
CAS# 67-63-0
ACGIH: Not listed.
California: Not listed.
NIOSH: Not listed.
NTP: Not listed.
OSHA: Not listed.
IARC: Group 3

Epidemiology:

Teratogenicity:

Reproductive:

Mutagenicity

Neurotoxicity

Section 12 - Ecological Information

Ecotoxicity:

Acute aquatic effects: Fathead minnow: LC50 =1000 mg/L/96 Hr. Golden orfe: LC50 = 8970 mg/L/48 Hr. goldfish: LC50 = GT5000 mg/L/24 Hr.

Environmental:

This chemical has a low potential to affect aquatic organisms, secondary waste treatment microorganisms, and the germination and growth of some plants. It is readily biodegradable and is not expected to persist in an aquatic environment. It is not likely to bioconcentrate.

Physical:

None

Other:

None

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT

	60 - 100% V/V Isopropanol	5 - 59% V/V Isopropanol
Shipping Name:	Isopropanol	Flammable liquid, n.o.s. (Isopropanol)

Material Safety Data Sheet
Isopropyl alcohol

Hazard Class:	3	3
UN Number:	UN1219	UN1993
Packing Group:	PG II	PG III

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 7732-18-5 is listed on the TSCA Inventory.
CAS# 67-63-0 is listed on the TSCA Inventory.

SARA Reportable Quantities (RQ)

None of the components are on this list.

CERCLA/SARA Section 313

This material contains Isopropyl alcohol (CAS# 67-63-0, 70-100%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

OSHA - Highly Hazardous

None of the components are on this list.

US State

State Right to Know

Isopropyl alcohol can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California Regulations

European/International Regulations

Canadian DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 67-63-0 is listed on Canada's DSL List.

Canada Ingredient Disclosure List

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 67-63-0 is listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: October 28, 1997
Revision Date: February 7, 2007

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc. assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.

holox

Date: 2/1/96	MSDS No.: US-M290
Supersedes:	2/10/94
Trade Name:	Jet-LH 78 MR
Sizes:	All

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E7018

SECTION II - HAZARDOUS MATERIALS (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existance of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m³	PEL mg/m³
Iron	7439-89-6	15	10*	10*
Limestone and/or calcium carbonate	1317-65-3	10	10	15
Fluorides (as F)	7789-75-5	5	2.5	2.5
Silicates and other binders	1344-09-8	< 5	10*	10*
Titanium dioxides (as Ti)***	13463-67-7	< 5	10	10
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	< 5	0.2	1.0(c)
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	1	10*	10*
Aluminum oxide and/or Bauxite***	1344-28-1	< 0.5	10	10
[illegible]ne and/or zinc oxides***	1314-13-2	< 0.5	10	10
[illegible]meral silicates	1332-58-7	< 0.5	5**	5**
Vanadium alloys (as V)	7440-62-2	< 0.5	.05(@)	.05(@)
Carbon steel core wire	7439-89-6	60	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust.

(@) As V_2O_5 fume or dust.

(***) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

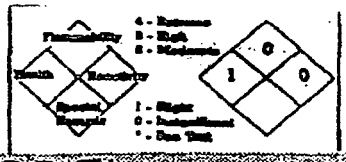
SECTION III - FIRE AND EXPLOSION HAZARD DATA

Flammable: Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product: Jet-LH 78 MR

Date: 2/1/96



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH 1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). *Exposure to extremely high levels of fluorides can cause abdominal* pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death.

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Reported exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash.

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can *kill*. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of manganese, potassium, silicon, sodium and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 4.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII
CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, "Safety in Welding and Cutting" published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

Date:	12/1/01	MSDS No.:	US-M260
Trade Name:	Jetweld 1		
Sizes:	All		
Supersedes:	3/22/99		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E7024-1

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!
This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Iron	7439-89-6	30	10*	10*
Titanium dioxides (as Ti)*****	13463-67-7	5	10	15
Silicates and other binders	1344-09-8	< 5	10*	10*
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	< 5	0.2	1.0(c)
Mineral silicates	1332-58-7	< 5	5**	5**
Quartz	14808-60-7	< 5	#0.05**	#0.1**
Cellulose and other carbohydrates	65996-61-4	< 5	10*	10*
Aluminum oxide and/or Bauxite*****	1344-28-1	1	10	10
Limestone and/or calcium carbonate	1317-65-3	0.5	10	15
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	0.5	10*	10*
Magnesite	1309-48-4	0.5	10	15
Zinc and/or zinc oxides*****	1314-13-2	< 0.5	5(d)	5(d)
Carbon steel core wire	7439-89-6	45	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

(#) Crystalline silica (quartz) is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a carcinogenic risk to humans.

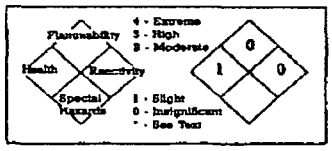
(d) Values are for zinc oxide fume. The ACGIH TLV has a STEL (Short Term Exposure Limit) of 10 milligrams per cubic meter.

SECTION III - FIRE AND EXPLOSION HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product:	Jetweld 1
Date:	12/1/01



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in *the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)*

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of manganese, potassium, silicon, sodium, titanium and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 2.5 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin ... or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

LINCOLN ELECTRIC

Date:	12/1/04	MSDS No.:	US-M270
Trade Name:	Jetweld 3		
Sizes:	All		
Supersedes:	12/1/01		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E7024

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard. All materials are listed on the TSCA inventory.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Iron	7439-89-6	30	10*	10*
Titanium dioxides (as Ti)*****	13463-67-7	5	10	15
Silicates and other binders	1344-09-8	< 5	10*	10*
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	< 5	0.2	1.0(c)
Mineral silicates	1332-58-7	< 5	5**	5**
Quartz	14808-60-7	< 5	#0.05**	#0.1**
Cellulose and other carbohydrates	65996-61-4	< 5	10*	10*
Aluminum oxide and/or Bauxite*****	1344-28-1	1	10	10
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	0.5	10*	10*
Limestone and/or calcium carbonate	1317-65-3	0.5	10	15
Magnesite	1309-48-4	0.5	10	15
Zinc and/or zinc oxides*****	1314-13-2	< 0.5	5(d)	5(d)
Carbon steel core wire	7439-89-6	45	10*	10*

Supplemental Information: (*) *Not listed. Nuisance value maximum* is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(#) Crystalline silica (quartz) is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a carcinogenic risk to humans.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter. Values are those proposed by OSHA in 1989. Present PEL is 5.0 milligrams per cubic meter (ceiling value).

(d) Values are for zinc oxide fume. The ACGIH TLV has a STEL (Short Term Exposure Limit) of 10 milligrams per cubic meter.

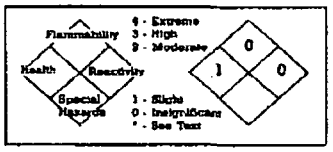
(**) As respirable dust.

SECTION III - HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI. Product is inert, no special handling or spill procedures required. Not regulated by DOT.

(CONTINUED ON SIDE TWO)

Product:	Jetweld 3
Date:	12/1/04



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOS - (Not Otherwise Specified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of manganese, potassium, silicon, sodium, titanium and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 2.5 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted. No applicable ecological information available.

15828

MATERIAL SAFETY DATA SHEET
Rohm and Haas Company

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

KATHON® 886 MW Biocide

Product Code : 62368
Key : 904283-1

MSDS Date : 12/09/99

COMPANY IDENTIFICATION

ROHM AND HAAS COMPANY
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399

EMERGENCY TELEPHONE NUMBERS

HEALTH EMERGENCY : 215-592-3000
SPILL EMERGENCY : 215-592-3000
CHEMTREC : 800-424-9300

KATHON® is a trademark of Rohm and Haas Company or one of its subsidiaries or affiliates

2. COMPOSITION/INFORMATION ON INGREDIENTS

No		CAS REG NO	WEIGHT (%)
1	5-Chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	10 - 12
2	2-Methyl-4-isothiazolin-3-one	2682-20-4	3 - 5
3	Magnesium nitrate	10377-60-3	14 - 18
4	Magnesium Chloride	7786-30-3	8 - 10
5	Water	7732-18-5	60 - 64

See Section 8, Exposure Controls / Personal Protection

3. HAZARDS IDENTIFICATION

Primary Routes of Exposure

Inhalation
Skin Contact
Eye Contact

Inhalation

Inhalation of vapor or mist can cause the following:
- irritation of nose, throat, and lungs

Eye Contact

Material can cause the following:
- corrosion to eyes - irreversible eye injury

Skin Contact

Skin irritation effects can be delayed for hours.
Material can cause the following:
- burns - corrosion to the skin - allergic contact dermatitis

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Ingestion

Material is harmful if swallowed.

4. FIRST AID MEASURES

Inhalation

Move subject to fresh air.

Eye Contact

IMMEDIATELY flush eyes with a large amount of water for at least 15 minutes. Get prompt medical attention.

Skin Contact

Wash affected skin areas thoroughly with soap and water immediately after exposure. Remove and wash contaminated clothing thoroughly. Do not take clothing home to be laundered. Discard contaminated shoes, belts and other articles made of leather. Get prompt medical attention.

Ingestion

If swallowed, give 2 glasses of water to drink. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person.

Note to Physician

MATERIAL IS CORROSIVE. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

5. FIRE FIGHTING MEASURES

Flash Point	Not Applicable
Auto-ignition Temperature	Not Applicable
Lower Explosive Limit	Not Applicable
Upper Explosive Limit	Not Applicable

Unusual Hazards

Combustion has the potential to generate toxic fumes of the following:
- hydrogen chloride - nitrogen oxides - sulfur oxides

Extinguishing Agents

Use extinguishing media appropriate for surrounding fire.

Personal Protective Equipment

Wear self-contained breathing apparatus (pressure-demand NIOSH approved or equivalent) and full protective gear.

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Special Procedures

Use water spray to cool containers exposed to fire. Minimize exposure. DO NOT breathe fumes. Contain run-off.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

Wear a NIOSH approved (or equivalent) respirator (with organic vapor/ acid gas cartridge and a dust/mist filter) during spill clean-ups and deactivation of this material.
MATERIAL IS CORROSIVE. Protective clothing, including chemical splash goggles, nitrile or butyl rubber full length gloves, rubber apron, or clothing made of nitrile or butyl rubber, and rubber overshoes must be worn during spill clean-ups and deactivation of this material. If material comes in contact with the skin during clean-up operations, IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. See SECTION 4, First Aid Measures, for further information.

Procedures

WARNING: KEEP SPILLS AND CLEAN-UP RESIDUALS OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER. Absorb the spill with spill pillows or inert solids such as clay or vermiculite, and transfer contaminated materials to suitable containers for disposal. Deactivate spill area with freshly prepared solution of 5% sodium bicarbonate and 5% sodium hypochlorite in water. Apply solution to the spill area at a ratio of 10 volumes deactivation solution per estimated volume of residual spill to deactivate any residual active ingredient. Let stand for 30 minutes. Flush the spill area with copious amounts of water to chemical sewer (if in accordance with local procedures, permits and regulations). DO NOT add deactivation solution to the waste pail to deactivate the adsorbed material. See SECTION 13, "Disposal Considerations", for information regarding the disposal of contained materials.

7. HANDLING AND STORAGE

Storage Conditions

The maximmum recommended storage temperature for this material is 40C/104F. The minimum recommended storage temperature for this material is -10C/14F. Store in a well ventilated area. The product as supplied evolves gas (largely carbon dioxide) slowly. To prevent the buildup of pressure the product is packaged in specially vented containers. Keep this product in the original container when not in use. Container must be stored and transported in an upright position to prevent spilling the contents through the vent.
Do not store this material in containers made of the following:
- steel

Handling Procedures

This material is corrosive. See SECTION 8, Exposure Controls/Personal Protection, prior to handling.

Other

CONTAINERS HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue (vapors and/or liquid) follow all MSDS and label warnings even after container is emptied.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limit Information

No		CAS REG NO	WEIGHT (%)
1	5-Chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	10 - 12
2	2-Methyl-4-isothiazolin-3-one	2682-20-4	3 - 5
3	Magnesium nitrate	10377-60-3	14 - 18
4	Magnesium Chloride	7786-30-3	8 - 10
5	Water	7732-18-5	60 - 64

Comp.		ROHM AND HAAS		OSHA		ACGIH	
No.	Units	TWA	STEL	TWA	STEL	TWA	STEL
1	mg/m3	0.076	0.23	None	None	None	None
2	mg/m3	1.5	4.5	None	None	None	None
3		None	None	None	None	None	None
4		None	None	None	None	None	None
5		None	None	None	None	None	None

Respiratory Protection

Typical use of this material does not result in workplace exposures that exceed the exposure limits listed in the "Exposure Limit Information" Section. For those special workplace conditions where the listed exposure limits are exceeded, a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. For concentrations up to 10 times the exposure limit, a NIOSH approved (or equivalent) half-mask or full facepiece air purifying respirator equipped with cartridges for organic vapors and dust/mist pre-filters should be worn.

For those unlikely situations where exposure may greatly exceed the listed exposure limits (i.e. greater than 10-fold), or in any emergency situation, wear a NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure-demand mode or a full facepiece airline respirator in the pressure-demand mode with emergency escape provision.

See SECTION 6, Accidental Release Measures, for respirator and protective clothing requirements for spill clean-up and decontamination of this material.

Eye Protection

Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed.

Hand Protection

NOTE: Material is a potential skin sensitizer.
The glove(s) listed below provide protection against permeation:
- Nitrile
- Butyl rubber

Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough.
Rinse and remove gloves immediately after use. Wash hands with soap and water.

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Other Protection

Use chemically resistant apron or other impervious clothing to avoid prolonged or repeated skin contact.

Engineering Controls (Ventilation)

Use local exhaust ventilation with a minimum capture velocity of 150 ft/min. (0.75 m/sec.) at the point of dust or mist evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Other Protective Equipment

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color	Amber
State	Liquid
Odor Characteristic	Pungent odor
pH	1.0 to 3.0
Viscosity	16 CPS @ 25°C/77°F
Specific Gravity (Water = 1)	1.3
Vapor Density (Air = 1)	0.62 Estimate
Vapor Pressure	0.0027 mmHg Component No. 1
Melting Point	-33°C/-27°F
Boiling Point	100°C/212°F Water
Solubility in Water	Completely soluble
Percent Volatility	60 to 64 % Water
Evaporation Rate (BAc = 1)	< 1

NOTE: Vapor Pressure for Component No. 2 = 4.4 x 10-5 mmHg

See Section 5, Fire Fighting Measures

10. STABILITY AND REACTIVITY

Instability

This material is considered stable under specified conditions of storage, shipment and/or use. See SECTION 7, Handling And Storage, for specified conditions.

Hazardous Decomposition Products

Thermal decomposition may yield the following:
- hydrogen chloride - sulfur dioxide - oxides of nitrogen

Hazardous Polymerization

Product will not undergo polymerization.

Incompatibility

Avoid contact with the following:
- oxidizing agents - reducing agents - amines - mercaptans

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11. TOXICOLOGICAL INFORMATION

Acute Data

Acute Oral LD50 - rat: 457 mg/kg product
Dermal LD50 - rabbit: 660 mg/kg product
Skin Irritation - rabbit: Corrosive (product)
Eye Irritation - rabbit: Corrosive (product)
Acute 4 Hr Inhalation - rat: 0.33 mg/L ai

Carcinogenicity Data

Carcinogenicty: Non-carcinogenic in both a mouse dermal and rat oral carcinogenicity study.

Mutagenicity Data

Mutagenicity: Collective data indicate non-mutagenic

Reproductive/Teratology Data

Teratogenicity: Not teratogenic

Sensitization Data

Sensitization: Skin sensitizer

12. ECOLOGICAL INFORMATION

Octanol/Water Coefficient = 0.401 (log P) for Component No.1
Octanol/Water Coefficient = -0.486 (log P) for Component No.2

Biodegradation (aquatic metabolism):
Component No. 1 t 1/2 anerobic = 4.8 hr
Component No. 1 t 1/2 aerobic = 17.3 hr
Component No. 2 t 1/2 aerobic = 9.1 hr

Environmental Toxicity

Acute Fish 96 Hr LC50, Rainbow Trout: 0.19 mg/L ai
Acute Fish 96 Hr LC50, Bluegill Sunfish: 0.28 mg/L ai
Acute Daphnia 48 Hr EC50: 0.16 mg/L ai
Acute Algal EC50, Selenastrum: 18 ug/L ai
Acute Algal EC50, Skeletonema: 3 ug/L ai
Activated Sludge Respiration Inhibition EC50: 4.5 mg/L ai

13. DISPOSAL CONSIDERATIONS

Procedure

Incinerate liquid and contaminated solids in accordance with local, state, and federal regulations. (See 40 CFR 268)

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14. TRANSPORT INFORMATION

US DOT Hazard Class ..... (CLASS) 8 (CORROSIVE MATERIAL)

This classification is the primary hazard class only. Exceptions in CFR 49 Parts 171-177 may apply. Consult CFR 49 Parts 171-177 to determine the appropriate subsidiary hazard class(es).

15. REGULATORY INFORMATION

Workplace Classification

This product is considered hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is subject to regulation under the Canadian Pest Control Products Act (P.C.P. Act). Therefore, this product is excluded from the supplier labeling and material safety data sheet requirements as specified in Section 12 of the Hazardous Products Act.

SARA TITLE 3; Section 311/312 Categorizations (40CFR 370)

This product is a hazardous chemical under 29CFR 1910.1200, and is categorized as an immediate health hazard.

SARA TITLE 3; Section 313 Information (40CFR 372)

This product contains a chemical which is listed in Section 313 at or above de minimis concentrations. The following listed chemicals are present: (Quantity present is found elsewhere on this MSDS.)
- Magnesium nitrate (10377-60-3) as nitrate compound

CERCLA Information (40CFR 302.4)

This material has a reportable quantity under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304. The material's hazardous waste number and reportable quantity is listed below. Releases of this material in excess of its reportable quantity must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.
Corrosivity, 100 lbs.

Waste Classification

When a decision is made to discard this material as supplied, it is classified as a RCRA hazardous waste with the characteristic of corrosivity, hazardous waste number: D002

United States

This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and is therefore exempt from U.S. Toxic Substances Control Act (TSCA) Inventory listing requirements.

ROHM AND HAAS COMPANY
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399

PRODUCT: KATHON® 886 MW Biocide
KEY: 904283-1
DATE: 12/09/99

16. OTHER INFORMATION

Rohm and Haas Hazard Rating		Scale
Toxicity	3	4=EXTREME
Fire	0	3=HIGH
Reactivity	0	2=MODERATE
Special	C	1=SLIGHT
		0=INSIGNIFICANT
		C=CORROSIVE

Ratings are based on Rohm and Haas guidelines, and are intended for internal use.

HMIS Hazard Ratings

HMIS Hazard Ratings: HEALTH = 3, FLAMMABILITY = 0, REACTIVITY = 0.
PERSONAL PROTECTION: See Section 8, Exposure Controls/Personal Protection for recommended handling of material as supplied; check with supervisor for your actual use condition.
Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe
* = Chronic Effects (See Section 3, Hazards Identification)

HMIS is a registered trademark of the National Paint and Coatings Association.

ABBREVIATIONS:
ACGIH = American Conference of Governmental Industrial Hygienists
OSHA = Occupational Safety and Health Administration
TLV = Threshold Limit Value
PEL = Permissible Exposure Limit
TWA = Time Weighted Average
STEL = Short-Term Exposure Limit
BAc = Butyl acetate
Bar denotes a revision from previous MSDS in this area.

The information contained herein relates only to the specific material identified. Rohm and Haas Company believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, expressed or implied, is made as to the accuracy, reliability, or completeness of the information. Rohm and Haas Company urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.

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)
KOLOR KUT GASOLINE GAUGING PASTE

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
KOLOR KUT PRODUCTS COMPANY

Address (Number, Street, City, State, and ZIP Code)
7915 EAST ELM STREET
HOUSTON, TX 77012

Emergency Telephone Number
713-926-4780

Telephone Number for Information
713-926-4780

Date Prepared
MARCH 1, 2006

Signature of Preparer (optional)
DM FRAUENBERGER

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
ALL INGREDIENTS NON HAZARDOUS				

KOLOR KUT GASOLINE GAUGING PASTE does not require an ODC Warning Label (1990 Clean Air Act-Sect 611) as it does not contain Class I or Class II ODC'S nor has it been manufactured with a Class I or Class II ODC

HAZARD INFORMATION LABEL DATA:

FLAMMABILITY....1
HEALTH.....0
REACTIVITY.....0
SPECIAL.....0

Section III — Physical/Chemical Characteristics

Boiling Point	212°F	Specific Gravity (H_2O = 1)	aprox. 1
Vapor Pressure (mm Hg.)	n/a	Melting Point	aprox. 120°F
Vapor Density (AIR = 1)	n/a	Evaporation Rate (Butyl Acetate = 1)	none

Solubility in Water
yes

Appearance and Odor
LIGHT PINK SEMISOLID

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
NONE	n/a	n/a	n/a

Extinguishing Media

Special Fire Fighting Procedures
none

Unusual Fire and Explosion Hazards
NONE

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	XX	NONE KNOWN

Incompatibility (*Materials to Avoid*): OXIDATING AGENTS & ACIDS

Hazardous Decomposition or Byproducts: NONE KNOWN.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XX	NONE KNOWN

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? NONE KNOWN AT NORMAL TEMPERATURE Skin? Mild irritation Ingestion?

Health Hazards (*Acute and Chronic*)

If ingested, induce vomiting immediately by giving 2 glasses of water and sticking finger down throat.

Carcinogenicity: NTP? NO IARC Monographs? NO OSHA Regulated? NO

Signs and Symptoms of Exposure: Irritation & bad odor

Medical Conditions Generally Aggravated by Exposure: Not Determined

Emergency and First Aid Procedures: Control contact & maintain at a minimum

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Unlikely, contain spill and wipe up. Not a hazardous waste.

Waste Disposal Method

Dispose of as per local, state & federal laws for non hazardous waste.

Precautions to Be Taken in Handling and Storing

Do not expose to high temeratures or water contamination, do not freeze (for preservation of product only).

Other Precautions

None known

Section VIII — Control Measures

Respiratory Protection (*Specify Type*): None Required

Ventilation	Local Exhaust: n/a	Special: n/a
	Mechanical (General): n/a	Other: n/a

Protective Gloves: If desired, not necessary

Eye Protection: Protective Eye Glasses

Other Protective Clothing or Equipment: None required

Work/Hygienic Practices: Be clean, after applying, clean hands with soap & water

☆U.S. Government Printing Office: 1987—181-664/60362

COPPOR00001039

JET-LUBE INC.

MATERIAL SAFETY DATA SHEET

CP-8

4849 HOMESTEAD ROAD / P.O. BOX 21258 / HOUSTON, TEXAS 77226 / 713/674-7617 / TELEX 775343

HMIS/NFPA Health: 0 Fire: 1 Reactivity: 0 PPI: NR

SECTION I: IDENTIFICATION AND EMERGENCY INFORMATION

THOMAS & BETTS Product: KOPR-SHIELD®
Chemical Name: Anti-Seize Compound

Emergency Phone: (713) 674-7617
Formula: Proprietary

SECTION II: HAZARDOUS INGREDIENTS

Hazardous Components	CAS No.	Wt%	OSHA PEL	ACGIH TLV	Other Limits of Exposure
Petroleum Oil	64742-57-0 64742-62-7	65 Max	Oil Mist TWA-5mg/M^3	NA	NA
Alkylene Carbonate	108-32-7	1 Max	5mg/M^3	NA	NA
Bentone	68953-58-2	4 Max	NA	NA	NA
Copper Flake	7440-50-8	30 Max	NA	1mg/M^3	NA

This product contains in part raw material components that are subject to the reporting requirements of Section 313 of title III of the Superfund Amendments, SARA of 1986 and 40 CFR, Part 372. ALL COMPONENTS ARE LISTED IN THE TSCA INVENTORY. THIS PRODUCT IS NOT HAZARDOUS BY D.O.T. GUIDELINES. THIS PRODUCT IS NOT CONTROLLED UNDER THE WHMIS REGULATIONS.

SECTION III: PHYSICAL & CHEMICAL DATA

Specific Gravity (H_2O=1): 1.20 Boiling Point: >700°F (371°C) Melting Point: NA
Vapor Pressure (mm Hg): <0.01 Vapor Density (Air=1): >5
Evaporation Rate (n-Butyl Acetate=1): <0.01
Volume % Volatile: None Solubility in Water: None Reactivity With Water: None
Appearance and Odor: Copper colored paste, petroleum odor.

SECTION IV: FIRE & EXPLOSION HAZARD DATA

Flash Point (C.O.C.): >560°F (293°C) Flammable Limits: LEL= 0.9% UEL= 7%
Auto-Ignition Temperature: >680°F (360°C)
Extinguishing Media: Use foam, dry chemical, water spray (fog), carbon dioxide or vaporizing liquid-type extinguishing agents.
Special Fire Fighting Procedures: Use supplied-air breathing equipment for enclosed or confined spaces.
Unusual Fire and Explosion Hazards: None

SECTION V: REACTIVITY DATA

Stability: Stable (x) Unstable ( )
Conditions to Avoid: Strong oxidizing materials and copper reactive agents
Incompatible Materials: Strong oxidizing materials, copper reactive agents
Hazardous Decomposition Products: Hydrogen, carbon monoxide, aldehydes, smoke, fumes, and toxic copper compounds.
Hazardous Polymerization: Will Not Occur (x) May Occur ( )

< = LESS THAN > = GREATER THAN M = MAXIMUM NA = NOT APPLICABLE
NR = NOT REQUIRED UN = UNKNOWN CL = CEILING PK = PEAK
PPI = PERSONAL PROTECTION INDEX

SECTION VI: HEALTH HAZARD DATA

Symptoms of Exposure: Redness and irritation of skin.
Effects of Overexposure: Repeated skin contact for persons hypersensitive to petroleum products can cause redness and irritation of skin.
Medical Conditions Potentially Aggravated by Exposure: UN
Is Material Listed as Carcinogen or Potential Carcinogen? No
National Toxicology Program: No IARC Monographs: No OSHA: No
Emergency and First Aid Procedures (by route of entry):
Inhalation: Clear air passage, call physician.
Ingestion: If ingested, call physician.
Eyes: Wash with copious quantities of water.
Skin: Remove by wiping, or waterless hand cleaner, followed by washing.

SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Scoop up excess, wipe up with rags, pick-up residue with diatomaceous earth to avoid walking hazard.
Waste Disposal Method: Consult federal, state and local regulations for petroleum products.

SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection (Type): NR
Ventilation: Local Exhaust: NR Special: NR Mechanical: NR
Other: NR
Protective Gloves: NR Eye Protection: NR Other: NR
Other Protective Equipment: Persons with hypersensitive skin should use gloves.
Special Hygienic Practice: Wash hands before eating.

SECTION IX: SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Normal precautions as with any petroleum product.

Other Precautions: NR

< = LESS THAN > = GREATER THAN M = MAXIMUM NA = NOT APPLICABLE
NR = NOT REQUIRED UN = UNKNOWN CL = CEILING PK = PEAK

Signature: Donald A Oldiges Date Issued: August 2, 1993
Prepared By: D. A. Oldiges, Technical Director

Disclaimer

The information contained herein is accurate and reliable as of the date issued to the best of JET-LUBE's knowledge. JET-LUBE doesn't warrant or guarantee its accuracy or reliability and shall not be liable for any loss or damage arising out of the use thereof. It is the user's responsibility to satisfy itself that the information offered for its consideration is suitable for its particular use.

Date:	8/15/01	MSDS No.:	US-F115
Trade Name:	Lincolnweld 780		
Sizes:	—		
Supersedes:	2/10/99		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Submerged Arc Flux

Classification: AWS F7A0-EL12
F7A2-EM12K

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!
This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Aluminum oxide and/or Bauxite*****	1344-28-1	45	10	10
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	10	0.2	1.0(c)
Silicates and other binders	1344-09-8	5	10*	10*
Fluorides (as F)	7789-75-5	5	2.5	2.5
Titanium dioxides (as Ti)*****	13463-67-7	< 5	10	15
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	< 5	10*	10*
Iron	7439-89-6	< 5	10*	10*
Magnesite	1309-48-4	< 5	10	15
Mineral silicates	1332-58-7	< 5	5**	5**

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(**) As respirable dust. Value for respirable quartz is 0.1 milligrams per cubic meter.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

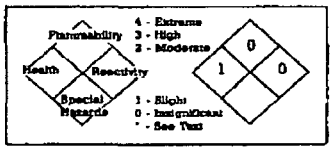
(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

SECTION III - FIRE AND EXPLOSION HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product:	Lincolnweld 780
Date:	8/15/01



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH-1989 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Overexposure to crystalline silica present in any dust from this flux can cause severe lung damage (silicosis). Silicosis is a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Crystalline silica is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) list as posing a carcinogenic risk to humans. WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of aluminum, calcium, magnesium, manganese, potassium, silicon and sodium with recommended Lincolnweld electrodes. (See MSDS for electrode being used.)

Maximum fume exposure guideline for this product (based on manganese content) is 4.0 milligrams per cubic meter.
Maximum respirable dust exposure guideline and PEL for this flux (based on crystalline silica) is 1.0 milligrams per cubic meter. Handle to minimize generation of airborne dust. Use adequate ventilation and dust collection. Use respiratory protection, if required, to keep exposure below limits. TLV value for respirable quartz is 0.05 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.* Use adequate dust control measures.

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number * or darker. Shield others by providing screens and flash goggles.
(*) No specific recommendation for submerged arc.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

CPA00898

Date:	7/28/03	MSDS No.:	US-W5
Trade Name:	L-56		
Sizes:	All		
Supersedes:	2/12/00		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Carbon Steel Electrode

Classification: AWS ER70S-6
EH11K

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed.
(1) The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard. All materials are listed on the TSCA inventory.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Carbon steel wire		100	10*	10*
Nominal wire composition:				
Total manganese *****	7439-96-5	< 2	0.2	1.0(c)
Total copper including plated coating *****	7440-50-8	< 0.5	0.2(a)	0.1(a)
Iron	7439-89-6	bal.	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m^3. TLV value for iron oxide is 5 milligrams per cubic meter.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(a) Values are for copper fume.

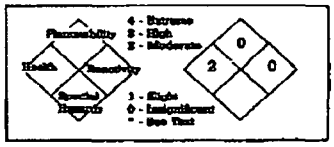
(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter. Values are those proposed by OSHA in 1989. Present PEL is 5.0 milligrams per cubic meter (ceiling value).

SECTION III - HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI. Product is inert, no special handling or spill procedures required. Not regulated by DOT.

(CONTINUED ON SIDE TWO)

Product:	L-56
Date:	7/28/03



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOS- (Not Otherwise Specified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of aluminum, calcium, magnesium, manganese, potassium, silicon, sodium, titanium and zirconium when used with recommended Lincolnweld fluxes. Primarily iron oxide; secondarily complex oxides of copper, manganese and silicon when used with gas shielding.

Maximum fume exposure guideline for this product (based on manganese content) is 1.5 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12* or darker. Shield others by providing screens and flash goggles.
(*) No specific recommendation for submerged arc.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted. No applicable ecological information available.

LINCOLN® ELECTRIC

Date:	12/1/01	MSDS No.:	US-W15
Trade Name:	Lincolnweld L-61		
Sizes:	All		
Supersedes:	5/12/99		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Carbon Steel Electrode

Classification: AWS EM12K

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m³	PEL mg/m³
Carbon steel wire		100	10*	10*
Nominal wire composition:				
Total manganese *****	7439-96-5	1.0	0.2	1.0(c)
Total copper including plated coating *****	7440-50-8	< 0.5	0.2(a)	0.1(a)
Iron	7439-89-6	bal.	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 milligrams per cubic meter.

(a) Values are for copper fume.

(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

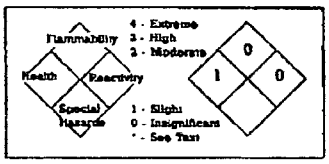
(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

SECTION III - FIRE AND EXPLOSION HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product:	Lincolnweld L-61
Date:	12/1/01



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH-1998 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq.)

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of aluminum, calcium, magnesium, manganese, potassium, silicon, sodium, titanium and zirconium when used with recommended Lincolnweld fluxes.

Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, 'Safety in Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number * or darker. Shield others by providing screens and flash goggles.
(*) No specific recommendation for submerged arc.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

#123040

LIQUINOX MSDS

Section 1 : PRODUCT AND COMPANY IDENTIFICATION

Chemical family: Detergent.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Supplier: Same as manufacturer.

Product name: Liquinox

Section 2 : INGREDIENT INFORMATION

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE

Section 3 : HAZARD IDENTIFICATION

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of acute exposure

Eye contact: May cause irritation.

Skin contact: Prolonged and repeated contact may cause irritation.

Inhalation: May cause headache and nausea.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: See effects of acute exposure.

Section 4 : FIRST AID MEASURES

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: If irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
If irritation persists, seek medical attention.

Ingestion: Do not induce vomiting, seek medical attention.
Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.

Section 5 : FIRE FIGHTING MEASURES

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Explosion Data

Sensitivity to static discharge: Not available.

Sensitivity to mechanical impact: Not available.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: Containers may rupture if exposed to heat or fire.

Section 6 : ACCIDENTAL RELEASE MEASURES

Leak/Spill: Contain the spill.
Prevent entry into drains, sewers, and other waterways.
Wear appropriate protective equipment.
Small amounts may be flushed to sewer with water.
Soak up with an absorbent material.
Place in appropriate container for disposal.
Notify the appropriate authorities as required.

Section 7 : HANDLING AND STORAGE

Handling procedures and equipment: Protect against physical damage.
Avoid breathing vapors/mists.
Wear personal protective equipment appropriate to task.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Avoid extreme temperatures.
Launder contaminated clothing prior to reuse.

Storage requirements: Store away from incompatible materials.
Keep containers closed when not in use.

Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Precautionary Measures

Gloves/Type:

Wear appropriate gloves.

Respiratory/Type: None required under normal use.

Eye/Type:

Safety glasses recommended.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

Exposure limit of material: Not available.

Section 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.

Appearance & odor: Odourless.
Pale yellow.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): @ 20°C (68°F).
17

Vapour density (air=1): >1

Volatiles (%)

By volume: Not available.

Evaporation rate (butyl acetate = 1): < 1.

Boiling point (°C): 100 (212F)

Freezing point (°C): Not available.

pH: 8.5

Specific gravity @ 20 °C: (water = 1).
1.083

Solubility in water (%): Complete.

Coefficient of water\oil dist.: Not available.

VOC: None

Chemical family: Detergent.

Section 10 : STABILITY AND REACTIVITY

Chemical stability: Product is stable under normal handling and storage conditions.

Conditions of instability: Extreme temperatures.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizing agents.

Hazardous decomposition products: See hazardous combustion products.

Section 11 : TOXICOLOGICAL INFORMATION

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Section 12 : ECOLOGICAL INFORMATION

Environmental toxicity: No data at this time.

Environmental fate: No data at this time.

Section 13 : DISPOSAL CONSIDERATIONS

Waste disposal: In accordance with local and federal regulations.

Section 14 : TRANSPORT INFORMATION

D.O.T. CLASSIFICATION: Not regulated.

Special shipping information: Not regulated.

Section 15 : REGULATORY INFORMATION

Canadian Regulatory Information

WHMIS classification: Not controlled.

DSL status: Not available.

USA Regulatory Information

SARA hazard catagories sections 311/312: Immediate (Acute) Health Hazard: No.
Delayed (Chronic) Health Hazard: No.
Fire Hazard: No.
Sudden Release of Pressure: No.
Reactive: No.

SARA Section 313: None

TSCA inventory: All components of this product are listed on the TSCA inventory.

NFPA

Health Hazard: 1

Flammability: 0

Reactivity: 0

HMIS

Health Hazard: 1

Flammability: 0

Physical hazard: 0

PPE: A

Section 16 : OTHER INFORMATION

Supplier MSDS date: 2006/07/14

Data prepared by: Global Safety Management
3340 Peachtree Road, #1800
Atlanta, GA 30326

Phone: 877-683-7460
Fax: (877) 683-7462

Web: www.globalsafetynet.com
Email: info@globalsafetynet.com.

General note: This material safety data sheet was prepared from information obtained from various sources, including product suppliers and the Canadian Center for Occupational Health and Safety.

HENKEL LOCTITE CORPORATION 04/06/03
ROCKY HILL, CONNECTICUT 06067
EMERGENCY PHONE: (860) 571-5100

MATERIAL SAFETY DATA SHEET Page 01 of 04

Loctite(R) 271(TM) Threadlocker High Strength
27143

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Loctite(R) 271(TM) Threadlocker High Strength
Item No.: 27143
Product Type: Anaerobic

2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredients	CAS No.	%
Polyglycol dimethacrylate	25852-47-5	65-70
Bisphenol A fumarate resin	39382-25-7	20-25
Saccharin	81-07-2	3-5
CUMENE HYDROPEROXIDE*	80-15-9	1-3
N,N-Dialkyltoluidines	613-48-9	0.1-1

* This component is listed as a SARA Section 313 Toxic Chemical.

Ingredients which have exposure limits

Exposure Limits (TWA) Ingredients	ACGIH (TLV)	OSHA (PEL)	OTHER
CUMENE HYDROPEROXIDE	None	None	1ppm(6mg/m3) Skin(WEEL)

Exposure Limits (STEL) Ingredients	ACGIH (TLV)	OSHA (PEL)

3. HAZARDS IDENTIFICATION

Toxicity: Eye irritant.
Estimated oral LD50 more than 5000mg/kg
Estimated dermal LD50 more than 2000mg/kg
Primary Routes of Entry: None known
Signs and Symptoms of Exposure: May cause dermatitis on prolonged contact in sensitive individuals.
Existing Conditions Aggravated by Exposure: None known

Ingredients	Literature Referenced Target Organ and Other Health Effects	Carcinogen NTP	IARC	OSHA
Polyglycol dimethacrylate	ALG IRR	NO	NO	NO
Bisphenol A fumarate resin	ALG IRR	NO	NO	NO
Saccharin	NTO	NO	N/A	NO

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MATERIAL SAFETY DATA SHEET Page 02 of 04

Product Name: Loctite(R) 271(TM) Threadlocker High Strength
Item No.: 27143

3. HAZARDS IDENTIFICATION (continued)

CUMENE HYDROPEROXIDE	ALG CNS COR IRR MUT	NO	NO	NO
N,N-Dialkyltoluidines	NTO	NO	NO	NO

Abbreviations

N/A Not Applicable ALG Allergen

CNS Central nervous system
IRR Irritant
NTO No Target Organs
COR Corrosive
MUT Mutagen

4. FIRST AID MEASURES

Ingestion:	Do not induce vomiting. Keep individual calm. Obtain medical attention.
Inhalation:	Does not apply
Skin Contact:	Flush with water.
Eye Contact:	Flush at least 15 minutes with water. Obtain medical attention.

5. FIRE FIGHTING MEASURES

Flash Point:	More than 200°F Method: Tag Closed Cup
Recommended Extinguishing Agents:	Carbon dioxide, foam, dry chemical
Special Firefighting Procedures:	Not available
Hazardous Products formed by Fire or Thermal Decomp	Irritating organic vapors
Unusual Fire or Explosion Hazards:	None
Explosive Limits:	
(% by volume in air)Lower	Not available
(% by volume in air)Upper	Not available

6. ACCIDENTAL RELEASE MEASURES

Steps to be taken in case of spill or leak:	Soak up in an inert absorbent. Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Safe Storage:	Store below 100 deg. F
(Contact Loctite Customer	Service 1-800-243-4874 for shelf life information)
Handling:	Avoid prolonged skin contact. Keep away from eyes.

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MATERIAL SAFETY DATA SHEET Page 03 of 04

Product Name: Loctite(R) 271(TM) Threadlocker High Strength
Item No.: 27143

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eyes:	Safety glasses or goggles.
Skin:	Neoprene, rubber, or butyl rubber gloves.
Ventilation:	Does not apply
Respiratory	Not available
	See Section 2 for Exposure Limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Red liquid
Odor:	Mild
Boiling Point:	More than 300°F
pH:	Does not apply
Solubility in Water:	Slight
Specific Gravity	1.10 at 80°F
Volatile Organic Compound (EPA Method 24)	12.0%; 132 g/l
Vapor Pressure:	Less than 5mm at 80°F
Vapor Density:	Not available
Evaporation Rate (Ether = 1)	Not available

10. STABILITY AND REACTIVITY

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Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility:	None
Conditions to Avoid:	Not available
Hazardous Decomposition Products (non-thermal):	None

11. TOXICOLOGICAL INFORMATION

See Section 3.

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended methods of disposal:	Incinerate following EPA and local regulations.
EPA Hazardous Waste Number	NR - Not a RCRA Hazardous Waste Material

Product Name:	Loctite(R) 271(TM) Threadlocker High Strength
Item No.:	27143

14. TRANSPORTATION INFORMATION

DOT (49 CFR 172)	
Domestic Ground Transport	
Proper Shipping Name:	Unrestricted
Hazard Class or Division:	Unrestricted
Identification Number:	None
Marine Pollutant:	None
IATA	
Proper Shipping Name:	Unrestricted
Class or Division:	Unrestricted
UN or ID Number:	None

15. REGULATORY INFORMATION

CA Proposition 65:	WARNING: This product contains chemicals known to the State of California to cause cancer. o-toluidine

16. OTHER INFORMATION

Estimated NFPA(R) Code:	
Health Hazard:	1
Fire Hazard:	1
Reactivity Hazard:	1
Specific Hazard:	Does not apply
Estimated HMIS(R) Code:	
Health Hazard:	1
Flammability Hazard:	1
Reactivity Hazards:	1
Personal Protection:	See Section 8.

NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By:	Stephen Repetto
Title:	Research Chemist; Safety,Health&Regulatory Affairs
Company:	Henkel Loctite Corporation, Rocky Hill CT 06067
(24hr.) Phone:	(860) 571-5100
Revision Date:	January 27, 1999 Revision: 0027

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MATERIAL SAFETY DATA SHEET Page 01 of 05

Loctite(R) 518 Flange Sealant Gasket Eliminator(R)
51845

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Loctite(R) 518 Flange Sealant Gasket Eliminator(R)
Item No.:	51845
Product Type:	Anaerobic

2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredients	CAS No.	%
Polyurethane methacrylate	Proprietary	70-75
Polyglycol dimethacrylate	25852-47-5	5-10
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	112945-52-5	5-10
ACRYLIC ACID*	79-10-7	5-7
CUMENE HYDROPEROXIDE*	80-15-9	1-3
ETHYLENE GLYCOL*	107-21-1	1-3
1-Acetyl-2-phenylhydrazine	114-83-0	0.1-1
Saccharin	81-07-2	0.1-1

* This component is listed as a SARA Section 313 Toxic Chemical.

The polyurethane methacrtylate resin is registered with the state of New Jersey as a trade secret: NJ TSRN 06-070-1067-5073P.

Ingredients which have exposure limits

Exposure Limits (TWA) Ingredients	ACGIH (TLV)	OSHA (PEL)	OTHER
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	10 mg/m3 TWA	6 mg/m3 TWA	3 mg/m3 TWA resp. dust
ACRYLIC ACID	2 ppm TWA skin 5.9 mg/m3 skin	10 ppm TWA skin 30 mg/m3 skin	1 ppm TWA skin 3 ppm STEL skin
CUMENE HYDROPEROXIDE	None	None	1ppm(6mg/m3) Skin(WEEL)
ETHYLENE GLYCOL	None	50 ppm ceiling 125mg/m3ceiling	None

Exposure Limits (STEL) Ingredients	ACGIH (TLV)	OSHA (PEL)
ETHYLENE GLYCOL	39.4ppm ceil ar 100mg/m3 ceil a	None

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MATERIAL SAFETY DATA SHEET Page 02 of 05

Product Name: Loctite(R) 518 Flange Sealant Gasket Eliminator(R)
Item No.: 51845

3. HAZARDS IDENTIFICATION

Toxicity:	Liquid is an eye and skin irritant. Vapors may irritate eye, nose and throat.
Primary Routes of Entry:	None known
Signs and Symptoms of Exposure:	Irritation of eyes, skin , nose or throat. May cause dermatitis on,prolonged contact in sensitive individuals.
Existing Conditions Aggravated by Exposure:	Acrylic acid: Opper respiratory and lung diseases.

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Ingredients	Literature Referenced Target Organ and Other Health Effects	Carcinogen NTP	IARC	OSHA
Polyurethane methacrylate	No Data	NO	NO	NO
Polyglycol dimethacrylate	ALG IRR	NO	NO	NO
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	NOI	NO	N/A	NO
ACRYLIC ACID	ALG COR IRR KID LIV	NO	N/A	NO
CUMENE HYDROPEROXIDE	ALG CNS COR IRR MUT	NO	NO	NO
ETHYLENE GLYCOL	BLO BNM CNS DEV EYE IRR KID LIV MET	NO	NO	NO
1-Acetyl-2-phenylhydrazine	ALG BLO KID MUT SOM	NO	NO	NO
Saccharin	NTO	NO	N/A	NO

Abbreviations

N/A Not Applicable	ALG Allergen
BLO Blood	BNM Bone Marrow
CNS Central nervous system	COR Corrosive
DEV Developmental	EYE Eyes
IRR Irritant	KID Kidney
LIV Liver	MET Metabolic
MUT Mutagen	NTO No Target Organs
NOI Nuisance dust	SOM Some evidence of carcinogenicity

4. FIRST AID MEASURES

Ingestion:	Do not induce vomiting. Keep individual calm. Obtain medical attention.
Inhalation:	Remove to fresh air. If symptoms persist, obtain medical attention.
Skin Contact:	Wash thoroughly with soap and water
Eye Contact:	Flush at least 15 minutes with water. Obtain medical attention.

5. FIRE FIGHTING MEASURES

Flash Point:	More than 200°F Method: Tag Closed Cup
Recommended Extinguishing Agents:	Carbon dioxide, foam, dry chemical
Special Firefighting Procedures:	Not available
Hazardous Products formed by Fire or Thermal Decomp	Irritating organic vapors.
Unusual Fire or Explosion Hazards:	None

Explosive Limits:

(% by volume in air)Lower	2.0% Acrylic acid
(% by volume in air)Upper	8.0% Acrylic acid

6. ACCIDENTAL RELEASE MEASURES

Steps to be taken in case of spill or leak:	Scrape up as much as possible and store in a partly filled, closed container until disposal. Residues may be cleaned up with solvent.

7. HANDLING AND STORAGE

Safe Storage:	Store below 100 deg. F
(Contact Loctite Customer	Service 1-800-243-4874 for shelf life information)
Handling:	Avoid skin and eye contact. Avoid breathing vapor

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eyes:	Safety glasses or goggles.
Skin:	Neoprene gloves.
Ventilation:	Sufficient to maintain vapor concentration below TLV
Respiratory	Not available
	See Section 2 for Exposure Limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Red gel
Odor:	Mild
Boiling Point:	More than 300°F
pH:	Does not apply
Solubility in Water:	Low
Specific Gravity	1.1 at 80°F
Volatile Organic Compound (EPA Method 24)	13.0%; 143 grams per liter
Vapor Pressure:	Less than 5mm at 80°F

Product Name: Loctite(R) 518 Flange Sealant Gasket Eliminator(R)
Item No.: 51845

9. PHYSICAL AND CHEMICAL PROPERTIES (continued)

Vapor Density:	Not available
Evaporation Rate (Ether = 1)	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility:	None
Conditions to Avoid:	Not available
Hazardous Decomposition Products (non-thermal):	None

11. TOXICOLOGICAL INFORMATION

Estimated Oral LD50 more than 5000 mg/kg.
Estimated Dermal LD50 more than 2000 mg/kg.

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended methods of disposal:	Incinerate following EPA and local regulations.
EPA Hazardous Waste Number	NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49 CFR 172)	
Domestic Ground Transport	
Proper Shipping Name:	Unrestricted
Hazard Class or Division:	Unrestricted
Identification Number:	None
Marine Pollutant:	None
IATA	
Proper Shipping Name:	Unrestricted
Class or Division:	Unrestricted
UN or ID Number:	None

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15. REGULATORY INFORMATION

CA Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive

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MATERIAL SAFETY DATA SHEET Page 05 of 05

Product Name: Loctite(R) 518 Flange Sealant Gasket Eliminator(R)
Item No.: 51845

15. REGULATORY INFORMATION (continued)

harm.
Ethylene Oxide

16. OTHER INFORMATION

Estimated NFPA(R) Code:
- Health Hazard: 2
- Fire Hazard: 1
- Reactivity Hazard: 1
- Specific Hazard: Does not apply

Estimated HMIS(R) Code:
- Health Hazard: 2
- Flammability Hazard: 1
- Reactivity Hazards: 1
- Personal Protection: See Section 8.

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HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Stephen Repetto
Title: Research Chemist, Environmental Health & Safety
Company: Henkel Loctite Corporation, Rocky Hill CT 06067
(24hr.) Phone: (860) 571-5100
Revision Date: January 26, 1999 Revision: 0032

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LOCTITE®

Material Safety Data Sheet

Henkel Technologies

Revision Date: 10/20/2006 **Issue date:** 10/20/2006

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: LOCTITE® 567™ PST® PIPE SEALANT WITH PTFE THREAD SEALANT PART NO. 56747
Item No. : 56747 / IDH No. 135491
Product type: Anaerobic Sealant
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
Bisphenol A fumarate resin 39382-25-7	30-60	None	None	None
Polyglycol dimethacrylate 25852-47-5	10-30	None	None	None
Polyglycol laurate 9004-81-3	10-30	None	None	None
Polyethylene glycol monococoate 61791-29-5	10-30	None	None	None
Poly(tetrafluoroethylene) 9002-84-0	5-10	None	None	AEL (DuPont): 10 mg/m³, 8 Hr TWA, total dust; 5mg/m³, 8 hr. TWA respirable dust
Titanium dioxide 13463-67-7	1-5	10 mg/m³ TWA	15 mg/m³ TWA total dust	None
Silica, amorphous, fumed, crystalline-free 112945-52-5	1-5	10 mg/m³ TWA inhalable 3 mg/m³ TWA respirable	6 mg/m³ TWA	None
Saccharin 81-07-2	1-5	None	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state:	Paste	**HEALTH:**	2*
Color:	White	**FLAMMABILITY:**	1
Odor:	Mild	**PHYSICAL HAZARD:**	1
		Personal Protection:	See Section 8

WARNING: CAUSES EYE IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: May cause respiratory tract irritation.
Skin contact: May cause allergic skin reaction. May cause skin irritation.

Eye contact:	Contact with eyes will cause irritation.
Ingestion:	Not expected to be harmful by ingestion.
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°C (200°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. Toxic fluorine compounds. Irritating organic vapors.*

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions:	Prevent product from entering drains or open waters.
Clean-up methods:	Soak up with inert absorbent. Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Handling:	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°C (100°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:	No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.
Respiratory protection:	Use a NIOSH approved air purifying respirator with an organic vapor cartridge if the potential to exceed established exposure limits exists.

Skin protection:	Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene, Butyl-rubber, or nitrile-rubber gloves.
Eye/face protection:	Safety goggles or safety glasses with side shields.

See Section 2 for exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Paste
Color:	White
Odor:	Mild
Vapor pressure:	Less than 5 mm Hg at 27°C (80°F)
pH:	Not applicable
Boiling point/range:	Greater than 149°C (300°F)
Melting point/range:	Not available
Specific gravity:	1.14
Vapor density:	Not available
Evaporation rate:	Not available
Solubility in water:	Slight
Partition coefficient (n-octanol/water):	Not available
VOC content:	0.1262%; 1.3841 grams/liter

10. STABILITY AND REACTIVITY

Stability:	Stable.
Hazardous polymerization:	Will not occur.
Hazardous decomposition products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Toxic fluorine compounds. Phenols. Irritating organic vapors.
Incompatability:	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 "Incompatability" (Section 10).

11. TOXICOLOGICAL INFORMATION

Product toxicity data: Acute oral LD50 greater than 10, 000 mg/kg (rat). Acute dermal LD50 greater than 2000 mg/kg (rabbit) (estimated).

Carcinogen Status

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen
Bisphenol A fumarate resin 39382-25-7	No	No	No
Polyglycol dimethacrylate 25852-47-5	No	No	No
Polyglycol laurate 9004-81-3	No	No	No
Polyethylene glycol monococoate 61791-29-5	No	No	No
Poly(tetrafluoroethylene) 9002-84-0	No	No	No
Titanium dioxide 13463-67-7	No	Group 2B	Yes
Silica, amorphous, fumed, crystalline-free 112945-52-5	No	No	No
Saccharin 81-07-2	No	No	No

Literature Referenced Target Organ & Other Health Effects

Hazardous components	Health Effects/Target Organs
Bisphenol A fumarate resin 39382-25-7	Allergen, Irritant
Polyglycol dimethacrylate 25852-47-6	Allergen, Irritant
Polyglycol laurate 9004-81-3	Allergen, Irritant
Polyethylene glycol monococoate 61791-29-5	No Target Organs
Poly(tetrafluoroethylene) 9002-84-0	No Target Organs
Titanium dioxide 13463-67-7	Irritant, Respiratory
Silica, amorphous, fumed, crystalline-free 112945-52-5	Nuisance dust
Saccharin 81-07-2	No Target Organs

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 hazardous

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

WaterTransportation (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:	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:	None above reporting de minimus.
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.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: 11, 15

Prepared by: Regulatory Affairs

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ROCKY HILL, CONNECTICUT 06067
EMERGENCY PHONE: (860) 571-5100

MATERIAL SAFETY DATA SHEET Page 01 of 05

Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R)
56790

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R) Thread Sealant for Stainless Steel
Item No.:	56790
Product Type:	Anaerobic

2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredients	CAS No.	%
Bisphenol A fumarate resin	39382-25-7	30-35
Polyglycol dimethacrylate	25852-47-5	20-25
Polyglycol laurate	9004-81-3	20-25
Poly(ethylene)	9002-88-4	5-10
Poly(tetrafluoroethylene)	9002-84-0	5-10
TITANIUM DIOXIDE	13463-67-7	3-5
CUMENE HYDROPEROXIDE*	80-15-9	1-3
N,N-Dialkyltoluidines	613-48-9	1-3
Saccharin	81-07-2	1-3
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	112945-52-5	1-3
Epoxy resin	25068-38-6	0.1-1

* This component is listed as a SARA Section 313 Toxic Chemical.

Ingredients which have exposure limits

Exposure Limits (TWA) Ingredients	ACGIH (TLV)	OSHA (PEL)	OTHER
Poly(tetrafluoroethylene)	None	None	AEL (DuPont) 5mg/m3 8hr dust
TITANIUM DIOXIDE	10 mg/m3	15 mg/m3 Total dust	None
CUMENE HYDROPEROXIDE	None	None	1ppm(6mg/m3) Skin(WEEL)
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	10 mg/m3 TWA	6 mg/m3 TWA	3 mg/m3 TWA resp. dust

Exposure Limits (STEL) Ingredients	ACGIH (TLV)	OSHA (PEL)

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MATERIAL SAFETY DATA SHEET Page 02 of 05

Product Name: Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R) Thread Sealant for Stainless Steel
Item No.: 56790

3. HAZARDS IDENTIFICATION

Toxicity:	Moderate eye irritant.
Primary Routes of Entry:	None known
Signs and Symptoms of Exposure:	May cause dermatitis on prolonged contact in sensitive individuals
Existing Conditions Aggravated by Exposure:	None known

Ingredients	Literature Referenced Target Organ and Other Health Effects	Carcinogen NTP IARC OSHA

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Bisphenol A fumarate resin	ALG IRR	NO	NO	NO
Polyglycol dimethacrylate	ALG IRR	NO	NO	NO
Polyglycol laurate	ALG	NO	NO	NO
Poly(ethylene)	NTO	NO	N/A	NO
Poly(tetrafluoroethylene)	NTO	NO	N/A	NO
TITANIUM DIOXIDE	IRR RES	NO	NO	NO
CUMENE HYDROPEROXIDE	ALG CNS COR IRR MUT	NO	NO	NO
N,N-Dialkyltoluidines	NTO	NO	NO	NO
Saccharin	NTO	NO	N/A	NO
SILICA, AMORPHOUS, FUMED, CRYSTALLINE-FREE	NUI	NO	N/A	NO
Epoxy resin	ALG IRR	NO	NO	NO

Abbreviations

N/A Not Applicable	ALG Allergen
CNS Central nervous system	COR Corrosive
IRR Irritant	MUT Mutagen
NTO No Target Organs	NUI Nuisance dust
RES Respiratory	

4. FIRST AID MEASURES

Ingestion:	Do not induce vomiting. Keep individual calm. Obtain medical attention.
Inhalation:	Does not apply
Skin Contact:	Wash with soap and water.
Eye Contact:	Flush at least 15 minutes with water. Obtain medical attention.

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MATERIAL SAFETY DATA SHEET Page 03 of 05

Product Name:	Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R) Thread Sealant for Stainless Steel
Item No.:	56790

5. FIRE FIGHTING MEASURES

Flash Point:	More than 200°F Method: Tag Closed Cup
Recommended Extinguishing Agents:	Carbon dioxide, foam, dry chemical
Special Firefighting Procedures:	Not available
Hazardous Products formed by Fire or Thermal Decomp	Irritating organic vapors
Unusual Fire or Explosion Hazards:	None
Explosive Limits:	
(% by volume in air)Lower	Not available
(% by volume in air)Upper	Not available

6. ACCIDENTAL RELEASE MEASURES

Steps to be taken in case of spill or leak:	Soak up in an inert absorbent. Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Safe Storage:	Store below 100°F
(Contact Loctite Customer	Service 1-800-243-4874 for shelf life information)
Handling:	Avoid prolonged skin contact. Keep away from eyes.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eyes:	Safety glasses or goggles.
Skin:	Rubber or plastic gloves.
Ventilation:	Does not apply

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Respiratory	NIOSH approved respirator if ventilation is inadequate.
	See Section 2 for Exposure Limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White paste
Odor:	Mild
Boiling Point:	More than 300°F
pH:	Does not apply
Solubility in Water:	Slight
Specific Gravity	1.14 at 80°F
Volatile Organic Compound (EPA Method 24)	8.6%; 98.04 grams per liter
Vapor Pressure:	Less than 5mm at 80°F

Product Name:	Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R) Thread Sealant for Stainless Steel
Item No.:	56790

9. PHYSICAL AND CHEMICAL PROPERTIES (continued)

Vapor Density:	Not available
Evaporation Rate (Ether = 1)	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility:	None
Conditions to Avoid:	Not available
Hazardous Decomposition Products (non-thermal):	None

11. TOXICOLOGICAL INFORMATION

Oral LD50 greater than 10,000 mg/kg.
Estimated dermal LD50 greater than 2000 mg/kg.

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended methods of disposal:	Incinerate following EPA and local regulations.
EPA Hazardous Waste Number	NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49 CFR 172)	
Domestic Ground Transport	
Proper Shipping Name:	Unrestricted
Hazard Class or Division:	Unrestricted
Identification Number:	None
Marine Pollutant:	None
IATA	
Proper Shipping Name:	Unrestricted
Class or Division:	Unrestricted
UN or ID Number:	None

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Product Name: Loctite(R) 567 PST(R) Pipe Sealant With Teflon(R) Thread Sealant for Stainless Steel
Item No.: 56790

15. REGULATORY INFORMATION

CA Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. 1,4-dioxane, benzene, acetaldehyde, ethylene oxide, o-toluidine

16. OTHER INFORMATION

Estimated NFPA(R) Code:
- Health Hazard: 1
- Fire Hazard: 1
- Reactivity Hazard: 1
- Specific Hazard: Does not apply

Estimated HMIS(R) Code:
- Health Hazard: 1*
- Flammability Hazard: 1
- Reactivity Hazards: 1
- Personal Protection: See Section 8.

NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Stephen Repetto
Title: Senior Regulatory Specialist, Health & Regulatory
Company: Henkel Loctite Corporation, Rocky Hill CT 06067
(24hr.) Phone: (860) 571-5100
Revision Date: March 03, 2003 Revision: 0035

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MATERIAL SAFETY DATA SHEET Page 01 of 05

Loctite(R) 592 Thread Sealant PST(R)
59231

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Loctite(R) 592 Thread Sealant PST(R) Pipe Sealant With Teflon(R) Hi Perf.
Item No.:	59231
Part No.:	59231
Product Type:	Anaerobic Sealant

2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredients	CAS No.	%
Bisphenol A fumarate resin	39382-25-7	25-30
SILICA, MICA	12001-26-2	15-20
Octanol	111-87-5	10-15
Polyglycol dimethacrylate	25852-47-5	10-15
Polyglycol dioctanoate	18268-70-7	10-15
Poly(tetrafluoroethylene)	9002-84-0	5-10
Silica, amorphous, treated	68909-20-6	3-5
CUMENE HYDROPEROXIDE*	80-15-9	1-3
Organic esters	Proprietary	1-3
TITANIUM DIOXIDE	13463-67-7	1-3

* This component is listed as a SARA Section 313 Toxic Chemical.

The organic esters are registered with the state of New Jersey as a trade secret: NJ TSRN 06-070-1067-5085.

Ingredients which have exposure limits

Exposure Limits (TWA) Ingredients	ACGIH (TLV)	OSHA (PEL)	OTHER
SILICA, MICA	3 mg/m3 TWA	20 mppcf	None
Poly(tetrafluoroethylene)	None	None	AEL (DuPont) 5mg/m3 8hr dust
Silica, amorphous, treated	10mg/m3 (Inhal) 3mg/m3 (Resp)	20 mppcf	6 mg/m3
CUMENE HYDROPEROXIDE	None	None	1ppm(6mg/m3) Skin(WEEL)
TITANIUM DIOXIDE	10 mg/m3	15 mg/m3 Total dust	None

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EMERGENCY PHONE: (860) 571-5100

MATERIAL SAFETY DATA SHEET Page 02 of 05

Product Name: Loctite(R) 592 Thread Sealant PST(R) Pipe Sealant With Teflon(R) Hi Perf.
Item No.: 59231

2. COMPOSITION, INFORMATION ON INGREDIENTS (continued)

Exposure Limits (STEL) Ingredients	ACGIH (TLV)	OSHA (PEL)

3. HAZARDS IDENTIFICATION

Toxicity:	Mild eye irritant. Oral LD50 more than 10,000 mg/kg. Dermal LD50 more than 5000 mg/kg.
Primary Routes of Entry:	None known
Signs and Symptoms of Exposure:	Intoxication, nausea, headache, dizziness.

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May cause dermatitis on prolonged contact in sensitive individuals.

Existing Conditions Aggravated by Exposure: None known

Ingredients	Literature Referenced Target Organ and Other Health Effects	Carcinogen NTP	IARC	OSHA
Bisphenol A fumarate resin	ALG IRR	NO	NO	NO
SILICA, MICA	LUN	NO	NO	NO
Octenol	CNS IRR	NO	NO	NO
Polyglycol dimethacrylate	ALG IRR	NO	NO	NO
Polyglycol dioctanoate	IRR	NO	NO	NO
Poly(tetrafluoroethylene)	NTO	NO	N/A	NO
Silica, amorphous, treated	NTO	NO	NO	NO
CUMENE HYDROPEROXIDE	ALG CNS COR IRR MUT	NO	NO	NO
Organic esters	No Data	NO	NO	NO
TITANIUM DIOXIDE	IRR RES	NO	NO	NO

Abbreviations

N/A Not Applicable	ALG Allergen
CNS Central nervous system	COR Corrosive
IRR Irritant	LUN Lung
MUT Mutagen	NTO No Target Organs
RES Respiratory	

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting. Keep individual calm. Obtain medical attention.

Inhalation: Remove to fresh air. If symptoms persist, obtain medical attention.

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MATERIAL SAFETY DATA SHEET Page 03 of 05

Product Name: Loctite(R) 592 Thread Sealant PST(R) Pipe Sealant With Teflon(R) Hi Perf.
Item No.: 59231

4. FIRST AID MEASURES (continued)

Skin Contact: Wash with soap and water.
Eye Contact: Flush at least 15 minutes with water. Obtain medical attention.

5. FIRE FIGHTING MEASURES

Flash Point: More than 200°F Method: Tag Closed Cup
Recommended Extinguishing Agents: Carbon dioxide, foam, dry chemical
Special Firefighting Procedures: Not available
Hazardous Products formed by Fire or Thermal Decomp: Toxic fluorides.
Unusual Fire or Explosion Hazards: None

Explosive Limits:
(% by volume in air) Lower: Approximately 1% Octanol
(% by volume in air) Upper: Approximately 8% Octanol

6. ACCIDENTAL RELEASE MEASURES

Steps to be taken in case of spill or leak: Soak up in an inert absorbent. Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

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Safe Storage:	Store below 100°F
(Contact Loctite Customer	Service 1-800-243-4874 for shelf life information)
Handling:	Avoid prolonged skin contact. Do not use for prolonged periods in confined area without adequate ventilation. Keep away from eyes.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eyes:	Safety glasses or goggles.
Skin:	Rubber or plastic gloves.
Ventilation:	Local ventilation recommended for prolonged use.
Respiratory	Not available

See Section 2 for Exposure Limits.

Product Name:	Loctite(R) 592 Thread Sealant PST(R) Pipe Sealant With Teflon(R) Hi Perf.
Item No.:	59231

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White paste
Odor:	Mild
Boiling Point:	More than 300°F
pH:	Does not apply
Solubility in Water:	Slight
Specific Gravity	1.21 at 80°F
Volatile Organic Compound (EPA Method 24)	16.9%; 204.5 grams per liter
Vapor Pressure:	Less than 10mm at 80°F
Vapor Density:	Not available
Evaporation Rate (Ether = 1)	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility:	None
Conditions to Avoid:	Not available
Hazardous Decomposition Products (non-thermal):	None

11. TOXICOLOGICAL INFORMATION

See Section 3.

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended methods of disposal:	Incinerate following EPA and local regulations.
EPA Hazardous Waste Number	NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49 CFR 172)	
Domestic Ground Transport	
Proper Shipping Name:	Unrestricted
Hazard Class or Division:	Unrestricted
Identification Number:	None
Marine Pollutant:	None
IATA	

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MATERIAL SAFETY DATA SHEET Page 05 of 05

Product Name: Loctite(R) 592 Thread Sealant PST(R) Pipe Sealant With Teflon(R) Hi Perf.
Item No.: 59231

14. TRANSPORTATION INFORMATION (continued)

Proper Shipping Name: Unrestricted
Class or Division: Unrestricted
UN or ID Number: None

15. REGULATORY INFORMATION

CA Proposition 65: No Prop65 chemicals are known to be present.

16. OTHER INFORMATION

Estimated NFPA(R) Code:
Health Hazard: 1
Fire Hazard: 1
Reactivity Hazard: 1
Specific Hazard: Does not apply

Estimated HMIS(R) Code:
Health Hazard: 1
Flammability Hazard: 1
Reactivity Hazards: 1
Personal Protection: See Section 8.

NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Stephen Repetto
Title: Senior Regulatory Specialist, Health & Regulatory
Company: Henkel Loctite Corporation, Rocky Hill CT 06067
(24hr.) Phone: (860) 571-5100
Revision Date: October 13, 2000 Revision: 0032

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LOCTITE®

Material Safety Data Sheet

Henkel Technologies

Revision Date: 01/03/2005 **Issue date:** 01/03/2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: Loctite(R) Locquic(R) Primer T 7471 Aerosol
Product type: Primer
Company address:
Henkel Corporation
1001 Trout Brook Crossing
Rocky Hill, Connecticut 06067

Item No. : 22477
Region: United States
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
Acetone 67-64-1	60-100	500 ppm TWA 750 ppm STEL	1000 ppm TWA 2400 mg/m³ TWA	None
Isobutane 75-28-5	10-30	1000 ppm TWA listed under aliphatic hydrocarbon gases alkane C1-C4	None	None
Isopropyl alcohol 67-63-0	5-10	200 ppm TWA 400 ppm STEL	400 ppm TWA 980 mg/m³ TWA	None
2-Mercaptobenzothiazole 149-30-4	0.1-1	None	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Aerosol
Color: Yellow to Amber
Odor: Acetone

HEALTH: 2*
FLAMMABILITY: 4
PHYSICAL HAZARD: 0
Personal Protection: See Section 8

DANGER: FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE AND SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, inhalation, eyes, Ingestion

Potential Health Effects

Inhalation: May cause respiratory tract irritation. Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Skin contact: Irritating to skin. Solvent action can dry and defat the skin, causing the skin to crack, leading to dermatitis.
Eye contact: Vapors may irritate eyes. Contact with eyes will cause irritation.
Ingestion: Moderately toxic by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

See Section 11 for additional toxicological information.

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4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If discomfort persists seek medical attention.

Skin contact: Immediately flush skin with plenty of water (using soap, if available).

Eye contact: Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time.

Ingestion: If conscious, drink plenty of water. Do not induce vomiting. Keep individual calm. Obtain medical attention.

5. FIRE-FIGHTING MEASURES

Flash point: -8.3°C (17°F) (Base only) Tagliabue closed cup (estimated)

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: Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition, and flash back.

Hazardous combustion products: Irritating organic vapors. Oxides of carbon. Oxides of nitrogen. Oxides of sulfur.

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions: Prevent product from entering drains or open waters.

Clean-up methods: Remove all ignition sources. Ensure adequate ventilation. Soak up with inert absorbent. Store in a closed container until ready for disposal.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing vapor and mist. Wash thoroughly after handling. During use and until all vapors are gone: Keep area ventilated - do not smoke; extinguish all flames, pilot lights, and heaters; turn off stoves, electrical tools and appliances, and any other sources of ignition.

Storage: Store away from heat, sparks, flames, or other sources of ignition. For safe storage, store at or below 49°C (120°F).

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: Use local ventilation if general ventilation is insufficient to maintain vapor concentration below established exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Skin protection: Chemical resistant, impermeable gloves.

Eye/face protection: Safety goggles or safety glasses with side shields.

See Section 2 for exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Aerosol
Color:	Yellow to Amber
Odor:	Acetone
Vapor pressure:	Approximately 172 mmHg @20°C (68° F) (Base only)
pH:	Not applicable
Boiling point/range:	Not available
Melting point/range:	Not available
Specific gravity:	.7953 Base only
Vapor density:	Not available
Evaporation rate:	Not available
Solubility in water:	Miscible
Partition coefficient (n-octanol/water):	Not available
VOC content:	8.306%; 106 grams/liter

10. STABILITY AND REACTIVITY

Stability: Stable.

Hazardous polymerization: Will not occur.

Hazardous decomposition products: Oxides of carbon. Oxides of nitrogen. Oxides of sulfur. Irritating organic vapors.

Incompatability: Strong oxidizers.

Conditions to avoid: See "Handling and Storage" (Section 7) and "Incompatabilty" (Section 10).

11. TOXICOLOGICAL INFORMATION

Carcinogen Status

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen
Acetone 67-64-1	No	No	No
Isobutane 75-28-5	No	No	No
Isopropyl alcohol 67-63-0	No	No	No
2-Mercaptobenzothiazole 149-30-4	No	No	No

Literature Referanced Target Organ & Other Health Effects

Hazardous components	Health Effects/Target Organs
Acetone 67-64-1	Blood, Central nervous system, Irritant, Reproductive
Isobutane 75-28-5	Cardiac, Central nervous system, Lung
Isopropyl alcohol 67-63-0	Allergen, Blood, Central nervous system, Irritant, Kidney, Liver, Brain, Spleen
2-Mercaptobenzothiazole 149-30-4	Allergen, Kidney, 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 in accordance with Federal, State and local regulations.

EPA hazardous waste number: *D001: Ignitable.*

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR):

Proper shipping name:	Aerosols, flammable
Hazard class or division:	2.1
Identification number:	UN 1950
Packing group:	None
Exceptions:	Consumer Commodity ORM-D (Not more than 1 Liter)
DOT reportable quantity (lbs):	Acetone (CAS# 67-64-1) is reportable at 5000 pounds (2270 kg).

International Air Transportation (ICAO/IATA):

Proper shipping name:	Aerosols, flammable
Hazard class or division:	2.1
Identification number:	UN 1950
Packing group:	None
Exceptions:	May Qualify as Consumer Commodity ID8000 (Not more than 500 ml)

WaterTransportation (IMO/IMDG):

Proper shipping name:	Aerosols, flammable
Hazard class or division:	2
Identification number:	UN 1950
Packing group:	None
Exceptions:	Limited quantity (Not more than 1 L)
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.

CERCLA/SARA Section 302 EHS: None above reporting de minimus.
CERCLA/SARA Section 311/312: Immediate Health Hazard, Delayed Health Hazard
CERCLA/SARA 313: None above reporting de minimus.

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: A, B.5, D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

Prepared by: Kyra Kozak Woods, Health and Regulatory Affairs Specialist

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ConocoPhillips

Marine Diesel Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Marine Diesel Oil

MSDS Code: 724260

Synonyms: Diesel Fuel Marine
Marine Diesel - Dyed
Marine Fuel Oil
Marine Gas Oil
Residual Marine Fuel Oil
Residual Marine Gas Oil

Intended Use: Fuel

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers: Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!
Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard
Combustible Liquid and Vapor

NFPA

Appearance: Dyed red to dark brown
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

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

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

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

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 respiratory tract, irritation of the digestive tract, nausea, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Diesel Fuel No. 2	68476-34-6	100
Naphthalene	91-20-3	<1

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek 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.

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

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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. If container is not properly cooled, it can rupture in the heat of a fire. Combustible. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). May create vapor/air explosion hazard if heated. Vapors are heavier than air and can accumulate in low areas.

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

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 and 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Combustible. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical 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. 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 with minimal risk. 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.
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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any 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

Component	ACGIH	OSHA	Other:
Diesel Fuel No. 2	TWA: 100 mg/m^3 Skin	—	—
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m^3	TWA: 0.2 mg/m^3 (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

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.

Personal Protective Equipment (PPE):

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

Respiratory: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

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.

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:	Dyed red to dark brown
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40 mm Hg
Vapor Density (air=1):	< 3
Boiling Point/Range:	320-725°F / 160-385°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.81-0.89 @ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Viscosity:	32.6-40.0 SUS @ 100°F
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>140°F / >60°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.3
UEL (vol % in air):	10.0
Autoignition Temperature:	446-500°F / 230-260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: *Avoid all possible sources of ignition.*

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 fuel 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.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Diesel Fuel No. 2

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Target Organs: Limited evidence of renal impairment has been noted from a few older case reports involving excessive exposure to diesel fuel No. 2. However, renal toxicity has not been demonstrated to be a consistent finding of diesel fuel exposure.

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Diesel Fuel No. 2	9 ml/kg (Rat)	>5ml/kg (Rabbit)	No data available

12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Diesel fuel, Combustible liquid, NA1993, III
Non-Bulk Package Marking:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking:	Combustible / 1993
Packaging - References:	None; None; 49 CFR 173.241 ***(Exceptions; Non-bulk; Bulk)***
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128
Note:	***May also be shipped as:*** Diesel fuel, Combustible liquid, UN1202, III ***Bulk Package/Placard Marking would also be changed to:*** 1202 ***Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.***

International Maritime Dangerous Goods (IMDG)

Shipping Description:	***Not regulated. Flash point is above 60°C, cc.***

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

UN/ID #:	***Not regulated. Flash point is above 60°C, cc.***

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Naphthalene	Cancer
Toluene	Developmental Toxicant
Benzene	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
B3 - Combustible Liquids

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

Issue Date:	13-Dec-2007
Status:	Final
Previous Issue Date:	15-Mar-2007
Revised Sections or Basis for Revision:	Exposure limits (Section 8)
MSDS Code:	724260

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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)

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MCCABE AND SONS, INC -- MCCABE GASOLINE LEVEL INDICATOR PASTE

MSDS Safety Information

FSC: 6850
NIIN: 00-270-5526
MSDS Date: 02/17/1998
MSDS Num: CJMLF
Product ID: MCCABE GASOLINE LEVEL INDICATOR PASTE
MFN: 01
Responsible Party
Cage: TO298
Name: MCCABE AND SONS, INC
Box: 235
City: GLEN ROCK PA 17327
Info Phone Number: 717-235-2685
Emergency Phone Number: 717.235.2685
Preparer's Name: C. WILLIAMS
Review Ind: Y
Published: Y

Contractor Summary

Cage: TO298
Name: MCCABE AND SONS, INC
Box: 235
City: GLEN ROCK PA 17327
Phone: 717-235-2685
Cage: 0E5D8
Name: VEHICLES INC.
Address: 702 GARFIELD ST
Box: 1444
City: EMPORIA KS 66801-5110
Phone: 316-343-6653

Item Description Information

Item Manager: S9G
Item Name: GASOLINE INDICATING PASTE
Unit of Issue: JR
Quantitative Expression: 2000000022502
UI Container Qty: 0
Type of Container: JAR

Ingredients

Cas: 1314-13-2
RTECS #: ZH4810000
Name: ZINC OXIDE
OSHA PEL: 5 MG/M3
ACGIH TLV: 10 MG/M3 DUST
ACGIH STEL: 5 MG/M3 FUME

Health Hazards Data

Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: TARGET ORGANS: RESPIRATORY SYSTEM (). ACUTE OVEREXPOSURE CAN CAUSE IRRITATION OF THE EYES, RESPIRATORY TRACT AND SKIN. LIBERATION OF ZINC FUME MAY CAUSE FEVER, CHILLS, NAUSEA, AND VOMITING. CHRON IC EXPOSURE

HAS PRODUCED NO KNOWN HEALTH HAZARDS.
Explanation Of Carcinogenicity: MATERIAL IS NOT TO BE CARCINOGENIC BY NTP, IARC, OSHA.
Signs And Symptions Of Overexposure: IRRITATION, METAL FUME FEVER CAUSES CHILLS, FEVER, NAUSEA, AND VOMTING
Medical Cond Aggravated By Exposure: NONE KNOWN.
First Aid: EYE CONTACT - FLUSH EYES IMMEDIATELY WITH WATER FOR 15 MINUTES AND CALL A PHYSICIAN. INGESTION - INDUCE VOMITING IMMEDIATELY AND CALL A PHYSICIAN.

Handling and Disposal

Spill Release Procedures: SEGREGATE AND CLEAN UP TO AVOID GENERATING DUST AND VAPOR. CONSIDER USE OF RESPIRATORS AND PERSONAL PROTECTIVE EQUIPMENT IN EXTREME CASES INVOLVING LARGE QUANTITIES OF THIS MATERIAL.
Waste Disposal Methods: SANITARY LANDFILL. INCINERATION AT PERMITTED FACILITY.
Handling And Storage Precautions: STORE IN COOL, DRY, WELL-VENTILATED AREA.
Other Precautions: DO NOT INGEST. AVOID CONTACT WITH EYES AND SKIN. KEEP CONTAINER CLOSED AND AWAY FROM OXIDIZERS. WASH THOROUGHLY AFTER HANDLING.

Fire and Explosion Hazard Information

Flash Point Method: COC
Flash Point: =198.9C, 390.F
Flash Point Text: 390-495F
Extinguishing Media: DRY CHEMICAL, FOAM, WATER OR CARBON DIOXIDE.
Fire Fighting Procedures: AVOID BREATHING VAPORS
Unusual Fire/Explosion Hazard: NONE

Control Measures

Respiratory Protection: CONSIDER USE OF NIOSH APPROVED RESPIRATOR IF DUST OR FUME PRESENT ABOVE PEL
Ventilation: LOCAL EXHAUST IS REOMMENDED TO KEEP BELOW PEL.
Protective Gloves: IMPERVIOUS GLOVES ARE USUALLY NOT REQUIRED.
Eye Protection: SAFETY GLASSES WITH SIDE SHIELDS OR CHEMICAL GOGGLES
Other Protective Equipment: BOOTS, APRON, AND SUIT MAY BE CONSIDERED IN EXTREME SITUATIONS
Work Hygienic Practices: AVOID BREATHING DUST OR VAPOR. WEAR LONG SLEEVED SHIRT, TROUSERS, AND SAFETY SHOES.
Supplemental Safety and Health: EYEWASH AND SAFETY SHOWER SHOULD BE AVAILABLE.

Physical/Chemical Properties

HCC: V5
Boiling Point: >232.2C, 450.F
Vapor Pres: <0.01
Vapor Density: NIL
Spec Gravity: 2.1
Evaporation Rate & Reference: NIL (BU ACETATE=1)
Solubility in Water: PARTIAL
Appearance and Odor: VIOLET BLUE PASTE WITH NO ODOR.

Reactivity Data

Stability Indicator: NO
Materials To Avoid: STRONG OXIDIZERS
Hazardous Decomposition Products: MAY LIBERATE ZINC OXIDE FUME, CARBON DIOXIDE, CARBON MONOXIDE AND OXIDES OF NITROGEN
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT KNOWN.

Transportation Information

Responsible Party Cage: TO298
Trans ID NO: 148619
Product ID: MCCABE GASOLINE LEVEL INDICATOR PASTE
MSDS Prepared Date: 02/17/1998
Review Date: 09/22/1999
[illegible] 1
[illegible] Unit Weight: 0.15 LB JAR
Multiple KIT Number: 0
Unit Of Issue: JR
Container QTY: 0
Type Of Container: JAR

Detail DOT Information

DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail IMO Information

IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

Detail IATA Information

IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail AFI Information

AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

[illegible]OM Label

Product ID: MCCABE GASOLINE LEVEL INDICATOR PASTE
Cage: TO298
Assigned IND: Y
Company Name: MCCABE AND SONS, INC
PO Box: 235
City: GLEN ROCK PA
Zipcode: 17327
Health Emergency Phone: 717.235.2685
Date Of Label Review: 09/22/1999
Status Code: A
Signal Word: NONE
Health Hazard: None
Contact Hazard: None
Fire Hazard: None
Reactivity Hazard: None

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Supplemental Allowances

LE VALLEY FUEL CO INC - 0020031340
N 6TH AVE
YAKIMA, WA 98902

Eff. Date: 02/06/2003

Group: CENTRAL PREMIX

Products	Posted Price $	Supp Allow $	Cust Price $
76,GUARDOL QLT,15W40,1/55	4.5900	1.4400	3.3900
76,GUARDOL QLT,15W40,BULK	4.0000	1.4400	2.9900
76,GUARDOL QLT,30,1/55	4.4900	1.5400	3.2900
76,HT/4 FLUID,10,1/55	4.6500	1.6800	3.4500
76,HT/4 FLUID,30,1/55	4.7000	1.6400	3.4500
76,MP GEAR LUBE,80W90,1/120	0.8050	0.2350	0.5900
76,MP GEAR LUBE,80W90,1/410	0.7400	0.3150	0.4900
76,REDTAC GREASE,#1,1/120	1.1150	0.1850	0.0000
76,REDTAC GREASE,#1,40/14	1.3175	0.2550	1.1800
76,REDTAC GREASE,#2,1/120	1.1150	0.1850	0.0000
76,REDTAC GREASE,#2,1/400	1.0600	0.1650	0.0000
76,REDTAC GREASE,#2,40/14	1.3175	0.2550	1.1800
76,SUPER,ATF,1/55	4.4600	1.7200	3.1500
76,UNAX AW,46,1/55	3.7300	1.5200	2.3900
76,UNAX AW,46,BULK	3.1400	1.4400	1.9100
UNAX AW,68,1/55	3.7300	1.3400	2.4400
,UNAX AW,68,BULK	3.1400	1.3900	1.9600

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MATERIAL SAFETY DATA SHEET:NA-103

DATE OF ISSUE: 07/11/2002 **SUPERCEDES:** 07/11/2002

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms:
N/A

Trade Name & Synonyms:
NA-103

Chemical Family:
AMINE SOLUTION

Formula Mixture: X

Manufacturer's Name:
CHEMAQUA, INC

Address:
BOX 152170
IRVING, TEXAS 75015

Prepared By:	Product Code Number	Emergency Phone Number
C Williamson/Chemist	0881	800-424-9300

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS

Chemical Name (Ingredients)	Hazard	TLV	PEL	STEL	CAS #
CYCLOHEXYLAMINE	$	10 PPM 1.	N/E 2.	N/E	108-91-8
$ FLAM/CORR/TOX/SENSITIZER					

SECTION III - PHYSICAL DATA

Boiling Point (f):	210°	**Specific Gravity (H20=1):**	0.959
Vapor Pressure (MM HG):	N/E	**Color:**	PALE YELLOW
Vapor Density (Air=1):	3.4	**Odor:**	AMMONIACAL
PH @ 100% :	12.8	**Clarity**	TRANSPARENT
% Volatile by Volume:	100	**Evaporation Rate (BU A/C=1):**	N/E
H20 Solubility:	COMPLETE	**Viscosity:**	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point:	Flammable Limits:	LEL:	UEL:
83°F / SETAFLASH	CYCLOHEXYLAMINE	1.5%	9.4%

Extinguishing Media:

Foam: Alcohol Foam:X CO2:X Dry Chemical:X Water Spray:X Other:

Special Fire Fighting Procedures:

FIREFIGHTERS SHOULD WEAR A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. COOL FIRE-EXPOSED CONTAINERS WITH WATER SPRAY TO PREVENT BURSTING.

Unusual Fire and Explosion Hazards:

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL TO DISTANT SOURCES OF IGNITION AND FLASHBACK. STATIC CHARGES GENERATED BY EMPTYING CONTAINER IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.

NFPA Hazard Rating: **(0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)**

Health:3 Flammability:3 Instability:0 Special:

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
10 PPM AS CYCLOHEXYLAMINE 1.

Effects of Overexposure:

-Acute(Short Term Exposure)

EYE CONTACT: CORROSIVE. CAUSES BURNS, CORNEAL DAMAGE AND POSSIBLE BLINDNESS. SKIN CONTACT:

CORROSIVE. CAUSES BURNS AND POSSIBLE DEEP ULCERATIONS AND SCARRING. MAY CAUSE ALLERGIC SKIN REACTION. PRODUCT MAY BE ABSORBED THROUGH THE SKIN IN HARMFUL AMOUNTS. INHALATION: CAUSES BURNS TO THE RESPIRATORY TRACT, NOSE, MOUTH AND THROAT WITH DISCOMFORT, NASAL DISCHARGE, SNEEZING, COUGHING AND CHEST PAIN. INGESTION: CORROSIVE. CAUSES BURNS TO THE MOUTH, THROAT, ESOPHAGUS AND STOMACH WITH NAUSEA AND PAIN. INGESTION AND SUBSEQUENT VOMITING OF THIS PRODUCT CAN LEAD TO ASPIRATION OF THE PRODUCT INTO THE LUNGS WHICH CAN CAUSE DAMAGE AND MAY BE FATAL.

-Chronic (Long Term Exposure)

MAY CAUSE SKIN SENSITIZATION IN SOME INDIVIDUALS. PROLONGED CONTACT MAY CAUSE PULMONARY EMBOLI, DYSPNEA AND CHANGES IN THE LIVER. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA AND DERMATITIS. TARGET ORGANS: BLOOD-FORMING ORGANS, LIVER AND LUNGS.

Primary Routes of Entry: Inhalation: Ingestion: Absorption:X

Emergency and First Aid Procedures:

-Inhalation:

REMOVE FROM THE AREA TO FRESH AIR. IF NOT BREATHING, CLEAR THE AIRWAY AND START MOUTH TO MOUTH ARTIFICIAL RESPIRATION. GET IMMEDIATE MEDICAL ATTENTION.

-Eye Contact:

IMMEDIATELY RINSE THE EYES WITH WATER. REMOVE ANY CONTACT LENSES AND CONTINUE FLUSHING FOR AT LEAST 15 MINUTES. HOLD THE EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYES AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

-Skin Contact:

WASH AFFECTED AREAS WITH LARGE AMOUNTS OF SOAP AND WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET IMMEDIATE MEDICAL ATTENTION. WASH CLOTHING AND CLEAN SHOES BEFORE REUSE.

-Ingestion:

GIVE 3 TO 4 GLASSES OF WATER, BUT DO NOT INDUCE VOMITING. IF VOMITING OCCURS, GIVE FLUIDS AGAIN. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-Notes to Physician:

THERE IS NO SPECIFIC ANTIDOTE. TREAT THE PATIENT SYMPTOMATICALLY. DEPENDING ON THE AMOUNT INGESTED AND RETAINED AS WELL AS THE TOXICITY OF THE PRODUCT, GASTRIC LAVAGE SHOULD BE CONSIDERED. KEEP PATIENT'S HEAD BELOW HIPS TO PREVENT PULMONARY ASPIRATION. IF COMATOSE, A CUFFED ENDOTRACHAEL TUBE WILL PREVENT ASPIRATION.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:

IARC: No **NTP:** No **OSHA:** No **ACGIH:** No **OTHER:** No

CYCLOHEXYLAMINE
SKN-HMN SDT: 125 MG/48H SEVERE 3.
EYE-RBT SDT: 50 uG/24H SEVERE 3.
IHL-RAT LC50: 7500 MG/M3 3.
ORL-RAT LD50: 11 MG/KG 3.
ORL-MOUSE LD50: 224 MG/KG 3.

IN HUMAN PATCH TESTS, A 25% SOLUTION PRODUCED SEVERE SKIN IRRITATION & POSSIBLE SKIN SENSITIZATION 4.

SECTION VII - REACTIVITY DATA

Stability: Stable:X Unstable:

Conditions to Avoid: AVOID HEAT, HOT SURFACES, SPARKS OR OPEN FLAME.

Incompatibility (Materials to Avoid):

STRONG OXIDIZING AGENTS SUCH AS CHLORINE BLEACH AND CONCENTRATED HYDROGEN PEROXIDE; ORGANIC AND MINERAL ACIDS; CONTACT WITH FINELY DIVIDED METALS SUCH AS ALUMINUM, COPPER, LEAD, MAGNESIUM, NICKEL, TIN AND ZINC.

Hazardous Decomposition Products:

OXIDES OF CARBON AND NITROGEN; AMMONIA GAS.

Hazardous Polymerization: May Occur: Will Not Occur:X

Conditions to Avoid: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be Taken If Material Is Released or Spilled:

WEAR APPROPRIATE PROTECTIVE CLOTHING. ELIMINATE ALL SOURCES OF IGNITION AND VENTILATE THE AREA. USE ONLY NON-SPARKING EQUIPMENT. USE CARE AS SPILLS MAY BE SLIPPERY. DIKE AND CONTAIN SPILL. ABSORB WITH AN INERT MATERIAL AND TRANSFER ALL MATERIAL INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. FLUSH AREA WITH WATER.

Waste Disposal Method(s):

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Neutralizing Agent:

USE DILUTE ACIDS SUCH AS HYDROCHLORIC ACID OR VINEGAR. ADD CAUTIOUSLY WHILE MIXING. WEAR APPROPRIATE PROTECTIVE CLOTHING.

SECTION IX - SPECIAL PROTECTION INFORMATION

Required Ventilation:

LOCAL VENTILATION IS RECOMMENDED TO CONTROL EXPOSURE FROM OPERATIONS THAT CAN GENERATE MISTS OR VAPORS.

Respiratory Protection:

A NIOSH/MSHA APPROVED RESPIRATOR IN POORLY VENTILATED AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV OR OSHA PEL OR WHERE MISTING EXISTS.

Glove Protection:

NEOPRENE OR NITRILE RUBBER GLOVES SHOULD BE WORN.

Eye Protection:

CHEMICAL GOGGLES AND A FACE SHIELD SHOULD BE WORN WHEN HANDLING.

Other Protection:

WEAR PROTECTIVE CLOTHING WHEN HANDLING.

SECTION X - STORAGE AND HANDLING INFORMATION

Storage Temperature: Indoors:X Outdoors: Heated: Refrigerated:

Minimum Temperature:35°F Maximum Temperature:120°F

Precautions to be taken in Handling and Storing:

ALWAYS STORE MATERIAL IN ITS ORIGINAL CONTAINER. KEEP THE CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. USE WITH CAUTION AROUND HEAT, SPARKS, PILOT LIGHTS, STATIC ELECTRICITY AND OPEN FLAME. EMPTY CONTAINERS MAY CONTAIN PRODUCT RESIDUES WHICH MAY EXHIBIT THE HAZARDS OF THE PRODUCT. TO AVOID POSSIBLE EXPLOSION DO NOT PRESSURIZE, CUT, WELD, SOLDER, DRILL, GRIND OR EXPOSE EMPTY CONTAINERS TO HEAT, HOT SURFACES, SPARKS OR OPEN FLAMES. GROUND AND BOND CONTAINER WHEN HANDLING NEAR FLAMMABLE VAPORS AND ALL SOURCES OF IGNITION.

Other Precautions:

KEEP OUT OF REACH OF CHILDREN. READ THE ENTIRE LABEL BEFORE USING THE PRODUCT. FOLLOW THE LABEL DIRECTIONS.

SECTION XI - REGULATORY INFORMATION

Chemical Name	CAS Number	Upper % Limit

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. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 2001.
2. OSHA PEL.
3. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, CCINFODisc, 2002.
4. PATTY'S INDUSTRIAL HYGIENE & TOXICOLOGY; VOLUME 2A, 2B, 2C; 3RD EDITION; 1981-1982.

ALL COMPONENTS IN THIS PRODUCT CAN BE FOUND IN THE CURRENT TSCA INVENTORY. ----------

IRR:IRRITANT, FLAM/FLAMM:FLAMMABLE, COMB:COMBUSTIBLE, CORR:CORROSIVE CARC:CARCINOGENIC, TOX:TOXIC, N/A:NOT APPLICABLE, N/E:NOT ESTABLISHED, COC:CLEVELAND OPEN CUP, PMCC:PENSKY-MARTIN CLOSED CUP, TCC:TAGLIABUE CLOSED CUP, LEL:LOWER EXPLOSION LIMIT, UEL:UPPER EXPLOSION LIMIT, NFPA:NATIONAL FIRE PROTECTION ASSOCIATION, IARC:INTERNATIONAL AGENCY FOR THE RESEARCH ON CANCER, NTP:NATIONAL TOXICOLOGY PROGRAM, OSHA:OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, ACGIH:AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, TLV:THRESHOLD LIMIT VALUE, PEL:PERMISSIBLE EXPOSURE LIMIT, STEL:SHORT-TERM EXPOSURE LIMIT, MLD:MILD, MOD:MODERATE, SEV:SEVERE, MUT:MUTAGENIC, ASPHYX:ASPHYXIANT, PNOS:PARTICULATES (INSOLUBLE) NOT OTHERWISE SPECIFIED, SDT:STANDARD DRAIZE TEST, ORL:ORAL, IHL:INHALATION, HMN:HUMAN

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.

CHEMAQUA, INC 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."

NALCO/EXXON
ENERGY CHEMICALS, L.P.

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCON® 7620-WB

EMERGENCY TELEPHONE NUMBER
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :	NALCON® 7620-WB
APPLICATION :	MICROORGANISM CONTROL CHEMICAL
CHEMICAL DESCRIPTION :	Methylene bis thiocyanate, Glycol, in aqueous solution
COMPANY IDENTIFICATION :	Nalco/Exxon Energy Chemicals, L.P. 180 - 3553 31 Street, N.W. Calgary, Ontario T2L 2K7
EMERGENCY TELEPHONE NUMBER :	(800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 3 / 3 FLAMMABILITY : 1 / 1 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Ethoxylated alcohol	41928-09-0	5.0 - 10.0
Ethylene Glycol	107-21-1	5.0 - 10.0
Methylenebisthiocyanate	6317-18-6	10.0

3. HAZARDS IDENTIFICATION

"EMERGENCY OVERVIEW"

DANGER
CORROSIVE. MAY BE HARMFUL OR FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN.
CAUSES SEVERE SKIN AND EYE DAMAGE.
Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Keep container closed when not in use.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin, Inhalation

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HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Corrosive. Will cause eye burns and permanent tissue damage.

SKIN CONTACT :
May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered.

INGESTION :
Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach. May be harmful or fatal if swallowed. Excessive exposure may cause central nervous system effects, nausea, vomiting, anesthetic or narcotic effects. Large quantities may cause kidney damage.

INHALATION :
Not a likely route of exposure. Irritating, in high concentrations, to the eyes, nose, throat and lungs.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

EYE CONTACT :
PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Immediately flush eye with water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

SKIN CONTACT :
Immediately flush with plenty of water for at least 15 minutes. For a large splash, flood body under a shower. Remove contaminated clothing. Wash off affected area immediately with plenty of water. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

INGESTION :
DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink. Get immediate medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. Get medical attention.

IF SWALLOWED: Feed gruel, or bread soaked in milk. Follow with milk or milk of magnesia or beaten eggs. CALL A PHYSICIAN.

IN CASE OF PERSONAL CONTACT: Remove excess material and flush skin or eyes with cold water for at least 15 minutes. FOR EYES: Get medical attention. Remove and wash contaminated clothing before reuse.

NOTE TO PHYSICIAN :
Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : > 212 °F / > 100 °C (PMCC)

EXTINGUISHING MEDIA :
Dry powder, Foam, Carbon dioxide, Other extinguishing agent suitable for Class B fires
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
This product is toxic to fish and other water organisms. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store the containers tightly closed. Store separately from oxidizers. Store in suitable labelled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

ACGIH/TLV :
Substance(s)

Ethylene Glycol	CEILING: 100 mg/m3

OSHA/PEL :
Substance(s)

Ethylene Glycol	CEILING: 50 ppm , 125 mg/m3

ENGINEERING MEASURES :
General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :
If significant mists, vapors or aerosols are generated an approved respirator is recommended. A dust, mist, fume cartridge may be used. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
Impervious gloves

SKIN PROTECTION :
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :
Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Moderate

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE Viscous liquid

APPEARANCE	White
ODOR	Pine

SPECIFIC GRAVITY	0.95 - 1.06
DENSITY	7.9 - 8.8 lb/gal
SOLUBILITY IN WATER	Partial
pH (100 %)	3.1 - 4.7
VISCOSITY	1,680 - 5,000 cps @ 75 °F /
FREEZING POINT	28 °F / -2 °C
POUR POINT	28 °F / -2 °C
VOC CONTENT	11.78 %

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

The following results are for the product.

ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	900 mg/kg	Product

Rating : Non-Hazardous

ACUTE DERMAL TOXICITY :

Species	LD50	Tested Substance
Rabbit	> 3,000 mg/kg	Product

Rating : Non-Hazardous

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ACUTE INHALATION TOXICITY :

Species	LC50	Tested Substance
Rat	2.30 mg/l (4 hrs)	Product

PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
8.0 / 8.0	Product

Rating : Extremely irritating (Corrosive)

PRIMARY EYE IRRITATION :

Draize Score	Tested Substance
110.0 / 110.0	Product

Rating : Extremely irritating (Corrosive)

CARCINOGENICITY :
Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence, or a different pattern of tumors when compared to untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce chromosomal breakage or mutagenic effects.

TERATOGENICITY :
Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations. A mouse inhalation study of 1000 mg/m3 and 2500 mg/m3 showed malformations in the offspring.

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Bluegill Sunfish	96 hrs	2.2 mg/l	Product
Rainbow Trout	96 hrs	1.7 mg/l	Product

Rating : Toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs	0.570 mg/l		Product

Rating : Very toxic

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: High

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Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Do not contaminate water, food or feed by storage or disposal. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law.

METAL CONTAINER: Triple rinse (or equivalent), then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. PLASTIC CONTAINER: Triple rinse (or equivalent), then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Ethoxylated alcohol : Irritant

Ethylene Glycol : Target Organ Effect - Kidney, Exposure Limit
Methylenebisthiocyanate : Corrosive to eyes

CERCLA/SUPERFUND, 40 CFR 117, 302 :
This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product.

RQ Substance	RQ
Ethylene Glycol	71,400 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

Hazardous Substance(s)	CAS NO	% (w/w)
Ethylene Glycol	107-21-1	5.0 - 10.0

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

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CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
This product contains the following substances listed in the regulation:

Substance(s)	Citations
Ethylene Glycol :	Sec. 111, Sec. 112

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
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 CPR.

WHMIS CLASSIFICATION :
Pesticide controlled products are not regulated under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Moderate

* The environmental risk is: High

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should

COPPOR00001102

be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 11/18/1998
Replaces : 12/03/1997

MATERIAL SAFETY DATA SHEET

HAZARD RATINGS HMIS
Health 0
Flammability 1
Reactivity 0
PPE X

BOSTIK FINDLEY

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product	**V170950**
MSDS Name	NEVER-SEEZ LITHIUM EP GREASE
CAS #	Mixture
Generic Description	Anti-Seize Compound
Manufacturer	BOSTIK FINDLEY, INC. 211 Boston Street Middleton , MA 01949 USA

24 Hour Emergency Assistance
Phone: 1-800-227-0332

General Assistance
Phone: 1-978-777-0100

MSDS Assistance
Phone: 1-978-777-0100

2 COMPOSITION / INFORMATION ON INGREDIENTS

No hazardous ingredients as per 29 CFR 1910.1200.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Extended contact with this material may cause irritation to the skin, eyes, and mucous membranes. Primary Routes of Exposure: eyes, skin, and inhalation. Irritating fumes and gases may be released upon thermal processing or during combustion.

POTENTIAL HEALTH EFFECTS

SKIN CONTACT: This product may cause irritation to the skin. Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

EYE CONTACT: This product may cause irritation to the eyes.

INHALATION: Fumes released during thermal processing may irritate respiratory system, skin and eyes.

INGESTION: Ingestion may cause gastrointestinal tract discomfort or damage.

TARGET ORGANS

Skin.

4 FIRST AID MEASURES

SKIN

For minor exposures, wash thoroughly with soap and clean water. In situations involving considerable skin contact, place the contaminated person in a deluge shower for at least 15 minutes. Remove contaminated clothing to prevent further skin exposure and dispose of properly. Get medical attention if irritation persists.

EYE

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

INHALATION

Move person to non-contaminated air. If the affected person is not breathing, apply artificial respiration. Seek medical attention.

INGESTION

Do not induce vomiting. If person is conscious and can swallow, immediately give two glasses of water. Seek immediate medical attention. Do not give anything by mouth to an unconscious or convulsing person.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Dermatitis.

NOTES TO PHYSICIAN

Treat symptomatically and supportively. Contact Bostik Findley to determine whether any additional information is available.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Use dry chemical, carbon dioxide, or foam. Water spray (fog).

DUST EXPLOSION HAZARD

None Known

SENSITIVITY TO MECHANICAL IMPACT

None Known

SENSITIVITY TO STATIC DISCHARGE

None Known

UNUSUAL FIRE & EXPLOSION HAZARDS

Product may burn and produce toxic gases in a fire.

FIRE FIGHTING EQUIPMENT/INSTRUCTIONS

Firefighters should wear full protective clothing including self contained breathing apparatus.

Flash Point > 482 F (> 250 C)

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Appropriate safety measures and protective equipment should be used. See Section 8. Do not discharge to lakes, streams, ponds, or sewers. Dispose of in compliance with local, state, and federal regulations.

SPILL OR LEAK PROCEDURE

Scrape up grease and deposit into appropriate containers for disposal.

CLEAN-UP PROCEDURES

Scrape up the spilled material. Deposit into appropriate containers for disposal. Follow the guidelines of 29CFR 1910.120 for dealing with a spill of any size. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill, including the material spilled, the quantity of the spill and the area in which the spill occurred. Wear appropriate protective equipment and clothing during clean-up.

7 HANDLING & STORAGE

STORAGE

Keep the container tightly closed and in a cool, well-ventilated place.

EMPTY CONTAINER PRECAUTION

Attention! Follow label warnings even after container is emptied since empty containers may retain product residues. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption, or where skin contact can occur.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation is not normally required.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear safety glasses with side shields.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear protective impervious gloves to minimize skin exposure. Work clothing sufficient to prevent all skin contact should be worn, such as coveralls and long sleeves.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Not normally needed.

9 PHYSICAL & CHEMICAL PROPERTIES

Solubility In Water	< 0.1
Target Solids	100 %
Density	0.9 g/cc
Odor Threshold	NA
Octanol/Water Coefficient	NA
Odor	Grease-like
Physical State	Paste
Freeze Protect	No

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Stable under normal conditions.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

If product is burned hazardous gases such as oxides of carbon and nitrogen and various hydrocarbons may be produced.

HAZARDOUS POLYMERIZATION

Will not occur.

CONDITIONS TO AVOID

Avoid contact with Strong Oxidizers and Strong Acids.

11 TOXICOLOGICAL INFORMATION

CHRONIC EFFECTS

Chronic overexposure to the hazardous materials in this product has been associated with dermatitis.

12 ECOLOGICAL INFORMATION

VOC (Volatile Organic Compounds) 0 lb/gal

ECOTOXICOLOGICAL INFORMATION

No data available for this product.

13 DISPOSAL CONSIDERATIONS

We make no guarantee or warranty of any kind that the use or disposal of this product complies with all local, state, or federal laws. It is also the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.

WASTE DISPOSAL

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. Be aware that State and Local requirements may differ widely depending on location and may in many cases be different from Federal rules.

14 TRANSPORT INFORMATION

COMMENTS

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations.

Proper Shipping Name	Non-Regulated
DOT Restrictions	Not Applicable

15 REGULATORY INFORMATION

This MSDS is prepared and distributed pursuant to the Federal Hazard Communication Standard, 29 CFR 1910.1200.

FEDERAL REGULATIONS

All components are on the U.S. EPA TSCA Inventory List.

STATE REGULATIONS

If this product contains any ingredients listed under California Proposition 65, they will be noted below:

INTERNATIONAL REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and contains all the information required by the Controlled Products Regulations.

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS). Class D Division 2 Sub-division B.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES

Not Regulated

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard	No
Delayed Hazard	No
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No

SARA 313 TOXIC CHEMICALS

Not Regulated

16 OTHER INFORMATION

DISCLAIMER

The data in this MSDS has been compiled from publicly available sources. This data relates only to the designated product and not to the use of said product in combination with other materials. 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 which exist. Responsibility for proper precautions and safe use of the product lies with the user. All data in this MSDS is typical of the product as a whole, and does not represent any individual lot or batch, therefore, Bostik Findley, Inc. makes no warranty about the accuracy of the data herein and assumes no liability for the use of such data. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Issue Date 20-Feb-2002 **Supercedes** New

Prepared By Russell Hardenber

MATERIAL SAFETY DATA SHEET

BOSTIK FINDLEY

HAZARD RATINGS HMIS
Health 1
Flammability 1
Reactivity 0
PPE X

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product V057701

MSDS Name NEV-SZ REG NSBT16 1

CAS # Mixture

Generic Description Miscellaneous

Manufacturer BOSTIK FINDLEY, INC.
211 Boston Street
Middleton , MA 01949 USA

24 Hour Emergency Assistance
Phone: 1-800-227-0332

General Assistance
Phone: 1-978-777-0100

MSDS Assistance
Phone: 1-978-777-0100

2 COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number	Percentage
Graphite	7782-42-5	10 - 30
Copper Powder	7440-50-8	5 - 10
Zinc Oxide	1314-13-2	1 - 3
Aluminum Powder	7429-90-5	1 - 3
Non-hazardous and other ingredients below reportable levels	Proprietary	Balance

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Extended contact with this material may cause irritation to the skin, eyes, and mucous membranes. Primary Routes of Exposure: eyes, skin, and inhalation. Irritating fumes and gases may be released upon thermal processing or during combustion.

POTENTIAL HEALTH EFFECTS

SKIN CONTACT: This product may cause irritation to the skin. Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

EYE CONTACT: This product may cause irritation to the eyes.

INHALATION: Fumes released during thermal processing may irritate respiratory system, skin and eyes.

INGESTION: Ingestion may cause gastrointestinal tract discomfort or damage.

TARGET ORGANS

Skin.

4 FIRST AID MEASURES

SKIN

For minor exposures, wash thoroughly with soap and clean water. In situations involving considerable skin contact, place the contaminated person in a deluge shower for at least 15 minutes. Remove contaminated clothing to prevent further skin exposure and dispose of properly. Get medical attention if irritation persists.

EYE

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

INHALATION

Move person to non-contaminated air. If the affected person is not breathing, apply artificial respiration. Seek medical attention.

INGESTION

Do not induce vomiting. If person is conscious and can swallow, immediately give two glasses of water. Seek immediate medical attention. Do not give anything by month to an unconscious or convulsing person.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Dermatitis.

NOTES TO PHYSICIAN

Treat symptomatically and supportively. Contact Bostik Findley to determine whether any additional information is available.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Use dry chemical, carbon dioxide, or foam. Water spray (fog).

DUST EXPLOSION HAZARD

None Known

SENSITIVITY TO MECHANICAL IMPACT

None Known

SENSITIVITY TO STATIC DISCHARGE

None Known

UNUSUAL FIRE & EXPLOSION HAZARDS

Product may burn and produce toxic gases in a fire.

FIRE FIGHTING EQUIPMENT/INSTRUCTIONS

Firefighters should wear full protective clothing including self contained breathing apparatus.

Flash Point > 482 F (> 250 C)

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Appropriate safety measures and protective equipment should be used. See Section 8. Do not discharge to lakes, streams, ponds, or sewers. Dispose of in compliance with local, state, and federal regulations.

SPILL OR LEAK PROCEDURE

Scrape up grease and deposit into appropriate containers for disposal.

CLEAN-UP PROCEDURES

Scrape up the spilled material. Deposit into appropriate containers for disposal. Follow the guidelines of 29CFR 1910.120 for dealing with a spill of any size. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill, including the material spilled, the quantity of the spill and the area in which the spill occurred. Wear appropriate protective equipment and clothing during clean-up.

7 HANDLING & STORAGE

STORAGE

Keep the container tightly closed and in a cool, well-ventilated place.

EMPTY CONTAINER PRECAUTION

Attention! Follow label warnings even after container is emptied since empty containers may retain product residues. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption, or where skin contact can occur.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation is not normally required.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear safety glasses with side shields.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear protective impervious gloves to minimize skin exposure. Work clothing sufficient to prevent all skin contact should be worn, such as coveralls and long sleeves.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Not normally needed.

EXPOSURE LIMITS

ACGIH - Occupational Exposure Limits - 8 Hour TWAs

COPPER	7440-50-8	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dusts and mists, as Cu)
ZINC OXIDE	1314-13-2	5 mg/m3 TWA (fume); 10 mg/m3 TWA (dust)

OSHA - Vacated PELs - Time Weighted Averages

COPPER	7440-50-8	0.1 mg/m3 TWA (fume, dusts, mists as Cu)
ZINC OXIDE	1314-13-2	5 mg/m3 TWA (fume); 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

9 PHYSICAL & CHEMICAL PROPERTIES

Solubility In Water	0.1 %
Target Solids	100 %
Density	1.21 g/cc
Odor Threshold	NA
Octanol/Water Coefficient	NA
Odor	Hydrocarbon
Color	Gray-Black
Physical State	Paste
Freeze Protect	No

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Stable under normal conditions.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

If product is burned hazardous gases such as oxides of carbon and nitrogen and various hydrocarbons may be produced.

HAZARDOUS POLYMERIZATION

Will not occur.

CONDITIONS TO AVOID

Avoid contact with Strong Oxidizers and Strong Acids.

11 TOXICOLOGICAL INFORMATION

LD50

NIOSH - Selected LD50s and LC50s

ZINC OXIDE	1314-13-2	Inhalation LC50 Mouse: 2500 mg/m3; Oral LD50 Mouse: 7950 mg/kg

CHRONIC EFFECTS

Chronic overexposure to the hazardous materials in this product has been associated with dermatitis.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available for this product.

13 DISPOSAL CONSIDERATIONS

We make no guarantee or warranty of any kind that the use or disposal of this product complies with all local, state, or federal laws. It is also the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.

WASTE DISPOSAL

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. Be aware that State and Local requirements may differ widely depending on location and may in many cases be different from Federal rules.

14 TRANSPORT INFORMATION

COMMENTS

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations. This product is regulated under IMDG Classification for Ocean Transport as an environmentally hazardous substance, liquid, n.o.s. (contains copper metal powder), class 9, UN3082, PG III, Marine Pollutant.

Proper Shipping Name	Non-Regulated
DOT Restrictions	Not Applicable

15 REGULATORY INFORMATION

This MSDS is prepared and distributed pursuant to the Federal Hazard Communication Standard, 29 CFR 1910.1200.

FEDERAL REGULATIONS

All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA - Hazardous Substances and their Reportable Quantities

COPPER	7440-50-8	final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)
ZINC OXIDE	1314-13-2	statutory RQ = 1 pound (0.454 kg)

Based on an evaluation of the components used, this product does contain hazardous ingredients identified as per 29 CFR 1910.1200.

STATE REGULATIONS

If this product contains any ingredients listed under California Proposition 65, they will be noted below:

INTERNATIONAL REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and contains all the information required by the Controlled Products Regulations.

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS). Class D Division 2 Sub-division B.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES

Not Regulated

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard	No
Delayed Hazard	No
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No

SARA 313 TOXIC CHEMICALS

Component	CAS Number	Percentage
Copper Powder	7440-50-8	5 - 10
Zinc Oxide	1314-13-2	1 - 3
Aluminum Powder	7429-90-5	1 - 3

16 OTHER INFORMATION

DISCLAIMER

The data in this MSDS has been compiled from publicly available sources. This data relates only to the designated product and not to the use of said product in combination with other materials. 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 which exist. Responsibility for proper precautions and safe use of the product lies with the user. All data in this MSDS is typical of the product as a whole, and does not represent any individual lot or batch, therefore, Bostik Findley, Inc. makes no warranty about the accuracy of the data herein and assumes no liability for the use of such data. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Issue Date 10-Jul-2002 **Supercedes** 06-Nov-2001

Prepared By Russell Hardenber

MSDS Sections Reviewed and/or Updated

Composition / Information on Ingredients: COMPOSITION COMMENTS

Composition / Information on Ingredients: CONDITIONAL DEFAULT STATEMENTS

ChemProducts

FILE NO.:
MSDS DATE: / /

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: n-Hexane
SYNONYMS: Hexane; Normal hexane; Hexanes
PRODUCT CODES: H0285

MANUFACTURER: ChemProducts, Inc.
ADDRESS: 6310 SW Virginia Avenue Portland OR 97201

CHEMTREC PHONE: 800-424-9300

CHEMICAL NAME: Hexane
CHEMICAL FAMILY: Aliphatic hydrocarbon
CHEMICAL FORMULA: C_6H_{14}

REVISION DATE: 7Dec99

SECTION 2: HAZARDOUS INGREDIENTS OF MATERIALS

INGREDIENTS	%	TLV UNITS	CAS NO.
n-Hexane	.85	50 ppm	110-54-3
Methylpentanes, may include 2-methylpentane	<5	500 ppm	107-83-5
Methylcyclopentane	<10	Not established	96-37-7

SECTION 3: PHYSICAL DATA

PHYSICAL STATE: Liquid

ODOR AND APPEARANCE: Clear, colorless volatile liquid, gasoline-like odor

ODOR THRESHOLD (ppm): 64-244 ppm. Poor warning properties, odor threshold exceeds TLV.

VAPOR PRESSURE (mm Hg): 124 mm Hg at 20°C

EVAPORATION RATE (Ethyl ether=1): 0.3

BOILING POINT (°C): 67-69°C

FREEZING POINT (°C): -95°C

pH: Not applicable.

SPECIFIC GRAVITY: 0.66 to 20°C

COEFFICIENT OF WATER/OIL DISTRIBUTION: LogP(oct) = 3.6

SECTION 4: SHIPPING DESCRIPTIONS

UN: 1208

T.D.G. CLASS: 3.1

PKG. GROUP: II

SECTION 5: REACTIVITY DATA

CHEMICAL STABILITY: Stable

INCOMPATIBILITY WITH OTHER SUBSTANCES: Reacts vigorously with chlorine, oxygen and strong oxidizing agents (peroxides, nitrates, perchlorates), increasing risk of fire and explosion. Explodes violently in contact with fluorine. May explode with nitrogen tetroxide. Not corrosive to most metals. May attack some forms of plastic, rubber, and coatings.

REACTIVITY: Avoid heat, sparks, open flame, and all ignition sources. Avoid incompatible materials. Avoid generation of mist. Confined materials may explode upon heating.

HAZARDOUS DECOMPOSITION PRODUCTS: Cox

SECTION 6: FIRE AND EXPLOSION DATA

FLAMMABILITY: Flammable. Readily ignited in most ambient conditions. Vapor is heavier than air and may "flash back" to an ignition source.

EXTINGUISHING MEDIA: Dry chemical, foam, or carbon dioxide. Water may be used to cool containers, disperse vapors, and flush spilled material away from ignition source, but is not suitable for extinguishing fire involving this material. Firefighters must wear protective equipment and clothing sufficient to prevent inhalation of mist or fumes, and contact with skin and eyes.

FLASH POINT (METHOD USED): -21°C (TCC)

AUTOIGNITION TEMPERATURE: 225°C

UPPER FLAMMABLE LIMIT (% BY VOLUME): 7.5

LOWER FLAMMABLE LIMIT (% BY VOLUME): 1.1

HAZARDOUS COMBUSTION PRODUCTS: COx

SENSITIVITY TO IMPACT: Probably not sensitive.

SENSITIVITY TO STATIC DISCHARGE: Vapor is readily ignited by static discharge. Liquid can accumulate static charge by flow or agitation.

SECTION 7: TOXICOLOGICAL PROPERTIES AND HEALTH DATA

LD50: (rat, oral) 28,710 mg/kg; (dermal, rabbit) >2 g/kg

LC50: (inh, mouse) 35,000 ppm/1h

EFFECTS OF ACUTE EXPOSURE TO PRODUCT

INHALED: 10 minute exposure at 1,500 ppm can cause irritation of respiratory tract, nausea, and headache; 10 minutes at 5,000 ppm can cause dizziness, drowsiness. Massive exposures can cause central nervous system depression, unconsciousness and death.

IN CONTACT WITH SKIN: May cause irritation, burning sensation, reddenning. May be absorbed through skin in harmful amounts.

IN CONTACT WITH EYES: Vapor and liquid may cause irritation and pain.

INGESTED: May cause burning sensation in the mouth and throat, nausea, and vomiting. Probably low oral toxicity. However, may be aspirated into the lungs during ingestion or vomiting, which can cause pulmonary edema, chemical pneumonitis, and death.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT

Causes harm to the nervous system producing numbness or tingling in the extremities, spasms in the legs, tiredness, muscle weakness and more severe nerve damage. Peripheral neuropathy developed within 7 months in mice at 250 ppm. Methyl pentanes have produced kidney damage in male rats only, but no comparable health hazard for kidney disease is known to occur in humans. Prolonged skin contact can cause dermatitis. Abnormal color perception and pigment changes in the eyes have been reported in workers exposed to 423 to 1,280 ppm for five years or more. Mild forms of anemia have been associated with exposure – reversible on termination of exposure.

CARCINOGENICITY: Not carcinogenic in animal tests.

TERATOGENICITY: Has shown teratogenic effects in animal testing (RTECS No. MN 9275000).

REPRODUCTIVE EFFECTS: Testicular damage in male rats at concentrations that produced other toxicity. No human information available.

MUTAGENICITY: No human information available. Mutagenic in testing with rats; negative in some cell testing.

SYNERGISTIC PRODUCTS: Neurotoxic and respiratory effects enhanced by both methyl ethyl ketone and lead acetate, but decreased by toluene.

SECTION 8: PREVENTIVE MEASURES

ENGINEERING CONTROLS: [redacted]

RESPIRATORY PROTECTION: Dust/mist mask [redacted] To 500 ppm: NIOSH/MSHA approved supplied-air respirator or self-contained breathing apparatus. To 1,100 ppm: supplied-air respirator in continuous flow mode. Higher or unknown concentrations, as in fire or spill conditions, full-face-piece positive-pressure self-contained breathing apparatus or positive pressure, full face-piece air-supplied respirator with an auxiliary positive pressure self-contained breathing apparatus.

EYE PROTECTION: [redacted] and/or face shield.

SKIN PROTECTION: [redacted] polyvinyl alcohol, Viton, Teflon, 4H, CPF3, TrelichemHPS, Tychem 10000 gloves. Other impervious or resistant protective clothing sufficient to prevent contact.

OTHER PERSONAL PROTECTIVE EQUIPMENT: Safety shower and eye wash in work area.

LEAK AND SPILL PROCEDURE: Evacuate area. Eliminate all sources of ignition. Provide maximum ventilation. Cleanup personnel must be thoroughly trained in the hazards of this material and must wear protective equipment and clothing sufficient to prevent inhalation of vapors or mists, and contact with skin, eyes or clothing. Contain spill and collect using inert absorbent material. Prevent from entering sewers or waterways. Do not touch spilled material or contaminated absorbent. Contaminated absorbent may pose the same hazards as the chemical; treat with caution. Flush area of spill with copious amounts of running water.

WASTE DISPOSAL: All waste material should be packaged, labelled, transported and disposed of in accordance with federal, provincial, and local regulations.

HANDLING PROCEDURES AND EQUIPMENT: Workers handling this material must be thoroughly trained in its hazards and its safe use. Keep away from heat, sparks and open flame. Post "No Smoking" signs. Bond and ground containers during liquid transfer. Use non-sparking ventilation systems and electrical equipment. Avoid generating mist. Use the smallest amount possible for the purpose in an area with adequate ventilation. Treat empty containers with caution; they may contain hazardous residues.

STORAGE REQUIREMENTS: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight, and away from heat and ignition sources, and all incompatible materials. Protect from damage. Keep containers tightly closed when not in use. Inspect regularly for leaks or damage. Storage facilities should be made of fire resistant material, and have raised sills or ramps, with trenching to a safe area.

SECTION 9: FIRST AID MEASURES

SPECIFIC MEASURES

EYES: IMMEDIATELY FLUSH eyes with warm running water for at least twenty (20) minutes, holding eyelides open while flushing. Repeat flushing if irritation persists. Obtain MEDICAL ADVICE immediately.

SKIN: Remove contaminated clothing (including rings, watches, belts and shoes). Immediately flush exposed area with warm running water for at least twenty (20) minutes. Get medical advice immediately. Decontaminate clothing before reuse.

INHALATION: IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Eliminate ignition sources. Give oxygen for breathing difficulty. If breathing has STOPPED give artificial respiration. If breathing AND PULSE are absent, give CPR. IMMEDIATELY OBTAIN MEDICAL ATTENTION. Stay with casualty until medical assistance is reached.

INGESTION: DO NOT INDUCE VOMITING. DANGER OF ASPIRATION WITH EMESIS. If casualty is alert and not convulsing, rinse out mouth with water. Give 2 to 4 glasses of water to dilute material. IMMEDIATELY GET MEDICAL ATTENTION. If spontaneous vomiting occurs have casualty lean forward with head down to avoid breathing in of vomitus.

ChemProducts believes that the information herein is factual but it is not intended to be all inclusive. The information relates only to the specific Material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change because ChemProducts has no continuing control over the Material, those handling, storing or using the Material should satisfy themselves that they have current information regarding the particular way the Material is handled, stored and used and that the same is done in accordance with federal, state and local law. CHEMPRODUCTS MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE.

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Nitrogen, compressed (MSDS No. P-4631-G)	**Trade Name:** Nitrogen, Medipure™ Nitrogen
Chemical Name: Nitrogen	**Synonyms:** Dinitrogen
Formula: N_2	**Chemical Family:** Permanent gas
Telephone: **Emergencies:** 1-800-645-4633* **CHEMTREC:** 1-800-424-9300* **Routine:** 1-800-PRAXAIR	**Company Name:** Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

* *Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Nitrogen	7727-37-9	>99%*	None currently established	Simple asphyxiant

* *The symbol > means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! High-pressure gas.
Can cause rapid suffocation.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: TLV-TWA, simple asphyxiant (ACGIH, 2004). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

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EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

SKIN CONTACT–No harm expected.

SWALLOWING–An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT–No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Asphyxiant. Lack of oxygen can kill.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of nitrogen suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: Nitrogen is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Flush with water. If discomfort persists, seek medical attention.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: Flush eyes thoroughly with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. If discomfort persists, seek medical attention.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable	**UPPER:** Not applicable

EXTINGUISHING MEDIA: Nitrogen cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! High-pressure gas. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Shut off flow if you can do so without risk. Self-contained breathing apparatus may be required by rescue workers. (See section 16.) On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Nitrogen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! High-pressure gas. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using nitrogen, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers,* available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to prevent oxygen deficiency.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: None required under normal use. Air-supplied respirators must be used in confined spaces or in an oxygen-deficient atmosphere. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select in accordance with 29 CFR 1910.134 and ANSI Z88.2.

SKIN PROTECTION: Wear work gloves when handling cylinders.

EYE PROTECTION: Wear safety glasses when handling cylinders. Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	28.01
SPECIFIC GRAVITY (air = 1) at 70°F (21.1°C) and 1 atm:	0.967
GAS DENSITY at 70°F (21.1°C) and 1 atm:	0.072 lb/ft^3 (1.153 kg/m^3)
SOLUBILITY IN WATER, vol/vol at 32°F (0°C) and 1 atm:	0.023
PERCENT VOLATILES BY VOLUME:	100
BOILING POINT at 1 atm:	-320.44°F (-195.80°C)
MELTING POINT at 1 atm:	-345.8°F (-209.9°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, tasteless gas at normal temperature and pressure.

10. Stability and Reactivity

STABILITY: ☐ Unstable ☒ Stable

INCOMPATIBILITY (materials to avoid): None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: ☐ May Occur ☒ Will Not Occur

CONDITIONS TO AVOID: Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium [above 1472°F (800°C)], and magnesium to form nitrides. At high temperature it can also combine with oxygen and hydrogen.

11. Toxicological Information

Nitrogen is a simple asphyxiant.

12. Ecological Information

No adverse ecological effects expected. Nitrogen does not contain any Class I or Class II ozone-depleting chemicals. Nitrogen is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure cylinder in a well-ventilated area or outdoors, and then slowly discharge gas to the atmosphere.

14. Transport Information

DOT/IMO SHIPPING NAME: Nitrogen, compressed

HAZARD CLASS: 2.2	**IDENTIFICATION NUMBER:** UN 1066	**PRODUCT RQ:** None
SHIPPING LABEL(s):	NONFLAMMABLE GAS	
PLACARD (when required):	NONFLAMMABLE GAS	

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ: None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No	**PRESSURE:** Yes
DELAYED: No	**REACTIVITY:** No
	FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Nitrogen does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Nitrogen is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Nitrogen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Nitrogen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Nitrogen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

NOTE: The suitability of nitrogen as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: ***High-pressure gas.*** Use piping and equipment adequately designed to withstand pressures to be encountered. ***Gas can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH	= 0	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= SA (CGA recommends this to designate Simple Asphyxiant.)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA-580
	3001-5500 psig	CGA-680
	5001-7500 psig	CGA-677
PIN-INDEXED YOKE:	0-3000 psig	CGA-960 (medical use)
ULTRA-HIGH-INTEGRITY CONNECTION:	0-3000 psig	CGA-718

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
G-10.1	*Commodity Specification for Nitrogen*
P-1	*Safe Handling of Compressed Gases in Containers*
P-9	*Inert Gases – Argon, Nitrogen, and Helium*
SB-2	*Oxygen-Deficient Atmospheres*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

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PRAXAIR.

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

Printed in USA

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Nitrogen, compressed (MSDS No. P-4631-G)	**Trade Name:** Nitrogen, Medipure™ Nitrogen
Chemical Name: Nitrogen	**Synonyms:** Dinitrogen
Formula: N_2	**Chemical Family:** Permanent gas
Telephone: **Emergencies:** 1-800-645-4633* **CHEMTREC:** 1-800-424-9300* **Routine:** 1-800-PRAXAIR	**Company Name:** Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

* *Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Nitrogen	7727-37-9	>99%*	None currently established	Simple asphyxiant

* *The symbol > means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! High-pressure gas.
Can cause rapid suffocation.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: TLV-TWA, simple asphyxiant (ACGIH, 2004). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

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EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

SKIN CONTACT–No harm expected.

SWALLOWING–An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT–No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Asphyxiant. Lack of oxygen can kill.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of nitrogen suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: Nitrogen is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Flush with water. If discomfort persists, seek medical attention.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: Flush eyes thoroughly with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. If discomfort persists, seek medical attention.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable	**UPPER:** Not applicable

EXTINGUISHING MEDIA: Nitrogen cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! High-pressure gas. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Shut off flow if you can do so without risk. Self-contained breathing apparatus may be required by rescue workers. (See section 16.) On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Nitrogen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! High-pressure gas. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using nitrogen, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to prevent oxygen deficiency.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: None required under normal use. Air-supplied respirators must be used in confined spaces or in an oxygen-deficient atmosphere. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select in accordance with 29 CFR 1910.134 and ANSI Z88.2.

SKIN PROTECTION: Wear work gloves when handling cylinders.

EYE PROTECTION: Wear safety glasses when handling cylinders. Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	28.01
SPECIFIC GRAVITY (air = 1) at 70°F (21.1°C) and 1 atm:	0.967
GAS DENSITY at 70°F (21.1°C) and 1 atm:	0.072 lb/ft^3 (1.153 kg/m^3)
SOLUBILITY IN WATER, vol/vol at 32°F (0°C) and 1 atm:	0.023
PERCENT VOLATILES BY VOLUME:	100
BOILING POINT at 1 atm:	-320.44°F (-195.80°C)
MELTING POINT at 1 atm:	-345.8°F (-209.9°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, tasteless gas at normal temperature and pressure.

10. Stability and Reactivity

STABILITY: ☐ Unstable ☒ Stable

INCOMPATIBILITY (materials to avoid): None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: ☐ May Occur ☒ Will Not Occur

CONDITIONS TO AVOID: Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium [above 1472°F (800°C)], and magnesium to form nitrides. At high temperature it can also combine with oxygen and hydrogen.

11. Toxicological Information

Nitrogen is a simple asphyxiant.

12. Ecological Information

No adverse ecological effects expected. Nitrogen does not contain any Class I or Class II ozone-depleting chemicals. Nitrogen is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure cylinder in a well-ventilated area or outdoors, and then slowly discharge gas to the atmosphere.

14. Transport Information

DOT/IMO SHIPPING NAME: Nitrogen, compressed

HAZARD CLASS: 2.2	**IDENTIFICATION NUMBER:** UN 1066	**PRODUCT RQ:** None
SHIPPING LABEL(s):	NONFLAMMABLE GAS	
PLACARD (when required):	NONFLAMMABLE GAS	

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ: None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No
DELAYED: No
PRESSURE: Yes
REACTIVITY: No
FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Nitrogen does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Nitrogen is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Nitrogen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Nitrogen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Nitrogen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

NOTE: *The suitability of nitrogen as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.*

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: ***High-pressure gas.*** Use piping and equipment adequately designed to withstand pressures to be encountered. ***Gas can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH	= 0	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= SA (CGA recommends this to designate Simple Asphyxiant.)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA-580
	3001-5500 psig	CGA-680
	5001-7500 psig	CGA-677
PIN-INDEXED YOKE:	0-3000 psig	CGA-960 (medical use)
ULTRA-HIGH-INTEGRITY CONNECTION:	0-3000 psig	CGA-718

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
G-10.1	*Commodity Specification for Nitrogen*
P-1	*Safe Handling of Compressed Gases in Containers*
P-9	*Inert Gases – Argon, Nitrogen, and Helium*
SB-2	*Oxygen-Deficient Atmospheres*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

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PRAXAIR®

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

Printed in USA

ConocoPhillips

No. 1 Diesel Fuel

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 1 Diesel Fuel

MSDS Code: 001929

Synonyms: Diesel Fuel No. 1
No. 1 Diesel, Ultra Low Sulfur, Dyed and Undyed
No. 1 High Sulfur Diesel - Dyed
No. 1 High Sulfur Distillate
No. 1 Low Sulfur Diesel - Dyed
No. 1 Low Sulfur Distillate

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

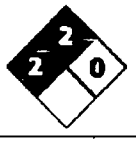
Emergency Telephone Numbers: Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!
Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard

NFPA



Appearance: Clear, light yellow, or light green (may be dyed red)
Physical Form: Liquid
Odor: Kerosene

Potential Health Effects

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

Skin: Skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation).No harmful effects from skin absorption are expected.

Inhalation (Breathing): Expected to have a low degree of toxicity by inhalation.

Ingestion (Swallowing): No harmful effects expected from 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 respiratory tract, irritation of the digestive tract, nausea, vomiting, pneumonitis (inflammation of the lungs), signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, respiratory (asthma-like) disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Hydrodesulfurized Kerosene ..C9-16	64742-81-0	0-100
Hydrotreated Distillate, Light ..C9-16	64742-47-8	0-100
Kerosene ..C9-16	8008-20-6	0-100

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, 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. 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

NFPA 704 Hazard Class

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

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. 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Spill precautions: 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).

Environmental precautions: 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 absorbent material.

Methods for cleaning up: 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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 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.

"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.

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Hydrodesulfurized Kerosene ..C9-16	TWA: 200 mg/m^3 Skin	—	—
Hydrotreated Distillate, Light ..C9-16	TWA: 200 mg/m^3 Skin based on Kerosene 8008-20-6	—	—
Kerosene ..C9-16	TWA: 200 mg/m^3 Skin	—	—

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.

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of nitrile 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, nitrile apron and/or arm covers may be necessary.

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an oxygen-deficient atmosphere, 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Clear, light yellow, or light green (may be dyed red)
Physical Form:	Liquid
Odor:	Kerosene
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40 mmHg
Vapor Density (air=1):	> 4.5
Boiling Point/Range:	300-572°F / 149-300°C
Melting/Freezing Point:	<-40°F / <-40°C
Solubility in Water:	<0.1%
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.775-0.840 @ 68°F (20°C)
Bulk Density:	6.73 lbs/gal
Viscosity:	1-2.4 cSt @ 40°C
VOC Content(%):	0.16 lb/1000 gal
Percent Volatile:	98-100% @ 545°F (285°C)
Evaporation Rate (nBuAc=1):	<1
Flash Point:	100-150°F / 38-66°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	0.7
UEL (vol % in air):	7.0
Autoignition Temperature:	410°F / 210°C

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): strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc..

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides. The use of hydrocarbon fuel 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.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Hydrodesulfurized Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Reproductive: Skin application in female rats at 494, 330, or 165 mg/kg daily for 7 consecutive weeks (premating, mating, and gestation), or for 8 consecutive weeks in males did not result in systemic, reproductive, or developmental toxicity.

Hydrotreated Distillate, Light ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Hydrodesulfurized Kerosene ..C9-16	>5 g/kg (Rat) based on Kerosene	>=2 g/kg (Rabbit)	>5 mg/L (4-hr., Rat)
Hydrotreated Distillate, Light ..C9-16	> 5g/kg (Rat) based on Kerosene	>2g/kg (Rabbit)	>5mg/L (4-hr., Rat)
Kerosene ..C9-16	>5 g/kg (Rat)	>2,000 mg/kg (Rabbit)	>5000 ppm (rat)

12. ECOLOGICAL INFORMATION

When No 1 distillates (kerosene, jet fuels, heating oils) escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with jet fuel can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of kerosenes and jet fuels are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of jet fuel. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled jet fuel. Direct toxicity and fouling of sea birds from jet fuel can occur if birds dive through floating layers of spilled fuel.

Phytotoxic effects of jet fuel have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in jet fuels.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Diesel fuel, Combustible liquid, NA1993, III
Non-Bulk Package Marking:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking:	Combustible/1993
Packaging - References:	None; none; 49 CFR 173.241 ***(Exceptions; Non-bulk; Bulk)***
Emergency Response Guide:	128
Note:	***May also be shipped as:*** Diesel fuel, Combustible liquid, UN1202, III ***Bulk Pakcage/Placard Marking would also be changed to:*** 1202

International Maritime Dangerous Goods (IMDG)

Shipping Description:	***Not regulated if flashpoint is >60° C closed-cup*** UN1202, Diesel fuel, 3, III , (FP° C), *where FP is the material's flash point in degrees C.*
Non-Bulk Package Marking:	Diesel fuel, UN1202
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable/1202
Packaging - Non-Bulk:	P001, LP01
EMS:	F-E, S-E
Note:	***May also replace*** Diesel fuel ***with*** Gas Oil ***or*** Heating Oil, light ***as the Shipping Name***

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

UN/ID #:	***Not regulated if flashpoint is >60° C cc*** UN1202
Proper Shipping Name:	Diesel fuel
Hazard Class/Division:	3
Packing Group:	III
Non-Bulk Package Marking:	Diesel fuel, UN1202
Labels:	Flammable liquid
ERG Code:	3L

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Naphthalene	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 CPR.

WHMIS Hazard Class
B3 - Combustible Liquids
D2B - Toxic Material

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

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	20-Mar-2007
Status:	Final
Product Code:	Multiple
Revised Sections or Basis for Revision:	Format change
MSDS Code:	001929

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

ConocoPhillips

No. 1 Heating Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	No. 1 Heating Oil
MSDS Code:	724220
Synonyms:	No. 1 Distillate No. 1 Fuel Oil Stove Oil
Intended Use:	Heating Oil
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!
Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard
Cancer Hazard (Component)

NFPA

Appearance: Clear, light yellow, or light green (may be dyed red)
Physical Form: Liquid
Odor: Kerosene

Potential Health Effects

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

Skin: Skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

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

Ingestion (Swallowing): Low to moderate 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 respiratory tract, irritation of the digestive tract, nausea, vomiting, diarrhea, pneumonitis (inflammation of the lungs) and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Other Comments: This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders respiratory (asthma-like) disorders and liver disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Hydrodesulfurized Kerosene ..C9-16	64742-81-0	0-100
Kerosene ..C9-16	8008-20-6	0-100
Cat Cracked Distillate, Light ..C9-25	64741-59-9	0-20
Naphthalene	91-20-3	0-3

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek 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.

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

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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 and 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical 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. 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 with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors (see Section 5). Use water sparingly to minimize environmental contamination and reduce disposal requirements.
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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any 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

Component	ACGIH	OSHA	Other:
Hydrodesulfurized Kerosene ..C9-16	TWA: 200 mg/m^3 Skin	---	---
Kerosene ..C9-16	TWA: 200 mg/m^3 Skin	---	---
Cat Cracked Distillate, Light ..C9-25	TWA: 0.2 mg/m^3 as Coal Tar Pitch Volatiles as Benzene Solubles	TWA: 0.2 mg/m^3 as Coal Tar Pitch Volatiles as Benzene Solubles	---
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m^3	TWA: 0.2 mg/m^3 (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

***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.

Personal Protective Equipment (PPE):

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

Respiratory: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

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.

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, light yellow, or light green (may be dyed red)
Physical Form:	Liquid
Odor:	Kerosene
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40mm Hg
Vapor Density (air=1):	> 4.5
Boiling Point/Range:	300-572°F / 149-300°C
Melting/Freezing Point:	No data
Solubility in Water:	<0.1%
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.775-0.840 @ 60°F (15.6°C)
Bulk Density:	6.73 lbs/gal
Viscosity:	1-2.4 cSt @ 40°C
VOC Content(%):	0.16 lb/1000 gal
Percent Volatile:	@ 545°F (285°C)
Evaporation Rate (nBuAc=1):	<1
Flash Point:	100 -150°F / 38 - 66°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	0.7
UEL (vol % in air):	7.0
Autoignition Temperature:	410°F / 210°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc..

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen and sulfur.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Hydrodesulfurized Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Reproductive: Skin application in female rats at 494, 330, or 165 mg/kg daily for 7 consecutive weeks (premating, mating, and gestation), or for 8 consecutive weeks in males did not result in systemic, reproductive, or developmental toxicity.

Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Cat Cracked Distillate, Light ..C9-25

Carcinogenicity: Application of light catalytic cracked distillate to mouse skin, two or three times a week (duration unspecified), resulted in an increased incidence of skin tumors. Catalytically cracked distillates have been identified as a carcinogen by IARC.

Target Organs: Dermal application of light catalytic cracked distillate to rats, 5 days a week, for 13 weeks resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity).

Reproductive: Female rats were exposed daily during gestation to concentrations of 0, 25, 50, 125, 500 and 1000 mg/kg via dermal application. Increased resorptions were reported at the highest dose.

Mutagenic Effects: Testing of light catalytic cracked distillate produced a positive result in in-vitro (mouse lymphoma assays) and in-vivo (sister chromatid exchange) assays. Negative results were obtained in assays using germ cells.

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Hydrodesulfurized Kerosene ..C9-16	>5 g/kg (Rat) based on Kerosene	>=2 g/kg (Rabbit)	>5 mg/L (4-hr., Rat)
Kerosene ..C9-16	>5 g/kg (Rat)	>2,000 mg/kg (Rabbit)	>5000 ppm (rat)
Cat Cracked Distillate, Light ..C9-25	3.2 g/kg (Rat)	>2 g/kg (Rabbit)	5.4 mg/L (Rat)

12. ECOLOGICAL INFORMATION

12. ECOLOGICAL INFORMATION

When No 1 distillates (kerosene, jet fuels, heating oils) escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with jet fuel can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of kerosenes and jet fuels are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of jet fuel. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled jet fuel. Direct toxicity and fouling of sea birds from jet fuel can occur if birds dive through floating layers of spilled fuel.

Phytotoxic effects of jet fuel have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in jet fuels.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	***Shipping description is for bulk shipments only. Non-Bulk shipments are unregulated.*** Heating oil, light, Combustible liquid, UN1202, III
Non-Bulk Package Marking:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking:	Combustible / 1202
Packaging - References:	None; None; 49 CFR 173.241 ***(Exceptions; Non-bulk; Bulk)***
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128
Note:	This product has been reclassified as a Combustible Liquid for domestic land transportation using 49 CFR 173.150(f). ***Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.***

International Maritime Dangerous Goods (IMDG)

Shipping Description:	***Not regulated if flashpoint is >60° C closed-cup*** UN1202, Heating oil, light, 3, III, (FP° C.cc), *[where FP is the material's flash point in degrees Celsius closed cup]*
Non-Bulk Package Marking:	Heating oil, light, UN1202
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable / 1202
Packaging - Non-Bulk:	P001, LP01
EMS:	F-E, S-E
Note:	***Proper Shipping name can be:*** Gas Oil ***or*** Diesel fuel ***or*** Heating Oil, light

14. TRANSPORTATION INFORMATION

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

UN/ID #:	***Not regulated if flashpoint is >60° C closed-cup*** UN1202
Proper Shipping Name:	Heating oil, light
Hazard Class/Division:	3
Packing Group:	III
Non-Bulk Package Marking:	Heating oil, light, UN1202
Labels:	Flammable liquid
ERG Code:	3L
Note:	***Proper Shipping name can be:*** Gas Oil ***or*** Diesel fuel ***or*** Heating Oil, light

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Naphthalene	0-3	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Naphthalene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Mineral Oils (Aromatic)	Skin 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
B2 - Flammable Liquids
D2B

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

Issue Date:	26-Dec-2007
Status:	Final
Previous Issue Date:	09-Nov-2005
Revised Sections or Basis for Revision:	Format change Exposure limits (Section 8)
MSDS Code:	724220

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

ConocoPhillips

No. 2 Diesel Fuel

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	No. 2 Diesel Fuel
MSDS Number:	001847
Synonyms:	CARB Diesel TF3; CARB Diesel; CARB Diesel 10%; CARB Diesel Ultra Low Sulfur - Dyed and Undyed; EPA Low Sulfur Diesel Fuel - Dyed and Undyed; EPA Off Road High Sulfur Diesel - Dyed; High Sulfur Diesel Fuel; Low Sulfur Diesel Fuel; No. 2 Diesel Fuel Oil; No. 2 High Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Undyed; No. 2 Low Sulfur Distillate; No. 2 Diesel with Renewable Diesel; No. 2 Ultra Low Sulfur Diesel - Dyed; No. 2 Ultra Low Sulfur Diesel - Undyed; Super Diesel Fuel; Super Diesel Fuel II-LS; Virgin Diesel Fuel; No. 2 Distillate; ULSD; Super Diesel Fuel; Super Diesel Fuel II-LS; Virgin Diesel Fuel; Distillate Blend Stock
Intended Use:	Fuel
Manufacturer/Supplier:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!

Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard

NFPA

Appearance: Straw colored to dyed red
Physical Form: Liquid
Odor: Diesel fuel

Potential Health Effects

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

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

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

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 digestive tract, irritation of the respiratory tract, nausea, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration*
Diesel Fuel No. 2	68476-34-6	95-100
Renewable Diesel	Proprietary	0-5
Naphthalene	91-20-3	<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 flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

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): 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

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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, 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 nitrogen and sulfur may also be formed.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical 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. 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 foam on spills to minimize vapors (see Section 5). Use water sparingly to minimize environmental contamination and reduce disposal requirements. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any 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

Component	US-ACGIH	OSHA	Other
Diesel Fuel No. 2	TWA: 100 mg/m³ Skin	—	—
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m³	TWA: 0.2 mg/m³ (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

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 organic vapor cartridges/canisters 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).

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.

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:	Straw colored to dyed red
Physical Form:	Liquid
Odor:	Diesel fuel
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40 mm Hg
Vapor Density (air=1):	> 3
Boiling Point/Range:	300-690°F / 149-366°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.81-0.88 @ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Percent Volatile:	Negligible @ ambient conditions
Evaporation Rate (nBuAc=1):	<1
Flash Point:	125 -180°F / 52 - 82°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.3
UEL (vol % in air):	10.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizers

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

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Diesel Fuel No. 2

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC.

Target Organs: Limited evidence of renal impairment has been noted from a few older case reports involving excessive exposure to diesel fuel No. 2. However, renal toxicity has not been demonstrated to be a consistent finding of diesel fuel exposure.

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Diesel Fuel No. 2	> 5 g/kg	>5ml/kg	4.6 - 7.6 mg/L
Renewable Diesel	9 ml/kg (Rat)	>5ml/kg (Rabbit)	No data available

12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Diesel fuel, Combustible liquid, NA1993, III
Non-Bulk Package Marking:	Not Regulated *[49 CFR 173.150(f)(2)]*
Non-Bulk Package Labeling:	Not Regulated *[49 CFR 173.150(f)(2)]*
Bulk Package/Placard Marking:	Combustible / 1993
Packaging - References:	None; None; 49 CFR 173.241 *(Exceptions; Non-bulk; Bulk)*
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128

International Maritime Dangerous Goods (IMDG)

Shipping Description:	*Not regulated if flashpoint is >60° C closed-cup*
Non-Bulk Package Marking:	Diesel fuel, UN1202
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable / 1202
Packaging - Non-Bulk:	P001, LP01
EMS:	F-E, S-E
Note:	*Proper Shipping name can be:* Gas Oil *or* Diesel fuel *or* Heating Oil, light

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

UN/ID #:	*Not regulated if flashpoint is >60° C closed-cup* UN1202
Proper Shipping Name:	Diesel fuel
Hazard Class/Division:	3
Subsidiary risk:	None
Packing Group:	III
Non-Bulk Package Marking:	Diesel fuel, UN1202
Labels:	Flammable liquid
ERG Code:	3L
Note:	*Proper Shipping name can be:* Gas Oil *or* Diesel fuel *or* Heating Oil, light

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Naphthalene	Cancer
Toluene	Developmental Toxicant
Benzene	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
B3 - Combustible Liquids
D2A
D2B

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

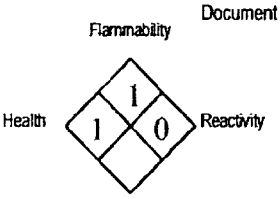
16. OTHER INFORMATION

Issue Date:	16-Jun-2008
Status:	Final
Previous Issue Date:	02-Jan-2008
Revised Sections or Basis for Revision:	Product Name / Synonyms (Section 1)
MSDS Number:	001847

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-DFG = Deutsche Forschungsgemeinschaft; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; N/A = Not Applicable; N/D = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

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.

Document # 6810-005



HMIS Rating

MATERIAL SAFETY DATA SHEET

GENERAL INFORMATION

PRODUCT NAME OR NUMBER (as it appears on label)	CATALOG NUMBER
Noalox® Anti-Oxidant	All "30" Series
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
IDEAL INDUSTRIES, INC.	**(815) 895-5181**
ADDRESS (Number, Street, City, State, Zip Code)	
Becker Place, Sycamore, IL 60178	
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD CLASS NO., HAZARD ID NO. (49 CFR 172.101)	
None	
CHEMICAL DESCRIPTION	FORMULA
Petroleum-Based Mixture	Proprietary

SECTION I - INGREDIENTS

CAS REGISTRY NO.	%W	CHEMICAL NAME(S)*	Listed as a carcinogen in NTP, IARC or OSHA :910(e) (specify)
9003-29-6	<80	Polybutene	No
7440-66-6	20	Zinc Dust	No
7631-86-9	<5	Silicon Dioxide	No

SECTION II - PHYSICAL DATA

BOILING POINT	SPECIFIC GRAVITY (H_2O=1)	PERCENT VOLATILE BY VOLUME (%)
>500°F °C	1.04	N.E.
SOLUBILITY IN WATER	pH =	PERCENT SOLID BY WEIGHT (%)
Moderate	6.5 - 8.0	100
APPEARANCE AND ODOR		IS MATERIAL: LIQUID SOLID GEL GAS PASTE
Gray solid paste, mild odor		

SECTION III - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 310 F	method used C.O.C	FLAMMABLE LIMITS	LEL	UEL
			N.E.	N.E.
EXTINGUISHING MEDIA				
Use dry chemical, carbon dioxide or foam				
SPECIAL FIRE FIGHTING PROCEDURES				
Self-contained respiratory protection should be provided for fire fighters. Keep fire exposed containers cool with water.				
UNUSUAL FIRE AND EXPLOSION HAZARDS				
Water or foam may cause a frothing reaction. (Water reacts with zinc dust)				

* None of the chemical raw materials contained in this formulation are considered hazardous under the Federal Hazards Communication Standard 29 C. F. R 1910.1200

SECTION IV - HEALTH HAZARD INFORMATION

EFFECTS OF OVEREXPOSURE - Conditions to Avoid	None normally expected. Upon prolonged contact may cause temporary eye discomfort.
THRESHOLD LIMIT VALUE	Zinc dust or silicon dioxide as dust: 10mg/m
PRIMARY ROUTES OF ENTRY Inhalation ☐ Skin Contact ☒ Other (specify)	
EMERGENCY FIRST AID PROCEDURES	
SKIN CONTACT:	Wash with soap and water for 15 minutes
EYE CONTACT:	Flush with water for 15 minutes
INGESTION:	Induce vomiting and consult physician or local poison control center

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Avoid conditions of moisture or high humidity.
	STABLE	X	
INCOMPATIBILITY (materials to avoid)	Avoid strong oxidizers, strong acids and water		
HAZARDOUS DECOMPOSTION PRODUCTS:	Excessive heat and burning may release oxides of carbon		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: None
	WILL NOT OCCUR	X	

SECTION VI - SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Wipe up, shovel or vacuum spilled material. Clean up spills immediately. Use absorbent media.
WASTE DISPOSAL METHOD	Comply with Federal, state and local regulations for solid landfill
CERCLA (Superfund) REPORTABLE QUANTITY (in lbs)	None Required
RCRA HAZARDOUS WASTE NO. (40CFR 261.33)	None Required
VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water)	120 g/l, calculated
* Theoretical ____ lb/gal N/A	* Analytical ____ lb/gal N/A

SECTION VII - PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)	If TLV exceeded, use NIOSH respirator		
VENTILATION	LOCAL EXHAUST (Specify Rate) Necessary above TLV	SPECIAL	None
	MECHANICAL (General) (Specify Rate) Recommended in closed areas	OTHER	None
PROTECTIVE GLOVES (specify type) None normally needed -Neoprene if necessary	EYE PROTECTION (specify type) Safety glasses or splash goggles		
OTHER PROTECTIVE EQUIPMENT	Eye fountain in work area is recommended		

SECTION VIII - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	Store in dry conditions at temperatures between 40 - 120 F
OTHER PRECAUTIONS	Keep away from children, infants and pets

SECTION IX - ADDITIONAL INFORMATION

This product contains the following materials that are subject to the reporting requirements of Section 313 of EPCRA:

CAS # 7440-66-6, Zinc Dust, 20%

N/A = Not Applicable, N.E. = None Established

THIS MATERIAL SAFETY DATA SHEET PREPARED BY:		
NAME	James R. MacMurdo	SIGNATURE: James R. MacMurdo
TITLE	Director, Corporate Quality Assurance	
DATE	03/10/2006	

Manufactured for

INDUSTRIAL SCIENTIFIC

CORPORATION

1001 Oakdale Road
Oakdale, PA 15071-1500

Phone (412) 788-4353
TOLL-FREE 800-DETECTS
Fax (412) 788-8353

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas: Oxygen, 0.0015-23.5%; Propane, 0-1.1%; n-Pentane, 0-0.75%; n-Hexane; 0-0.48%; Carbon Monoxide, 0.0005-1.0%; Hydrogen Sulfide, 0.001-0.025%

NOTE: MIXTURES COMPRISED OF AN AIR BALANCE GAS CONTAIN BETWEEN 19.5-23.5% OXYGEN.

SYNONYMS: Not Applicable

CHEMICAL FAMILY NAME: Not Applicable

FORMULA: Not Applicable

Document Number: 50016 (Replaces ISC MSDS No.1810-2187,1810-2343,1810-3366, 1810-3937 1810-7219, 1810-7599)

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	CALGAZ
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
General MSDS Information	1-713/868-0440
Fax on Demand:	1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH TLV		OSHA		IDLH	OTHER
			TWA ppm	STEL ppm	TWA ppm	STEL ppm	ppm	ppm
Oxygen	7782-44-7	0.0015 - 23.5%	There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5%.					
Propane	74-98-6	0 - 1.1%	2500	NE	1000	NE	2100	NIOSH REL: 1000 DFG MAK: 1000 ppm
n-Pentane	109-66-0	0 - 0.75%	600	750	1000 600 (Vacated 1989 PEL)	750 (Vacated 1989 PEL)	1500	NIOSH REL: TWA = 120 STEL = 610 (ceiling) 15 minutes DFG MAKs: TWA = 1000 PEAK = 2•MAK, 60 min., momentary value
n-Hexane	110-54-3	0 - 0.48%	50	NE	500 50 (Vacated 1989 PEL)	NE	1100	NIOSH REL: 50 DFG MAK: 50
Hydrogen Sulfide	7783-06-4	0.001 - 0.025 %	10 NIC = 5	15 NIC = 5	10 (Vacated 1989 PEL)	20 (ceiling), 50 (10 min. peak, once per shift) 15 (Vacated 1989 PEL)	100	NIOSH REL: STEL = 10 (ceiling), 10 minutes DFG MAKs: TWA = 10 PEAK = 2•MAK, 10 min., momentary value
Carbon Monoxide	630-08-0	0.0005 - 1.0%	25	NE	50 35 (Vacated 1989 PEL)	200 (ceiling) (Vacated 1989 PEL)	1200	NIOSH RELs: TWA = 35 STEL = 200 ceiling DFG MAKs: TWA = 30 PEAK = 2•MAK, 15 min., average value, 1 hr interval DFG MAK Pregnancy Risk Classification: B
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established NIC = Notice of Intended Change See Section 16 for Definitions of Terms Used.

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture 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: This gas mixture is a colorless gas which has a rotten-egg odor (due to the presence of Hydrogen Sulfide). The odor cannot be relied on as an adequate warning of the presence of this gas mixture, because olfactory fatigue occurs after over-exposure to Hydrogen Sulfide. Hydrogen Sulfide and Carbon Monoxide (another component of this gas mixture) are toxic to humans in relatively low concentrations. Over-exposure to this gas mixture can cause skin or eye irritation, nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. The Propane, n-Pentane, and n-Hexane components can cause anesthetic or peripheral neuropathy effects. Additionally, releases of this gas mixture may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this gas mixture is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A significant health hazard associated with this gas mixture is the potential of inhalation of Hydrogen Sulfide, a component of this gas mixture. Such over-exposures may occur if this gas mixture is used in a confined space or other poorly-ventilated area. Over-exposures to Hydrogen Sulfide can cause dizziness, headache, and nausea. Exposure to this component can result in respiratory arrest, coma, or unconsciousness. Continuous inhalation of low concentrations of Hydrogen Sulfide may cause olfactory fatigue, so that the odor is no longer an effective warning of the presence of this gas. A summary of exposure concentrations and observed effects are as follows:

CONCENTRATION OF HYDROGEN SULFIDE	OBSERVED EFFECT
0.3-30 ppm	Odor is obvious and unpleasant.
50 ppm	Eye irritation. Dryness and irritation of nose, throat.
Slightly higher than 50 ppm	Irritation of the respiratory system.
100-150 ppm	Temporary loss of smell.
200-250 ppm	Headache, vomiting, nausea. Prolonged exposure may lead to lung damage. Exposures of 4-8 hours can be fatal.
300-500	Swifter onset of symptoms. Death occurs in 1-4 hours.
500 ppm	Headache, excitement, staggering, and stomach ache after brief exposure. Death occurs within 0.5 - 1 hour of exposure.
> 600 ppm	Rapid onset of unconsciousness, coma, death.
> 1000 ppm	Immediate respiratory arrest.
NOTE:	This gas mixture contains a maximum of 250 ppm Hydrogen Sulfide. The higher concentration values here are presented to delineate the complete health effects which have been observed for humans after exposure to Hydrogen Sulfide.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	3
FLAMMABILITY HAZARD	(RED)	0
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES | RESPIRATORY | HANDS | BODY

See Section 8

For Routine Industrial Use and Handling Applications

Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide (25 ppm), another component of this gas mixture, can result in serious health consequences. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and asphyxiation occurs.

Since the affinity of Carbon Monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this gas mixture is released in a small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the following:

CONCENTRATION OF CARBON MONOXIDE	OBSERVED EFFECT
All exposure levels:	Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red.
200 ppm:	Slight symptoms (i.e. headache) after several hours of exposure.
400 ppm:	Headache and discomfort experienced within 2-3 hours of exposure.
1,000 - 2000 ppm:	Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger.
200-2500 ppm:	Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes.
> 2500 ppm:	Potential for collapse and death before warning symptoms.

Another hazard associated with this gas mixture is the potential for anesthetic and peripheral neuropathy effects after inhalation over-exposures to the Propane, n-Pentane and n-Hexane components of this gas mixture. Specific human over-exposure data are available for n-Pentane and n-Hexane, as follows:

CONCENTRATION OF n-PENTANE	OBSERVED EFFECT
Brief (10 minute) up to 5,000 ppm:	No symptoms.
Higher than 5,000 ppm:	Exhilaration, dizziness and headache can occur.
Long term:	Can cause chronic neurological disorder causing damage to the nerves in the hands and feet (peripheral neuropathy)

CONCENTRATION OF n-HEXANE	OBSERVED EFFECT
Brief (10 minute) at 1,500 ppm:	Irritation of the respiratory tract, nausea and headache.
5000 ppm;	Dizziness and drowsiness can occur.
Long term at 500 ppm:	Can affect the nerves in the arms and legs. Effects include numbing or tingling sensations in the fingers and toes, tiredness, muscle weakness, cramps and spasms in the leg, difficulty in holding objects or walking, abdominal pains, loss of appetite, weight loss. More serious exposures can cause damage to the nerves in the hands and feet (peripheral neuropathy).
Eyes and Vision:	Abnormal color perception and pigment changes in the eyes have been reported among industrial workers exposed to 423-1280 ppm for 5 years or more.
Blood Cells:	Mild forms of anemia have also been associated with exposure to hexane. These are of temporary nature.

Additionally, if mixtures of this gas mixture contain less than 19.5% Oxygen and are released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. 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. Under some circumstances of over-exposure, death may occur. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN	OBSERVED EFFECT
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, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

SKIN and EYE CONTACT: The Hydrogen Sulfide component of this gas mixture may be irritating to the skin. Inflammation and irritation of the eyes can occur at very low airborne concentration of Hydrogen Sulfide (less than 10 ppm). Exposure over several hours may result in "gas eyes" or "sore eyes" with symptoms of scratchiness, irritation, tearing and burning. Above 50 ppm of Hydrogen Sulfide, there is an intense tearing, blurring of vision, and pain when looking at light. Over-exposed individuals may see rings around bright lights. Most symptoms disappear when exposure ceases. However, in serious cases, the eye can be permanently damaged.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects.

ACUTE: Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. However, the Hydrogen Sulfide and Carbon Monoxide components of this gas mixture are toxic to humans. Over-exposure to this gas mixture can cause nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Due to the presence of Hydrogen Sulfide, over-exposures to this gas mixture can also irritate the skin and eyes; severe eye contamination can result in blindness. Inhalation over-exposures to Propane, n-Pentane, and n-Hexane can cause anesthetic effects and motor neuropathy (i.e. pain and tingling in feet and hands).

3. HAZARD IDENTIFICATION (Continued)

CHRONIC: Abnormal color perception and pigment changes in the eyes have been reported among persons exposed to 420 -1300 ppm of n-Hexane for five years. Additionally, long-term exposure to low levels of n-Hexane or n-Pentane can affect the nerves in the arms and legs. Effects include numbing or tingling sensation, tiredness, cramps, spasms in legs, difficulty holding objects or walking, loss of appetite and weight loss. Pentane isomers, such as n-Pentane, and Propane can cause sensitization of the heart to epinephrine. Refer to Section 11 (Toxicology Information) for additional information on the components of this gas mixture.

TARGET ORGANS: ACUTE: Respiratory system, blood system, central nervous system, cardiovascular system. CHRONIC: Reproductive system, cardiovascular system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

SKIN EXPOSURE: If irritation of the skin develops after exposure to this gas mixture, immediately begin decontamination with 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.

EYE EXPOSURE: If irritation of the eye develops after exposure to this gas mixture, 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. Seek medical assistance immediately, preferably an ophthalmologist.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by over-exposure to this gas mixture. Carbon Monoxide, a component of this gas mixture, can aggravate some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris. Because of the presence of Hydrogen Sulfide, n-Hexane or n-Pentane in this gas mixture, central nervous system conditions, eye disorders, or skin problems may be aggravated by over-exposure to this gas mixture.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure. Hyperbaric oxygen is the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask, or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering stimulant drugs. Be observant for initial signs of pulmonary edema in the event of severe inhalation over-exposures.

5. FIRE-FIGHTING MEASURES

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 gas mixture. Use extinguishing media appropriate for surrounding fire.

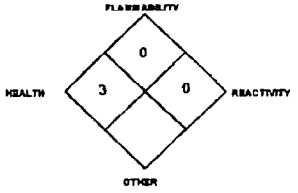
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture contains toxic gases, Hydrogen Sulfide and Carbon Monoxide, and presents an extreme health hazard to firefighters. This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk of over-exposure to Hydrogen Sulfide and Carbon Monoxide, the toxic components of this gas mixture, and other safety hazards related to the remaining components of this gas mixture, than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for Hydrogen Sulfide, Carbon Monoxide, and Oxygen. Hydrogen Sulfide and Carbon Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients) and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing a gas mixture with Hydrogen Sulfide or Carbon Monoxide. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Eye wash stations/safety showers should be near areas where this gas mixture is used or stored. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All work practices should minimize releases of Hydrogen Sulfide and Carbon Monoxide-containing gas mixtures.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

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. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this gas mixture in well-ventilated areas. If this gas mixture is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Oxygen, Hydrogen Sulfide, and Carbon Monoxide.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if Carbon Monoxide levels exceed the exposure levels given in Section 2 (Composition and Information on Ingredients) or if oxygen levels are below 19.5%, or if either level is unknown during emergency response to a release of this gas mixture. If respiratory protection is required for emergency response to this gas mixture, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards. The following NIOSH respiratory protection recommendations for Hydrogen Sulfide and Carbon Monoxide are provided for further information.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

NIOSH/OSHA RECOMMENDATIONS FOR HYDROGEN SULFIDE CONCENTRATIONS IN AIR:

Up to 100 ppm: Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide; or gas mask with canister to protect against hydrogen sulfide; or SAR; or full-facepiece SCBA.

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA.

NOTE: The IDLH concentration for Hydrogen Sulfide is 100 ppm.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON MONOXIDE CONCENTRATIONS IN AIR:

Up to 350 ppm: Supplied Air Respirator (SAR)

Up to 875 ppm: Supplied Air Respirator (SAR) operated in a continuous flow mode.

Up to 1200 ppm: Gas mask with canister to protect against carbon monoxide; or full-facepiece SCBA; or full-facepiece Supplied Air Respirator (SAR).

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece Supplied Air Respirator (SAR) with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister to protect against carbon monoxide; or escape-type SCBA.

NOTE: End of Service Life Indicator (ESLI) required for gas masks.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: No special protection is needed under normal circumstances of use. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: No special protection is needed under normal circumstances of use. 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.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: 0.072 lbs/ ft^3 (1.153 kg/m^3)

FREEZING/MELTING POINT @ 10 psig: -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

EVAPORATION RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD: Not applicable.

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

BOILING POINT: -195.8°C (-320.4°F)

pH: Not applicable.

MOLECULAR WEIGHT: 28.01

EXPANSION RATIO: Not applicable.

SPECIFIC VOLUME (ft^3/lb): 13.8

The following information is for the gas mixture.

APPEARANCE AND COLOR: This gas mixture is a colorless gas which has an rotten egg-like odor, due to the presence of Hydrogen Sulfide.

HOW TO DETECT THIS SUBSTANCE (warning properties): Continuous inhalation of low concentrations of Hydrogen Sulfide (a component of this gas mixture) may cause olfactory fatigue, so that there are no distinct warning properties. 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. Wet lead acetate paper can be used for leak detection. The paper turns black in the presence of Hydrogen Sulfide. Cadmium chloride solutions can also be used. Cadmium solutions will turn yellow upon contact with Hydrogen Sulfide.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Propane, n-Hexane, and n-Pentane include carbon oxides. The decomposition products of Hydrogen Sulfide include water and sulfur oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this gas mixture (Hydrogen Sulfide, Propane, n-Pentane, n-Hexane) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel and iron (especially at high temperatures and pressures). Hydrogen Sulfide is corrosive to most metals, because it reacts with these substances to form metal sulfides.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this gas mixture:

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the

n-PENTANE:

LD_{50} (intravenous, mouse) = 446 mg/kg.

LC_{50} (inhalation, rat) = 364 g/m^3/4 hours

LCLo (inhalation, mouse) = 325 g/m^3/2 hours

n-HEXANE:

Eye, rabbit = 10 mg/ mild

TCLo (inhalation, rat) = 10,000 ppm/7 hr.

TCLo (inhalation, rat) = 5000 ppm/20 hours; teratogenic effects

LD50 (oral, rat) = 28710 mg/kg

LDLo (intraperitoneal, rat) = 9100 mg/kg

LCLo (inhalation, mouse) = 120,000 mg/kg

LD50 (rat, oral): 28,710 mg/kg

ACUTE INHALATION (mouse): 30,000 ppm, narcosis within 30 to 60 minutes; 35,000-40,000 ppm, convulsions and death.

DERMAL (rabbit): 2 to 5 ml/kg for 4 hours resulted in restlessness and *discoordination.; death occurred at 5 ml/kg.*

HYDROGEN SULFIDE:

LCLo (inhalation, human) = 600 ppm/30 minutes

LDLO (inhalation, man) = 5.7 mg/kg; central nervous system, pulmonary effects

n-HEXANE (continued):

CHRONIC INHALATION (rat): 400-600 ppm, 5 days/week, peripheral neuropathy in 45 days; 850 ppm for 143 days, loss of weight and degeneration of the sciatic nerve. (mouse): 250 ppm, peripheral *neuropathy within 7 months; no effects at* 100 ppm.

PROPANE:

Long-Term Inhalation: No toxicity or abnormalities were observed when monkeys were exposed to approximately 750 ppm for 90 days. Similar results were obtained when monkeys were exposed to an aerosol spray containing 65% propane and isobutane.

CARBON MONOXIDE:

TCLo (inhalation, mouse) = 65 ppm/24 hours *(7-18 preg): rep. effects*

TCLo (inhalation, mouse) = 8 ppb/1 hour (female 8D post): ter. effects

HYDROGEN SULFIDE (continued):

LCLo (inhalation, human) = 800 ppm/5 minutes

LC_{50} (inhalation, rat) = 444 ppm

CARBON MONOXIDE (continued):

TCLo (inhalation, human) = 600 mg/m^3/10 minutes

LCLo (inhalation, man) = 4000 ppm/30 minutes

TCLo (inhalation, man) = 650 ppm/45 *minutes; central nervous system and* blood system effects.

LCLo (inhalation, human) = 5000 ppm/5 minutes

LCLo (inhalation, dog) = 4000 ppm/46 minutes

LCLo (inhalation, rabbit) = 4000 ppm

LC_{50} (inhalation, rat) = 1811 ppm/4 hours

LC_{50} (inhalation, guinea pig) = 2450 ppm/4 hours

LC_{50} (inhalation, guinea pig) = 5718 ppm/4 hours

LCLo *(inhalation, mammal)* = 5000 *ppm/5* minutes

LD_{50} (inhalation, wild bird) = 1334 ppm

HYDROGEN SULFIDE (continued):

LC_{50} (inhalation, mouse) = 673 ppm/1 hour

LCLo (inhalation, mammal) = 800 ppm/5 minutes

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: The Hydrogen Sulfide component of this gas mixture, is irritating to the eyes, and may be irritating to the skin.

SENSITIZATION OF PRODUCT: The components of this gas mixture are not known to be skin or respiratory sensitizers. Pentane isomers (i.e. n-Pentane) and Propane can cause cardiac sensitization to epinephrine.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for the components of this gas mixture.

Embryotoxicity: This gas mixture contains components that may cause embryotoxic effects in humans; however, due to the small total amount of the components, embryotoxic effects are not expected to occur.

Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder size and small total amount of all components. The Carbon Monoxide component of this gas mixture which exists up to 1%, can cause teratogenic effects in humans. Severe

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11. TOXICOLOGICAL INFORMATION (continued)

exposure to Carbon Monoxide during pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the fetus.

Reproductive Toxicity: The components of this gas mixture are 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 (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 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.

BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) have been determined for the components of this gas mixture, as follows:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
CARBON MONOXIDE • Carboxyhemoglobin in blood • Carbon monoxide in end-exhaled air	 • End of shift • End of shift	 • 3.5% of hemoglobin • 20 ppm
n-HEXANE • 2,5-Hexanedione in urine • n-Hexane in end-exhaled air	• End of shift	• 5 mg/g creatinine

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this gas mixture.

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K_{ow} = -0.65

PROPANE: Log K_{ow} = 2.36. Water Solubility = 62.4 ppm, 25°C. Propane is readily degraded by soil bacteria.

PENTANE: Log K_{ow} = 3.39. Water Solubility = 38.5 mg/L. LOG BCF (n-pentane) = calculated, 1.90 and 2.35, respectively. Photolysis, hydrolysis, and bioconcentration are not anticipated to be important fate processes. Biodegradation and soil adsorption are anticipated to be more important processes for this compound.

n-HEXANE: Log K_{ow} = 3.90-4.11. Water Solubility = 9.5 mg/L. Estimated Bioconcentration Factor =2.24 and 2.89. Bioconcentration in aquatic organisms is low. Hexane is volatile. Rapid volatilization from water and soil is anticipated for this compound. Hexane will float in slick on surface of the water

HYDROGEN SULFIDE: Water Solubility = 1 g/242 mL at 20°C.

CARBON MONOXIDE: Water solubility = 3.3 ml/100 cc at 0 °C, 2.3 ml at 20°C.

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C; 1.6 volumes Nitrogen/100 volumes water at 20°C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this gas mixture's effects on plant and animal life. The Hydrogen Sulfide and Carbon Monoxide components of this gas mixture, can be deadly to exposed animal life, producing symptoms similar to those experienced by humans. This gas mixture may also be harmful to plant life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of this gas effects on aquatic life. The presence of more than a trace of Carbon Monoxide is a hazard to fish. The following aquatic toxicity data are available for the Hydrogen Sulfide component of this gas mixture.

TLm (Asellussp) = 0.111 mg/L/96 hour
TLm (Crangonyx sp) = 1.07 mg/L/96 hour
TLm (Gammarus) = 0.84 mg/L/96 hour
LC_{50} (fly inhalation) = 380 mg/m^3/960 minutes
LC_{50} (fly inhalation) = 1500 mg/m^3/7 minutes
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0478 mg/L/96 hour
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0448 mg/L/96 hour at 21-22 °C
TLm (Pimephlaes promelas, fathead minnow) = 0.0071-0.55 mg/L/96 hour
TLm (Salvenilis fontinalis, brook trout) = 0.0216-0.038 mg/L/96 hour at 8-12.5 °C

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.
HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER: UN 1956
PACKING GROUP: Not Applicable
DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126
MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).
SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). *Additionally, the vehicle should be well-ventilated during transportation.*
Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is considered as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.
HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER: UN 1956
PACKING GROUP: Not Applicable
HAZARD LABEL: Class 2.2 (Non-Flammable Gas)
SPECIAL PROVISIONS: None
EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: 0.12
ERAP INDEX: None
PASSENGER CARRYING SHIP INDEX: None
PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: 75
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126
NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: This gas is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
n-Hexane	NO	YES	YES
Hydrogen Sulfide	YES	YES	YES

15. REGULATORY INFORMATION (Continued)

U.S. SARA THRESHOLD PLANNING QUANTITY: Section 302 EHS TPQ = Hydrogen Sulfide = 500 lbs (227 kg);
U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Hexane = 5000 lb (2270 kg); Hydrogen Sulfide = 100 lbs (45.4 lb)
OTHER U.S. FEDERAL REGULATIONS:

- Hydrogen Sulfide, Carbon Monoxide, Propane, n-Pentane and n-Hexane are subject to the reporting requirements of CFR 29 1910.1000.
- Hydrogen Sulfide, Propane and n-Pentane are subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be affected by the regulation.
- Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Hydrogen Sulfide is listed in Appendix A of this regulation. The Threshold Quantity for Hydrogen Sulfide under this regulation is 1500 lbs.
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen, Oxygen and n-Hexane are not listed Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Hydrogen Sulfide is listed under this regulation in Table 1 as a Regulated Substance (Toxic Substance), in quantities of 10,000 lbs (4,553 kg) or greater. Carbon Monoxide, Propane and n-Pentane are listed under this regulation in Table 3, as Regulated Substances (Flammable), in quantities of 10,000 lbs (4,553 kg) or greater, and so this mixture will not be affected by the regulation.

U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Florida - Substance List: Oxygen, Carbon Monoxide, n-Pentane, n-Hexane, Hydrogen Sulfide.
Illinois - Toxic Substance List: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Missouri - Employer Information/Toxic Substance List I: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: Hydrogen Sulfide.
Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Texas - Hazardous Substance List: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
West Virginia - Hazardous Substance List: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
Wisconsin - Toxic and Hazardous Substances: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Carbon Monoxide component of this gas mixture is on the California Proposition 65 lists as a chemical known to the State of California to cause birth defects or other reproductive harm.
ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this gas mixture are on the Canadian DSL inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this gas mixture are not on the CEPA Priorities Substances List.
CANADIAN WHMIS CLASSIFICATION: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2A, as per the Controlled Product Regulations.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. CALGAZ will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 *"Safe Handling of Compressed Gases in Containers"*
AV-1 *"Safe Handling and Storage of Compressed Gases"*
"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
619/670-0609

Fax on Demand: 1-800/231-1366

AIR LIQUIDE

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this gas mixture. To the best of CALGAZ knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

FLOWSERVE

MATERIAL SAFETY DATA SHEET

NORDSTROM 1033 BULK SEALANT

FILE NO.: MSDS8000
MSDS DATE: 5/28/2002

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: NORDSTROM 1033 BULK SEALANT

PRODUCT CODES: Bulk & Super Soft Grades Only, All Sizes & Packaging

MANUFACTURER: Flowserve – Sulphur Springs Operation
ADDRESS: 1511 Jefferson St.
Sulphur Springs, TX 75482

EMERGENCY PHONE: (903) 885-3159
MSDS REQUESTS: (903) 885-3151
FAX: (903) 439-3313

PRODUCT USE: Valve Sealant and Lubricant

PREPARED BY: Michael Braxeal

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT	% WT	CAS NUMBER	OSHA PEL	ACGIH TLV
Polyester Resin	80-90	Proprietary	NA	NA
Silica, Fumed	5-15	112945-52-5	15 mg/m³ *	10 mg/m³ *
Silica, Fumed	1-5	68611-44-9	15 mg/m³ *	10 mg/m³ *
Performance Additives	<5	Mixture	NA	NA

* **NOTE:** All ingredients are encapsulated in a nonhazardous mixture. Injury from airborne dusts should not occur under normal conditions. Refer to OSHA/ACGIH Standard Nuisance Dust and OSHA/ACGIH Total Dust guidelines for more information.

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYES: Contact with material may cause irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INGESTION: May be irritating to the gastrointestinal tract.

INHALATION: None expected.

CARCINOGENICITY: None known.

SECTION 4 FIRST AID MEASURES

EYES: Flush eyes for 15 minutes with water. Contact a physician.

SKIN: Wash thoroughly with soap and water. Contact a physician if irritation occurs.

INGESTION: Give two glasses of water and consult a physician immediately.

INHALATION: Remove to fresh air.

SECTION 5 FIRE-FIGHTING MEASURES

FLAMMABLE LIMITS IN AIR: NA

FLASH POINT (COC): >530 °F
>277 °C

AUTOIGNITION TEMPERATURE: ND

NFPA HAZARD CLASSIFICATION
HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0

EXTINGUISHING MEDIA: Dry chemical powder, carbon dioxide, chemical foam.

SPECIAL FIRE FIGHTING PROCEDURES: Wear a respirator in confined spaces when fighting fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion may produce carbon dioxide, carbon monoxide, and other asphyxiants.

SECTION 6 ACCIDENTAL RELEASE MEASURES

ACCIDENTAL SPILLS: Recover free material. Add absorbent if applicable and dispose of in accordance with applicable local, state, and federal regulations.
Wash spill area with a detergent solution.

SECTION 7 HANDLING AND STORAGE

HANDLING AND STORAGE: Store in sealed containers to avoid contamination with foreign material.

OTHER PRECAUTIONS: None known

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION : Normal ventilation in accordance with good engineering practice.

RESPIRATORY PROTECTION: Not needed under normal usage conditions. No respirable dust expected.

EYE PROTECTION: Safety glasses recommended as standard practice.

SKIN PROTECTION: Use resistant gloves to minimize skin contact.

OTHER PROTECTIVE EQUIPMENT: None under normal usage conditions.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
APPEARANCE:	Green grease
ODOR:	Slight odor
PHYSICAL STATE:	Semisolid / Solid
pH AS SUPPLIED:	Neutral / NA
BOILING POINT:	NA
MELTING POINT:	NA
VAPOR PRESSURE (mmHg):	Nil
VAPOR DENSITY (AIR = 1):	NA
SPECIFIC GRAVITY (H2O = 1):	1.11 @ 75 °F
EVAPORATION RATE:	Nil
SOLUBILITY IN WATER:	Slight
PERCENT SOLIDS BY WEIGHT:	5-20
PERCENT VOLATILE BY WT:	Nil
VOLATILE ORGANIC COMPOUNDS (VOC):	Nil

SECTION 10	STABILITY AND REACTIVITY
STABILITY DATA:	Product is stable.
CONDITIONS TO AVOID (STABILITY):	None known
INCOMPATIBILITY (MATERIAL TO AVOID):	Avoid strong oxidizers.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:	Incomplete combustion may produce carbon dioxide, carbon monoxide, and other asphyxiants. Avoid fire.
HAZARDOUS POLYMERIZATION:	None known
CONDITIONS TO AVOID (POLYMERIZATION):	None known

SECTION 11	TOXICOLOGICAL INFORMATION
TOXICOLOGICAL INFORMATION:	ND

SECTION 12	ECOLOGICAL INFORMATION
ECOLOGICAL INFORMATION:	ND

SECTION 13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of product in accordance with all local, state, and federal regulations as applicable.

RCRA HAZARD CLASS: Nonhazardous

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT): Not regulated, nonhazardous product

SECTION 15 REGULATORY INFORMATION

UNITED STATES FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): All components are listed or excluded.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): None

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): None

311/312 HAZARD CATEGORIES: None

313 REPORTABLE INGREDIENTS: None

OTHER REGULATIONS

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS): Not regulated

SECTION 16 OTHER INFORMATION

DISCLAIMER: The information presented has been compiled from sources considered to be dependable and is accurate to the best of the seller's knowledge. All data is offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate. It is the obligation of the user to evaluate and use this product safely and to comply with all applicable laws and regulations.

NA = Not Applicable
ND = Not Determined

Material Safety Data Sheet
n-Undecane, 99%

ACC# 33888

Section 1 - Chemical Product and Company Identification

MSDS Name: n-Undecane, 99%
Catalog Numbers: AC140660000, AC140660050, AC140661000, AC140665000
Synonyms:
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1120-21-4	N-UNDECANE	99	214-300-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 141 deg F.
Warning! Flammable liquid and vapor. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage.
Target Organs: None known.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: Aspiration hazard. May cause irritation of the digestive tract. Direct aspiration into the lungs may cause chemical pneumonitis, pulmonary edema, and hemorrhaging.
Inhalation: May cause respiratory tract irritation.
Chronic: Not available. None

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

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Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Flammable liquid and vapor.
Extinguishing Media: For large fires, use water spray, fog, or alcohol-resistant foam. For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
Flash Point: 141e deg F (60.56 deg C)
Autoignition Temperature: 240 deg C (464.00 deg F)
Explosion Limits, Lower:.60 vol %
Upper: 6.50 vol %
NFPA Rating: (estimated) Health: ; Flammability: 2; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
N-UNDECANE	none listed	none listed	none listed

OSHA Vacated PELs: N-UNDECANE: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when

necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: Not available.
pH: Not available.
Vapor Pressure: 20 mbar @ 20 deg C
Vapor Density: 5.4
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 196 deg C @ 760 mm Hg
Freezing/Melting Point:-26 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:.7400g/cm3
Molecular Formula:C11H24
Molecular Weight:156.31

Section 10 - Stability and Reactivity

Chemical Stability: Stability unknown.
Conditions to Avoid: Ignition sources.
Incompatibilities with Other Materials: Bases, oxidizing agents, reducing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1120-21-4: YQ1525000
LD50/LC50:
CAS# 1120-21-4:
Inhalation, rat: LC50 = >442 ppm/8H;
Carcinogenicity:
CAS# 1120-21-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Undecane	Undecane
Hazard Class:	3	3
UN Number:	UN2330	UN2330
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 1120-21-4 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 1120-21-4: flammable.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.

STATE
CAS# 1120-21-4 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
Not available.
Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)
CAS# 1120-21-4: No information available.
Canada - DSL/NDSL
CAS# 1120-21-4 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B3.
Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997
Revision #2 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

OIL-DRI
CORPORATION OF AMERICA
410 North Michigan Avenue
Chicago, IL 60611

Material Safety Data Sheet

Floor Absorbent (#1003000)

☎ (312)321-1515 information (800)424-9300 emergency

1. PRODUCT IDENTIFICATION

MSDS Number: 1003000

Identity: Floor Absorbent

Issued: April 23, 2007

Chemical Name: Fullers Earth

2. COMPOSITION

Component	CAS Number	Amount	Exposure Limit
Quartz (crystalline silica) 0.000085% in the respirable range	14808-60-7	10-20% bulk	PEL - 10 mg/m³/%Si02+2 TWA TLV - 0.025 mg/m³ TWA
Fullers Earth	8031-18-3	80-90%	PEL - 5 mg/m³ TWA (respirable fraction) TLV - 3 mg/m³ TWA (respirable fraction) TLV - 10 mg/m³ TWA (inhalable dust)

PEL- OSHA Permissable Exposure Limit. TLV- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value. TWA- 8 hour Weighted Average. STEL-Short Term Exposure Limit.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is a non-combustible, chemically inert mineral. This mineral sample contains a small amount of naturally-occurring crystalline silica as quartz. Prolonged overexposure to respirable crystalline silica may cause lung disease (silicosis). IARC, in Monograph 68, has concluded that crystalline silica inhaled in the form of quartz from occupational sources is carcinogenic to humans (Group 1); however, carcinogenicity was not detected in all industrial circumstances studied. Because applications and exposure data indicate that exposure to respirable quartz in this product with normal use is well below the OSHA Permissible Exposure Limit (PEL) and ACGIH Threshold Limit Value (TLV); and because the company is not aware of any scientific or medical data available indicating that exposure to dust from this product under conditions of normal use will cause silicosis or cancer; adverse effects would not be expected from normal use of this product.

HEALTH HAZARDS

INGESTION: No adverse effects expected with unused material.

INHALATION: Inhalation of excessive concentrations of dust may cause irritation of mucous membranes and upper respiratory tract.

EYE: Contact may cause mechanical irritation and possible injury.

SKIN: No adverse effects expected.

SENSITIZATION: No adverse effects expected.

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Material Safety Data Sheet

Floor Absorbent (#1003000)

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CHRONIC/CARCINOGENICITY:

Inhalation of excessive concentrations of any dust, including this material, may lead to lung injury. This product contains crystalline silica. Excessive inhalation of respirable crystalline silica may cause silicosis, a progressive, disabling and fatal disease of the lung. Symptoms may include cough, shortness of breath, wheezing and reduced pulmonary function. The International Agency for Research on Cancer (IARC), in Monograph 68 has concluded that crystalline silica inhaled in the form of quartz or cristobalite, from occupational sources is carcinogenic to humans (Group 1). However, in making the overall evaluation, the Working Group noted that carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs. The National Toxicology Program (NTP) classifies crystalline silica as a known carcinogen. Because applications and exposure data indicate that exposure to respirable quartz in this product with normal use is well below the OSHA Permissible Exposure Limit (PEL) and ACGIH Threshold Limit Value (TLV); and because the company is not aware of any scientific or medical data available indicating that exposure to dust from this product under conditions of normal use will cause silicosis or cancer; adverse effects would not be expected from normal use of this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

None currently known.

4. FIRST AID MEASURES

EYE: Immediately flush eyes with cool running water, lifting upper and lower lids. If irritation persists or for foreign body in the eye, get immediate medical attention.

SKIN: None needed for normal use.

INGESTION: If used material is ingested, get medical attention due to possibility of chemical contamination. If large amount of unused material is swallowed, get immediate medical attention.

INHALATION: Remove to fresh air.

5. FIREFIGHTING MEASURES

FLASH POINT: This product is not combustible.

FLAMMABLE LIMITS Not applicable

EXTINGUISHING MEDIA:

Use media that is appropriate for surrounding fire.

UNUSUAL FIRE OR EXPLOSION HAZARDS:

This product does not normally present a fire or explosion hazard, however, at concentration exceeding 0.1 oz/ft3 dusts can be ignited by sparks or other ignition sources. Minimize hazard by avoiding the generation of airborne dusts, electrically grounding equipment to prevent static sparks and by eliminating ignition sources in the work area. Combustion products may be hazardous.

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CORPORATION OF AMERICA
410 North Michigan Avenue
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Material Safety Data Sheet

Floor Absorbent (#1003000)

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SPECIAL FIREFIGHTING INSTRUCTIONS

None required.

HAZARDOUS COMBUSTION PRODUCTS:

None

6. ACCIDENTAL RELEASE MEASURES

Sweep up and collect for re-use or disposal

7. HANDLING AND STORAGE

HANDLING: Avoid breathing dust. If clothing becomes dusty, launder before re-use.

STORAGE: Store in a dry area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES:

Refer to Section 2.

ENGINEERING CONTROLS:

For operations where the exposure limit may be exceeded, local exhaust ventilation is recommended.

RESPIRATORY PROTECTION:

For operations where the exposure limit may be exceeded, a NIOSH/MSHA approved high efficiency particulate respirator is recommended.

SKIN PROTECTION: None required for normal use.

EYE PROTECTION: Safety glasses or goggles recommended.

OTHER: None required for normal use.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR:

Gray to tan granules, no odor

PHYSICAL STATE: Solid

BOILING POINT: Not applicable

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SOLUBILITY IN WATER:

Insoluble

SPECIFIC GRAVITY: 2.2

pH: Not applicable

MELTING POINT: Not applicable

OIL-DRI
CORPORATION OF AMERICA
410 North Michigan Avenue
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Material Safety Data Sheet

Floor Absorbent (#1003000)

☎ (312)321-1515 information (800)424-9300 emergency

OCTANOL/WATER COEFFICIENT:
Not available

10. STABILITY AND REACTIVITY

STABILITY: Stable

INCOMPATIBILITY: Contact of dry clay with turpentine, vegetable oil or other unsaturated organic compounds, or with hydrofluoric acid may generate heat and/or fire. Do not use with these compounds.

HAZARDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS POLYMERIZATION:
Will not occur.

11. TOXICOLOGICAL INFORMATION

No data available.

12. ECOLOGICAL INFORMATION

No data available.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with local, state and federal environmental regulations. Unused material is suitable for disposal in sanitary landfill. Used material may be subject to regulation, depending on the nature of the material absorbed. Check with appropriate regulatory authority for used material containing hazardous waste.

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME:
Not regulated

UN NUMBER: Not applicable

HAZARD CLASS/PACKING GROUP:
Not applicable

LABELS REQUIRED: None

15. REGULATORY INFORMATION

CERCLA/SUPERFUND None

SARA HAZARD CATEGORY (311/312):
Chronic Health

SARA 313: None

TSCA: All of the components of this product are listed on the EPA TSCA Inventory or exempt from notification requirements.

EINECS: All of the components of this product are listed on the EINECS Inventory or exempt

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	from notification requirements
EEC R&S Phrases:	Not Classified as Dangerous under EEC Labeling Regulations
JAPAN MITI:	All of the components of this product are existing chemical substances as defined in the Chemical Substances Control Law.
AICS:	All of the components of this product are listed on the AICS Inventory or exempt from notification requirements
CANADIAN DSL:	All of the components of this product are listed on the Canadian Domestic Substance List or exempt from notification requirements.
CA PROPOSITION 65:	This product contains respirable crystalline silica which is known to the State of California to cause cancer.

16. OTHER INFORMATION

NFPA RATING:	Health=1 Fire=0 Reactivity=0
HMIS RATING:	Health=1* Fire=0 Reactivity=0

The information in this data sheet is believed to be accurate. However, each purchaser should make its own test to determine the suitability of the product for its purposes. OIL-DRI CORPORATION OF AMERICA MAKES NO WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCT and assumes no responsibility for any risk or liability arising from the use of the information or the product. Statements about the product should not be construed as recommendations to use the product in infringement of any patent.

OLI-9101.x
Material Safety Data Sheet

1 Company Identification

Innospec Fuel Specialties
8375 S. Willow Street
Littleton, CO 80124

Product information 1-800-441-9547
In Case of Emergency
Call Chemtrec 1-800-424-9300

2 Composition / Ingredient Information

Material	CAS Number	%
Proprietary Polymers		60-80
*Xylene	1330-20-7	20-40
*(Ethylbenzene)	100-41-4	(3-6)
May contain one or more of the following:		
Catalytic Reformed Naphtha	64741-67-9	10-20
Heavy Aromatic Naphtha	64742-94-5	10-20
*(Naphthalene)	91-20-3	(<2)
Light Ends of Polyethylbenzene Residue	178535-25-6	10-20
(Triethylbenzene)	102-25-0	(<4)

*Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

3 Hazardous Identification

Potential Health Effects

Skin contact may cause skin irritation with discomfort or rash. Xylene can penetrate the skin in amounts capable of causing systemic toxicity. Eye contact may cause eye irritation with discomfort, tearing or blurring of vision. Inhalation of Ethylbenzene may cause irritation of the upper respiratory passages with coughing and discomfort.

Inhalation or ingestion of Xylene or Ethylbenzene may cause nonspecific discomfort, such as nausea, headache, or weakness; or temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness.

Inhalation or ingestion of Ethylbenzene may cause abnormal liver or kidney function. Aspiration of Ethyl benzene into the lungs during ingestion or vomiting may lead to chemical pneumonitis.

Ingestion of Xylene or Ethylbenzene may cause gastrointestinal tract irritation. Higher exposure to Xylene may lead to cardiac stress; anemia and other blood changes; respiratory effects; possible liver and kidney damage; or fatality from gross overexposure.

Eye contact with the product ingredients may cause eye irritation with discomfort, tearing, or blurring of vision. Direct exposure may cause skin irritation (redness, swelling). A single prolonged exposure may result in the material being absorbed through the skin in harmful amounts.

Inhalation or ingestion of Heavy Aromatic Naphtha may cause central nervous system depression with anesthetic effects, such as dizziness, headache, confusion, incoordination and loss of consciousness. Higher exposures may result in fatality from gross overexposure. Ingestion may cause gastrointestinal irritation. Aspiration hazard! Small amounts aspirated into the lungs during ingestion or vomiting may cause lung injury, possibly leading to death. Symptoms of aspiration into the lungs include coughing, gasping, choking, shortness of breath, bluish discolored skin, rapid breathing and heart rate. Chemical pneumonitis from aspiration may result in fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after the exposure, depending on how much chemical entered the lungs.

In general, overexposure to high atmospheric concentrations of alkyl-substituted aromatics may produce central nervous system depression, headache, dizziness, incoordination, nausea and loss of appetite. Aspiration (liquid enters the lung), may cause lung damage due to chemical pneumonia, a condition caused by petroleum-like solvents.

Minute amounts of petroleum hydrocarbons aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possible death.

Individuals with preexisting diseases of the kidneys or liver may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

Ethylbenzene and Naphthalene have been classified by the Internal Agency for Research on Cancer (IARC) as possibly carcinogenic to humans (Group 2B). This IARC classification was based upon limited evidence of carcinogenicity to animals and inadequate evidence of carcinogenicity to humans.

4 First Aid Measures

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

Skin Contact
Flush skin with water after contact. Wash contaminated clothing before reuse.

Eye Contact
In case of contact immediately, flush eyes with plenty of water for at least 15 minutes. Call a physician.

Ingestion
If swallowed, do not induce vomiting. Allow victim to rinse his mouth and then to drink 2-4 cupfuls of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 grams activated charcoal in 400-ml water and mix thoroughly. Administer 5 ml/kg or 350 ml for an average adult.

Because of the danger of aspiration, emesis or gastric lavage should not be employed unless the risk is justified by the presence of additional toxic substances. Activated charcoal may induce vomiting, but may be given after emesis or lavage to absorb toxic additives. Steroid therapy in mild to moderate cases does not improve outcome. Bacterial pneumonia often occurs after exposure, but prophylactic antibiotics are not indicated and should be reserved for documented bacterial pneumonia.

5 Fire Fighting Measures

Flammable Properties

Flash Point..... 94°F (34°C)
Method..... PMCC
Flammable Liquid

Extinguishing Media

Water Spray, Foam, Dry Chemical, CO_2.

Fire Fighting Instructions

Wear self-contained breathing apparatus. Wear full protective equipment.

6 Accidental Release Measures

Note: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) SECTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Soak up with sawdust, sand, oil dry or other absorbent material. Remove source of heat, sparks, flame, impact, friction, or electricity. Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean-Up

Soak up with sawdust, sand, oil dry or other absorbent material.

Accidental Release Measures

Spills are very slippery and should be cleaned up promptly. Unless released material is cleaned up immediately for reprocessing, recycling, or reuse, a release of 100 lbs. may trigger the reporting requirements of CERCLA Section 103.

7 Handling and Storage

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling.

Handling (Physical Aspects)

Keep away from heat, sparks and flames.

Storage
Store in a well-ventilated place. Keep container tightly closed. Store in accordance with National Fire Protection Association recommendations.

8 Exposure Controls

Engineering Controls
Use only with adequate ventilation. Keep container tightly closed.

Personal Protective Equipment

Eye/Face Protection
Wear coverall chemical splash goggles or safety glasses.

Respirators
Where there is potential for airborne exposures in excess of applicable limits, wear NIOSH/MSHA approved respiratory protection.

Protective Clothing
Where there is potential for skin contact have available and wear as appropriate impervious gloves, apron, pants, hood and jacket.

Exposure Limits

Xylene:

PEL (OSHA)	100 ppm, 435 ,mg/m^3, 8 hr TWA
TLV (ACGIH)	100 ppm, 434 mg/m^3, 8 hr TWA STEL 150 ppm, 651 mg/m^3, A4; BEI
AEL* (Innospec Fuel Specialties)	100 ppm, 8 & 12 hr, TWA, skin 150 ppm, 15 minute TWA

Ethylbenzene:

PEL (OSHA)	100 ppm, 435 mg/m^3, 8 hr, TWA
TLV (ACGIH)	100 ppm, 434 mg/m^3, 8 hr, TWA, A3, BEI STEL 125 ppm, 543 mg/m^3
AEL* (Innospec Fuel Specialties)	None established

Heavy Aromatic Naphtha:

PEL (OSHA)	None established
TLV (ACGIH)	None established
AEL* (Innospec Fuel Specialties)	50 ppm, 300 mg/m^3, 8 hr, TWA

Naphthalene:

PEL (OSHA)	10 ppm, 50 mg/m^3, 8 hr. TWA
TLV (ACGIH)	10 ppm, 52 mg/m^3, 8 hr TWA, Skin; A4 STEL 15 ppm, 79 mg/m^3, A4
AEL* (Innospec Fuel Specialties)	None established

The "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposure should be considered.

* AEL is Innospec Fuel Specialties's acceptable exposure limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

9 Physical and Chemical Properties

Physical Data

Appearance..... Clear Amber
Form..... Liquid
Odor..... Aromatic
Specific Gravity..... 0.947 @ 60/60°F (16/16°C)
Density..... 7.89 lbs./gal. @ 60°F (16°C)
Solubility in water..... insoluble

10 Stability and Reactivity

Chemical Stability
Stable at normal temperatures and storage conditions.

Incompatibility
Incompatible with strong oxidizers.

Decomposition
Decomposes with heat. Hazardous decomposition products include oxides of carbon.

Polymerization
Will not occur.

11 Toxicological Information

Animal Data

Xylene (mixed isomers):
Inhalation 4 hour LC50..... 6,700 ppm in rats
Skin absorption LD50..... 4,320 mg/kg in rabbits
Oral ALD..... 4,500 mg/kg in rats

Ethylbenzene:
Inhalation 4 hour LC50..... >4,000 ppm in rats
Skin absorption LD50..... ~15,000 mg/kg in mice
Oral LD50..... >3,500 mg/kg in rats

Proprietary Polymer (read across data):
Oral LD50..... >2,000 mg/kg in rats
Dermal LD50..... >2,000 mg/kg in rabbits
Skin sensitization..... negative in guinea pigs

Heavy Aromatic Naphtha:
Inhalation 6 hour LC50..... >11.67 mg/L in rats
Skin Absorption LD50..... >3,160 mg/kg in rabbits
Oral LD50..... >5,000 mg/kg in rats

Naphthalene:
Inhalation 15 minute LC50: ..... >0.34 mg/L in rats
Skin Absorption LD50: ..... 10,000 mg/kg in rabbits
Oral LD50: ..... 1,780 mg/kg in rats

Dermal absorption of Xylene in animals causes narcosis. Toxic effects described in animals by inhalation include upper respiratory irritation; central nervous system effects; behavioral effects; decreased weight gain; hearing loss; and effects on the blood, liver, kidneys, heart, spleen, lungs and bone marrow. By ingestion, Xylene caused central nervous system effects; decreased body weight and liver effects. Tests of Xylene in animals demonstrate no carcinogenic activity. Xylene does not produce heritable genetic damage in animals or genetic damage in bacterial or mammalian cell cultures. Although abnormal sperm were observed after an interperitoneal injection in rats, Xylene did not produce reproductive effects. Developmental toxicity was observed in animals exposed to Xylene but only at concentrations that were maternally toxic.

Heavy Aromatic Naphtha is a severe skin irritant, and is an eye irritant, but is not a skin sensitizer in animals. Repeated inhalation exposures caused reduced growth rate, respiratory tract irritation, congestion in liver and spleen, changes in blood tests and equilibrium disturbances. No animal test reports are available to define carcinogenic, mutagenic, developmental or reproductive hazards.

12 Ecological Information

Proprietary Polymer (read across data):
LC50, 96 hours, >1,000 mg/L in fish (WAF)
EC50, 48 hours, >1,000 mg/L in Daphnia (WAF)
IC50, 72 hours, >1,000 mg/L in algae (WAF)
IC50, 3 hours, >1,000 mg/L (WAF)

Proprietary Polymer present at <5% (read across data):
Acute toxicity in fish >100 mg/L

Xylene:
96 hour LC50 fathead minnow: 27-42 mg/L

Heavy Aromatic Naphtha:
96 hour LC50, fathead minnows: 4.2 – 20.8 mg/L

13 Disposal Considerations

Waste Disposal
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial and Local regulations. May be a RCRA hazardous waste due to the ignitability characteristics.

14 Shipping Information

DOT

Proper Shipping Name.....Xylene Solution
Hazard Class 3
I.D. No. (UN/NA).....UN 1307
Packing Group III
Special Information .....Flash Point: 34°C
Marine Pollutant .....No
DOT Label(s) .....Flammable Liquid

IMO

Proper Shipping Name.....Xylene 30% Solution
Hazard Class 3
I.D. No. (UN).....1307
Packing Group III
Special Information .....Flash Point: 34°C
Marine Pollutant .....No
IMO Label .....Flammable Liquid

Reportable Quantity

Xylene.....100 lbs.
Ethylbenzene .....1000 lbs.

Shipping Containers

Steel Drums UN1A1/Y/100

15 US Federal Regulations

TSCA Inventory Status.....Reported / Included

Title III Hazard Classifications Sections 311, 312

Acute .....Yes
Chronic .....Yes
Fire .....Yes
Reactivity.....No
Pressure .....No

16 Other Information

NPCA-HMIS Rating

Health.....2* (Chronic Health Effects)
Flammability.....3
Reactivity 0

Personal Protection rating to be supplied by user depending on use conditions

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS:

Ann Marie Savini
Innospec Fuel Specialties
Newark, DE 19702
(800) 441-9547 or
(302) 451-1362

MATERIAL SAFETY DATA SHEET

L-4638-A
September 1985

An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200, available from OSHA regional or area offices.
(Essentially similar to U.S. Department of Labor Form OSHA-20 and generally accepted in Canada for information purposes)
Do Not Duplicate This Form. Request an Original.

I. PRODUCT IDENTIFICATION

PRODUCT Oxygen

CHEMICAL NAME	Oxygen	**SYNONYMS**	Not applicable
FORMULA	O_2	**CHEMICAL FAMILY**	Not applicable
		MOLECULAR WEIGHT	32.00

TRADE NAME Oxygen

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Safety Data Sheets. See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1984-1985 ACGIH TLV-TWA (OSHA-PEL)
Oxygen (7782-44-7)	100	None currently established (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	−183°C (−297.4°F)	**FREEZING POINT**	−218.4°C (−361.1°F)
SPECIFIC GRAVITY (H_2O = 1)	Gas	**VAPOR PRESSURE AT 20°C.**	Gas
VAPOR DENSITY (air = 1)	1.105 @ 25°C	**SOLUBILITY IN WATER, % by wt.**	Negligible
PERCENT VOLATILES BY VOLUME	100	**EVAPORATION RATE (Butyl Acetate = 1)**	Not applicable

APPEARANCE AND ODOR Colorless, odorless gas at normal temperature and pressure.

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:
In the USA 1-800-UCC-HELP (1-800-822-4357) **In Canada 514 — 640-6400**
For routine information contact your local supplier

L-4638-A

Union Carbide requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product 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 the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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UNION CARBIDE CANADA LIMITED ☐ LINDE DIVISION

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IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None currently established.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — No evidence of adverse effects from available information.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT — No evidence of adverse effects from available information.

EYE CONTACT — No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: See "Notes to Physician."

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See "Notes to Physician."

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING — This product is a gas at normal temperature and pressure.

SKIN — No emergency care anticipated.

INHALATION — Remove to fresh air. Give artificial respiration if not breathing. Keep victim warm and at rest. Call a physician.

EYES — No emergency care anticipated.

NOTES TO PHYSICIAN: *Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity.*

Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the paranasal sinuses may produce "vacuum-type" headache.

Newborn premature infants exposed to high oxygen concentrations may suffer delayed retinal damage which can progress to retinal detachment and blindness (retrolental fibroplasia). Retinal damage can also occur in adults exposed to 100% oxygen under greater than atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised.

All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

WHEN USED IN WELDING AND CUTTING: Read and understand the manufacturer's instructions and the precautionary label on the product. See American Standard Z49.1 "Safety in Welding and Cutting" published by the American Welding Society, P.O. Box 351040, Miami, Florida 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail. For further SAFETY AND HEALTH information, refer to Linde's free publication, L-52-529, "Precautions and Safe Practices for Electric Welding and Cutting", as well as L-2035, "Precautions and Safe Practices for Gas Welding, Cutting, and Heating." You may obtain copies from your local supplier, or by writing to Union Carbide Corporation, Linde Division, Communications Department, 39 Old Ridgebury Road, Danbury, Connecticut, 06817-0001.

NOTE: Suitability for use as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the effects, methods, frequency and duration of use, hazards, side effects and precautions to be taken.

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V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not applicable	**AUTOIGNITION TEMPERATURE**	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	**LOWER** Not applicable	**UPPER**	Not applicable

EXTINGUISHING MEDIA: Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (i.e. safety shower) is the preferred extinguishing media for clothing fires.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately cool containers with water spray from maximum distance until cool, then move containers away from fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent, vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Container may rupture due to heat of fire. No part of a container should be subjected to a temperature higher than 52°C (approximately 125°F). Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Smoking, flames and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

VI. REACTIVITY DATA

STABILITY	
UNSTABLE	**STABLE**
	X

CONDITIONS TO AVOID: See Section IX.

INCOMPATIBILITY (materials to avoid): Combustible materials, asphalt, flammable materials, especially oils and greases.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION	
May Occur	**Will not Occur**
	X

CONDITIONS TO AVOID: None currently known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area. Remove all flammable materials from vicinity. Oxygen must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

WASTE DISPOSAL METHOD: Slowly release into atmosphere, in an open, outdoors area. Remove all flammable materials from vicinity.

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VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): Not required.

VENTILATION	**LOCAL EXHAUST** — Not applicable.
	MECHANICAL (general) — Acceptable.
	SPECIAL — Not applicable.
	OTHER — Not applicable.

PROTECTIVE GLOVES: Preferred for cylinder handling.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

IX. SPECIAL PRECAUTIONS

WARNING: High pressure gas. Vigorously accelerates combustion. Avoid contact with oils, greases and other flammable materials. Never use manifolds for oxygen cylinders unless specifically designed for such use. Use only with equipment conditioned for oxygen service. Use piping and equipment adequately designed to withstand pressures to be encountered. Protect container against physical damage. Isolate from combustible gas installations and combustible materials by adequate distance or by gas-tight, fire-resistive barriers. Protect against over-heating. Never use an oxygen jet for cleaning purposes of any sort, especially clothing, as it increases the likelihood of an engulfing fire. Note: Reverse flow into cylinder may cause rupture. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

MIXTURES: When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death. Be sure to read and understand all labels and other instructions supplied with all containers of this product.

***NOTE:** Compatibility with plastics should be confirmed prior to use. For safety information on general handling of compressed gas cylinders, obtain a copy of pamphlet P-1, "Safe Handling of Compressed Gases in Containers" from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.*

OTHER HANDLING AND STORAGE CONDITIONS: Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak. Never lubricate oxygen valves, regulators, etc., with any combustible substance.

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Union Carbide, it is the user's obligation to determine the conditions of safe use of the product.

LINDE
UNION CARBIDE

GENERAL OFFICES

IN THE USA:
Union Carbide Corporation
Linde Division
39 Old Ridgebury Road
Danbury, CT 06817-0001

IN CANADA:
Union Carbide Canada Limited
Linde Division
123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.

4693

MATERIAL SAFETY DATA SHEET

U S Chemical

SECTION 1 - MANUFACTURER OR SUPPLIER DATA

US9211Z 6381 XX

MANUFACTURER'S NAME & MAILING ADDRESS	PREPARED BY	SIGNATURE
U S Chemical - A DIVISION OF HYDRITE CHEMICAL CO. 316 Hart Street Watertown, Wisconsin 53094 USA	D. E. Kenas	David E. Kenas X
	TITLE: Quality Assurance Manager	DATE: 12-9-92
EMERGENCY TELEPHONE NO. (24 HOUR SERVICE): Medical Emergency ONLY: 1-800-228-5635 Ext. 075	PRODUCT INFORMATION TELEPHONE NO. (8-5 CST): Product Information: 1-800-558-9566	

SECTION 2 - IDENTITY OF MATERIAL

PRODUCT NAME			
USCairite PAX-SOLV			
PRODUCT DESCRIPTION: D-Limonene Based Waterless Cleanser		FORMULA: Proprietary Blend	CHEMICAL FAMILY: N.A.
REGULATED IDENTIFICATION	DOT PROPER SHIPPING NAME: Not Regulated by D.O.T.		
	SHIPPING ID NUMBER: N.A.	HAZARD CLASS: N.A.	

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	SPECIFIC GRAVITY (H2O = 1)	PHYSICAL FORM	COLOR
N.A.	.970	Liquid	Opaque White
VAPOR PRESSURE (mm Hg)	MELTING POINT	SOLUBILITY IN WATER	SCENT
N.A.	N.A.	Complete	Citrus
VAPOR DENSITY (AIR = 1)	EVAPORATION RATE (BUTYL ACETATE = 1)	pH 2500 ppm SOLUTION	pH CONCENTRATE
N.A.	N.A.	N.A.	7.0
OTHER: Highly Viscous, Opaque White Cream.			

SECTION 4 - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS (CHEMICAL NAME: COMMON NAME)	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED	PERCENT
None	N.A.	N.A.	N.A.	N.A.

This product does not contain any hazardous components according to the criteria of 29 CFR 1910.1200, OSHA. This includes 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, OSHA, and Threshold Limit Values for Chemical Substances adopted by ACGIH, and other safety information sources.

NFPA RATING: Health-1/Flammability-1/Reactivity-0
HMIS RATING: Health-1/Flammability-1/Reactivity-0

CARCINOGENICITY:
This product does not contain any known carcinogens or anticipated carcinogens according to the criteria of the NTP Annual Report on Carcinogens, IARC Monographs, and OSHA 29 CFR 1910, Subpart Z.

(CONTINUED ON REVERSE SIDE)

SECTION 5 - SAFE USAGE DATA

PROTECTIVE EQUIPMENT TYPES	EYES: None required with normal use.	
	RESPIRATORY: None required with normal use.	GLOVES: None required with normal use.
	OTHER: None required with normal use.	
VENTILATION	GENERAL MECHANICAL: None Needed.	
	LOCAL EXHAUST: None required with normal use.	
PRECAUTIONS	HANDLING & STORAGE: Follow all label directions. Instruct personnel about proper use, hazards, precautions, and first-aid measures. Avoid ingestion and contact with eyes. Rotate stock regularly. Handle carefully to avoid damaging container. Keep container closed when not in use. Recommended storage temp. below 100° F. Keep out of children's reach.	

SECTION 6 - HEALTH HAZARD DATA

EFFECTS OF EXPOSURE	INHALATION: None Known.	
	INGESTION: May cause discomfort, nausea, vomiting, and irritation to mouth, esophagus, stomach, and to other tissues with which contact is made.	
	SKIN & EYES: SKIN: Prolonged exposure to concentrate may cause slight irritation to highly sensitive skin. EYES: Contact may cause tearing, and mild to severe irritation depending upon exposure.	
	ACUTE & CHRONIC: ACUTE: Irritant to eyes. CHRONIC: None Known.	
ROUTES OF ENTRY	INGESTION-X SKIN ABSORPTION- SKIN- EYES-X INHALATION-	TARGET ORGANS: None Known.

SECTION 7 - PHYSICAL HAZARD DATA

FLAMMABILITY	LEL = N.A. UEL = N.A.	FLASH POINT = N.A.	METHOD USED = N.A.
STABILITY	STABLE: X	CONDITIONS TO AVOID: Avoid mixing with any other cleaning product.	
	UNSTABLE:	HAZARDOUS DECOMPOSITION PRODUCTS: None known.	
HAZARDOUS POLYMERIZATION	MAY OCCUR:	CONDITIONS TO AVOID: N.A.	
	WILL NOT OCCUR: X		
INCOMPATIBILITY	MATERIALS TO AVOID: Strong oxidizing agents and strong alkali such as caustic soda or caustic potash.		

SECTION 8 - EMERGENCY RESPONSE DATA

FIRE	EXTINGUISHING MEDIA: For fires in area, use appropriate media. For example: Water spray, dry chemical, carbon dioxide, or alcohol foam.
	SPECIAL PROCEDURES: Evacuate area of unprotected and unnecessary personnel.
	UNUSUAL HAZARDS: Not Applicable.
FIRST AID MEASURES	INGESTION: Do not induce vomiting. If patient is conscious and can swallow, administer milk or water.
	SKIN: Remove contaminated clothes, then flood with water.
	EYES: Flood with lukewarm (not hot) water poured from a large glass 2 or 3 inches from eyes. Remove contacts. Have patient blink as much as possible while flooding the eyes. Continue for 15 minutes.
	ADMINISTER FIRST AID TREATMENT AS STATED ABOVE, THEN CALL 1-800-228-5635 Ext. 075 OR CONTACT A *PHYSICIAN FOR FURTHER MEDICAL INSTRUCTIONS.*
SPILLS	STEPS TO BE TAKEN: Wear proper protective equipment including rubber boots. Stop leak if you can do so without risk. Dike or dam large spills. Ventilate area if needed. Soak up with sand or other non-combustible inert absorbent materials. Flush area with water and follow with normal clean-up procedures. Keep combustibles away! Be careful as spills are slippery.
RQ = N.A.	WASTE DISPOSAL METHOD: Comply with all federal, state, and local regulations. Consult state and local authorities for restrictions on disposal of chemical waste. If approved, may be diluted and drained to a municipal sewer or waste treatment plant. Rinse empty container thoroughly with water before discarding.

THE DATA IN THIS MATERIAL SAFETY DATA SHEET RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS. THE DATA CONTAINED IS BELIEVED TO BE ACCURATE. HOWEVER, SINCE USE CONDITIONS VARY AND ARE OUTSIDE OUR CONTROL, U S CHEMICAL • A DIVISION OF HYDRITE CHEMICAL CO. MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, AND ASSUMES NO LIABILITY FOR FAILURE TO FOLLOW PRODUCT USE DIRECTIONS AND SAFETY PRECAUTIONS.

MATERIAL SAFETY DATA SHEET

920-R-A11
04 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER	DATE OF PREPARATION	HMIS CODES	
		Health	2*
920-R-A11	29-FEB-08	Flammability	3
		Reactivity	0

PRODUCT NAME
PHENICON® HS Flake Filled High Solids Epoxy (Part A), Reddish Gray

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 for Chemical Emergency ONLY (spill, leak,
(800) 424-9300 fire, exposure, or accident)

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
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	
11	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	
1	71-36-3	1-Butanol				
			ACGIH TLV	20	ppm	5.5 mm
			OSHA PEL	50	ppm (Skin) CEILING	
1	78-93-3	Methyl Ethyl Ketone				
			ACGIH TLV	200	ppm	70 mm
			ACGIH TLV	300	ppm STEL	
			OSHA PEL	200	ppm	
			OSHA PEL	300	ppm STEL	
6	Proprietary	Epoxy Polymer				
			ACGIH TLV	Not Available		
			OSHA PEL	Not Available		
20	25068-38-6	Epoxy Polymer				
			ACGIH TLV	Not Available		
			OSHA PEL	Not Available		

Continued on page 2

12	14808-60-7	Quartz			
		ACGIH TLV	0.025	mg/m3	as Resp. Dust
		OSHA PEL	0.1	mg/m3	as Resp. Dust
12	14807-96-6	Talc			
		ACGIH TLV	2	mg/m3	as Resp. Dust
		OSHA PEL	2	mg/m3	as Resp. Dust
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.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

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

May cause allergic skin reaction in susceptible persons or skin sensitization.

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. If irritation persists or occurs later, get medical attention. 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
80 F PMCC	1.0	11.2

FLAMMABILITY CLASSIFICATION

RED LABEL -- Flammable, Flash below 100 F (38 C)

Continued on page 3

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed 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

DOL Storage Class IC

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

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.

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).

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.

Continued on page 4

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.

OTHER PROTECTIVE EQUIPMENT

Use of barrier cream on exposed skin is recommended.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	14.74 lb/gal	1766 g/l
SPECIFIC GRAVITY	1.77	
BOILING POINT	174 - 292 F	78 - 144 C
MELTING POINT	Not Available	
VOLATILE VOLUME	31 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

2.20 lb/gal	264 g/l	Less Water and Federally Exempt Solvents
2.20 lb/gal	264 g/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

Continued on page 5

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

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.

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."

TOXICOLOGY DATA

CAS No.	Ingredient Name					
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
71-36-3	1-Butanol					
		LC50	RAT	4HR	8000	ppm
		LD50	RAT		790	mg/kg
78-93-3	Methyl Ethyl Ketone					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		2740	mg/kg
Proprietary	Epoxy Polymer					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
25068-38-6	Epoxy Polymer					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
14808-60-7	Quartz					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
14807-96-6	Talc					
		LC50	RAT	4HR	Not Available	
		LD50	RAT		Not Available	
13463-67-7	Titanium Dioxide					
		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.
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)
1 Gallon and Less may be Classed as CONSUMER COMMODITY, ORM-D
Larger Containers are Regulated as:
UN1263, PAINT, 3, PG III, (ERG#128)

DOT (Dept of Transportation) Hazardous Substances & Reportable Quantities
Ethyl benzene 1000 lb RQ
Xylenes (isomers and mixture) 100 lb RQ

Bulk Containers may be Shipped as (check reportable quantities):
RQ, UN1263, PAINT, 3, PG III, (XYLENES (ISOMERS AND MIXTURE)), (ERG#128)

Canada (TDG)
UN1263, PAINT, CLASS 3, PG III, LIMITED QUANTITY, (ERG#128)

IMO
UN1263, PAINT, CLASS 3, PG III, (27 C c.c.), EmS F-E, S-E

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
100-41-4	Ethylbenzene	2	
1330-20-7	Xylene	11	
71-36-3	1-Butanol	1	

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.

Continued on page 7

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.

ControlTech
Tank Linings,
Containment &
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Coatings

TRM.26

PHENICON® HS FLAKE FILLED

PART A	920-R-A11	REDDISH GRAY
PART B	700-C-685	HARDENER
PART B	700-C-825	LOW TEMPERATURE HARDENER

PRODUCT INFORMATION

Revised 4/05

PRODUCT DESCRIPTION

PHENICON HS FLAKE FILLED is a VOC-compliant epoxy novolac phenolic with micaceous iron oxide. Designed for use as part of a system for internal tank lining.

The micaceous iron oxide provides:

- Improved abrasion and blister resistance
- Lower moisture vapor transmission
- Film reinforcement
- Higher temperature resistance
- Improved edge protection

Low temperature hardener available for applications from 35°F minimum to 80°F maximum

RECOMMENDED USES

Designed as part of a system to improve performance in immersion service compared to non-micaceous iron oxide filled coatings

- Internal tank lining for most petroleum products such as: crude oil, unleaded gasoline, most aromatic solvents, motor fuels, alkalies, and brines.
- Secondary containment.
- Low temperature hardener not recommended for use at application temperatures above 80°F.
- Acceptable for use with cathodic protection systems.

PRODUCT CHARACTERISTICS

Finish:	Semi-Gloss
Color:	Reddish Gray
Volume Solids:	75% ± 2%, mixed
Weight Solids:	86% ± 2%, mixed
VOC (calculated):	<250 g/L; 2.08 lb/gal, mixed
Mix Ratio:	4:1 by volume

Recommended Spreading Rate per coat:

Wet mils:	7.0 - 8.0
Dry mils:	5.0 - 6.0
Coverage	200 -240 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 7.0 mils wet @ 50% RH:

With 700-C-685 Hardener:

	@ 55°F	@ 77°F	@ 120°F
To touch:	7 hours	3 hours	1 hour
To recoat:			
minimum:	48 hours	18 hours	4 hours
maximum:	30 days	30 days	30 days
Cure to service	14 days	7 days	3 days
Pot Life:	4 hours	2 hours	30 minutes
Sweat-in Time:	30 minutes	15 minutes	None
required			

With 700-C-825 Hardener:

	@ 35°F	@ 55°F	@ 77°F
To touch:	12 hours	4 hours	2 hours
To recoat:			
minimum	24 hours	18 hours	12 hours
maximum:	30 days	30 days	30 days
Cure to service	7 days	5 days	3 days
Pot Life:	4 hours	2 hours	1 hour
Sweat-in Time:	15 minutes	None	None

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent

Shelf Life:	36 months, unopened Store indoors at 40°F to 100°F.
Flash Point:	80°F, PMCC, mixed
Reduction:	Not recommended
Clean Up:	255-C-005

PERFORMANCE CHARACTERISTICS

RESISTANCE GUIDE IMMERSION (Ambient temperature)

- Alkalies ..... Recommended
- Crude oil ..... Recommended
- Diesel fuel ..... Recommended
- Lubricating oils ..... Recommended
- Fuel oils ..... Recommended
- Aromatic solvents ..... Recommended
- Hi-aromatic gasoline ..... Recommended
- Ethanol gasohol ..... Recommended
- MTBE, ETBE, TAME ..... Recommended
- Ether/fuel blends (reformed gas) ..... Recommended
- Acids ..... Recommended*
- Methanol, ethanol, or blends ..... Recommended**
- Aviation Gasoline/Jet Fuel ..... Recommended

SECONDARY CONTAINMENT (Immersion service up to 72 hours)

- Alkalies ..... Recommended
- Crude oil ..... Recommended
- Diesel fuel ..... Recommended
- Lubricating oils ..... Recommended
- Fuel oils ..... Recommended
- Aromatic solvents ..... Recommended
- Hi-aromatic gasoline ..... Recommended
- Ethanol gasohol ..... Recommended
- MTBE, ETBE, TAME ..... Recommended
- Ether/fuel blends (reformed gas) ..... Recommended
- Dilute acids ..... Recommended
- Methanol, ethanol, or blends ..... Recommended
- Aviation Gasoline/Jet Fuel ..... Recommended

System Tested:
Surface Preparation: SSPC-SP10
Finish: 2 cts Phenicon HS Flake Filled @ 5 mils dft/ct

Abrasion Resistance:
Method: ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load
Result: 26 mg loss

Adhesion:
Method: ASTM D4541
Result: 800 psi

Dry Heat Resistance:
Method: ASTM D2485
Result: 300°F, discolors

Moisture Condensation Resistance:
Method: ASTM D4585, 100°F, 1000 hours
Result: Rating 10 per ASTM D610 for rusting

Pencil Hardness:
Method: ASTM D3363
Result: 2H

Epoxy coatings may darken or yellow following application and curing.

* Consult your Sherwin-Williams representative for specific application, temperature, concentration, and exposure recommendations.

** Not recommended when using Low Temperature Hardener

continued on back

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PHENICON® HS FLAKE FILLED

PART A	920-R-A11	REDDISH GRAY
PART B	700-C-685	HARDENER
PART B	700-C-825	LOW TEMPERATURE HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel, Immersion:
1 ct. Phenicon HS Flake Filled @ 5.0 - 6.0 mils dft
1-2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Steel, Immersion:
2 cts Phenicon HS Flake Filled @ 5.0 - 6.0 mils dft/ct

Concrete, smooth, Immersion:
1 ct. Corobond 100 Epoxy Primer/Sealer @ 4.0 - 6.0 mils dft
1 ct. Phenicon HS Flake Filled @ 5.0 - 6.0 mils dft
1-2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Concrete, rough, Immersion:
1 ct. Corobond 100 Epoxy Primer/Sealer @ 4.0 - 6.0 mils dft
1-2 cts. Kem Cati-Coat HS Epoxy Filler/Sealer @ 10 - 20 mils dft/ct, as required to fill voids and provide a continuous substrate
1-2 cts. Phenicon HS Flake Filled @ 5.0 - 6.0 mils dft/ct

The use of Steel-Seam VSE is acceptable for filling pits and fairing on steel and concrete under Phenicon HS Flake Filled

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel	
Immersion:	SSPC-SP10/NACE 2, 2 mil profile
Concrete & Masonry	
Immersion:	SSPC-SP13/NACE 6-4.3.1 or 4.3.2, or ICRI 03732, CSP 2-3

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature: (air and surface)
with 700-C-685 Hardener: 55°F minimum, 120°F maximum
with 700-C-825 Hardener: 35°F minimum, 80°F maximum
Material must be mixed at 55°F minimum
At least 5°F above dew point
Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	4 gallons in a 5 gallon container
Part B:	1 gallon
Weight per gallon:	12.47 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

DISCLAIMER

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WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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TRM.26A

PHENICON® HS FLAKE FILLED

PART A	920-R-A11	REDDISH GRAY
PART B	700-C-685	HARDENER
PART B	700-C-825	LOW TEMPERATURE HARDENER

APPLICATION BULLETIN

Revised 4/05

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel, Immersion Service:

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Iron & Steel, Atmospheric Service:

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Poured Concrete:

New

For surface preparation, refer to SSPC-SP13/NACE 6, ICRI 03732 CSP 2-3. Surfaces must be clean, dry, sound and offer sufficient profile to achieve adequate adhesion. Minimum substrate cure is 28 days at 75°F. Remove all form release agents, curing compounds, salts, efflorescence, laitance, and other foreign matter by sandblasting, shotblasting, mechanical scarification, or suitable chemical means. Refer to ASTM D4260. Rinse thoroughly to achieve a final pH between 8.0 and 11.0. Allow to dry thoroughly prior to coating.

Old

Surface preparation is done in much the same manner as new concrete, however, if the concrete is contaminated with oils, grease, chemicals, etc., they must be removed by cleaning with a strong detergent. Refer to ASTM D4258. Form release agents, hardeners, etc. must be removed by sandblasting, shot blasting, mechanical scarification, or suitable chemical means. If surface deterioration presents an unacceptably rough surface, Kem Cati-Coat HS Epoxy Surfacer is recommended to patch and resurface damaged concrete. Fill all cracks, voids and bugholes with Steel Seam VSE.

Always follow the standard methods listed below:

ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
ICRI 03732

Immersion Service:

In addition to the above surface preparation, abrasive blasting of the concrete surface is required.

APPLICATION CONDITIONS

Temperature: (air and surface)
with 700-C-685 Hardener: 55°F *minimum*, 120°F *maximum*
with 700-C-825 Hardener: 35°F minimum, 80°F maximum
Material must be mixed at 55°F minimum
At least 5°F above dew point

Relative humidity: 85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reduction ..... Not recommended

Cleanup 255-C-005

Airless Spray:
Pressure ..... 3000 psi
Hose ..... 3/8" - 1/2" ID
Tip ..... .017" - .021"
Filter ..... 30 mesh

Conventional Spray:
Gun ..... Binks 95
Tip and Needle 66/65
Air Cap ..... 65 PR
Atomization Pressure ... 65-75 psi
Fluid Pressure ..... 15-20 psi

Brush:
Brush ..... Nylon/Polyester or Natural Bristle

Roller:
Cover ..... 3/8" woven with phenolic core

If specific application equipment is not listed above, equivalent equipment may be substituted.

continued on back

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Coatings

TRM.26A

PHENICON® HS FLAKE FILLED

PART A	920-R-A11	REDDISH GRAY
PART B	700-C-685	HARDENER
PART B	700-C-825	LOW TEMPERATURE HARDENER

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly, by using power agitation. Make certain no pigment remains on the bottom of the can. Then combine four parts by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated. Re-stir before using.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	7.0 - 8.0
Dry mils:	5.0 - 6.0
Coverage	200 -240 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 7.0 mils wet @ 50% RH:

With 700-C-685 Hardener:

	@ 55°F	@ 77°F	@ 120°F
To touch:	7 hours	3 hours	1 hour
To recoat:			
minimum:	48 hours	18 hours	4 hours
maximum:	30 days	30 days	30 days
Cure to service	14 days	7 days	3 days
Pot Life:	4 hours	2 hours	30 minutes
Sweat-in Time: required	30 minutes	15 minutes	None

With 700-C-825 Hardener:

	@ 35°F	@ 55°F	@ 77°F
To touch:	12 hours	4 hours	2 hours
To recoat:			
minimum	24 hours	18 hours	12 hours
maximum:	30 days	30 days	30 days
Cure to service	7 days	5 days	3 days
Pot Life:	4 hours	2 hours	1 hour
Sweat-in Time:	15 minutes	None	None

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Reduction of material will affect film build, appearance, and adhesion.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with reducer 255-C-005

Low temperature hardener recommended for applications below 55°F. Low temperature hardener not recommended for use at application temperatures above 80°F.

Use of low temperature hardener may cause accelerated yellowing of the coating.

Do not use low temperature hardener for immersion service in methanol, ethanol, or blends.

Holiday Detection: Use a wet sponge-type detector such as KD Bird Dog or equivalent equipment per manufacturer's recommendation. Test only cured coating, as solvent entrapment in fresh films may provide false readings.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer 255-C-005 Clean tools immediately after use with Reducer 255-C-005. Follow manufacturer's safety recommendations when using any solvent.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

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MATERIAL SAFETY DATA SHEET

920-W-A11
06 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER	DATE OF PREPARATION	HMIS CODES	
		Health	2*
920-W-A11	29-FEB-08	Flammability	3
		Reactivity	0

PRODUCT NAME
PHENICON® High Solids Epoxy (Part A), 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 for Chemical Emergency ONLY (spill, leak,
(800) 424-9300 fire, exposure, or accident)

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT			UNITS	VAPOR PRESSURE
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	
11	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	
1	71-36-3	1-Butanol				
			ACGIH TLV	20	ppm	5.5 mm
			OSHA PEL	50	ppm (Skin) CEILING	
1	78-93-3	Methyl Ethyl Ketone				
			ACGIH TLV	200	ppm	70 mm
			ACGIH TLV	300	ppm STEL	
			OSHA PEL	200	ppm	
			OSHA PEL	300	ppm STEL	
6	Proprietary	Epoxy Polymer				
			ACGIH TLV	Not Available		
			OSHA PEL	Not Available		
20	25068-38-6	Epoxy Polymer				
			ACGIH TLV	Not Available		
			OSHA PEL	Not Available		

Continued on page 2

0.1	14808-60-7	Quartz			
			ACGIH TLV	0.025	mg/m3 as Resp. Dust
			OSHA PEL	0.1	mg/m3 as Resp. Dust
20	14807-96-6	Talc			
			ACGIH TLV	2	mg/m3 as Resp. Dust
			OSHA PEL	2	mg/m3 as Resp. Dust
27	7727-43-7	Barium Sulfate			
			ACGIH TLV	10	mg/m3 as Dust
			OSHA PEL	10	mg/m3 Total Dust
			OSHA PEL	5	mg/m3 Respirable Fraction
11	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.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

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

May cause allergic skin reaction in susceptible persons or skin sensitization.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

EYES: Plush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water. If irritation persists or occurs later, get medical attention. 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.

Continued on page 3

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
80 F PMCC	1.0	11.2

FLAMMABILITY CLASSIFICATION

RED LABEL --- Flammable, Flash below 100 F (38 C)

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed 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

DOL Storage Class IC

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

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.

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).

Continued on page 4

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.

OTHER PROTECTIVE EQUIPMENT

Use of barrier cream on exposed skin is recommended.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	14.80 lb/gal	1773 g/l
SPECIFIC GRAVITY	1.78	
BOILING POINT	174 - 292 F	78 - 144 C
MELTING POINT	Not Available	
VOLATILE VOLUME	31 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

2.21 lb/gal	265 g/l	Less Water and Federally Exempt Solvents
2.21 lb/gal	265 g/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

Continued on page 5

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

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.

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."

TOXICOLOGY DATA

Continued on page 6

CAS No.	Ingredient Name				
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
71-36-3	1-Butanol				
		LC50	RAT	4HR	8000 ppm
		LD50	RAT		790 mg/kg
78-93-3	Methyl Ethyl Ketone				
		LC50	RAT	4HR	Not Available
		LD50	RAT		2740 mg/kg
Proprietary	Epoxy Polymer				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
25068-38-6	Epoxy Polymer				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
14808-60-7	Quartz				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
14807-96-6	Talc				
		LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
7727-43-7	Barium Sulfate				
		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 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.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Continued on page 7

Section 14 -- TRANSPORT INFORMATION

US Ground (DOT)
1 Gallon and Less may be Classed as CONSUMER COMMODITY, ORM-D
Larger Containers are Regulated as:
~~UN1263, PAINT, 3, PG III, (ERG#128)~~

DOT (Dept of Transportation) Hazardous Substances & Reportable Quantities
Ethyl benzene 1000 lb RQ
Xylenes (isomers and mixture) 100 lb RQ

Bulk Containers may be Shipped as (check reportable quantities):
RQ, UN1263, PAINT, 3, PG III, (XYLENES (ISOMERS AND MIXTURE)), (ERG#128)

Canada (TDG)
UN1263, PAINT, CLASS 3, PG III, LIMITED QUANTITY, (ERG#128)

IMO
UN1263, PAINT, CLASS 3, PG III, (27 C c.c.), EmS F-E, S-E

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
100-41-4	Ethylbenzene	2	
1330-20-7	Xylene	11	
71-36-3	1-Butanol	1	

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.

ControlTech
Tank Linings,
Containment &
Corrosion Control
Coatings

TRM.25
PHENICON® HS

Part A	920-W-A11	Off White
Part A	920-A-175	Light Gray
Part B	700-C-685	Hardener
Part B	700-C-825	Low Temperature Hardener

PRODUCT INFORMATION

Revised 5/06

Product Description

PHENICON HIGH SOLIDS is a VOC-compliant epoxy novolac phenolic coating formulated for use as an internal lining for tanks used to hold crude oil and most refined petroleum products including unleaded gasoline, MTBE, aromatic solvents, and most octane booster blending stocks. Also formulated for secondary containment uses.

- Chemical Resistant
- Low temperature hardener available for applications from 35°F minimum to 80°F maximum

Recommended Uses

- Internal tank lining for most petroleum products such as: crude oil, unleaded gasoline, most aromatic solvents, motor fuels, alkalies, and brines.
- Secondary containment.
- Heavy duty exterior structural coating
- Low temperature hardener not recommended for use at application temperatures above 80°F
- Acceptable for use with cathodic protection systems

Product Characteristics

Finish:	Semi-Gloss
Color:	Off White, Light Gray
Volume Solids:	75% ± 2%, mixed
Weight Solids:	86% ± 2%, mixed
VOC (calculated):	<250 g/L; 2.08 lb/gal, mixed
Mix Ratio:	4:1 by volume

Recommended Spreading Rate per coat:

Wet mils:	7.0 - 8.0
Dry mils:	5.0 - 6.0
Coverage	200 -240 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 7.0 mils wet @ 50% RH:

With 700-C-685 Hardener:

	@ 55°F	@ 77°F	@ 120°F
To touch:	7 hours	3 hours	1 hour
To recoat:			
minimum:	48 hours	18 hours	4 hours
maximum:	30 days	30 days	30 days
Cure to service:	14 days	7 days	3 days
Pot Life:	4 hours	2 hours	30 minutes
Sweat-In Time:	30 minutes	15 minutes	None

With 700-C-825 Hardener:

	@ 35°F	@ 55°F	@ 77°F
To touch:	12 hours	4 hours	2 hours
To recoat:			
minimum	24 hours	18 hours	12 hours
maximum:	30 days	30 days	30 days
Cure to service:	7 days	5 days	3 days
Pot Life:	4 hours	2 hours	1 hour
Sweat-In Time:	15 minutes	None	None

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent

Shelf Life:	36 months, unopened Store indoors at 40°F to 100°F.
Flash Point:	80°F, PMCC, mixed
Reduction:	Not recommended
Clean Up:	255-C-005

Performance Characteristics

RESISTANCE GUIDE

IMMERSION (Ambient temperature)

- Alkalies ..... Recommended
- Crude oil ..... Recommended
- Diesel fuel ..... Recommended
- Lubricating oils ..... Recommended
- Fuel oils ..... Recommended
- Aromatic solvents ..... Recommended
- Hi-aromatic gasoline ..... Recommended
- Ethanol gasohol ..... Recommended
- MTBE, ETBE, TAME ..... Recommended
- Ether/fuel blends (reformed gas) ..... Recommended
- Acids ..... Recommended*
- Methanol, ethanol, or blends ..... Recommended**
- Aviation Gasoline/Jet Fuel ..... Recommended

SECONDARY CONTAINMENT (Immersion service up to 72 hours)

- Alkalies ..... Recommended
- Crude oil ..... Recommended
- Diesel fuel ..... Recommended
- Lubricating oils ..... Recommended
- Fuel oils ..... Recommended
- Aromatic solvents ..... Recommended
- Hi-aromatic gasoline ..... Recommended
- Ethanol gasohol ..... Recommended
- MTBE, ETBE, TAME ..... Recommended
- Ether/fuel blends (reformed gas) ..... Recommended
- Dilute acids ..... Recommended
- Methanol, ethanol, or blends ..... Recommended
- Aviation Gasoline/Jet Fuel ..... Recommended

Epoxy coatings may darken or yellow following application and curing.

* Consult your Sherwin-Williams representative for specific application, temperature, concentration, and exposure recommendations.

** Not recommended when using Low Temperature Hardener

continued on back

ControlTech
Tank Linings, Containment & Corrosion Control Coatings

TRM.25
PHENICON® HS

Part A	920-W-A11	Off White
Part A	920-A-175	Light Gray
Part B	700-C-685	Hardener
Part B	700-C-825	Low Temperature Hardener

PRODUCT INFORMATION

Recommended Systems

Steel:
2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Steel:
1 ct Phenicon HS Flake Filled @ 5.0 - 6.0 mils dft
1-2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Steel, with hold primer:
1 ct. Copoxy Shop Primer @ 1.0 - 1.5 mils dft
2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Concrete, smooth:
2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

Concrete, rough:
1 ct. *Corobond 100 Epoxy Primer/Sealer @ 4.0 - 6.0 mils dft*
1-2 cts. Kem Cati-Coat HS Epoxy Filler/Sealer @ 10.0 - 20.0 mils dft/ct, as required to fill voids and provide a continuous substrate
1-2 cts Phenicon HS Epoxy Phenolic @ 5.0 - 6.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

Surface Preparation

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel:	
Immersion	SSPC-SP10/NACE 2, 2 mil profile
Concrete & Masonry:	
Immersion	SSPC-SP13/NACE 6, or ICRI 03732, CSP 2-3

Tinting

Tinting is acceptable for use in guide coat or prime coat only. Use 844 Colorants up to 1/4 oz per gallon maximum.

Application Conditions

Temperature: (air and surface)
700-C-685 Hardener: 55°F minimum, 120°F maximum
700-C-825 Hardener: 35°F minimum, 80°F maximum
Material must be mixed at 55°F minimum
At least 5°F above dew point
Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

Ordering Information

Packaging:	5 gallons mixed
Part A:	4 gallons in a 5 gallon container
Part B:	1 gallon
Weight per gallon:	12.45 ± 0.2 lb, mixed

Safety Precautions

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

Disclaimer

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Warranty

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ControlTech
Tank Linings,
Containment &
Corrosion Control
Coatings

TRM.25A
PHENICON® HS

Part A	920-W-A11	Off White
Part A	920-A-175	Light Gray
Part B	700-C-685	Hardener
Part B	700-C-825	Low Temperature Hardener

APPLICATION BULLETIN

Revised 5/06

Surface Preparation

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel (immersion service)

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Iron & Steel (atmospheric service)

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Poured Concrete

New

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI 03732, CSP 2-3. Surfaces must be clean, dry, sound and offer sufficient profile to achieve adequate adhesion. Minimum substrate cure is 28 days at 75°F. Remove all form release agents, curing compounds, salts, efflorescence, laitance, and other foreign matter by sandblasting, shotblasting, mechanical scarification, or suitable chemical means. Refer to ASTM D4260. Rinse thoroughly to achieve a final pH between 8.0 and 11.0. Allow to dry thoroughly prior to coating.

Old

Surface preparation is done in much the same manner as new concrete, however, if the concrete is contaminated with oils, grease, chemicals, etc., they must be removed by cleaning with a strong detergent. Refer to ASTM D4258. Form release agents, hardeners, etc. must be removed by sandblasting, shot blasting, mechanical scarification, or suitable chemical means. If surface deterioration presents an unacceptably rough surface, Kem Cati-Coat HS Epoxy Surfacer is recommended to patch and resurface damaged concrete.

Fill all cracks, voids and bugholes with Steel Seam VSE.

Always follow the standard methods listed below:

ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
ICRI 03732

Immersion Service:

In addition to the above surface preparation, abrasive blasting of the concrete surface is required.

Application Conditions

Temperature: (air and surface)
700-C-685 Hardener: 55°F minimum, 120°F maximum
700-C-825 Hardener: 35°F minimum, 80°F maximum
Material must be mixed at 55°F minimum
At least 5°F above dew point

Relative humidity: 85% maximum

Application Equipment

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reduction ..... Not recommended

Cleanup 255-C-005

Airless Spray:
Pressure ..... 3000 psi minimum
Hose ..... 3/8" - 1/2" ID
Tip ..... .017" - .021"
Filter ..... 60 mesh

Conventional Spray:
Gun ..... Binks 95
Tip and Needle 66/65
Air Cap ..... 65 PR
Atomization Pressure ... 65-75 psi
Fluid Pressure ..... 15-20 psi

Brush:
Brush ..... Nylon/Polyester or Natural Bristle

Roller:
Cover ..... 3/8" woven with phenolic core

If specific application equipment is not listed above, equivalent equipment may be substituted.

continued on back

ControlTech
Tank Linings, Containment & Corrosion Control Coatings

TRM.25A
PHENICON® HS

PART A	920-W-A11	OFF WHITE
PART A	920-A-175	LIGHT GRAY
PART B	700-C-685	HARDENER
PART B	700-C-825	LOW TEMPERATURE HARDENER

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly, by using power agitation. Make certain no pigment remains on the bottom of the can. Then combine four parts by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated. Re-stir before using.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	7.0 - 8.0
Dry mils:	5.0 - 6.0
Coverage	200 -240 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 7.0 mils wet @ 50% RH:

With 700-C-685 Hardener:

	@ 55°F	@ 77°F	@ 120°F
To touch:	7 hours	3 hours	1 hour
To recoat:			
minimum:	48 hours	18 hours	4 hours
maximum:	30 days	30 days	30 days
Cure to service:	14 days	7 days	3 days
Pot Life:	4 hours	2 hours	30 minutes
Sweat-In Time:	30 minutes	15 minutes	None

With 700-C-825 Hardener:

	@ 35°F	@ 55°F	@ 77°F
To touch:	12 hours	4 hours	2 hours
To recoat:			
minimum	24 hours	18 hours	12 hours
maximum:	30 days	30 days	30 days
Cure to service:	7 days	5 days	3 days
Pot Life:	4 hours	2 hours	1 hour
Sweat-In Time:	15 minutes	None	None

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Reduction of material will affect film build, appearance, and adhesion.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with reducer 255-C-005

Low temperature hardener recommended for applications below 55°F. Low temperature hardener not recommended for use at application temperatures above 80°F

Use of low temperature hardener may cause accelerated yellowing of the coating.

Do not use low temperature hardener for immersion service in methanol, ethanol, or blends.

Holiday Detection: Use a wet sponge-type detector such as KD Bird Dog or equivalent equipment per manufacturer's recommendation. Test only cured coating, as solvent entrapment in fresh films may provide false readings.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer 255-C-005 Clean tools immediately after use with Reducer 255-C-005. Follow manufacturer's safety recommendations when using any solvent.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

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MATERIAL SAFETY DATA SHEET 09/03/04

SECTION 1 MANUFACTURER'S INFORMATION

Product name: Plug N Dike, dry granular
Manufacturer: PND Corporation
14320 NE 21st St, Ste 6
Bellevue, WA 98007
Telephone for information: 425 562-7252

SECTION 2 HAZARDOUS INGREDIENTS

Hazardous Component	CAS#	%	Exposure Limits
Bentonite blend (contains less than 2% of crystalline silica(quartz).	14805-60-7	95 - 99	OSHA PEL (nuisance dust) Respirable Mass: 5mg/m3 Total Mass: 15mg/m3
Starch Polymer	65930-0706	0.5 - 2	Respirable Mass: 5mg/m3 Total Mass: 15mg/m3

SECTION 3 PHYSICAL DATA

Boiling Point: N/A Vapor Pressure: N/A Vapor Density: N/A
Solubility in Water: Negligible Specific Gravity: 2.5 Melting Point: N/A
Evaporation Rate: N/A Appearance: gray granules or powder, odorless

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A Flammable Limits: N/A
Extinguishing Media: N/A Special Fire Fighting Procedures: Non-flammable
Unusual Fire and Explosion Hazard: N/A

SECTION 5 REACTIVITY DATA

Stability: Stable Incompatibility: None known
Hazardous Decomposition: None known Conditions to avoid: None known
Hazardous Polymerization: Will not occur

SECTION 6 HEALTH HAZARD DATA

Hazardous Material Information System

Health Hazard	1
Flammability Hazard	0
Reactivity Hazard	0
Specific Hazard	None

Route of Entry: Inhalation - yes as dust Skin - no Ingestion - unlikely
May cause delayed respiratory disease if dust inhaled over a prolonged period of time. IARC concludes there is limited evidence of the carcinogenicity of crystalline silica to humans. The small quantities of crystalline (quartz) in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or clay. IARC states the toxic effect of crystalline silica (quartz) is reduced by this protective effect. OHSA PEL for crystalline quartz is 0.1mg/m3.

PND CORPORATION Fax:425-562-7254 Feb 23 '05 10:37 P.02

Emergency and First Aid Procedures:
Eye contact: Flush the eyes immediately with large amounts of water. If irritation persists, get immediate medical attention.
Gross inhalation: Get to fresh air. If breathing is difficult, get immediate medical attention.
Skin: Does not affect skin. Wash off dust.

SECTION 7 ***PRECAUTIONS FOR SAFE HANDLING AND USE***

For Spill or Product Release: Shovel, sweep or vacuum the material. Wear approved respiratory protection. Avoid breathing dust. Avoid adding water, as the product can be slippery when wet.

Waste Disposal Method: Uncontaminated original material may be disposed of in the solid waste, but check with your local regulatory agencies first. If used to plug or stop a chemical leak, then dispose of according to the regulations for that chemical.

SECTION 8 **CONTROL MEASURES**

Respiratory Protection: Use appropriate NIOSH-approved respirator protection.
Ventilation: Local exhaust
Eye Protection: Safety glasses or goggles recommended
Protective Gloves: Recommended

SECTION 9 **TRANSPORTATION**

US Department of Transportation: Not regulated by DOT as a hazardous material. No hazard class, number, label or placard is required.

Canadian TDG: Not regulated

SECTION 10 **OTHER REGULATORY INFORMATION**

SARA 311/312	Hazard Categories for reporting: Chronic Health
SARA 313	None
TSCA	All of the components of this product are listed on the EPA inventory or exempt from notification requirements.

CERCLA Section 103
Reportable Quantity: None

The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, PND Corporation extends no warranties, makes no representation and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

LOCTITE®

Material Safety Data Sheet

Henkel Technologies

Revision Date: 05/30/2006 **Issue date:** 05/30/2006

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: RC(TM) 620 Retaining Cmpd High Temp
Product type: Anaerobic Adhesive
Company address:
Henkel Corporation
1001 Trout Brook Crossing
Rocky Hill, Connecticut 06067

Item No. : 62005
Region: United States
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	60-100	None	None	None
Maleimide Resin 3006-93-7	10-30	None	None	None
Hydroxyalkyl methacrylate 27813-02-1	1-5	None	None	1 ppm TWA; 3 ppm STEL
Cumene hydroperoxide 80-15-9	1-5	None	None	1 ppm (6 mg/m³) Skin (WEEL), 1ppm, skin TWA, (WEEL)
Silica, amorphous, fumed, crystalline-free 112945-52-5	1-5	6 mg/m³ TWA	10 mg/m³ TWA	3 mg/m³ TWA respirable dust
1-Acetyl-2-phenylhydrazine 114-83-0	0.1-1	None	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Liquid
Color: Green
Odor: Mild

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 BE HARMFUL IF SWALLOWED.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: May cause respiratory tract irritation.
Skin contact: May cause allergic skin reaction.
Eye contact: Contact with eyes will cause irritation.
Ingestion: May be harmful if swallowed.

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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°C (200°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:	None
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Toxic fumes. 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.
Storage:	For safe storage, store at or below 38°C (100°F).
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:	No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limts.
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. Neoprene gloves.

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 mm Hg at 27°C (80°F)
pH:	Not applicable
Boiling point/range:	Greater than 149°C (300°F)
Melting point/range:	Not available
Specific gravity:	1.1
Vapor density:	Not available
Evaporation rate:	Not available
Solubility in water:	Slight
Partition coefficient (n-octanol/water):	Not available
VOC content:	8.3%; 91 grams/liter (EPA Method 24)

10. STABILITY AND REACTIVITY

Stability: Stable.

Hazardous polymerization: Will not occur.

Hazardous decomposition products: Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Toxic fumes. Irritating organic vapors.

Incompatability: Strong oxidizers.

Conditions to avoid: See "Handling and Storage" (Section 7) and "Incompatabilty" (Section 10).

11. TOXICOLOGICAL INFORMATION

Product toxicity data: Acute oral LD50 greater than 10, 000 mg/kg (rat). 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
Maleimide Resin 3006-93-7	No	No	No
Hydroxyalkyl methacrylate 27813-02-1	No	No	No
Cumene hydroperoxide 80-15-9	No	No	No
Silica, amorphous, fumed, crystalline-free 112945-52-5	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
Maleimide Resin 3006-93-7	No Target Organs
Hydroxyalkyl methacrylate 27813-02-1	Allergen, Irritant
Cumene hydroperoxide 80-15-9	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Silica, amorphous, fumed, crystalline-free 112945-52-5	Nuisance dust
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

WaterTransportation (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:	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: 8

Prepared by: Kyra Kozak Woods, Product Safety and Regulatory Affairs Specialist

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MATERIAL SAFETY DATA SHEET
MSDS 0077

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
RectorSeal T Plus 2

HMIS CODES
Health
1
Flammability
1
Reactivity
0
PPI
B

PRODUCT CODES
23710, 23631, 23551, 23431, 23391, 23271, 23191, 23112

CHEMICAL FAMILY:
Organic

USE
Pipe Thread Sealant

MANUFACTURER'S NAME
The RectorSeal Corporation
2601 Spenwick Drive
Houston, Texas 77055 USA

EMERGENCY TELEPHONE NO.
Chemtrec 24 Hours
(800) 424-9300

VALIDATION DATE
TELEPHONE NO.
February 10, 2006

TECHNICAL SERVICE
(800) 231-3345

REVISION DATE
February 10, 2006

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	UNITS
None as defined by OSHA Hazard Communication Standard 29 CFR 1910.1200.			

Section 3 -- HAZARDS IDENTIFICATION

SUMMARY OF ACUTE HAZARDS
May produce slight to moderate skin and eye irritation.

ROUTE OF EXPOSURE, SIGNS AND SYMPTOMS

INHALATION
None known.

EYE CONTACT
Irritation, watering may occur.

SKIN CONTACT
Frequent or prolonged contact may irritate and cause dermatitis.

INGESTION
May cause nausea and vomiting. Not expected to produce toxic effects unless large amounts are ingested.

SUMMARY OF CHRONIC HAZARDS
None known.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Individuals with pre-existing or chronic diseases of the eyes, skin or persons with chemical sensitivity may have increased susceptibility to
excessive exposures.

Section 4 -- FIRST AID MEASURES

If INHALED:	N/A
If on SKIN:	Wash with soap and water. Seek medical attention if irritation persists.
If in EYES:	Flush with large amounts of water. Get medical attention if irritation persists.
If SWALLOWED:	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
>300 F (149 C) SETA CC	N/D	N/D

EXTINGUSING MEDIA
Foam, dry chemical, carbon dioxide or water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus
(SCBA) and other protective clothing. Hazardous decomposition products
possible (see Section 10).
UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat may build up pressure and rupture
closed containers. Above 500 F (260 C) the fumes are acutely toxic.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wipe or scrape
up spilled material to prevent footing hazard and place in trash.

Section 7 -- HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep container closed and
upright when not in use.
OTHER PRECAUTIONS: Avoid prolonged or repeated contact with skin or

clothing. Empty containers may contain residues; treat as if full and
observe all products precautions. Do not reuse empty containers.
KEEP OUT OF REACH OF CHILDREN.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION (SPECIFY TYPE): None required.
VENTILATION - LOCAL EXHAUST: N/A
SPECIAL: N/A
MECHANICAL (GENERAL): N/A
OTHER: N/A
PROTECTIVE GLOVES: Wear rubber gloves.
EYE PROTECTION: Chemical splash goggles (ANSI Z-87.1 or equivalent)
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls recommended.
WORK/HYGIENIC PRACTICES: Where use can result in skin contact, wash exposed
areas thoroughly before eating, drinking, smoking, or leaving work area.
Launder contaminated clothing before reuse.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT:	N/D
SPECIFIC GRAVITY (H20 = 1):	1.32
VAPOR PRESSURE (mm Hg):	< 1 @ 77 F (25 C)
MELTING POINT:	N/A
VAPOR DENSITY (AIR = 1):	N/A
EVAPORATION RATE (ETHYL ACETATE = 1):	N/A
APPEARANCE/ODOR:	White Paste/Slight Odor
SOLUBILITY IN WATER:	Negligible

VOLATILE ORGANIC COMPOUNDS(VOC)Content
(Theoretical Percentage By Weight): 0% or (0 g/L)

Section 10 -- STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known.
INCOMPATIBILITY (MATERIALS TO AVOID): Gaseous oxygen and strong oxidizing
materials.
HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO2 and fragmented hydrocarbons.
HAZARDOUS POLYMERIZATION: Will not occur.

Section 11 -- TOXICOLOGY INFORMATION

CHRONIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

TOXICOLOGY DATA
Ingredient Name

	Oral-Rat	LD50: N/A
	Inhalation-Rat	LC50: N/A

Section 12 -- Ecological Information

ECOLOGICAL DATA
Ingredient Name

Food Chain Concentration Potential	N/A
WATERFOWL TOXICITY	N/A
BOD	N/A
AQUATIC TOXICITY	N/A

Section 13 -- DISPOSAL CONSIDERATIONS

Waste Classification: Non-regulated solid waste
Disposal Method: Approved landfill
Waste from this product is not considered hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Dispose of in accordance with Federal, State, and Local regulation regarding pollution.

Section 14 -- TRANSPORTATION INFORMATION

DOT:	Non-Regulated
OCEAN (IMDG):	Non-Regulated
AIR (IATA):	Non-Regulated
WHMIS (CANADA):	Non-Regulated

Section 15 -- REGULATORY INFORMATION

REGULATORY DATA
Ingredient Name

SARA 313	N/A
TSCA Inventory	All components listed
CERCLA RQ	N/A

RCRA Code N/A

Section 16 -- OTHER INFORMATION

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). The information herein is given in good faith,
but no warranty, expressed or implied is made. Consult RectorSeal for further
information: (713) 263-8001

Redux™ Technology

Material Safety Data Sheet

Product Name: Redux 333 **Effective date: 9/15/2004**
MSDS #: 18 **Page 1 of 6**

SECTION 1 -- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

IDENTIFICATION

Product Name	Redux 333
Chemical Name	Aqueous Blended Deposit Control Agent
Chemical Family	
Formula	
Synonym	

COMPANY IDENTIFICATION

Redux Technology
550 VT Rte. 30, P.O. Box 331
Newfane, VT 05345
Phone: 802-365-7200
Fax: 802-365-4652
Email: info@reduxtech.com

EMERGENCY TELEPHONE NUMBER

24 hours a day: CHEMTREC 1-800-424-9300.
Number for non-emergency questions concerning MSDS: (802) 365-7200

SECTION 2 -- COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS #	Amount (%W/W)
Water	7732-18-5	~45%
Dispersing Copolymer	Not Hazardous	~8%
Organic Phosphorous Compound	Proprietary	~11%
Other Ingredients	Proprietary	~36%

SECTION 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	**Eye and skin irritant. Material may cause burns on exposed tissues. Eye contact may cause corneal injury, which may result in permanent impairment of vision, or even blindness. Prolonged or repeated skin may cause irritation or even a burn.**

POTENTIAL HEALTH EFFECTS	
INGESTION.....	Corrosive and causes severe and permanent damages to mouth throat and stomach. May be fatal if swallowed.
INHALATION.....	Damages airways and lungs, depending upon amount and duration of exposure. Effects can vary from irritation to bronchitis or pneumonia.
EYE CONTACT.....	Severely corrosive to the eyes, and may cause permanent damage, including blindness.
SKIN CONTACT.....	Corrosive; causes severe skin burns. Harmful contact may not cause immediate pain.

SECTION 4 – FIRST AID MEASURES

INGESTION	If swallowed, DO NOT induce vomiting. Immediately drink a large quantity of water. If available, give large quantities of milk. Never give anything by mouth to an unconscious person. **Get medical attention immediately.** If vomiting occurs spontaneously, keep airway clear.
INHALATION	*Get person out of contaminated area to fresh air. If breathing has stopped,* resuscitate and administer oxygen if readily available. **Get medical attention immediately.**
EYE CONTACT	Immediately flush eye with plenty of cool, running water. Remove contact lenses if applicable and continue flushing for at least 15 minutes, holding eyelids apart to ensure thorough rinsing of the entire eye. **Get medical attention immediately.**
SKIN CONTACT	Immediately flush skin with plenty of cool running water for at least 15 minutes. Wash with soap and water. If irritation develops or persists, get medical attention. Remove contaminated clothing and shoes; wash before reuse.
NOTE TO PHYSICIAN	*Information pertaining to ingestion toxicology, therapy, symptomatology and treatment* can be found in Clinical Toxicology of Commercial Products, authored by Gosselin, Smith and Hodge and published by Williams & Wilkins, Baltimore, Maryland.

SECTION 5 – FIRE FIGHTING MEASURES

FLASH POINT / METHOD	None / N.A.	FLAMMABLE LIMITS	Not flammable or combustible
EXTINGUISHING MEDIA	Use extinguishing media appropriate for surrounding fire.		
SPECIAL FIRE FIGHTING PROCEDURES	Pressure demand self-contained respiratory protection and protective clothing should be worn by fire fighters.		
FIRE AND EXPLOSION HAZARDS	Not a fire or explosion hazard		

SECTION 6 – ACCIDENTAL RELEASE MEASURES

RESPONSE TO SPILLS	Absorb with inert material such as vermiculite, shovel into closeable container for disposal. Thoroughly flush residual with water.

SECTION 7 – HANDLING AND STORAGE

HANDLING PRECAUTIONS	Wear proper safety equipment. Mix only with water. Follow appropriate tank entry procedures (ANSI Z117) and OSHA Confined Space Regulations.
STORAGE PRECAUTIONS	Store in a cool, dry and well-ventilated place. Keep from freezing. Keep container tightly closed when not in use.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

HYGIENIC PRACTICES	Observe label precautions; use personal protective equipment. Avoid breathing mists or vapors of this product.
ENGINEERING CONTROLS	**Facilities using this product must be equipped with an eyewash station.** Local Exhaust: None

PERSONAL PROTECTIVE EQUIPMENT

X	**RESPIRATOR**	NIOSH/MSHA approved respirator where mists or sprays may be generated.
X	**GOGGLES / FACE SHIELD**	Chemical splash goggles required; also use face shield if exposure is severe
X	**APRON**	Required; PVC, Neoprene or Vinyl acceptable
X	**GLOVES**	Required; use PVC, Neoprene or Nitrile with long gauntlet or protective cuff
X	**BOOTS**	Rubber

SECTION 9 -- PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Clear pale yellow liquid	BOILING POINT	> 212° F
ODOR	Slight Odor	FREEZING POINT	< 32° F
pH	Approx. 1.9	VAPOR PRESSURE	Similar to water
SPECIFIC GRAVITY	1.1	VAPOR DENSITY	Similar to water
SOLUBILITY IN WATER	Complete	EVAPORATION RATE	Similar to water

SECTION 10 -- STABILITY AND REACTIVITY

CHEMICAL STABILITY		**STABLE**	X		**UNSTABLE**	
CONDITIONS TO AVOID	Do not mix with anything but water.					
INCOMPATIBILITY	Do not mix with quaternay amines, acids, sulfides and strong oxidizers.					
HAZARDOUS PRODUCTS OF DECOMPOSITION	Carbon dioxide and carbon monoxide.					
POLYMERIZATION		**WILL NOT OCCUR**	X		**MAY OCCUR**	
CONDITIONS TO AVOID	Not applicable					

SECTION 11 -- TOXICOLOGICAL INFORMATION

Oral:	Rat LD50 = ~13,400 mg/kg
Dermal:	Rabbit LD50 = >43,000 mg/kg
Eye Irritation:	Corrosive
Skin irritation	Mild Irritant

CARCINOGENICITY

	THIS PRODUCT CONTAINS A KNOWN OR SUSPECTED CARCINOGEN
X	**THIS PRODUCT DOES NOT CONTAIN ANY KNOWN OR ANTICIPATED CARCINOGENS ACCORDING TO THE CRITERIA OF THE NTP ANNUAL REPORT ON CARCINOGENS AND OSHA 29 CFR 1910, Z**

OTHER EFFECTS

ACUTE	May be corrosive to all body tissues which it comes in contact.
CHRONIC	The chronic local effect may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray, or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness.

SECTION 12 -- ECOLOGICAL INFORMATION

BIODEGRADABILITY		**CONSIDERED BIODEGRADABLE**	X		**NOT BIODEGRADABLE**	
BOD / COD VALUE	Not established					
ECOTOXICITY	Daphnia Magna: 48 hr EC50 = 2950 mg/l Midge Larvae: 48 hr LC50 = >50,000 mg/l Grass Schrimp: 96 hr LC50 = 10,000 mg/l Rainbow Trout: 96 hr LC50 = 2060 mg/l					

SECTION 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD	Product that cannot be used according to the label must be disposed of as a hazardous waste at an approved hazardous waste management facility. Empty containers may be triple rinsed, then offered for recycling or reconditioning; or puncture and dispose of in a sanitary landfill.								
RCRA CLASSIFICATION	Hazardous, corrosive D002								
RECYCLE CONTAINER		**YES**	X		**CODE**	2 - HDPE		**NO**	

SECTION 14 -- TRANSPORT INFORMATION

DOT CLASSIFICATION		**HAZARDOUS**	x		**NOT HAZARDOUS**	
DESCRIPTION	Corrosive					

SECTION 15 -- REGULATORY INFORMATION

REGULATORY STATUS

	EPA REGISTERED (UNDER FIFRA)	
	FDA REGULATED	
	KOSHER	
	SARA TITLE III MATERIAL	
	USDA AUTHORIZED	
	NSF APPROVAL	

SECTION 16 -- OTHER INFORMATION

NFPA CLASSIFICATION

3	**BLUE**	HEALTH HAZARD
0	**RED**	FLAMMABILITY
1	**YELLOW**	REACTIVITY
C	**WHITE**	SPECIAL HAZARD

ConocoPhillips

Reprocessed Fuel Oil (RFO)

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Reprocessed Fuel Oil (RFO)

MSDS Code: 724300

Intended Use: Fuel

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers: Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Black
Physical Form: Liquid
Odor: Characteristic 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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). 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: Effects of overexposure may include irritation of the digestive tract, nausea, vomiting. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Reprocessed Lubricating Oil	68476-77-7	80-100
Additives	PROPRIETARY	0-20

4. FIRST AID MEASURES

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

Skin: 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 or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

Health: 1 **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. Vapors are heavier than air and can accumulate in low areas.

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

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.

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.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Immediate cleanup of any spill is recommended. Notify fire authorities and appropriate federal, state, and local agencies. 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

7. HANDLING AND STORAGE

Handling: 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. Use good personal hygiene practices.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Reprocessed Lubricating Oil	TWA: 5mg/m^3 STEL: 10 mg/m^3 as Oil Mist, if Generated	TWA: 5 mg/m^3 as Oil Mist, if Generated	—

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

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of nitrile 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, nitrile apron and/or arm covers may be necessary.

Respiratory: Inhalation is not an expected route of exposure. However, a NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

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:	Black
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1
Vapor Density (air=1):	>1
Boiling Point/Range:	275-960°F / 135-516°C

Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.89-0.92 @ 60°F (15.6°C)
Bulk Density:	56 lb/ft3
Viscosity:	4-40 cSt @ 100°C; 15-680 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>410°F / >210°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 storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen, sulfur, phosphorus and zinc. Hydrogen sulfide and alkyl mercaptans may also be released. Thermal decomposition may produce hydrogen sulfide and other sulfur-containing gases at temperatures greater than 113°F.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Reprocessed Lubricating Oil

Carcinogenicity: Unrefined lubricating oils have been classifed by IARC as a possible carcinogen because of their polycyclic aromatic hydrocarbon (PAH) content. This material contains used reprocessed oils which were previously refined by a variety of processes. The PAH content is unknown.

Reproductive: Reprocessed lubricating oils have not been evaluated for developmental or reproductive toxicity, however some blending components can contain polycyclic aromatic compounds, some of which are known to cause developmental toxicity in animal studies.

Mutagenic Effects: Reprocessed lubricating oils have not been evaluated for genetic toxicity, however some blending components can contain polycyclic aromatic compounds, some of which are known to cause positive responses in both in-vitro and in-vivo assays.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Reprocessed Lubricating Oil	>5g/kg (Similar material)	>2g/kg (Similar material)	No Data

12. ECOLOGICAL INFORMATION

Not evaluated.

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.

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: Federal compliance requirements may apply. See 49 CFR 171.12.

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

UN/ID #: Not regulated
Note: Federal compliance requirements may apply. See 49 CFR 171.11.

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

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 CPR.

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 listed on the Canadian DSL.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	13-Jun-2007
Status:	Final
Product Code:	Multiple
Revised Sections or Basis for Revision:	Composition (Section 3) Format change
MSDS Code:	724300

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

ConocoPhillips

Residual Fuel Oil

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Residual Fuel Oil

MSDS Code: 724250

Synonyms:
Asphalt Feed Stock
Asphalt Flux
Bunker C
Ferndale - Residual Fuel Oil - 1030
Intermediate Fuel Oil
LAR - Blended Pitch
Low Sulfur Fuel Oil

Intended Use: Fuel

Responsible Party:
ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information:
Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers:
Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!
Combustible Liquid and Vapor
May Contain or Release Poisonous Hydrogen Sulfide Gas
Possible Skin Cancer Hazard
Possible Target Organ Hazard

NFPA

Appearance: Opaque black
Physical Form: Liquid
Odor: Characteristic petroleum

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness. Contact with the heated material may cause thermal burns. Vapors or fumes may cause watering of the eyes.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Solid material is not expected to be a skin irritant; however, skin contact with molten material may cause thermal burns. Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): No information available on acute toxicity. May contain or release poisonous hydrogen sulfide gas - see Other Comments.

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

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea, vomiting, diarrhea, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.
This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include respiratory (asthma-like) disorders, liver disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Fuel Oil, Residual	68476-33-5	100
Hydrogen Sulfide	7783-06-4	Variable (<1)

4. FIRST AID MEASURES

Eye: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention. For contact with hot material, gently open eyelids and flush affected eye(s) with cold (not icy) water. Seek immediate medical attention.

Skin: 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. For contact with hot liquid, flush or immerse affected area(s) using only cold (not icy) water. If blistering occurs, apply a sterile dressing and seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% $NaNO_2$ solution (0.5 gm $NaNO_2$ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: This material is combustible and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). May create vapor/air explosion hazard if heated. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

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

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 and 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. Hazardous combustion/decomposition products may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Combustible. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. 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.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. In a tank, barge, or other closed container, the vapor space above materials that contain hydrogen sulfide (H_2S) may result in concentrations immediately dangerous to life or health (IDLH).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Fuel Oil, Residual	0.2 mg/m³ as Coal Tar Pitch Volatiles as Benzene Solubles TWA: 5mg/m³ 10 mg/m³ STEL as Oil Mist, if Generated	5 mg/m³ TWA as Oil Mist, if Generated	100 mg/m³ - 8 hr. TWA (ConocoPhillips Guidelines)
Hydrogen Sulfide	TWA: 10 ppm STEL: 15 ppm	Ceiling: 20 ppm	---

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. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of nitrile gloves is advised to prevent skin contact and possible irritation (see glove manufacturers literature for information on permeability).

Respiratory: Wear a positive pressure air supplied respirator in situations where there may be potential for airborne exposure to H2S above exposure limits. If exposure concentation is unknown or if conditions immediately dangerous to life or health (IDLH) exist, use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode.

A NIOSH certified air purifying respirator with an organic vapor cartridge in combination with a Type 95 (R or P) particulate filter may be used under conditions where H2S is not detected, and airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in pressure demand or other positive pressure mode 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

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:	Opaque black
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	Negligible
Vapor Density (air=1):	>1
Boiling Point/Range:	>350°F / >77°C
Melting/Freezing Point:	No data
Solubility in Water:	<0.1%
Partition Coefficient (n-octanol/water) (Kow):	No data

Specific Gravity:	0.94-0.99 @ 60°F (15.6°C)
Bulk Density:	8.04 lbs/gal
Percent Volatile:	> 0.1%
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>150°F / >66°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.5
UEL (vol % in air):	7.0
Autoignition Temperature:	>450

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

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

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen and sulfur and hydrogen sulfide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Fuel Oil, Residual

Carcinogenicity: Application of residual fuel oil to mouse skin, twice a week (duration unspecified) resulted in an increased incidence of skin tumors. It has been identified as a carcinogen by IARC.

Target Organs: Dermal application of a similar material, Fuel Oil No. 6, to rabbits, 5 days a week for 2 weeks, resulted in slight to severe multifocal necrosis of the liver and mild centrilobular vacuolar degeneration.

Reproductive: Residual fuel oils have not been evaluated for developmental or reproductive toxicity, however some blending components can contain polycyclic aromatic compounds, some of which are known to cause developmental toxicity in animal studies.

Mutagenic Effects: Residual fuel oils have not been evaluated for genetic toxicity, however some blending components can contain polycyclic aromatic compounds, some of which are known to cause positive responses in both in-vitro and in-vivo assays.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Fuel Oil, Residual	> 5 g/kg, rat (similar material)	> 4.9 g/kg, rat (similar material)	No Data
Hydrogen Sulfide	Not Applicable	Not Applicable	LC50 (rat) = 1500 mg/m^3/15 min

12. ECOLOGICAL INFORMATION

12. ECOLOGICAL INFORMATION

The composition and resulting toxicity of heavy fuel oils varies depending on the amount and type of blended middle distillate (cutter stock). Following accidental spillage, the lighter, more volatile components will be lost by evaporation, dissolution and biodegradation. The water-soluble fraction, which principally contains aromatic hydrocarbons and polar compounds, will be responsible for the acute toxicity effects on organisms. The remaining heavy fraction will become attached to the substrate or sequestered in the sediments. Little long-term impact has been observed in the supralittoral, littoral or pelagic zones following a spill. However, the tar-like residue may persist for many years in the sediments with possible resuspension and continued long-term impacts on benthic organisms. Log Kow values of heavy fuel oil components range from 2.7 to over 6 suggesting the potential for bioaccumulation.

In general, data for No. 6 fuel oil (without cutter stock) indicate that it is essentially nontoxic to a variety of organisms. However, a wide range of LC50 values (expressed in terms of dissolved hydrocarbons, in the range 0.9 to 2417 ppm) are seen for blended fuels; these products may contain a higher proportion of lower molecular weight hydrocarbons.

Physical entrapment of birds and coating of feathers with tarry residue following spills has been well documented. Birds that survive initial coating of heavy fuel oil may have decreased resistance to disease or environmental perturbation. Reduced survival and hatching success has been observed in Mallard eggs topically treated with heavy fuel oil.

Heavy mortalities have been observed in plant populations during the first year after a spill, with recovery evident in 2 years and normal population growth after 5 years. The season of the year may influence the degree of damage observed.

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.

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:	***Shipping description is for bulk shipments only with flashpoints below 200° F. Non-Bulk shipments and flashpoints above or equal to 200° F are unregulated.*** Petroleum distillates, n.o.s., Combustible liquid, UN1268, III
Non-Bulk Package Marking:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Non-Bulk Package Labeling:	Not Regulated ***[49 CFR 173.150(f)(2)]***
Bulk Package/Placard Marking:	Combustible / 1268
Packaging - References:	None; None; 49 CFR 173.241 ***(Exceptions; Non-bulk; Bulk)***
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128
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. Flash point is above 60°C, cc.***
Note:	Federal compliance requirements may apply. See 49 CFR 171.12.

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

UN/ID #:	***Not regulated. Flash point is above 60°C, cc***
Note:	Federal compliance requirements may apply. See 49 CFR 171.11.

	LTD. QTY	**Passenger Aircraft**	**Cargo Aircraft Only**

14. TRANSPORTATION INFORMATION

Packaging Instruction #:	—	—	—
Max. Net Qty. Per Package:	—	—	—

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
Hydrogen Sulfide	500 lb	100 lb

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

Acute Health: Yes
Chronic Health: Yes
Fire Hazard: Yes
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):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Residual Fuel Oils	Skin 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 CPR.

WHMIS Hazard Class
B3 - Combustible Liquids
D2A - Very Toxic Material

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

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date: 09-Jul-2007
Status: Final
Product Code: IFO-040
Revised Sections or Basis for Revision: Format change
Periodic review and update
MSDS Code: 724250

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

RIDGID

MATERIAL SAFETY DATA SHEET

Section 1 – Product & Company Identification

Product Name.....:	RIDGID Nu-Clear Thread Cutting Oil
Product Catalog No. .....:	41565, 70835, 41575, 41585
Company Name.....:	Ridge Tool Company
Address .....:	400 Clark Street
:	Elyria, Ohio 44036-2023
Telephone .....:	1-800-519-3456 (USA) (8:00 am – 5:00 pm EST, M-F)
Emergency Telephone .....:	1-440-323-5581 (USA) (24 Hours)
Issue Date .....:	January 5, 2006

Section 2 – Hazards Identification

EMERGENCY OVERVIEW:

This product is a liquid that is insoluble in water. Direct eye contact may cause minor, short term irritation. Short term skin exposure is not expected to be irritating. Inhalation and ingestion are not anticipated routes of exposure during normal conditions of use.

POTENTIAL HEALTH EFFECTS AND SYMPTOMS FROM SHORT TERM / ACUTE EXPOSURE:

- Eye

  This product is not expected to cause eye irritation under normal conditions of use. Symptoms of slight eye irritation may result when direct contact occurs, or when exposed to high mist levels in poorly ventilated areas.

- Skin

  Short term skin contact is not expected to cause skin irritation. Prolonged or repeated direct exposure to the skin may result in symptoms of irritation and redness. In severe cases, prolonged or repeated contact may result in dermatitis accompanied by symptoms of irritation, itching, dryness, cracking and/or inflammation.

- Inhalation:

  This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause upper respiratory tract irritation and difficulty breathing.

- Ingestion:

  Ingestion may cause slight stomach irritation and discomfort.

- Potential Chronic Health Effects

  No further data known.

- Medical Conditions Aggravated By Exposure:

  No further data known.

- Carcinogenicity:

  This product is not listed as a known or suspected carcinogen by IARC, OSHA or the NTP.

Section 3 – Composition / Information On Ingredients

Components listed in this section may contribute to the potential hazards associated with exposure to the concentrate. The product may contain additional non-hazardous or trade secret components.

Component:	CAS #	% By Weight
Mineral Oil	64742-54-7	> 95
Sulfur Additive Package	Mixture	< 5

CARCINOGENIC COMPONENTS:

This product contains no carcinogens.

Product Name.....: RIDGID Nu-Clear Thread Cutting Oil

Section 4 – First Aid Measures

EYE CONTACT:

Upon direct eye contact, hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If irritation is due to exposure to mist or vapors, remove the individual to fresh air. If irritation persists, flush the eyes with clean water until the irritation subsides. If symptoms persist, contact a physician.

SKIN CONTACT:

Remove product from the skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If symptoms of exposure persist, contact a physician.

INHALATION:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs, remove the employee to fresh air. Contact a physician or other medical professional if irritation or distress persists.

INGESTION:

If small amounts are ingested, first aid measures are not likely to be necessary. If larger amounts are ingested or if symptoms of ingestion occur, dilute stomach contents with two glasses of water or milk. (NOTE: Do NOT give anything by mouth to an unconscious person.) Do not induce vomiting without medical supervision. If vomiting occurs spontaneously, keep airway clear. If symptoms of ingestion persist, seek medical attention.

NOTE TO PHYSICIANS:

No further data known.

Section 5 – Fire Fighting Measures

FIRE AND EXPLOSIVE PROPERTIES:

Flashpoint.....:	385°F Cleveland Open Cup
Flammability Limits.....:	LEL - N/A
	UEL - N/A

EXTINGUISH MEDIA:

In accordance with NFPA guidance, dry chemical, foam or CO2 fire extinguishers are all acceptable. Note that while water fog extinguishers are also acceptable, do NOT apply a direct stream of water onto burning product because it may cause spreading and increase fire intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

No further data known.

FIRE-FIGHTING PROCEDURES AND EQUIPMENT:

Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage. See Section 8 of the MSDS for other PPE to be worn as conditions warrant.

Section 6 – Accidental Release Measures

PERSONAL PRECAUTIONS:

Use personal protection recommended in Section 8.

ENVIRONMENTAL:

This material is a water pollutant. Do not let spilled or leaking material enter waterways.

CLEAN-UP MEASURES:

Important: As with any spill or leak, before responding, ensure that you are familiar with the potential hazards and recommendations of the MSDS. Appropriate personal protective equipment must be worn.

If possible, safely contain the spill with dikes or other spill response equipment appropriate for petroleum or organic material releases. Take measures to prevent spreading of product. Note that while product will ignite, it will not readily burn. However, as a precaution, eliminate ignition sources. Prevent from entering sewers or waterways. Large volumes may be transferred to an appropriate container for proper disposal. Small volumes or residues may be soaked up with absorbents. Spill response materials should be collected for proper disposal.

Product Name.....: RIDGID Nu-Clear Thread Cutting Oil

Section 7 – Handling And Storage

HANDLING:

As with any industrial chemical, handle the product in a manner that minimizes exposure to practicable levels. Prior to handling, consult Section 8 of this MSDS to evaluate personal protective equipment needs. Open containers slowly to relieve any pressure. Follow all other standard industrial hygiene practices.

Empty containers may contain product residue. All safety precautions taken when handling this product should also be taken when handling empty drums and containers. Keep containers closed when not in use.

Product residue in empty containers is combustible but will not readily burn. Note, however, that excessive heating or cutting of empty containers may create an ignition source sufficient to start a fire and, in extreme cases, cause an explosion.

STORAGE:

Protect product quality by storing indoors and away from extreme temperatures. Close all containers when not in use.

SPECIAL COMMENTS:

No further data known.

Section 8 – Exposure Controls / Personal Protection

EXPOSURE GUIDELINES:

Component		
Mineral Oil	ACGIH TLV: ACGIH STEL: OSHA PEL:	5 mg / m3 (as mist) 10 mg / m3 (as mist) 5 mg / m3 (as mist
Sulfur Additive Package	No information	

ENGINEERING CONTROLS:

Normal general ventilation is expected to be adequate. It is recommended that ventilation be designed in all instances to maintain airborne concentrations at lowest practicable levels. Ventilation should, at a minimum, prevent airborne concentrations from exceeding any exposure limits.

The user may wish to refer to 29 CFR 1910.1000(d) (2) and the ACGIH "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices" (Appendix C) for the determination of exposure limits of mixtures. An industrial hygienist or similar professional may be consulted to confirm that the calculated exposure limits apply.

PERSONAL PROTECTIVE EQUIPMENT:

Selection of personal protective equipment should be based upon the anticipated exposure and made in accordance with OSHA's Personal Protective Equipment Standard found in 29 CFR 1910 Subpart I. The following information may be used to assist in PPE selection.

- Eye Protection

  Wear eye protection appropriate to prevent eye exposure. Where splashing is not likely, chemical safety glasses with side shields are recommended. Where splashing may occur, chemical goggles or full face shield is recommended.

- Skin Protection

  Gloves are not normally needed during normal conditions of use. If health effects are experienced, oil or chemical resistant gloves such as butyl or nitrile are recommended.

  Where splashing or soaking is likely, wear oil or chemical resistant clothing to prevent exposure.

- Respiratory Protection

  A respirator may be worn to reduce exposure to vapors, dust or mist. Select a NIOSH/MSHA approved respirator appropriate for the type and physical character of the airborne material. A self-contained breathing apparatus is recommended in all situations where airborne contaminant concentration has not been confirmed to be below safe levels. Respirator use should comply with the OSHA Respirator Protection Standard found in 29 CFR 1910.134.

- General Hygiene Considerations

  Wash thoroughly after handling.

Section 9 – Physical And Chemical Properties

Physical Appearance:	Clear Yellow
Odor.	Mild Petroleum
Physical State	Liquid
Water Solubility	Insoluble
Specific Gravity	.878

Section 10 – Stability And Reactivity

STABILITY:

This product is stable.

CONDITIONS TO AVOID:

Avoid contact with incompatible materials and exposure to extreme temperatures.

INCOMPATIBLE MATERIALS:

This product is incompatible with strong oxidizing agents.

DECOMPOSITION PRODUCTS MAY INCLUDE:

Thermal decomposition products are dependent on combustion conditions. A complex mixture of airborne solid, liquid, particulates and gasses may evolve when the material burns. Combustion by-products may include:

oxides of carbon

oxides of sulfur

incompletely burned hydrocarbons as fumes and smoke

POSSIBILITY OF HAZARDOUS REACTIONS:

This product is not expected to polymerize

Section 11 – Toxicological Information

EYE EFFECTS:

No further toxicological data known.

SKIN EFFECTS:

No further toxicological data known.

ORAL EFFECTS:

No further toxicological data known.

INHALATION EFFECTS:

No further toxicological data known.

OTHER:

No further toxicological data known.

Section 12 – Ecological Information

ECOTOXICOLOGICAL INFORMATION:

This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.

ENVIRONMENTAL FATE:

The degree of biodegradability and persistence of this product has not been determined.

Section 13 – Disposal Consideration

WASTE DISPOSAL:

Ensure that collection, transport, treatment and disposal of waste product and containers complies with all applicable laws and regulations. Note that use, mixture, processing or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal whether the product is regulated as a hazardous waste.

Section 14 – Transportation Information

U.S. DOT HAZARDOUS MATERIAL INFORMATION:

Not DOT regulated.

Section 15 – Regulatory Information

FEDERAL REGULATIONS:

SARA 313:

This product contains NONE of the 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.

CLEAN WATER ACT:

This product contains mineral oil and is subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802.

CERCLA REPORTABLE QUANTITY:

Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a particular component must be reported to the National Response Center at 1-800-424-8802.

None to report

TOXIC SUBSTANCE CONTROL ACT:

The components of this product are listed on the TSCA Inventory.

OZONE DEPLETING SUBSTANCES:

This product contains no ozone depleting substances as defined by the Clean Air Act.

HAZARDOUS AIR POLLUTANTS:

Any components listed below are defined by the Federal EPA as hazardous air pollutants:

None to report

STATE REGULATIONS

This product contains mineral oil, and as used, may be regulated by state used oil regulations. Check with the appropriate state agency to determine whether such a regulation exists.

CANADA

WHMIS Classification: None

DSL:

The components of this product are listed on DSL Inventory.

Section 16 – Other Information

HMIS RATING:

Health	Flammability	Reactivity	PPE
1	1	0	X

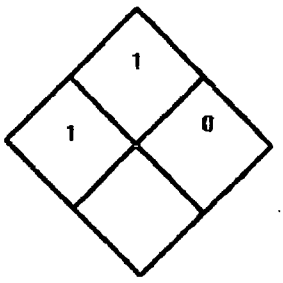
Prepared by:. . . . . Ridge Tool Company

Issue Date: . . . . . January 5, 2006
Last Revision Date: . . . . . May, 2004

RIDGE TOOL BELIEVES THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND, EXPRESSED OR IMPLIED, AND WE ASSUME NO RESPONSIBILITY FOR ANY LOSS, DAMAGE OR EXPENSE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THEIR USE.

RIDGID

Ridge Tool Company
400 Clark Street
Elyria, Ohio 44035-2023, U.S.A.



MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT INFORMATION

PRODUCT NAME: RIDGE PREMIUM NUCLEAR THREAD CUTTING OIL	EMERGENCY TELEPHONE NUMBER: (440) 323-5581
CHEMICAL FAMILY: PETROLEUM HYDROCARBON	TELEPHONE NUMBER FOR INFORMATION: 1-800-519-3456
DOT PROPER SHIPPING NAME: NOT A REGULATED MATERIAL	DATE PREPARED: MAY 2004

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OSHA PEL	ACGIH TLV	%
Paraffinic Mineral Oil	64742-54-7	5mg/m³TWA	5mg/m³ TWA 10mg/m³ STEL	>95%
Sulfur Additive Package	Mixture	no info	no info	<5%

Unlisted ingredients are trade secrets and are not hazardous chemicals under OSHA Hazard Communications Standard (29 CFR 1910.1200)

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	480°	Specific Gravity (H²0 = 1):	0.87
Vapor Pressure (mm Hg.)	0.01 @ 20°C	Solubility in Water:	NIL
Vapor Density (Air = 1)	1	Evaporation Rate (Butyl Acetate = 1)	1

APPEARANCE AND ODOR:
CLEAR AMBER LIQUID.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: (Method Used)	Flammable Limits:	LEL:	UEL:
385°F (Cleveland Open Cup)	Not Determined		

Extinguishing Media:
Water Fog, Dry Chemical, CO_2

Special Fire Fighting Procedures:
Wear self contained breathing apparatus. Keep fire exposed containers cool with water.

Unusual Fire and Explosion Hazards:
Hot vapors form explosive mixtures with air.

SECTION V - REACTIVITY DATA

Stability	Unstable		Conditions to Avoid:
	Stable	X	Spark and Open Flames

Incompatibility: (Materials to Avoid)
Strong acids and oxidants

Hazardous Decomposition or Byproducts:
Upon Combustion - CO, CO_2, Oxides of Sulfur

Hazardous	May Occur		Conditions to Avoid:
Polymerization	Will not Occur	X	None

SECTION VI - HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	X	X	X

Health Hazards: (Acute and Chronic)

Causes Irritation - May be skin defatter upon prolonged or repeated contact. Overexposure to vapors, mist or fumes may result in upper respiratory tract irritation and difficulty breathing. Mineral oil mist, OSHA established 8 hr. TWA PEL of 5 mg/m^3. ACGIH reccomends a 15 min. STEL TLV of 10 mg/m^3.

Carcinogenicity:	NPT?	IARC Monographs?	OSHA Regulated?
	Not Listed	Not Listed	Not Listed

Signs and Symptoms of Exposure:

Eyes: Mild irritation and redness. ***Ingestion***: Gastrointestinal irritation, nausea, vomiting and diarrhea. ***Inhalation***: Dizziness and difficulty breathing.

Medical Conditions Generally Aggravated by Exposure:

Sensitive Dry Skin.

Emergency and First Aid Procedures:

Eyes: Immediately flush with plenty of water for at least 15 minutes. Call a physician. ***Skin***: Wash with soap and water. ***Ingestion***: Do not induce vomiting. Dilute by giving at least 2 glasses of milk or water to a conscious person. Get medical attention. ***Inhalation***: Remove to fresh air and give artificial respiration is necessary. Get medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE.

Steps to be Taken in Case Material is Released or Spilled:

Do not use water - Soak up with sand, earth or other inert material. Put in suitable container. Dispose of in accordance with Local, State and Federal regulations.

Waste Disposal Method:

Dispose of material in accordance with Local, State and Federal regulations. Avoid contamination of sewers and water ways.

Precautions to be Taken in Handling and Storing:

Avoid contact with eyes, skin, and clothing. Remove contaminated clothing. Launder before re-use. Wash thoroughly after handling.

Other Precautions:

Avoid breathing mist or vapors.

SECTION VIII - CONTROL MEASURES

Respiratory Protection (Specify Type):

Use NISOH approved respirator if engineering or other controls are not adequate to reduce airborne exposure to below permissible exposure limits.

Ventilation:

General dilution or local exhaust recommended.

Protective Gloves:	Eye Protection:
Neoprene Oil Impervious if subject to continuous contact.	Safety Glasses or Goggles

Other Protective Clothing or Equipment:

Aprons, Oil Repellent Barrier Creme or other as required to avoid skin contact if subject to repeated exposure.

Work/Hygienic Practices:

Wash after handling.

SECTION IX - REGULATORY INFORMATION

TSCA:

All components are registered under regulations of TSCA.

Sara Title III:

Contains no ingredients subject to reporting under Section 313. Is reportable under Sections 311 and 312 if thresholds are met. Contains no extremely hazardous substances under Section 302. Health categories are Health/Acute and Health/Chronic.

WE BELIEVE THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE, BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND, EXPRESSED OR IMPLIED, AND WE ASSUME NO RESPONSIBILITY FOR ANY LOSS, DAMAGE, OR EXPENSE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THEIR USE.

RIDGID

MATERIAL SAFETY DATA SHEET

Section 1 – Product & Company Identification

Product Name..... :	RIDGID Dark Thread Cutting Oil
Product Catalog No. ..... :	41590, 70830, 41610, 41600
Company Name..... :	Ridge Tool Company
Address ..... :	400 Clark Street
:	Elyria, Ohio 44036-2023
Telephone ..... :	1-800-519-3456 (USA) (8:00 am – 5:00 pm EST, M-F)
Emergency Telephone ..... :	1-440-323-5581 (USA) (24 Hours)
Issue Date ..... :	January 5, 2006

Section 2 – Hazards Identification

EMERGENCY OVERVIEW:

This product is a liquid that is insoluble in water. Direct eye contact may cause minor, short term irritation. Short term skin exposure is not expected to be irritating. Inhalation and ingestion are not anticipated routes of exposure during normal conditions of use.

POTENTIAL HEALTH EFFECTS AND SYMPTOMS FROM SHORT TERM / ACUTE EXPOSURE:

- Eye

  This product is not expected to cause eye irritation under normal conditions of use. Symptoms of slight eye irritation may result when direct contact occurs, or when exposed to high mist levels in poorly ventilated areas.

- Skin

  Short term skin contact is not expected to cause skin irritation. Prolonged or repeated direct exposure to the skin may result in symptoms of irritation and redness. In severe cases, prolonged or repeated contact may result in dermatitis accompanied by symptoms of irritation, itching, dryness, cracking and/or inflammation.

- Inhalation:

  This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause upper respiratory tract irritation and difficulty breathing.

- Ingestion:

  Ingestion may cause slight stomach irritation and discomfort.

- Potential Chronic Health Effects

  No further data known.

- Medical Conditions Aggravated By Exposure:

  No further data known.

- Carcinogenicity:

  This product is not listed as a known or suspected carcinogen by IARC, OSHA or the NTP.

Section 3 – Composition / Information On Ingredients

Components listed in this section may contribute to the potential hazards associated with exposure to the concentrate. The product may contain additional non-hazardous or trade secret components.

Component:	CAS #	% By Weight
Mineral Oil	64742-54-7	> 90
Sulfur Additive Package	Mixture	< 10

CARCINOGENIC COMPONENTS:

This product contains no carcinogens.

Product Name.....: RIDGID Dark Thread Cutting Oil

Section 4 – First Aid Measures

EYE CONTACT:

Upon direct eye contact, hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If irritation is due to exposure to mist or vapors, remove the individual to fresh air. If irritation persists, flush the eyes with clean water until the irritation subsides. If symptoms persist, contact a physician.

SKIN CONTACT:

Remove product from the skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If symptoms of exposure persist, contact a physician.

INHALATION:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs, remove the employee to fresh air. Contact a physician or other medical professional if irritation or distress persists.

INGESTION:

If small amounts are ingested, first aid measures are not likely to be necessary. If larger amounts are ingested or if symptoms of ingestion occur, dilute stomach contents with two glasses of water or milk. (NOTE: Do NOT give anything by mouth to an unconscious person.) Do not induce vomiting without medical supervision. If vomiting occurs spontaneously, keep airway clear. If symptoms of ingestion persist, seek medical attention.

NOTE TO PHYSICIANS:

No further data known.

Section 5 – Fire Fighting Measures

FIRE AND EXPLOSIVE PROPERTIES:

Flashpoint.....:	385°F Cleveland Open Cup
Flammability Limits.....:	LEL - N/A
	UEL - N/A

EXTINGUISH MEDIA:

In accordance with NFPA guidance, dry chemical, foam or CO2 fire extinguishers are all acceptable. Note that while water fog extinguishers are also acceptable, do NOT apply a direct stream of water onto burning product because it may cause spreading and increase fire intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

No further data known.

FIRE-FIGHTING PROCEDURES AND EQUIPMENT:

Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage. See Section 8 of the MSDS for other PPE to be worn as conditions warrant.

Section 6 – Accidental Release Measures

PERSONAL PRECAUTIONS:

Use personal protection recommended in Section 8.

ENVIRONMENTAL:

This material is a water pollutant. Do not let spilled or leaking material enter waterways.

CLEAN-UP MEASURES:

Important: As with any spill or leak, before responding, ensure that you are familiar with the potential hazards and recommendations of the MSDS. Appropriate personal protective equipment must be worn.

If possible, safely contain the spill with dikes or other spill response equipment appropriate for petroleum or organic material releases. Take measures to prevent spreading of product. Note that while product will ignite, it will not readily burn. However, as a precaution, eliminate ignition sources. Prevent from entering sewers or waterways. Large volumes may be transferred to an appropriate container for proper disposal. Small volumes or residues may be soaked up with absorbents. Spill response materials should be collected for proper disposal.

Section 7 – Handling And Storage

HANDLING:

As with any industrial chemical, handle the product in a manner that minimizes exposure to practicable levels. Prior to handling, consult Section 8 of this MSDS to evaluate personal protective equipment needs. Open containers slowly to relieve any pressure. Follow all other standard industrial hygiene practices.

Empty containers may contain product residue. All safety precautions taken when handling this product should also be taken when handling empty drums and containers. Keep containers closed when not in use.

Product residue in empty containers is combustible but will not readily burn. Note, however, that excessive heating or cutting of empty containers may create an ignition source sufficient to start a fire and, in extreme cases, cause an explosion.

STORAGE:

Protect product quality by storing indoors and away from extreme temperatures. Close all containers when not in use.

SPECIAL COMMENTS:

No further data known.

Section 8 – Exposure Controls / Personal Protection

EXPOSURE GUIDELINES:

Component		
Mineral Oil	ACGIH TLV: ACGIH STEL: OSHA PEL:	5 mg / m3 (as mist) 10 mg / m3 (as mist) 5 mg / m3 (as mist
Sulfur Additive Package	No information	

ENGINEERING CONTROLS:

Normal general ventilation is expected to be adequate. It is recommended that ventilation be designed in all instances to maintain airborne concentrations at lowest practicable levels. Ventilation should, at a minimum, prevent airborne concentrations from exceeding any exposure limits.

The user may wish to refer to 29 CFR 1910.1000(d) (2) and the ACGIH "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices" (Appendix C) for the determination of exposure limits of mixtures. An industrial hygienist or similar professional may be consulted to confirm that the calculated exposure limits apply.

PERSONAL PROTECTIVE EQUIPMENT:

Selection of personal protective equipment should be based upon the anticipated exposure and made in accordance with OSHA's Personal Protective Equipment Standard found in 29 CFR 1910 Subpart I. The following information may be used to assist in PPE selection.

- Eye Protection

  Wear eye protection appropriate to prevent eye exposure. Where splashing is not likely, chemical safety glasses with side shields are recommended. Where splashing may occur, chemical goggles or full face shield is recommended.

- Skin Protection

  Gloves are not normally needed during normal conditions of use. If health effects are experienced, oil or chemical resistant gloves such as butyl or nitrile are recommended.

  Where splashing or soaking is likely, wear oil or chemical resistant clothing to prevent exposure.

- Respiratory Protection

  A respirator may be worn to reduce exposure to vapors, dust or mist. Select a NIOSH/MSHA approved respirator appropriate for the type and physical character of the airborne material. A self-contained breathing apparatus is recommended in all situations where airborne contaminant concentration has not been confirmed to be below safe levels. Respirator use should comply with the OSHA Respirator Protection Standard found in 29 CFR 1910.134.

- General Hygiene Considerations

  Wash thoroughly after handling.

Section 9 – Physical And Chemical Properties

Physical Appearance:	Black
Odor.	Mild Petroleum
Physical State	Liquid
Water Solubility	Insoluble
Specific Gravity	.878

Section 10 – Stability And Reactivity

STABILITY:

This product is stable.

CONDITIONS TO AVOID:

Avoid contact with incompatible materials and exposure to extreme temperatures.

INCOMPATIBLE MATERIALS:

This product is incompatible with strong oxidizing agents.

DECOMPOSITION PRODUCTS MAY INCLUDE:

Thermal decomposition products are dependent on combustion conditions. A complex mixture of airborne solid, liquid, particulates and gasses may evolve when the material burns. Combustion by-products may include:

oxides of carbon

oxides of sulfur

incompletely burned hydrocarbons as fumes and smoke

POSSIBILITY OF HAZARDOUS REACTIONS:

This product is not expected to polymerize

Section 11 – Toxicological Information

EYE EFFECTS:

No further toxicological data known.

SKIN EFFECTS:

No further toxicological data known.

ORAL EFFECTS:

No further toxicological data known.

INHALATION EFFECTS:

No further toxicological data known.

OTHER:

No further toxicological data known.

Section 12 – Ecological Information

ECOTOXICOLOGICAL INFORMATION:

This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.

ENVIRONMENTAL FATE:

The degree of biodegradability and persistence of this product has not been determined.

Section 13 – Disposal Consideration

WASTE DISPOSAL:

Ensure that collection, transport, treatment and disposal of waste product and containers complies with all applicable laws and regulations. Note that use, mixture, processing or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal whether the product is regulated as a hazardous waste.

Section 14 – Transportation Information

U.S. DOT HAZARDOUS MATERIAL INFORMATION:

Not DOT regulated.

Section 15 – Regulatory Information

FEDERAL REGULATIONS:

SARA 313:

This product contains NONE of the 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.

CLEAN WATER ACT:

This product contains mineral oil and is subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802.

CERCLA REPORTABLE QUANTITY:

Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a particular component must be reported to the National Response Center at 1-800-424-8802.

None to report

TOXIC SUBSTANCE CONTROL ACT:

The components of this product are listed on the TSCA Inventory.

OZONE DEPLETING SUBSTANCES:

This product contains no ozone depleting substances as defined by the Clean Air Act.

HAZARDOUS AIR POLLUTANTS:

Any components listed below are defined by the Federal EPA as hazardous air pollutants:

None to report

STATE REGULATIONS

This product contains mineral oil, and as used, may be regulated by state used oil regulations. Check with the appropriate state agency to determine whether such a regulation exists.

CANADA

WHMIS Classification: None

DSL:

The components of this product are listed on DSL Inventory.

Section 16 – Other Information

HMIS RATING:

Health	Flammability	Reactivity	PPE
1	1	0	X

Prepared by:. . . . . Ridge Tool Company

Issue Date: . . . . . January 5, 2006
Last Revision Date: . . . . . May, 2004

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RIDGID

MATERIAL SAFETY DATA SHEET

Section 1 – Product & Company Identification

Product Name.....:	RIDGID Dark Thread Cutting Oil
Product Catalog No. .....:	41590, 70830, 41610, 41600
Company Name.....:	Ridge Tool Company
Address .....:	400 Clark Street
:	Elyria, Ohio 44036-2023
Telephone .....:	1-800-519-3456 (USA) (8:00 am – 5:00 pm EST, M-F)
Emergency Telephone .....:	1-440-323-5581 (USA) (24 Hours)
Issue Date .....:	January 5, 2006

Section 2 – Hazards Identification

EMERGENCY OVERVIEW:

This product is a liquid that is insoluble in water. Direct eye contact may cause minor, short term irritation. Short term skin exposure is not expected to be irritating. Inhalation and ingestion are not anticipated routes of exposure during normal conditions of use.

POTENTIAL HEALTH EFFECTS AND SYMPTOMS FROM SHORT TERM / ACUTE EXPOSURE:

- Eye

  This product is not expected to cause eye irritation under normal conditions of use. Symptoms of slight eye irritation may result when direct contact occurs, or when exposed to high mist levels in poorly ventilated areas.

- Skin

  Short term skin contact is not expected to cause skin irritation. Prolonged or repeated direct exposure to the skin may result in symptoms of irritation and redness. In severe cases, prolonged or repeated contact may result in dermatitis accompanied by symptoms of irritation, itching, dryness, cracking and/or inflammation.

- Inhalation:

  This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause upper respiratory tract irritation and difficulty breathing.

- Ingestion:

  Ingestion may cause slight stomach irritation and discomfort.

- Potential Chronic Health Effects

  No further data known.

- Medical Conditions Aggravated By Exposure:

  No further data known.

- Carcinogenicity:

  This product is not listed as a known or suspected carcinogen by IARC, OSHA or the NTP.

Section 3 – Composition / Information On Ingredients

Components listed in this section may contribute to the potential hazards associated with exposure to the concentrate. The product may contain additional non-hazardous or trade secret components.

Component:	CAS #	% By Weight
Mineral Oil	64742-54-7	> 90
Sulfur Additive Package	Mixture	< 10

CARCINOGENIC COMPONENTS:

This product contains no carcinogens.

Product Name.....: RIDGID Dark Thread Cutting Oil

Section 4 – First Aid Measures

EYE CONTACT:

Upon direct eye contact, hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If irritation is due to exposure to mist or vapors, remove the individual to fresh air. If irritation persists, flush the eyes with clean water until the irritation subsides. If symptoms persist, contact a physician.

SKIN CONTACT:

Remove product from the skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If symptoms of exposure persist, contact a physician.

INHALATION:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs, remove the employee to fresh air. Contact a physician or other medical professional if irritation or distress persists.

INGESTION:

If small amounts are ingested, first aid measures are not likely to be necessary. If larger amounts are ingested or if symptoms of ingestion occur, dilute stomach contents with two glasses of water or milk. (NOTE: Do NOT give anything by mouth to an unconscious person.) Do not induce vomiting without medical supervision. If vomiting occurs spontaneously, keep airway clear. If symptoms of ingestion persist, seek medical attention.

NOTE TO PHYSICIANS:

No further data known.

Section 5 – Fire Fighting Measures

FIRE AND EXPLOSIVE PROPERTIES:

Flashpoint.....:	385°F Cleveland Open Cup
Flammability Limits.....:	LEL - N/A
	UEL - N/A

EXTINGUISH MEDIA:

In accordance with NFPA guidance, dry chemical, foam or CO2 fire extinguishers are all acceptable. Note that while water fog extinguishers are also acceptable, do NOT apply a direct stream of water onto burning product because it may cause spreading and increase fire intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

No further data known.

FIRE-FIGHTING PROCEDURES AND EQUIPMENT:

Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage. See Section 8 of the MSDS for other PPE to be worn as conditions warrant.

Section 6 – Accidental Release Measures

PERSONAL PRECAUTIONS:

Use personal protection recommended in Section 8.

ENVIRONMENTAL:

This material is a water pollutant. Do not let spilled or leaking material enter waterways.

CLEAN-UP MEASURES:

Important: As with any spill or leak, before responding, ensure that you are familiar with the potential hazards and recommendations of the MSDS. Appropriate personal protective equipment must be worn.

If possible, safely contain the spill with dikes or other spill response equipment appropriate for petroleum or organic material releases. Take measures to prevent spreading of product. Note that while product will ignite, it will not readily burn. However, as a precaution, eliminate ignition sources. Prevent from entering sewers or waterways. Large volumes may be transferred to an appropriate container for proper disposal. Small volumes or residues may be soaked up with absorbents. Spill response materials should be collected for proper disposal.

Product Name.....: RIDGID Dark Thread Cutting Oil

Section 7 – Handling And Storage

HANDLING:

As with any industrial chemical, handle the product in a manner that minimizes exposure to practicable levels. Prior to handling, consult Section 8 of this MSDS to evaluate personal protective equipment needs. Open containers slowly to relieve any pressure. Follow all other standard industrial hygiene practices.

Empty containers may contain product residue. All safety precautions taken when handling this product should also be taken when handling empty drums and containers. Keep containers closed when not in use.

Product residue in empty containers is combustible but will not readily burn. Note, however, that excessive heating or cutting of empty containers may create an ignition source sufficient to start a fire and, in extreme cases, cause an explosion.

STORAGE:

Protect product quality by storing indoors and away from extreme temperatures. Close all containers when not in use.

SPECIAL COMMENTS:

No further data known.

Section 8 – Exposure Controls / Personal Protection

EXPOSURE GUIDELINES:

Component		
Mineral Oil	ACGIH TLV: ACGIH STEL: OSHA PEL:	5 mg / m3 (as mist) 10 mg / m3 (as mist) 5 mg / m3 (as mist
Sulfur Additive Package	No information	

ENGINEERING CONTROLS:

Normal general ventilation is expected to be adequate. It is recommended that ventilation be designed in all instances to maintain airborne concentrations at lowest practicable levels. Ventilation should, at a minimum, prevent airborne concentrations from exceeding any exposure limits.

The user may wish to refer to 29 CFR 1910.1000(d) (2) and the ACGIH "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices" (Appendix C) for the determination of exposure limits of mixtures. An industrial hygienist or similar professional may be consulted to confirm that the calculated exposure limits apply.

PERSONAL PROTECTIVE EQUIPMENT:

Selection of personal protective equipment should be based upon the anticipated exposure and made in accordance with OSHA's Personal Protective Equipment Standard found in 29 CFR 1910 Subpart I. The following information may be used to assist in PPE selection.

- Eye Protection

  Wear eye protection appropriate to prevent eye exposure. Where splashing is not likely, chemical safety glasses with side shields are recommended. Where splashing may occur, chemical goggles or full face shield is recommended.

- Skin Protection

  Gloves are not normally needed during normal conditions of use. If health effects are experienced, oil or chemical resistant gloves such as butyl or nitrile are recommended.

  Where splashing or soaking is likely, wear oil or chemical resistant clothing to prevent exposure.

- Respiratory Protection

  A respirator may be worn to reduce exposure to vapors, dust or mist. Select a NIOSH/MSHA approved respirator appropriate for the type and physical character of the airborne material. A self-contained breathing apparatus is recommended in all situations where airborne contaminant concentration has not been confirmed to be below safe levels. Respirator use should comply with the OSHA Respirator Protection Standard found in 29 CFR 1910.134.

- General Hygiene Considerations

  Wash thoroughly after handling.

Section 9 – Physical And Chemical Properties

Physical Appearance:.....:	Black
Odor. .....:	Mild Petroleum
Physical State.....:	Liquid
Water Solubility.....:	Insoluble
Specific Gravity.....:	.878

Section 10 – Stability And Reactivity

STABILITY:

This product is stable.

CONDITIONS TO AVOID:

Avoid contact with incompatible materials and exposure to extreme temperatures.

INCOMPATIBLE MATERIALS:

This product is incompatible with strong oxidizing agents.

DECOMPOSITION PRODUCTS MAY INCLUDE:

Thermal decomposition products are dependent on combustion conditions. A complex mixture of airborne solid, liquid, particulates and gasses may evolve when the material burns. Combustion by-products may include:

oxides of carbon

oxides of sulfur

incompletely burned hydrocarbons as fumes and smoke

POSSIBILITY OF HAZARDOUS REACTIONS:

This product is not expected to polymerize

Section 11 – Toxicological Information

EYE EFFECTS:

No further toxicological data known.

SKIN EFFECTS:

No further toxicological data known.

ORAL EFFECTS:

No further toxicological data known.

INHALATION EFFECTS:

No further toxicological data known.

OTHER:

No further toxicological data known.

Product Name.....: RIDGID Dark Thread Cutting Oil

Section 12 – Ecological Information

ECOTOXICOLOGICAL INFORMATION:

This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.

ENVIRONMENTAL FATE:

The degree of biodegradability and persistence of this product has not been determined.

Section 13 – Disposal Consideration

WASTE DISPOSAL:

Ensure that collection, transport, treatment and disposal of waste product and containers complies with all applicable laws and regulations. Note that use, mixture, processing or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal whether the product is regulated as a hazardous waste.

Section 14 – Transportation Information

U.S. DOT HAZARDOUS MATERIAL INFORMATION:

Not DOT regulated.

Section 15 – Regulatory Information

FEDERAL REGULATIONS:

SARA 313:

This product contains NONE of the 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.

CLEAN WATER ACT:

This product contains mineral oil and is subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802.

CERCLA REPORTABLE QUANTITY:

Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a particular component must be reported to the National Response Center at 1-800-424-8802.

None to report

TOXIC SUBSTANCE CONTROL ACT:

The components of this product are listed on the TSCA Inventory.

OZONE DEPLETING SUBSTANCES:

This product contains no ozone depleting substances as defined by the Clean Air Act.

HAZARDOUS AIR POLLUTANTS:

Any components listed below are defined by the Federal EPA as hazardous air pollutants:

None to report

STATE REGULATIONS

This product contains mineral oil, and as used, may be regulated by state used oil regulations. Check with the appropriate state agency to determine whether such a regulation exists.

CANADA

WHMIS Classification: None

DSL:

The components of this product are listed on DSL Inventory.

Section 16 – Other Information

HMIS RATING:

Health	Flammability	Reactivity	PPE
1	1	0	X

Prepared by:. . . . . Ridge Tool Company

Issue Date: . . . . . January 5, 2006
Last Revision Date: . . . . . May, 2004

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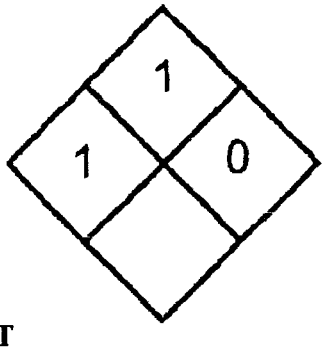
RIDGID

Ridge Tool Company
400 Clark Street
Elyria, Ohio 44036-2023, U.S.A.



MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT INFORMATION

PRODUCT NAME: RIDGID PREMIUM DARK THREAD CUTTING OIL	EMERGENCY TELEPHONE NUMBER: (440) 323-5581
CHEMICAL FAMILY: PETROLEUM HYDROCARBON	TELEPHONE NUMBER FOR INFORMATION: (800) 519-3456
DOT PROPER SHIPPING NAME: NOT A REGULATED MATERIAL	DATE PREPARED: January 24, 2002

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OSHA PEL	ACGIH TLV	%
Paraffinic Mineral Oil	64742-54-7	5mg/m³TWA	5mg/m³ TWA	>95%
			10mg/m3 STEL	
Sulfur Additive Package	Mixture	No info	No info	<5%

Unlisted ingredients are trade secrets and are not hazardous chemicals under OSHA Hazard Communications Standard (29 CFR 1910.1200)

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	480°	Specific Gravity (H^2O = 1):	0.87
Vapor Pressure (mm Hg.)	0.01 @ 20°C	Solubility in Water:	NIL
Vapor Density (Air = 1)	1	Evaporation Rate (Butyl Acetate = 1)	1

APPEARANCE AND ODOR:
Dark brown liquid

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: (Method Used) 385°F (Cleveland Open Cup)	Flammable Limits: Not Determined	LEL:	UEL:

Extinguishing Media:
Water Fog, Dry Chemical, CO_2 or foam.

Special Fire Fighting Procedures:
Wear self contained breathing apparatus. Keep fire exposed containers cool with water.

Unusual Fire and Explosion Hazards:
Hot vapors form explosive mixtures with air.

SECTION V - REACTIVITY DATA

Stability	Unstable		Conditions to Avoid: Spark and Open Flames
	Stable	X	

Incompatibility: (Materials to Avoid)
Strong acids and oxidants

Hazardous Decomposition or Byproducts:
Upon Combustion - CO, CO_2 Oxides of Sulfur

Hazardous	May Occur		Conditions to Avoid: None
Polymerization	Will not Occur	X	

FAX: 440-329-4848

MSDS# 486
PAGE 1 OF 2

SECTION VI - HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	X	X	X

Health Hazards: (Acute and Chronic)

Causes Irritation - May be skin defatter upon prolonged or repeated contact. Overexposure to vapors, mist or fumes may result in upper respiratory tract irritation and difficulty breathing. Mineral oil mist, OSHA established 8 hr. TWA PEL of 5 mg/m^3. ACGIH reccomends a 15 min. STEL TLV of 10 mg/m^3.

Carcinogenicity:	NPT?	IARC Monographs?	OSHA Regulated?
	Not Listed	Not Listed	Not Listed

Signs and Symptoms of Exposure:

Eyes: Mild irritation and redness. ***Ingestion***: *Gastrointestinal irritation*, nausea, vomiting and diarrhea. ***Inhalation***: Dizziness and difficulty breathing.

Medical Conditions Generally Aggravated by Exposure:

Sensitive Dry Skin.

Emergency and First Aid Procedures:

Eyes: Immediately flush with plenty of water for at least 15 minutes. Call a physician. ***Skin***: Wash with soap and water. ***Ingestion***: Do not induce vomiting. Dilute by giving at least 2 glasses of milk or water to a conscious person. Get medical attention. ***Inhalation***: Remove to fresh air and give artificial respiration is necessary. Get medical attention

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE.

Steps to be Taken in Case Material is Released or Spilled:

Do not use water - Soak up with sand, earth or other inert material. Put in suitable container. Dispose of in accordance with Local, State and Federal regulations.

Waste Disposal Method:

Dispose of material in accordance with Local, State and Federal regulations. Avoid contamination of sewers and water ways.

Precautions to be Taken in Handling and Storing:

Avoid contact with eyes, skin, and clothing. Remove contaminated clothing. Launder before re-use. Wash thoroughly after handling.

Other Precautions:

Avoid breathing mist or vapors.

SECTION VIII – CONTROL MEASURES

Respiratory Protection (Specify Type):

Use NISOH approved respirator if engineering or other controls are not adequate to reduce airborne exposure to below permissible exposure limits.

Ventilation:

General dilution or local exhaust recommended.

Protective Gloves:	Eye Protection:
Neoprene Oil Impervious if subject to continuous contact.	Safety Glasses or Goggles

Other Protective Clothing or Equipment:

Aprons, Oil Repellent Barrier Creme or other as required to avoid skin contact if subject to repeated exposure.

Work/Hygienic Practices:

Wash after handling.

SECTION IX - REGULATORY INFORMATION

TSCA:

All components are registered under regulations of TSCA.

Sara Title III:

Contains no ingredients subject to reporting under Section 313. Is reportable under Sections 311 and 312 if thresholds are met. Contains no extremely hazardous substances under Section 302. Health categories are Health/Acute and Health/Chronic.

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SAFETY-KLEEN 105 SOLVENT RECYCLED
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **SAFETY-KLEEN 105 SOLVENT RECYCLED**

SYNONYMS: Parts Washer Solvent; Petroleum Distillates; Petroleum Naphtha; Naphtha, Solvent; Stoddard Solvent; Mineral Spirits.

PRODUCT CODE: 6614, 6617, 1011662, 1014662

PRODUCT USE: Cleaning and degreasing metal parts.
If this product is used in combination with other products, refer to the Material Safety Data Sheet for those products.

24-HOUR EMERGENCY PHONE NUMBERS

These numbers are for emergency use only. If you desire non-emergency product information, please call a phone number listed below.	**MEDICAL:**	**TRANSPORTATION (SPILL):**
	1-800-752-7869	**1-800-468-1760**

SUPPLIER:
Safety-Kleen Systems, Inc.
5400 Legacy Drive
Cluster II, Building 3
Plano, Texas 75024
USA
1-800-669-5740
www.Safety-Kleen.com

TECHNICAL INFORMATION: 1-800-669-5740 Press 1 then Enter 7500

MSDS FORM NUMBER: 82310 **ISSUE:** April 20, 2004

ORIGINAL ISSUE: April 8, 1976 **SUPERSEDES:** March 16, 2004

PREPARED BY: Product MSDS Coordinator **APPROVED BY:** MSDS Task Force

COPPOR00001285

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

WT%	NAME	SYNONYM	CAS NO.	OSHA PEL** TWA	OSHA PEL** STEL	ACGIH TLV® TWA	ACGIH TLV® STEL	LD[a]	LC[b]
				ppm	ppm	ppm			
99-100	Distillates (petroleum), hydrotreated light	N. Av.	64742-47-8	500[c] ppm 2900[c] mg/m^3	N. Av.	100[c]	N. Av.	5000[c] mg/kg	5500[c] mg/m3/4h
0-0.2*	Tetrachloroethylene	Perchloroethylene; Tetrachloroethene	127-18-4	100 ppm	200 (ceiling)	25	100	2629	34.2 g/m^3/8h

**OSHA Final PEL value (enforceable). Some States have adopted more stringent values.

N. Av. = Not Available
* Even though the concentration range does not fall under the ranges prescribed by WHMIS, this is the actual range which varies with each batch of the product.

[a]Oral-Rat LD_{50}
[b]Inhalation-Rat LC_{50}

[c]Based on Stoddard Solvent

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE
Liquid, clear and green, mild hydrocarbon odor.

WARNING!

PHYSICAL HAZARDS
Combustible liquid and vapor.

HEALTH HAZARDS
May be harmful if inhaled.
May irritate the respiratory tract (nose, throat, and lungs), eyes, and skin.
May be harmful if swallowed.
Contains material that may cause central nervous system and kidney damage.
Contains material which may cause birth defects.
Suspect cancer hazard. Contains material (less than 0.2% by weight) which may cause cancer. Risk of cancer depends on duration and level of exposure.

ENVIRONMENTAL HAZARDS
Toxic to fish.

POTENTIAL HEALTH EFFECTS

INHALATION (BREATHING): High concentrations of vapor may be harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Massive acute overexposure may cause rapid central nervous system depression, sudden collapse, coma, and/or death.

EYES: May cause irritation.

SKIN: May cause irritation. Not likely to be absorbed in harmful amounts.

INGESTION (SWALLOWING): May be harmful if swallowed. May cause throat irritation, nausea, vomiting, and diarrhea. Breathing product into the lungs during ingestion or vomiting may cause lung injury and possible death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing respiratory tract (nose, throat, and lungs), central nervous system, kidney, eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

CHRONIC: Prolonged or repeated inhalation may cause toxic effects as noted under **INHALATION (BREATHING)**. Prolonged or repeated exposure may cause central nervous system and kidney damage or have mutagenic effects. Prolonged or repeated eye contact may cause inflammation of the membrane lining the eyelids and covering the eyeball (conjunctivitis). Prolonged or repeated skin contact may cause drying, cracking, redness, itching, and/or swelling (dermatitis). Contains material which may cause birth defects.

CANCER INFORMATION: This product contains tetrachloroethylene which may cause cancer. Risk of cancer depends on duration and level of exposure.. For more information, see **SECTION 11: CARCINOGENICITY**.

Also see **SECTION 15: CALIFORNIA**.

POTENTIAL ENVIRONMENTAL EFFECTS

Product is toxic to fish. Also see **SECTION 12: ECOLOGICAL INFORMATION**.

SECTION 4: FIRST AID MEASURES

INHALATION (BREATHING): Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Oxygen should only be administered by qualified personnel. Someone should stay with victim. Get medical attention if breathing difficulty persists.

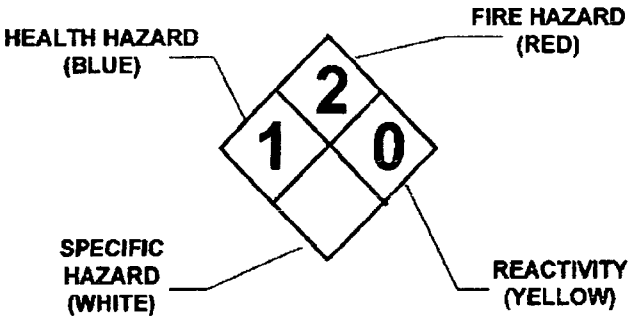
EYES:	If irritation or redness from exposure to vapor develops, move away from exposure into fresh air. Upon contact, immediately flush eyes with plenty of lukewarm water, holding eyelids apart, for 15 minutes. Get medical attention.
SKIN:	Remove affected clothing and shoes. Wash skin thoroughly with soap and water. Get medical attention if irritation or pain develops or persists.
INGESTION (SWALLOWING):	Do NOT induce vomiting. Immediately get medical attention. Call 1-800-752-7869 for additional information. If spontaneous vomiting occurs, keep head below hips to avoid breathing the product into the lungs. Never give anything by mouth to an unconscious person.
NOTE TO PHYSICIANS:	Treat symptomatically and supportively. Treatment may vary with condition of victim and specifics of incident. Call 1-800-752-7869 for additional information.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT:	105°F (40°C) Tag Closed Cup	
FLAMMABLE LIMITS IN AIR:	**LOWER:** 0.7 VOL% (minimum)	**UPPER:** 5 VOL% (maximum)
AUTOIGNITION TEMPERATURE:	410°F (210°C) (minimum)	
HAZARDOUS COMBUSTION PRODUCTS:	Decomposition and combustion materials may be toxic. Burning may produce carbon monoxide and unidentified organic compounds.	
CONDITIONS OF FLAMMABILITY:	Heat, sparks, or flame.	
EXTINGUISHING MEDIA:	Carbon dioxide, regular foam, dry chemical, water spray, or water fog.	

NFPA 704
HAZARD IDENTIFICATION:

This information is intended solely for the use by individuals trained in this system.



FIRE FIGHTING INSTRUCTIONS:

Keep storage containers cool with water spray. A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

FIRE AND EXPLOSION HAZARDS:

Vapor explosion hazard indoors, outdoors, or in sewers. Vapors may travel to ignition source and flashback. Vapors will spread along the ground and collect in low or confined areas. Run-off to sewer may create a fire hazard. Heated containers may rupture or be thrown into the air. "Empty" containers may retain residue and can be dangerous. Product is not sensitive to mechanical impact or static discharge.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Remove all ignition sources. Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. A vapor suppressing foam may be used to reduce vapors. Contain spill away from surface water and sewers. Contain spill as a liquid for possible recovery, or sorb with compatible sorbent material and shovel with a clean, sparkproof tool into a sealable container for disposal.

Additionally, for large spills: Water spray may reduce vapor, but may not prevent ignition in closed spaces. Dike far ahead of liquid spill for collection and later disposal.

There may be specific federal regulatory reporting requirements associated with spills, leaks, or releases of this product. Also see **SECTION 15: REGULATORY INFORMATION.**

SECTION 7: HANDLING AND STORAGE

HANDLING: Keep away from heat, sparks, or flame. Where flammable mixtures may be present, equipment safe for such locations should be used. Use clean, sparkproof tools and explosion-proof equipment. When transferring product, metal containers, including trucks and tank cars, should be grounded and bonded. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes, skin, clothing, and shoes. Do not smoke while using this product.

SHIPPING AND STORING: Keep container tightly closed when not in use and during transport. Store containers in a cool, dry place. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous. See **SECTION 14: TRANSPORTATION INFORMATION** for Packing Group information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below applicable exposure limits. Where explosive mixtures may be present, equipment safe for such locations should be used.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use NIOSH-certified P- or R- series particulate filter and organic vapor cartridges when concentration of vapor or mist exceeds applicable exposure limits. Protection provided by air purifying respirators is limited. Do not use N-rated respirators. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

EYE PROTECTION: Where eye contact is likely, wear chemical goggles; contact lens use is not recommended.

SKIN PROTECTION:	Where skin contact is likely, wear laminate (Ansell Edmont Barrier®, North Silver Shield®, Safety 4 4h®) or equivalent protective gloves; use of natural rubber (latex), polyvinyl chloride (PVC) or equivalent gloves is not recommended. To avoid prolonged or repeated contact with product where spills and splashes are likely, wear appropriate chemical-resistant faceshield, boots, apron, coveralls, long sleeve shirts, or other protective clothing.
PERSONAL HYGIENE:	Use good personal hygiene. Wash thoroughly with soap and water after handling product and before eating, drinking, or using tobacco products. Clean affected clothing, shoes, and protective equipment before reuse. Discard affected clothing, shoes, and/or protective equipment if they cannot be thoroughly cleaned. Discard leather articles, such as shoes, saturated with this product.
OTHER PROTECTIVE EQUIPMENT:	Where spills and splashes are likely, facilities storing or using this product should be equipped with an emergency eyewash and shower, both equipped with clean water, in the immediate work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE, APPEARANCE, AND ODOR:	Liquid, clear and green, mild hydrocarbon odor.
ODOR THRESHOLD:	30 ppm (based on Stoddard Solvent)
MOLECULAR WEIGHT:	Not available.
SPECIFIC GRAVITY:	0.77 to 0.80 at 60°F (15.6°C) (water = 1)
DENSITY:	6.4 to 6.7 LB/US gal (770 to 800 g/l)
VAPOR DENSITY:	5 (air = 1) (approximately)
VAPOR PRESSURE:	0.4 mm Hg at 68°F (20°C) (approximately) 1.0 mm Hg at 100°F (37°C) (approximately)
BOILING POINT:	310°F (155°C) (initial)
FREEZING/MELTING POINT:	-45°F (-43°C) (maximum)
pH:	Not applicable.
EVAPORATION RATE:	0.1 (butyl acetate = 1) (based on Stoddard Solvent)

SOLUBILITY IN WATER:	Insoluble.
FLASH POINT:	105°F (40°C) Tag Closed Cup
FLAMMABLE LIMITS IN AIR:	**LOWER:** 0.7 VOL% (minimum) **UPPER:** 5 VOL% (maximum)
AUTOIGNITION TEMPERATURE:	410°F (210°C) (minimum)

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressures. Avoid heat, sparks, or flame.
INCOMPATIBILITY:	Avoid acids, alkalies, oxidizing agents, reducing agents, reactive metals or reactive halogens.
REACTIVITY:	Polymerization is not known to occur under normal temperature and pressures. Not reactive with water.
HAZARDOUS DECOMPOSITION PRODUCTS:	None under normal temperatures and pressures. See also **SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.**

SECTION 11: TOXICOLOGICAL INFORMATION

SENSITIZATION:	Based on best current information, there is no known human sensitization associated with this product.
MUTAGENICITY:	Tetrachloroethylene has demonstrated human effects of mutagenicity. Based on best current information, the other component listed in **SECTION 2** is not a mutagen.

CARCINOGENICITY: Tetrachloroethylene is categorized by IARC as probably carcinogenic to humans (Group 2A). Tetrachloroethylene is listed by NTP as having sufficient evidence of carcinogenicity in experimental animals, but is not known or reasonably anticipated to be a human carcinogen according to NTP. Tetrachloroethylene is categorized by ACGIH as a confirmed animal carcinogen with unknown relevance to humans (A3).

Also see **SECTION 3: CANCER INFORMATION** and **SECTION 15: CALIFORNIA**.

REPRODUCTIVE TOXICITY: Based on best current information, there is no known reproductive toxicity associated with this product.

Also see **SECTION 15: CALIFORNIA**.

TERATOGENICITY: Tetrachloroethylene has demonstrated animal effects of teratogenicity.

Based on best current information, the other component listed in **SECTION 2** is not a teratogen.

TOXICOLOGICALLY SYNERGISTIC PRODUCT(S): Based on best current information, there are no known toxicologically synergistic products associated with this product.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: 2.9 mg/L 96 hour LC_{50} Rainbow trout, Donaldson trout (Oncorhynchus mykiss) (based on Petroleum distillates, hydrotreated light).

Component Analysis - Ecotoxicity - Aquatic Toxicity

Perchloroethylene (127-18-4)

Test & Species		Conditions
96 Hr LC50 rainbow trout	5.28 mg/L	Static
96 Hr LC50 fathead minnow	13.4 mg/L	flow-through
96 Hr LC50 bluegill	12.9 mg/L	Static

OCTANOL/WATER PARTITION COEFFICIENT: Not available.

VOLATILE ORGANIC COMPOUNDS: 100 WT%; 6.4 to 6.7 LB/US gal; 770 to 800 g/l
As per 40 CFR Part 51.100(s).

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Safety-Kleen regarding proper recycling or disposal.

USEPA WASTE CODE(S): D001, D019, D039 and D040
Based on available data, this information applies to the product as supplied to the user. Processing, use, or contamination by the user may change the waste code applicable to the disposal of this product.

SECTION 14: TRANSPORT INFORMATION

DOT:

Bulk Packages (>119 Gallons):
Shipping Name: Combustible liquid, n.o.s. (petroleum naphtha) **UN/NA #:** NA1993. **Hazard Class:** Combustible liquid. **Packing Group:** III **Required Placards:** Class 3, NA1993

*See 49 CFR 173.150(f)(1-4)

Non-bulk Packages (<120 Gallons) (shipments via vessel and aircraft must use bulk package shipping description):
Shipping Name: Cleaning compounds (Petroleum naphtha) (Not US DOT regulated). **UN/NA #:** None. **Hazard Class:** None **Packing Group:** None **Required Label(s):** None

TDG:

Large Means of Containment:
Shipping Name: PETROLEUM DISTILLATES, N.O.S. (petroleum naphtha).**UN/NA #:** UN1268 **Hazard Class:** 3 **Packing Group:** III **Required Placards:** Class 3, UN1268

*See TDGR 1.33

Small Means of Containment (shipments via aircraft must use large means of containment shipping description) :
Shipping Name: CLEANING COMPOUNDS (petroleum naphtha) (Not TDG regulated).**UN/NA #:** None **Hazard Class:** None **Packing Group:** None **Required Label(s):** None

EMERGENCY RESPONSE GUIDE NUMBER: 128
Reference *North American Emergency Response Guidebook*

SECTION 15: REGULATORY INFORMATION

USA REGULATIONS

SARA SECTIONS Based on the ingredients listed in **SECTION 2**, this product does not

302 AND 304: contain any "extremely hazardous substances" listed pursuant to Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Section 302 or Section 304 as identified in 40 CFR Part 355, Appendix A and B.

SARA SECTIONS 311 AND 312: This product poses the following health hazards as defined in 40 CFR Part 370 and is subject to the requirements of sections 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA):

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard
Fire Hazard

SARA SECTION 313: This product does contain a "toxic" chemical subject to the requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

Material	CAS
Perchloroethylene	127-18-4

CERCLA: Based on the ingredients listed in **SECTION 2**, this product contains the following "hazardous substance" listed under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) in 40 CFR Part 302, Table 302.4 with the following reportable quantities (RQ):

Material	CAS	RQ
Perchloroethylene	127-18-4	100 lb (45.4 kg)

TSCA: All the components of this product are listed on, or are automatically included as "naturally occurring chemical substances" on, or are exempted from the requirement to be listed on, the TSCA Inventory.

CALIFORNIA: This product may contain a detectable amount of benzene CAS 71-43-2, p-dichlorobenzene CAS 106-46-7, methylene chloride CAS 75-09-2, perchloroethylene CAS 127-18-2 and trichloroethylene CAS 79-01-6. WARNING: These chemicals are known to the State of California to cause cancer.

This product may contain a detectable amount of benzene CAS 71-43-2 and toluene CAS 108-88-3. WARNING: These chemicals are known to the State of California to cause birth defects or other reproductive harm.

CANADIAN REGULATIONS

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

WHMIS: Class B3 - Combustible Liquid

Class D2B - Irritating to eyes and skin.
Class D2A - Contains component that may cause cancer.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All the components of this product are listed on, or are automatically included as "substance occurring in nature" on, or are exempted from the requirements to be listed on, the Canadian Domestic Substances List (DSL).

SECTION 16. OTHER INFORMATION

REVISION INFORMATION: This MSDS has been revised in the following sections:
Section 14: Change in transportation

LABEL/OTHER INFORMATION: This product is United States Department of Agriculture (USDA) approved, ETL classified and Factory Mutual (FM) approved.

User assumes all risks incident to the use of this (these) product(s). To the best of our knowledge, the information contained herein is accurate. However, Safety-Kleen assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either express or implied, or 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. The data contained on this sheet apply to the product(s) as supplied to the user.

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MATERIAL SAFETY DATA SHEET

3M
3M Center
St. Paul, Minnesota
55144-1000
1-800-364-3577 or (651) 737-6501 (24 hours)

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DIVISION: ELECTRICAL PRODUCTS DIVISION
TRADE NAME:
SCOTCHRAP BRAND PIPE PRIMER
ID NUMBER/U.P.C.:
80-6107-3581-5 00-54007-34548-0 80-6108-3280-2 00-54007-41658-6
80-6109-2573-9 00-54007-42768-1
ISSUED: November 08, 2001
SUPERSEDES: March 13, 2001
DOCUMENT: 06-4427-8

1. INGREDIENT	C.A.S. NO.	PERCENT
MIXED HEXANE ISOMERS	Mixture	25 - 30
HEXANE	110-54-3	15 - 25
ISOBUTYLENE-ISOPRENE POLYMER	9010-85-9	10 - 15
CALCIUM ZINC RESINATE	68334-35-0	10 - 15
POTASSIUM ALUMINOSILICATE	1327-44-2	5 - 10
MIXED HEPTANES	Mixture	5 - 10
NAPHTHA (PETROLEUM), SOLVENT-REFINED LIGHT	64741-84-0	4 - 6
TOLUENE	108-88-3	4 - 6
ETHYL ALCOHOL	64-17-5	2 - 4
CARBON BLACK	1333-86-4	< 2
PIPERYLENE-2-METHYL-2-BUTENE POLYMER	26813-14-9	< 2
ZINC PHOSPHATE	7779-90-0	< 2
CYCLOHEXANE	110-82-7	< 1
QUARTZ SILICA	14808-60-7	< 1
WATER	7732-18-5	< 0.5
METHYL ALCOHOL	67-56-1	< 0.1
ETHYL ACETATE	141-78-6	< 0.1
METHYL ISOBUTYL KETONE	108-10-1	< 0.1
HEPTANE	142-82-5	< 0.1
ALIPHATIC HYDROCARBONS	Mixture	< 0.1

This product contains the following toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR Part 372:
HEXANE
CALCIUM ZINC RESINATE
TOLUENE

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

1. INGREDIENT	C.A.S. NO.	PERCENT
ZINC PHOSPHATE		
CYCLOHEXANE		
METHYL ALCOHOL		
METHYL ISOBUTYL KETONE		

2. PHYSICAL DATA

BOILING POINT:..... N/D
VAPOR PRESSURE:..... N/D
VAPOR DENSITY:..... N/D
EVAPORATION RATE:..... N/D
SOLUBILITY IN WATER:..... Nil
SPECIFIC GRAVITY:..... 0.83
PERCENT VOLATILE:..... 60
pH:..... N/A
VISCOSITY:..... 300cps
MELTING POINT:..... N/D

APPEARANCE AND ODOR:
Liquid, Black-Solvent odor

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... -14F Closed Cup
FLAMMABLE LIMITS - LEL:..... N/D
FLAMMABLE LIMITS - UEL:..... N/D
AUTOIGNITION TEMPERATURE:..... N/D

EXTINGUISHING MEDIA:
Carbon dioxide, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

NFPA HAZARD CODES: HEALTH: 2 FIRE: 4 REACTIVITY: 0
UNUSUAL REACTION HAZARD: none

OSHA FIRE HAZARD CLASS: Not determined

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:
Not applicable.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Extinguish all ignition sources. Clean up residue with an appropriate organic solvent. Read and follow safety precautions on the solvent label and MSDS. Place in a U.S. DOT-approved container.

RECOMMENDED DISPOSAL:
Incinerate in a permitted hazardous waste incinerator.

ENVIRONMENTAL DATA:
Not applicable.

REGULATORY INFORMATION:
Volatile Organic Compounds: N/D.
VOC Less H2O & Exempt Solvents: 478 gms/liter South Coast Air Quality Mgmt Dist Method.

Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste Number = D001 (Ignitable)

EPCRA HAZARD CLASS:
FIRE HAZARD: Yes PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:
Flush skin with large amounts of water. If irritation persists, get medical attention.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

6. SUGGESTED FIRST AID (continued)

INHALATION:
Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

IF SWALLOWED:
Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact. Wear unvented goggles during operations in which exposure is likely.

SKIN PROTECTION:
Avoid skin contact. Wear appropriate gloves when handling this material.

RECOMMENDED VENTILATION:
Use in a well-ventilated area. Provide sufficient ventilation to maintain emissions below recommended exposure limits. If exhaust ventilation is not adequate, use appropriate respiratory protection.

RESPIRATORY PROTECTION:
Avoid breathing of vapors. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: half-mask organic vapor respirator.

PREVENTION OF ACCIDENTAL INGESTION:
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

RECOMMENDED STORAGE:
Store away from heat. Keep container closed when not in use. Keep out of the reach of children.

FIRE AND EXPLOSION AVOIDANCE:
Keep container tightly closed. Flammable liquid and vapor. Keep away from heat, sparks, open flame, and other sources of ignition. Vapors may ignite explosively.

7. PRECAUTIONARY INFORMATION (continued)

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
MIXED HEXANE ISOMERS	NONE	NONE	NONE	NONE	
HEXANE	50	PPM	TWA	ACGIH	Y
HEXANE	50	PPM	TWA	OSHAV	
	OSHA VACATED PEL				
HEXANE	500	PPM	TWA	OSHA	
ISOBUTYLENE-ISOPRENE POLYMER	NONE	NONE	NONE	NONE	
CALCIUM ZINC RESINATE	NONE	NONE	NONE	NONE	
POTASSIUM ALUMINOSILICATE	NONE	NONE	NONE	NONE	
MIXED HEPTANES	NONE	NONE	NONE	NONE	
NAPHTHA (PETROLEUM), SOLVENT-REFINED LIGHT	NONE	NONE	NONE	NONE	
TOLUENE	50	PPM	TWA	ACGIH	Y
TOLUENE	100	PPM	TWA	OSHAV	
	OSHA VACATED PEL				
TOLUENE	150	PPM	STEL	OSHAV	
	OSHA VACATED PEL				
TOLUENE	200	PPM	TWA	OSHA	
TOLUENE	300	PPM	CEIL	OSHA	
TOLUENE	75	PPM	STEL	CMRG	Y
ETHYL ALCOHOL	1000	PPM	TWA	ACGIH	
ETHYL ALCOHOL	1000	PPM	TWA	OSHA	
CARBON BLACK	3.5	MG/M3	TWA	ACGIH	
CARBON BLACK	3.5	MG/M3	TWA	OSHA	
CARBON BLACK	0.5	MG/M3	TWA	CMRG	
PIPERYLENE-2-METHYL-2-BUTENE POLYMER	NONE	NONE	NONE	NONE	
ZINC PHOSPHATE	NONE	NONE	NONE	NONE	
CYCLOHEXANE	300	PPM	TWA	ACGIH	
CYCLOHEXANE	300	PPM	TWA	OSHA	
QUARTZ SILICA	0.1	MG/M3	TWA	OSHA	
	RESPIRABLE				
QUARTZ SILICA	0.05	MG/M3	TWA	ACGIH	
	RESPIRABLE				
WATER	NONE	NONE	NONE	NONE	
METHYL ALCOHOL	200	PPM	TWA	ACGIH	Y
METHYL ALCOHOL	250	PPM	STEL	ACGIH	Y
METHYL ALCOHOL	200	PPM	TWA	OSHA	Y
METHYL ALCOHOL	250	PPM	STEL	OSHA	Y
ETHYL ACETATE	400	PPM	TWA	ACGIH	
ETHYL ACETATE	400	PPM	TWA	OSHA	
METHYL ISOBUTYL KETONE	50	PPM	TWA	ACGIH	
METHYL ISOBUTYL KETONE	75	PPM	STEL	ACGIH	
METHYL ISOBUTYL KETONE	50	PPM	TWA	OSHAV	
	OSHA VACATED PEL				
METHYL ISOBUTYL KETONE	75	PPM	STEL	OSHAV	
	OSHA VACATED PEL				

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

EXPOSURE LIMITS (continued)

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
METHYL ISOBUTYL KETONE	100	PPM	TWA	OSHA	
HEPTANE	400	PPM	TWA	ACGIH	
HEPTANE	500	PPM	STEL	ACGIH	
HEPTANE	400	PPM	TWA	OSHAV	
	OSHA VACATED PEL				
HEPTANE	500	PPM	STEL	OSHAV	
	OSHA VACATED PEL				
HEPTANE	500	PPM	TWA	OSHA	
ALIPHATIC HYDROCARBONS	NONE	NONE	NONE	NONE	

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- CMRG: Chemical Manufacturer Recommended Exposure Guidelines
- OSHA: Occupational Safety and Health Administration
- OSHAV: Occupational Safety and Health Administration Vacated PEL. Vacated Permissible Exposure Limits (PEL) are enforced as the OSHA PEL in some states. Check with your local regulatory authority.

- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.

SKIN CONTACT:
Mild Skin Irritation (after prolonged or repeated contact): signs/symptoms can include redness, swelling, and itching.

May be absorbed through the skin and produce effects similiar to those caused by inhalation and/or ingestion.

INHALATION:
Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Peripheral Neuropathy: signs/symptoms can include tingling of extremities, incoordination, numbness, weakness and tremors.

Irritation (upper respiratory): signs/symptoms can include soreness

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

8. HEALTH HAZARD DATA (continued)

of the nose and throat, coughing and sneezing.

IF SWALLOWED:
Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue, blurred vision, slurred speech, giddiness, tremors and convulsions.

Peripheral Neuropathy: signs/symptoms can include tingling of extremities, incoordination, numbness, weakness and tremors.

Aspiration Pneumonitis: signs/symptoms can include coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.

REPRODUCTIVE/DEVELOPMENTAL TOXINS:
WARNING: Contains a chemical which can cause birth defects. [108-88-3]

SECTION CHANGE DATES

PRECAUTIONARY INFO. SECTION CHANGED SINCE March 13, 2001 ISSUE

The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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MATERIAL SAFETY
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DIVISION: ENGINEERED ADHESIVES
TRADE NAME:
SCOTCH-WELD (TM) 1838 B/A Part A Tan Epoxy Adhesive
ID NUMBER/U.P.C.:
62-1752-8535-2 00-21200-22603-8 62-1752-9536-9 00-21200-64507-5
ISSUED: August 06, 2001
SUPERSEDES: May 24, 2001
DOCUMENT: 10-3136-8

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1. INGREDIENT

	C.A.S. NO.	PERCENT	
POLYAMIDE RESIN	68410-23-1	60.0	- 100.0
CLAY	68953-58-2	5.0	- 10.0
AMORPHOUS SILICA	7631-86-9	1.0	- 5.0
TRIETHYLENETETRAMINE	112-24-3	.1	- 1.0

The components of this product are in compliance with the chemical notification requirements of TSCA.

---

2. PHYSICAL DATA

BOILING POINT:..... N/A
VAPOR PRESSURE:..... N/A
VAPOR DENSITY:..... N/A
EVAPORATION RATE:..... N/A
SOLUBILITY IN WATER:..... Nil
SPECIFIC GRAVITY:..... 0.950 Water=1
PERCENT VOLATILE:..... 0.00 % by wt
pH:..... N/A
VISCOSITY:..... 350000.0 centipoise
MELTING POINT:..... N/D

APPEARANCE AND ODOR:
Paste, amber, amine odor

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... N/A
FLAMMABLE LIMITS - LEL:..... N/A
FLAMMABLE LIMITS - UEL:..... N/A
AUTOIGNITION TEMPERATURE:..... N/D

EXTINGUISHING MEDIA:
Carbon dioxide, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
No unusual fire or explosion hazards are anticipated.

NFPA HAZARD CODES: HEALTH: 1 FIRE: 0 REACTIVITY: 1
UNUSUAL REACTION HAZARD: none

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature reaction (exotherm) with production of intense heat and smoke.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Oxides of Nitrogen, Hydrogen Cyanide, Hydrocarbons, Toxic Vapors, Gases or Particulates.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Ventilate area. Collect spilled material. Place in an approved metal container.

RECOMMENDED DISPOSAL:
Incinerate uncured waste in an industrial or commercial incinerator. Dispose of completely cured (or polymerized) material in a sanitary landfill.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

5. ENVIRONMENTAL INFORMATION (continued)

ENVIRONMENTAL DATA:
Not determined.

REGULATORY INFORMATION:
Volatile Organic Compounds: 0.0 gms/liter South Coast Air Quality Mgmt Dist Method.
VOC Less H2O & Exempt Solvents: 0.0 gms/liter South Coast Air Quality Mgmt Dist Method.

Since regulations vary, consult applicable regulations or authorities before disposal. In the event of an uncontrolled release of this material, the user should determine if the release qualifies as a reportable quantity.

EPCRA HAZARD CLASS:
FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

SKIN CONTACT:
Flush skin with large amounts of water. If irritation persists, get medical attention.

INHALATION:
Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

IF SWALLOWED:
Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact. The following should be worn alone or in combination, as appropriate, to prevent eye contact: Wear vented goggles. Wear safety glasses with side shields.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

7. PRECAUTIONARY INFORMATION (continued)

SKIN PROTECTION:
Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber, polyethylene/ethylene vinyl alcohol, polyvinyl chloride.

RECOMMENDED VENTILATION:
Use with appropriate local exhaust ventilation. Curing ovens must be exhausted to outdoors or to a suitable emission control device. If exhaust ventilation is not adequate, use appropriate respiratory protection.

RESPIRATORY PROTECTION:
Avoid breathing of vapors created during the cure cycle. Avoid breathing of dust created by cutting, sanding or grinding. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half-mask organic vapor respirator with dust/mist prefilter, full-face organic vapor respirator with dust/mist prefilter.

PREVENTION OF ACCIDENTAL INGESTION:
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

RECOMMENDED STORAGE:
Store in a cool place. Store away from acids. Keep container dry. Keep container in well-ventilated area. Keep out of the reach of children.

FIRE AND EXPLOSION AVOIDANCE:
Keep container tightly closed. Keep away from heat, sparks, open flame, and other sources of ignition. No smoking while handling this material.

OTHER PRECAUTIONARY INFORMATION:
For industrial or professional use only.

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
POLYAMIDE RESIN.....	NONE	NONE	NONE	NONE	
CLAY.....	NONE	NONE	NONE	NONE	
AMORPHOUS SILICA.....	3 AS RESPIRABLE DUST	MG/M3	TWA	CMRG	
TRIETHYLENETETRAMINE.....	NONE	NONE	NONE	NONE	

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN refer to

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

EXPOSURE LIMITS (continued)

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*

the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- CMRG: Chemical Manufacturer Recommended Exposure Guidelines

- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
Severe Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, cloudy appearance of the cornea, impaired vision and possible permanently impaired vision.

SKIN CONTACT:
Moderate Skin Irritation: signs/symptoms can include redness, swelling, itching, and dryness.

Prolonged or repeated exposure may cause:

Allergic Skin Reaction: signs/symptoms can include redness, swelling, blistering, and itching.

INHALATION:
Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

Prolonged or repeated exposure may cause:

Allergic Respiratory Reaction: signs/symptoms can include difficulty breathing, wheezing, tightness of chest, and respiratory failure.

IF SWALLOWED:
Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

SECTION CHANGE DATES

INGREDIENTS	SECTION CHANGED SINCE May 24, 2001	ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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MATERIAL SAFETY
DATA SHEET

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3M Center
St. Paul, Minnesota
55144-1000
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DIVISION: ENGINEERED ADHESIVES
TRADE NAME:
SCOTCH-WELD (TM) 1838 B/A Part B Tan Epoxy Adhesive
ID NUMBER/U.P.C.:
62-1614-8535-4 00-21200-22600-7 62-1614-9535-3 00-21200-22601-4
ISSUED: August 06, 2001
SUPERSEDES: May 24, 2001
DOCUMENT: 10-3142-6

---

1. INGREDIENT

	C.A.S. NO.	PERCENT	
EPOXY RESIN	25068-38-6	60.0	- 100.0
N-BUTYL GLYCIDYL ETHER	2426-08-6	10.0	- 30.0
CLAY	68953-58-2	5.0	- 10.0
AMORPHOUS SILICA	7631-86-9	1.0	- 5.0

The components of this product are in compliance with the chemical notification requirements of TSCA.

---

2. PHYSICAL DATA

BOILING POINT:..... N/A
VAPOR PRESSURE:..... N/A
VAPOR DENSITY:..... N/A
EVAPORATION RATE:..... N/A
SOLUBILITY IN WATER:..... Very slight
SPECIFIC GRAVITY:..... 1.300 Water=1
PERCENT VOLATILE:..... 0.00 % by wt
pH:..... N/D
VISCOSITY:..... ca. 350000.0 centipoise
MELTING POINT:..... N/D

APPEARANCE AND ODOR:
Paste, viscous, tan, with little odor

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... N/A
FLAMMABLE LIMITS - LEL:..... N/A
FLAMMABLE LIMITS - UEL:..... N/A
AUTOIGNITION TEMPERATURE:..... N/D

EXTINGUISHING MEDIA:
Water, Carbon dioxide, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
No unusual fire or explosion hazards are anticipated.

NFPA HAZARD CODES: HEALTH: 1 FIRE: 0 REACTIVITY: 1
UNUSUAL REACTION HAZARD: none

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature reaction (exotherm) with production of intense heat and smoke.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Hydrogen Chloride, Hydrocarbons, Toxic Vapors, Gases or Particulates.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Ventilate area. Collect spilled material. Place in an approved metal container.

RECOMMENDED DISPOSAL:
Incinerate uncured waste in an industrial or commercial incinerator. Dispose of completely cured (or polymerized) material in a sanitary landfill.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

5. ENVIRONMENTAL INFORMATION (continued)

ENVIRONMENTAL DATA:
Not determined.

REGULATORY INFORMATION:
Volatile Organic Compounds: 0.0 gms/liter South Coast Air Quality Mgmt Dist Method.
VOC Less H2O & Exempt Solvents: 0.0 gms/liter South Coast Air Quality Mgmt Dist Method.

Since regulations vary, consult applicable regulations or authorities before disposal.

EPCRA HAZARD CLASS:
FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:
Immediately wash skin with soap and large amounts of water. Remove contaminated clothing. If signs/symptoms occur, call a physician. Wash contaminated clothing before reuse and dispose of contaminated shoes.

INHALATION:
If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:
Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact. Wear unvented goggles during operations in which exposure is likely. Wear safety glasses with side shields.

SKIN PROTECTION:
Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: butyl rubber, polyethylene/ethylene vinyl alcohol, polyvinyl chloride.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

7. PRECAUTIONARY INFORMATION (continued)

RECOMMENDED VENTILATION:
If exhaust ventilation is not adequate, use appropriate respiratory protection. Provide ventilation adequate to control vapor concentrations below recommended exposure limits and/or control spray or mist.

RESPIRATORY PROTECTION:
Avoid breathing of vapors created during the cure cycle. Avoid breathing of dust created by cutting, sanding or grinding. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half-mask organic vapor respirator with dust/mist prefilter, full-face organic vapor respirator with dust/mist prefilter.

PREVENTION OF ACCIDENTAL INGESTION:
Wash hands after handling and before eating. Do not ingest.

RECOMMENDED STORAGE:
Store in a cool place. Store away from acids. Store away from heat. Store out of direct sunlight. Keep container dry. Keep container in well-ventilated area. Keep out of the reach of children.

FIRE AND EXPLOSION AVOIDANCE:
Keep container tightly closed. Keep away from heat, sparks, open flame, and other sources of ignition. Do not pierce or burn container, even after use. No smoking while handling this material.

OTHER PRECAUTIONARY INFORMATION:
For industrial or professional use only.

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
EPOXY RESIN	NONE	NONE	NONE	NONE	
N-BUTYL GLYCIDYL ETHER	25	PPM	TWA	ACGIH	
N-BUTYL GLYCIDYL ETHER	25	PPM	TWA	OSHAV	
	OSHA VACATED PEL				
N-BUTYL GLYCIDYL ETHER	50	PPM	TWA	OSHA	
CLAY	NONE	NONE	NONE	NONE	
AMORPHOUS SILICA	3	MG/M3	TWA	CMRG	
	AS RESPIRABLE DUST				

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

EXPOSURE LIMITS (continued)

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- CMRG: Chemical Manufacturer Recommended Exposure Guidelines
- OSHA: Occupational Safety and Health Administration
- OSHAV: Occupational Safety and Health Administration Vacated PEL. Vacated Permissible Exposure Limits (PEL) are enforced as the OSHA PEL in some states. Check with your local regulatory authority.

- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.

Dust created by cutting, grinding, sanding, or machining may cause eye irritation.

SKIN CONTACT:
Moderate Skin Irritation: signs/symptoms can include redness, swelling, itching, and dryness.

Prolonged or repeated exposure may cause:

Allergic Skin Reaction: signs/symptoms can include redness, swelling, blistering, and itching.

INHALATION:
Prolonged or repeated overexposure, above recommended guidelines, may cause:

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

IF SWALLOWED:
Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

SECTION CHANGE DATES

INGREDIENTS	SECTION CHANGED SINCE May 24, 2001	ISSUE

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DIVISION: ENGINEERED ADHESIVES
TRADE NAME:
SCOTCH-WELD (TM) 1838 B/A TAN EPOXY ADHESIVE
ID NUMBER/U.P.C.:
62-1614-6435-9 00-21200-22599-4
ISSUED: May 29, 2001
SUPERSEDES: April 17, 1998
DOCUMENT: 11-2681-2

This product is a kit or a multipart product which consists of multiple, independently packaged components. An MSDS for each of these components is included. Please do not separate the component MSDSs from this cover page. The document numbers of the MSDSs for components of this product are:
10-3142-6
10-3136-8

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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Semi-Synthetic Lithium Complex Extreme Pressure Grease Grade: NLGI #1.5

PRODUCT DESCRIPTION

AMSOIL #802 Semi-Synthetic, Lithium Complex, EP Grease is a premium product specifically designed to provide a superior lubrication in a wide operating temperature range for slow to medium speed, heavily loaded, industrial equipment. AMSOIL #802 incorporates an ISO-460 base oil (equivalent to SAE 140 gear oil) and extreme pressure (EP) additives to prevent wear. The narrow band NLGI #1.5 consistency and a high-grade lithium complex thickener improves cold temperature functionality yet resist high temperature oil separation, resist water washout, and has excellent shear stability. In addition, AMSOIL #802 is fully fortified with oxidation and rust inhibitors. AMSOIL #802 is a long life grease that protects industrial equipment in adverse conditions

APPLICATION

AMSOIL Semi-Synthetic 460 EP Grease is recommended for heavy-duty industrial applications where equipment exposured to environmental elements or heavy loads and shock loading conditions. This product is recommended for Bettis Actuators.

PERFORMANCE FEATURES

- Operating Service Range From -50°F to 350°F
- Extreme Pressure Wear Prevention
- Mechanical Shear Stability Prevents Thin Out
- Rust Inhibitors Prevent Corrosion
- Strong Water Washout Resistance
- Oxidation Inhibitors for Long Life
- Smooth & Tacky with Good Pumpability

EMERSON.
Process Management

BETTIS®

Valve Automation Division
Bettis Corporation
18703 GH Circle
P.O. Box 508
Waller, Texas 77484
USA

MATERIAL SAFEETY DATA SHEET

Amsoil Product Code:

802, Semi-Synthetic 460 EP # 1.5 Lithium Complex Grease

Company: Amsoil, Inc.
925 Tower Avenue
Superior, WI 54880

The following Bettis Corporation part numbers identifies AMSOIL Lithium Complex Grease:

049206
071164
128466
128467
121402
121302
142023

Semi-Synthetic Lithium Complex
Extreme Pressure Grease
Grade: NLGI #1.5

TYPICAL TECHNICAL PROPERTIES (PRODUCT CODE 802)

Thickener	Lithium Complex
Color	Red
NLGI Grade	1.5
Penetration ASTM D-217 (25°C(77°F), 0.1 mm) Worked 60 Strokes	300
Dropping Point ASTM D-2265 (°F/°C)	510/266
Base Oil Viscosity ASTM D-445 (cSt) @ 40°C	460
ISO Grade	460
Base Oil Flash Point ASTM D-92 °F	475
4 Ball Extreme Pressure Properties ASTM D-2596 weld load (kgf)	315
4 Ball Extreme Pressure Properties ASTM D-2596 load wear index (kgf)	44
Wear Protection ASTM D-2296 scar diameter, mm	0.40
Rust Prevention ASTM D-1743	PASS
Oil Separation FTM 791.321.2 (mass %)	5.0
Oil Separation ASTM D-1742 (mass %)	3.0
Low Temperature Torque @ -40°C N·m	2.5
Low Temperature Torque @ -50°F N·m	<5
Timken #OK Load	50
Water Washout @ 175°F % Maximum	10.0
Water Sprayoff % Maximum	20.0

AVAILABILITY

AMSOIL #802 Semi-Synthetic, Lithium Complex, EP Grease is a specialty product available in 400# Drums only. This product is available by special order from our Superior Distribution Center Only.

AMSOIL INC. Superior, WI 54880 715-392-7101 www.amsoil.com

AMSOIL Material Safety Data Sheet

Date Issued/Revised: June 18, 2003
Supersedes: March 20, 2003

Section 1: Product and Company Identification

Manufacturer: AMSOIL, Inc.
925 Tower Avenue
Superior, WI 54880

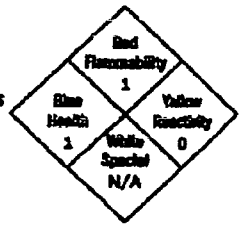
Telephone:
CHEMTREC (Spill Emergency Only): 1-800-424-9300
Information: 715-392-7101

Product Code	GHB, NLGI #1	GHD, NLGI #2
Label Name	EP HD Synthetic Lithium Complex Grease Moly Fortified	

Product Use ..... LUBRICATING GREASE

Section 2: Composition/Information on Ingredients

NFPA & HMIS Rating



OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)

This product is not formulated to contain ingredients that have exposure limits exceeding those established by US agencies.

*See Section 8 for exposure limits.

Section 3: Hazards Identification

POTENTIAL HEALTH EFFECTS: Minor eye, inhalation and skin irritant.

*See Section 11 for toxicological information.

Section 4: First Aid Measures

EYE: Flush with water for 15-20 minutes. Seek medical attention if irritation develops.

SKIN: Wash immediately with soap and water. Remove contaminated clothing and launder before reuse. Discard shoes and leather articles saturated with the product. Obtain medical advice if irritation occurs.

INHALATION: Remove exposed person to fresh air. If breathing is labored give oxygen. If breathing has stopped apply artificial respiration. Get immediate medical attention.

INGESTION: DO NOT INDUCE VOMITING. If conscious, give 2 glasses of water. If vomiting does occur, keep head below hips to reduce risk of aspiration. Get immediate medical attention.

Section 5: Fire Fighting Measures

FLAMMABILITY PROPERTIES:

	GHB, NLGI #1	GHD, NLGI #2
Flash Point	450°F(232°C)	450°F(232°C)

Method ..... COC ASTM D-92
LFL/UFL ..... Not Determined
Auto-Ignition Temperature ..... Not Determined

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, and alcohol foam.

FIREFIGHTING EQUIPMENT: Full bunker gear recommended including a positive pressure self-contained breathing apparatus.

Section 6: Accidental Release Measures

Isolate spill area. Provide adequate ventilation. Wear appropriate personal protection. Recover free product for recycle and/or disposal. Add sand, earth or other suitable absorbent to spill area. Prevent entry into sewers and waterways. Check under Transportation and Labeling (DOT/CERCLA) and Other Regulator Information Section (SARA) for hazardous substances to determine regulatory reporting requirements for spill.

Section 7: Handling and Storage

HANDLING: Keep containers closed. Avoid contact with eyes, skin or clothing. Wash hands after handling. Empty container may retain product residue which may exhibit hazards of product.

STORAGE: Keep away from heat or flame.

Section 8: Exposure Controls/Personal Protection

Chemical	%	OSHA PEL Limit
Antimony and Compounds	0-2	0.5 mg/m3

VENTILATION: Use adequate general or local exhaust ventilation to keep airborne concentrations below exposure limits.

RESPIRATORY: Use a NIOSH approved respirator when necessary.

SKIN: Use Viton or Nitrile gloves to avoid prolonged or repeated skin contact.

EYE: Use splash goggles or face shield where splashing is expected or can occur.

EXPOSURE LIMITS: The Threshold Limit Value (TLV) of 5 mg/m^3 is suggested for oil mist.

Section 9: Physical and Chemical Properties

	GHB, NLGI #1	GHD, NLGI #2
Physical State	Semi-Solid	
Boiling Point	Not Determined	
Freezing/Melting Point	-0°F(-17°C)/500°F(260°C)	
Vapor Pressure	Not Determined	
Vapor Density (Air=1)	Negligible	
Evaporation Rate	Not Determined	
Solubility in Water	Negligible	
Specific Gravity (Water=1)	0.8900	
Density, lb./gal.	7.412	
Volatility (Volume)	Negligible	
VOC	Unknown	
pH	Essentially Neutral	
Odor	Mild, Bland, Hydrocarbon Odor	
Odor Threshold	Not Determined	
Appearance	Dark Purple Smooth Semi-Solid	
Viscosity, cSt @ 100°C	19.2	
Viscosity, cSt @ 40°C	151	

Section 10: Stability and Reactivity

STABILITY: Stable under moderately elevated temperatures and pressures.

INCOMPATIBILITY: Avoid contact with strong oxidants.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION OF PRODUCT: Toxic oxides of carbon, aldehydes and other products of incomplete combustion.

Section 11: Toxicological Information

ACUTE EXPOSURE

Eye Irritation:	Moderate to strong eye irritation. Based on data from components or similar material.
Skin Irritation:	Not expected to be a primary skin irritant. Based on data from components or similar material. Prolonged or repeated skin contact as from clothing wet with material may cause dermatitis. Symptoms may include redness, edema, drying, defatting, and cracking of the skin.
Respiratory Irritation:	If material is misted or if vapors are generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract similar to that observed with mineral oil. Based on data from components or similar materials. Under good industrial hygiene practices where all exposure limits are observed, respiratory irritation should not be a problem.

CHRONIC EXPOSURE

Chronic Toxicity:	No data available to indicate product present at greater than 1.0% are chronic health hazards.
Carcinogenicity:	No data available to indicate product present at greater than 0.1% are a carcinogenic hazard.
Mutagenicity:	No data available to indicate product present at greater than 1.0% present a mutagenic or genotoxic hazard.
Reproductive Toxicity:	No data available to indicate product present at greater than 1.0% present a reproductive hazard.
Teratogenicity:	No data available to indicate product present at greater than 1.0% present a teratogenic hazards.

ADDITIONAL INFORMATION

Exposure Limits:	Under conditions which may generate mists, observe the OSHA PEL of 5 mg per cubic meter.

There are extensive toxicological data available on the various components of this product. An adequate representation of all these data is beyond the scope of this document. Please contact the AMSOIL Material Safety Data Sheet Coordinator for more detail.

Section 12: Ecological Information

No data available on the adverse effects of this product on the environment.

Section 13: Disposal Considerations

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Section 14: Transport Information

This product is not classified as hazardous material for DOT shipping. For further information relative to spills resulting from transportation incidents, refer to the latest DOT Emergency Response Guidebook for Hazardous Materials.

Please Note: Antimony Compounds, inorganic liquid, n.o.s., Hazard Class 6.1, UN3141

Section 15: Regulatory Information

U.S. Federal Regulations

- OSHA Table Z ..... Synthetic Base Stock (mist) and Antimony and Compounds
- TSCA ..... Not Applicable
- CERCLA 40 CFR 302.4 ..... Antimony and Compounds @ 0-2% Statutory RQ 1 lb.
  ..... Zinc and Compounds@ 0-2%, Statutory RQ 1 lb
- SARA Title III
  - Section 302 Extremely Hazardous ..... Not Applicable
  - Section 311/312
    - Fire Hazard ..... Yes
    - Reactive Hazard ..... No
    - Release of Pressure ..... No
    - Acute Health Hazard ..... Yes
    - Chronic Health Hazard ..... No
  - Section 313 Toxic Chemical ..... Antimony and Compounds Listed

U.S. State Regulations

- California (Prop 65)
  - Does not contain chemicals known to the state of California to cause cancer.

International Regulations

- WHMIS ..... All components listed

Section 16: Other Information

The information and recommendations contained herein are, to the best of AMSOIL's knowledge and belief, accurate and reliable as of the date issued. AMSOIL makes no warranty or guarantee, expressed or implied, of their accuracy or reliability, and AMSOIL shall not be liable for any loss or damage based upon the criteria supplied by the developers of these rating systems, together with AMSOIL's interpretation of the available data.

LINCOLN® ELECTRIC

Date:	2/1/02	MSDS No.:	US-M300
Trade Name:	Shield Arc 85		
Sizes:	All		
Supersedes:	4/1/99		

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products

Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I - IDENTIFICATION

Manufacturer/ Supplier: The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, OH 44117-1199
(216) 481-8100

Product Type: Covered Electrode

Classification: AWS E7010-A1

SECTION II - HAZARDOUS MATERIAL (1)

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
(1) The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Wt.%	TLV mg/m^3	PEL mg/m^3
Iron	7439-89-6	< 5	10*	10*
Cellulose and other carbohydrates	65996-61-4	< 5	10*	10*
Silicates and other binders	1344-09-8	< 5	10*	10*
Mineral silicates	1332-58-7	< 5	5**	5**
Titanium dioxides (as Ti)*****	13463-67-7	< 5	10	15
Manganese and/or manganese alloys and compounds (as Mn)*****	7439-96-5	1	0.2	1.0(c)
Iron oxides (as Fe)	65996-74-9	0.5	5	10
Molybdenum alloys (as Mo)	7439-98-7	0.5	10	10
Carbon steel core wire	7439-89-6	85	10*	10*

Supplemental Information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. TLV value for iron oxide is 5 milligrams per cubic meter.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

(**) As respirable dust.

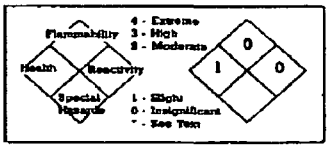
(*****) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

SECTION III - FIRE AND EXPLOSION HAZARD DATA

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See 249.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

Product:	Shield Arc 85
Date:	2/1/02



SECTION IV - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC - (Not Otherwise Classified) is 5 mg/m^3. ACGIH-1999 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. 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 Section 25249.5 et seq).

Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.*
Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.
IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases call a physician.

SECTION V - REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide; secondarily complex oxides of manganese, silicon, sodium and titanium.

Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION VI AND VII

CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instruction and the precautionary label on the product. Request Lincoln Safety Publication E205. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on many of the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1.
At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards .This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard (29 CFR 1910.1200). Other government regulations must be reviewed for applicability to these products.

WARNING: PRODUCT COMPONENTS PRESENT HEALTH AND SAFETY HAZARDS. READ AND UNDERSTAND THIS MATERIAL SAFETY DATA SHEET (M.S.DS.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES. This product may contain Chromium and/or Nickel which are listed by OSHA, NTP, or IARC as being a carcinogen or potential carcinogen. Use of this product may expose you or others to fumes and gases at levels exceeding those established by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Occupational Safety and Health Administration (OSHA) The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. **BE SURE TO CONSULT THE LATEST VERSION OF THE MSDS. MATERIAL SAFETY DATA SHEETS ARE AVAILABLE FROM J.W. HARRIS CO., INC.** salesinfo@jwharris.com 513-754-2000 www.jwharris.com

STATEMENT OF LIABILITY-DISCLAIMER

To the best of the J.W. Harris Company, Inc.'s knowledge, the information and recommendations contained in this publication are reliable and accurate as of the date prepared. However, accuracy, suitability, or completeness are not guaranteed, and no warranty, guarantee, or representation, expressed or implied, is made by J.W. Harris Co., Inc. as to the absolute correctness or sufficiency of any representation contained in this and other publications; J.W. Harris Co., Inc. assumes no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures are contained in this and other publications, or that other or additional measures may not be required under particular or exceptional conditions or circumstances . Data may be changed from time to time.

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):	**Listed in Section 2 under Class**
CHEMICAL NAME/CLASS:	**STAINLESS STEEL WIRE OR RODS AND **SUPER MISSILEWELD TIG and 99T**
SYNONYMS:	Not Applicable
PRODUCT USE:	Metal Welding
DOCUMENT NUMBER:	0106
SUPPLIER/MANUFACTURER'S NAME:	**J.W. HARRIS CO, INC.**
ADDRESS:	4501 Quality Place Mason, Ohio 45040
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	513-754-2000 **FAX** 513-754-8778
DATE OF PREPARATION:	February 13, 2004

2. COMPOSITION and INFORMATION ON INGREDIENTS

Class	C	Cr	Ni	Mo	Mn	Si	Cu	Fe
99T	-	-	Balance	-	0.50	-	-	-
3SMW **	0.20	35.00	25.00	3.00	2.50	1.00	(c)	Balance
ER308	0.08	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER308L	0.03	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER308LSi	0.03	19.5-22.0	9.0-11.0	0.75	1.0-2.5	0.65-1.00	0.75	Balance
ER309	0.12	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER309L	0.03	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER309LSi	0.03	23.0-25.0	12.0-14.0	0.75	1.0-2.5	0.65-1.00	0.75	Balance
ER310	0.08-0.15	25.0-28.0	20.0-22.5	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER312	0.12	28.0-32.0	8.0-10.5	0.75	1.0-2.5	0.30-0.65	0.75	Balance
ER316	0.08	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-0.65	0.75	Balance
ER316L	0.03	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.30-0.65	0.75	Balance
ER316LSi	0.03	18.0-20.0	11.0-14.0	2.0-3.0	1.0-2.5	0.65-1.00	0.75	Balance
ER317L	0.03	18.5-20.5	13.0-15.0	3.0-4.0	1.0-2.5	0.30-0.65	0.75	Balance
ER347 (a)	0.08	19.0-21.5	9.0-11.0	0.75	1.0-2.0	0.30-0.65	0.75	Balance
ER410	0.12	11.5-13.5	0.6	0.75	0.6	0.5	0.75	Balance
ER630 (b)	0.05	16.0-16.75	4.5-5.0	0.75	0.25-0.75	0.75	3.25-4.00	Balance

Single values are maximums, P and S =0.30% max. each , a: Cb(Nb)+Ta = 10XC min./1.0 max. , b= Cb(Nb)+Ta 0.15-0.30 c = Ti, Ta & Cb = 1.50 max each

2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
		TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	IDLH mg/m³	mg/m³
Iron (exposure limits are for Iron oxide dust and	7439-89-6	5	NE	10	NE	2500	NIOSH REL: TWA = 5 DFG MAK: TWA = 1.5 (respirable fraction) Carcinogen: IARC-3, TLV-A4
Manganese (exposure limits are for Manganese, elemental, inorganic compounds, and fume, as Mn)	7439-96-5	0.2	NE	1 (vacated 1989 PEL)	5 (ceiling) 3 (vacated 1989 PEL)	500	NIOSH REL: TWA = 1 STEL = 3 DFG MAKs: TWA = 0.5 (inhalable fraction) PEAK = 10•MAK 30 min., average value Carcinogen: EPA-D
Silicon	7440-21-3	10	NE	15 (Total dust) 5 (Respirable fraction) 10 (Total dust) (vacated 1989 PEL)	NE	NE	NIOSH REL: TWA = 10 (total dust), 5 (respirable fraction)
Molybdenum	7439-98-7	10 NIC-10 (inhalable fraction) NIC-3 (respirable fraction)	NE	15 10 (vacated 1989 PEL)	NE	5000	DFG MAK: TWA = 4 (inhalable fraction)
Niobium	7440-03-1	NE	NE	NE	NE	NE	NE
Phosphorus	7723-14-0	0.1	NE	0.1	NE	5	NIOSH REL: TWA = 0.1 DFG MAK: TWA = 01 (respirable fraction) PEAK = 2•MAK, 5 min., momentary value DFG MAK Pregnancy Risk Classification: D Carcinogen: EPA-D
Sulfur	7704-34-9	NE	NE	NE	NE	NE	NE
Carbon (exposure limits are for Particles Not Otherwise Specified)	7440-44-0	10 (Inhalable) 3 (Respirable)	NE	50 mppcf or 15 (Total Dust) 15 mppcf or 5 (Respirable Fraction)	NE	NE	DFG MAKs: TWA = 4 (Inhalable fraction); 1.5 (Respirable Fraction)
Copper (exposure limits are for "Copper fume, as Cu")	7440-50-8	0.2 (fume) 1 (dusts & mists)	NE	0.1 (fume) 1 (dusts & mists)	NE	100	NIOSH REL: TWA = 0.1 DFG MAK: TWA = 0.1 (Inhalable Fraction) PEAK = 2•MAK 30 min., average value Carcinogen: EPA-D

NE = Not Established. mppcf = Millions of Particles Per Cubic Foot See Section 16 for Definitions of Terms Used.

NOTE (1): The ACGIH has an established exposure limit for Welding Fumes, Not Otherwise Classified. The Threshold Limit Value is 5 mg/m³. NIOSH classifies welding fumes as carcinogens. Single values shown are maximum, unless otherwise noted.

NOTE (2): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. These products have been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

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2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
		TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	IDLH mg/m³	mg/m³
Chromium (Chromium, metal)	7440-47-3	0.5 0.5 (Cr. III)* 0.05 (Cr. VI.)*	NE	1.0 0.5 (Cr. III)*	NE 0.1(Ceiling on Cr. VI As CrO_3)*	250	NIOSH REL : TWA = 0.5 Carcinogen: EPA-D, EPA-CBD, IARC-3, TLV-A4 NIOSH REL : 0.5(Cr. III)* 0.001(Cr. VI)*
Nickel (exposure limits are for Nickel, elemental metal)	7440-02-0	1.5 (Inhalable fraction)	NE	1	NE	10	NIOSH REL: TWA = 0.015 Carcinogen: IARC-2B, MAK-1, NIOSH-Ca, NTP-R, TLV-A5

NE = Not Established. See Section 16 for Definitions of Terms Used. * Compounds as Cr. & Cr. VI Water Soluble

NOTE (1): The ACGIH has an established exposure limit for Welding Fumes, Not Otherwise Classified. The Threshold Limit Value is 5 mg/m³. NIOSH classifies welding fumes as carcinogens. Single values shown are maximum, unless otherwise noted.

NOTE (2): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. These products have 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: These products consist of solid metal rods that are odorless. There are no immediate health hazards associated with these products. The Nickel and Chromium components of some of these products are suspect carcinogens. These products are not flammable nor reactive. If involved in a fire, these products may generate irritating iron fumes, a variety of iron compounds, carbon dioxide, carbon monoxide, and metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: During welding operations, the most significant route of over-exposure is via inhalation of fumes.

INHALATION: Inhalation is not anticipated to be a significant route of over-exposure to the coated rods. Inhalation of large amounts of particulates generated by this product during metal processing operations may result in pneumoconiosis (a disease of the lungs). Repeated over-exposures, via inhalation, to the dusts or fumes generated by this product during welding operations may have adverse effects on the lungs with possible pulmonary edema and emphysema (life-threatening lung injuries). Nickel (a component of some of these products) can cause pulmonary asthma in hypersensitive individuals. Damage to lungs can occur. Inhalation of dusts and fumes of Iron can also cause metal fume fever. Inhalation of copper oxide fumes, which may be generated by some of these products during welding operations, can cause metal fume fever and Chronic over-exposure to Copper dust may cause tiredness, stuffiness, diarrhea, and vomiting. Symptoms of metal fume fever can be delayed 24-48 hours. Refer to Section 10 (Stability and Reactivity) for information on the specific composition of welding fumes and gases.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH	(BLUE)	2
FLAMMABILITY	(RED)	0
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		X

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications for the rods

See Section 16 for Definition of Ratings

CONTACT WITH SKIN or EYES: Contact of the rod form of these products with the skin is not anticipated to be irritating. Contact with the rod form of these products can be physically damaging to the eye. Fumes generated during welding operations can be irritating to the skin and eyes. Contact with the hot rods will burn contaminated skin or eyes. Due to the presence of Nickel, prolonged exposure of the eyes may result in sensitization resulting in conjunctivitis (inflammation of the mucous membranes of the eyes). Symptoms of skin over-exposure may include irritation and redness; prolonged or repeated skin over-exposures may lead to allergic contact dermatitis. Contact with the hot electrodes or rods will burn contaminated skin or eyes.

3. HAZARD IDENTIFICATION (Continued)

SKIN ABSORPTION: Skin absorption is not anticipated to be a significant route of over-exposure to the components of these products.

INGESTION: Ingestion is not anticipated to be a route of occupational exposure for these products.

INJECTION: Though not a likely route of occupational exposure for these products, injection (via punctures or lacerations in the skin) may cause local reddening, tissue swelling, and discomfort.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation In Lay Terms. Symptoms associated with over-exposure to these products and the fumes generated during welding operations are as follows:

ACUTE: The chief acute health hazard associated with these products would be the potential for irritation of contaminated skin and eyes when exposed to fumes during welding operations. Inhalation of large amounts of particulates generated by these products during metal processing operations can result in pneumoconiosis (a disease of the lungs). Inhalation of copper oxide fumes can cause metal fume fever. Rare cases of allergic contact dermatitis have been reported in people working with copper dust. Severe ingestion over-exposure to Copper (a component of some of these products) may be fatal. *In extreme cases, burns may occur from contact that are generated during thermal decomposition. Contact with the molten* material will burn contaminated skin or eyes.

CHRONIC: Chronic skin over-exposure to the fumes generated during welding operations may produce dermatitis (red, inflamed skin). Repeated over-exposures to the fumes generated by these products via inhalation can have adverse effects on the lungs (e.g., pulmonary edema and emphysema). Repeated or prolonged ingestion exposures to > 50–100 mg of Iron per day can result in deposition of iron in the body tissues, which can cause disease. Hypersensitivity to Nickel is common and can cause allergic contact dermatitis, pulmonary asthma, conjunctivitis and inflammatory reactions. Chronic over-exposure to Copper dust may cause tiredness, stuffiness, diarrhea, vomiting, discoloration of the skin and eyes, and kidney and liver disorder. Repeated over-exposures to the fumes generated by these products via inhalation can have adverse effects on the lungs (e.g., pulmonary edema and emphysema). Refer to Section 11 (Toxicological Information) for further information.

TARGET ORGANS: For fumes: ACUTE: Skin, eyes, respiratory system. CHRONIC: Skin, respiratory system, pancreas and liver.

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. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to health professional with victim.

SKIN EXPOSURE: If fumes generated by welding operations involving these products contaminate the skin, begin decontamination with running water. If molten material contaminates the skin, immediately begin decontamination with cold, running water. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse reaction occurs.

EYE EXPOSURE: If fumes generated by welding operations involving these products enter 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 immediate medical attention.

INHALATION: If fumes generated by welding operations involving these products are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

INGESTION: If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin, respiratory, pancreas, and liver disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by these products.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES (Continued)

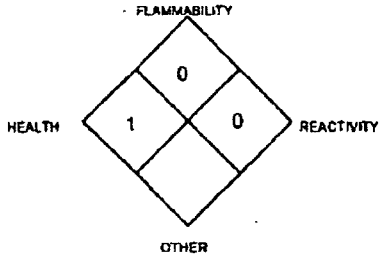
FLASH POINT: Not flammable.
AUTOIGNITION TEMPERATURE: Not flammable.
FLAMMABLE LIMITS (in air by volume, %):
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: These products are not flammable; use fire-extinguishing agents appropriate for surrounding materials.

Water Spray: YES	Carbon Dioxide: YES
Halon: YES	Foam: YES
Dry Chemical: YES	Other: Any "ABC" Class

UNUSUAL FIRE AND EXPLOSION HAZARDS When involved in a fire, these products may decompose and produce iron fumes, a variety of nickel, iron , copper and a variety of metal compounds and metal oxides. The hot material can present a significant thermal hazard to firefighters.
Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.
SPECIAL FIRE-FIGHTING PROCEDURES: Not applicable.

NFPA RATING



See Section 16 for Definition of Ratings

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Not applicable.

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 these products ON YOU or IN YOU. Wash thoroughly after handling these products. Do not eat or drink while handling these products. Use ventilation and other engineering controls to minimize potential exposure to these products.
STORAGE AND HANDLING PRACTICES: All employees who handle these products should be trained to handle it safely. Use in a well-ventilated location. Avoid breathing fumes of these products during welding operations. Open containers on a stable surface. Packages of these products must be properly labeled. When these products are used during welding operations, follow the requirements of the Federal Occupational Safety and Health Welding and Cutting Standard (29 CFR 1910 Subpart Q) and the safety standards of the American National Standards Institute for welding and cutting (ANSI Z49.1). Store packages in a cool, dry location. Store away from incompatible materials (see Section 10, Stability and Reactivity).
PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Not applicable.

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). Prudent practice is to ensure eyewash/safety shower stations are available near areas where these products are used.
RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed (i.e. a Weld Fume Respirator, or Air-Line Respirator for welding in confined spaces), U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Respiratory Protection is recommended to be worn during welding operations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998 The following are NIOSH recommendations for respirator selection for Welding fumes, based on NIOSH REL:

CONCENTRATION	RESPIRATORY EQUIPMENT FOR WELDING FUMES
At Concentrations above the NIOSH REL, or where there is no REL, at any Detectable Concentration:	Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode; or 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 pressure-demand or other positive-pressure mode.
Escape:	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having a high-efficiency particulate filter; or any appropriate escape-type, self-contained breathing apparatus
NOTE:	IDLH Concentration: Potential NIOSH carcinogen. [Not determined yet].

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8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EYE PROTECTION: Safety glasses. When these products are used in conjunction with welding, wear safety glasses, goggles, welding helmet or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian Standards. If necessary, refer to U.S. OSHA 29 CFR 1910.138, or appropriate Standards of Canada.

HAND PROTECTION: Wear gloves for routine industrial use. When these products are used in conjunction with welding, wear gloves that protect from sparks and flame (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). If necessary, refer to U.S. OSHA 29 CFR 1910.138, or appropriate Standards of Canada.

BODY PROTECTION: None normally needed for normal circumstances of use. Use body protection appropriate for task (i.e. apron, coveralls, chemically resistant boots). 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.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for elemental iron:

RELATIVE VAPOR DENSITY (air = 1): Not applicable.
EVAPORATION RATE (nBuAc = 1): Not applicable.
SPECIFIC GRAVITY (water = 1): 7.86
FREEZING/MELTING POINT: 1535°C (2795°F)
SOLUBILITY IN WATER: Insoluble.
pH: Not applicable.
VAPOR PRESSURE, mm Hg @ 20°C: Not applicable.
BOILING POINT: 3000°C (5432°F)
ODOR THRESHOLD: Not applicable.
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not applicable.

The following information is for these products:

APPEARANCE AND COLOR: These products consist of solid rods, which are odorless.
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance is a distinctive characteristic of these products.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Iron fumes, a variety of iron compounds, carbon dioxide, carbon monoxide, metal oxides.

NOTE: The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, the procedure, and the filler used. Other conditions that could also influence the composition and quantity of fumes and gases to which workers may be exposed include the following: any coatings on metal being welded (e.g., paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality of ventilation, the position of the welder's head with respect to the fume plume, and the presence of other contaminates in the atmosphere. When the filler is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2 (Composition and Information on Ingredients). Fume and gas decomposition products, and not the ingredients in the filler, are important. Concentration of the given fume or gas component may decrease or increase by many times the original concentration. New compounds in the filler may form. Decomposition products of normal operations include not only those originating from volatilization, reaction, or oxidation of the product's components but also those from base metals and any coating (as noted previously). The best method to determine the actual composition of generated fumes and gases is to take an air sample from inside the welder's helmet if worn or in breathing zone. For additional information, refer to the American Welding Society Publication, "Fumes and Gases in the Welding Environment".

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, strong oxidizers, halogens, phosphorous.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid uncontrolled exposure to extreme temperatures and incompatible materials.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Presented below are human toxicological data available for the components of these products present in concentration greater than 1%. Other data for animals are available for the components of these products, but are not presented in this Material Safety Data Sheet.

PHOSPHORUS (YELLOW):
LDLo (oral, woman) = 22 mg/kg; cardiovascular effects
TDLo (oral, woman) = 11 mg/kg
LDLo (oral, human) = 1400 µg/kg
LDLo (oral, woman) = 4600 µg/kg; pulmonary system, gastrointestinal tract, skin effects
TDLo (oral, woman) = 2600 µg/kg

MANGANESE:
TCLo (inhalation, man) = 2300 µg/m^3; BRN, central nervous system effects

IRON:
TDLo (oral, child) = 77 mg/kg; BAH, gastrointestinal tract, blood effects

SULFUR:
Eye Irritancy (human) = 8 ppm

COPPER:
TDLo (oral, human) = 1200 µg/kg; gastrointestinal tract effects

11. TOXICOLOGICAL INFORMATION (Continued)

SUSPECTED CANCER AGENT: The components of these products are listed as follows:

COPPER: EPA-D (Not Classifiable as to Human Carcinogenicity)

CHROMIUM: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of lack of data), EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available), EPA-CBD (Cannot Be Determined); IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

PHOSPHOROUS: EPA-D (Not Classifiable as to Human Carcinogenicity)

CHROMIUM VI: ACGIH TLV-A1 (Confirmed Human Carcinogen : Agent is carcinogenic to humans based epidemiologic studies of, or convincing clinical evidence in, exposed humans),EPA-A (Human Carcinogen: sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer), IARC-1(Carcinogenic to Humans: sufficient evidence of carcinogenicity),NIOSH-X (Carcinogen defined with no further categorization),NTP-1(Known to be carcinogenic: sufficient evidence from human studies), MAK-1(Substances which are considered to be carcinogenic for man because adequate results of long-term animal studies or evidence from animal and epidemiological studies)

CHROMIUM OXIDE: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of lack of data), EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available), EPA-CBD (Cannot Be Determined); IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

IRON (as Iron Oxide): ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of lack of data), IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

MANGANESE: EPA-D (Not Classifiable as to Human Carcinogenicity)

NICKEL: ACGIH TLV-A5 (Not Suspected as a Human Carcinogen), IARC-2B (Possibly Carcinogenic to Humans), MAK-1(Substances That Cause Cancer in Man and Which Can Be Assumed to Make a Significant Contribution to Cancer Risk), NIOSH-Ca (Potential Occupational Carcinogen with No Further Categorization), NTP-R (Reasonably Anticipated to Be A Human Carcinogen)

The other components of these products are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Dusts or fumes of these products may be irritating to contaminated skin and eyes. Fumes may be irritating to the respiratory system.

SENSITIZATION TO THE PRODUCT: Hypersensitivity to the Nickel component of these products can cause allergic contact dermatitis, asthma, and conjunctivitis. Rare cases of allergic contact dermatitis have been reported in people working with copper dust.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of these products and their components on the human reproductive system.

Mutagenicity: These products are not reported to produce mutagenic effects in humans. Animal mutation data are available for the, Chromium (III) Oxide, Molybdenum, Nickel, components of these products; these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

Embryotoxicity These products are not reported to produce embryotoxic effects in humans.

Teratogenicity: These products are not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Copper, Molybdenum, and Nickel components of these products indicate teratogenic effects.

Reproductive Toxicity: These products are not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Copper, Molybdenum and Phosphorus components of these products indicate adverse reproductive effects.

A mutagen is a chemical, which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical, which 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, 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.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of these products are expected to persist in the environment for an extended period of time. Iron, the major component in some of these products, will react with water and air to form a variety of stable iron oxides. The following environmental data are available for components of these products:

CHROMIUM: Chromium (metal) is insoluble in water, and is not oxidized by air, even in the presence of much moisture. The biological half-life of Chromium is listed as 0.5, 5.9, and 83.4 days, respectively, for three different components. Snails show a bioaccumulation factor of $1x10^6$ (total Chromium).

PHOSPHORUS (RED): Bioconcentrates in sediments, clams, fish, birds, and mammals.

COPPER: Solubility: Insoluble. There is no evidence of any biotransformation for copper compounds. Copper is accumulated by all plants and animals. BCF Algae = 12; plants = 1,000; invertebrate = 1,000, fish = 667 and fish =200 (Soluble copper salts).

NICKEL: Water solubility: Insoluble. Nickel is stable in air at ordinary temperature and is not affected by water. No data were found to suggest that nickel is involved in any biological transformation in the aquatic environment.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: These products are not expected to cause adverse effects on plant or animal life. Animal studies on copper, manganese, nickel, and silicon indicate various health effects after ingestion and exposures. **SULFUR:** Carrot and bean production is greatly reduced with high sulfur residues in the soil.

EFFECT OF CHEMICAL ON AQUATIC LIFE: These products may cause adverse effects on aquatic life, especially if large quantities are released into bodies of water. Low chronic aquatic limits indicate a high chronic hazard, it may be concentrated to toxic levels in food chain. The Nickel component of these products is toxic to aquatic life. Exposure of 0.095 ppm of Nickel for 3 weeks to Daphnid and Fathead minnows affected reproduction in these fish.

PHOSPHORUS (RED): Radioactive phosphorus has been concentrated by factors of 75,000 by waterfowl and up to 850,000 by aquatic life.

SULFUR: TLm (mosquito fish) 10,000 ppm/ 96 hours/ fresh water

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. These products, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: Wastes of these products should be tested per the Toxicity Characteristic Leaching Procedures requirements of RCRA to determine if such wastes meet the following characteristic: D007 (Chromium) 5.0 mg/L (Regulated Level).

14. TRANSPORTATION INFORMATION

THESE PRODUCTS ARE NOT HAZARDOUS (Per 49 CFR 172.101) BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not applicable.
HAZARD CLASS NUMBER and DESCRIPTION: Not applicable.
UN IDENTIFICATION NUMBER: Not applicable.
PACKING GROUP: Not applicable.
DOT LABEL(S) REQUIRED: Not applicable.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2000: Not applicable.

MARINE POLLUTANT: No component of these products is designated as a marine pollutant by the Department of Transportation (49 CFR 172.101, Appendix B). The Department of Transportation (49 CFR 172.101, Appendix B), lists Copper, metal powder as a Marine Pollutant. This component is not present in the specific form listed and therefore, this product does not meet the marking requirement of 49 CFR 172.322.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: These products are not considered as dangerous goods, per regulations of Transport Canada.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of these products are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Chromium	No	Yes	No
Copper	No	Yes	Yes
Chromium (III) Oxide (Chromium Compound Category)	No	Yes	Yes
Manganese	No	No	Yes
Nickel	No	Yes	Yes

15. REGULATORY INFORMATION (Continued)

ADDITIONAL U.S. REGULATIONS:

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of these products. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. TSCA INVENTORY STATUS: The components of these products are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Chromium = 5000 lbs; Copper =5000 lbs.; Nickel = 100 lbs; RQs for Chromium, Copper, and Nickel are applicable to particles 100 micrometers or less in diameter.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

STATE REGULATORY INFORMATION: The components of these products are covered under specific State regulations, as denoted below:

Alaska-Designated Toxic and Hazardous Substances:, Chromium, Copper Fume, *Chromium (III) Compounds)*, *Molybdenum*, Nickel, Phosphorus .

California-Permissible Exposure Limits for Chemical Contaminants:, Chromium, Copper, Manganese, Nickel, Phosphorus , Silicon, and.

Florida-Substance List: Chromium, Copper, Manganese, Molybdenum, Nickel, Sulfur and Phosphorus.

Illinois-Toxic Substance List: Chromium, Copper, Manganese, Nickel, Phosphorus, Silicon, Molybdenum, , and.

Kansas-Section 302/313 List: Chromium, Manganese, Nickel, and Copper.

Massachusetts-Substance List: Chromium, Chromium (III) Oxide, Copper, Sulfur Manganese, Molybdenum, Nickel, Phosphorus.

Michigan-Critical Materials Register: Chromium, Copper, and Nickel.

Minnesota-List of Hazardous Substances:, Chromium, Manganese, Nickel, , Silicon, and Phosphorus.

Missouri-Employer Information/Toxic Substance List:, Chromium, Chromium (III) Oxide, Copper , Manganese, Molybdenum, Nickel, Phosphorus, Silicon,.

New Jersey-Right to Know Hazardous Substance List: Chromium, Chromium (III) Oxide, Copper, Phosphorus , Manganese, Molybdenum, Nickel, Sulfur ,.

North Dakota-List of Hazardous Chemicals, Reportable Quantities: Chromium, Copper, Nickel, and Phosphorus.

Pennsylvania-Hazardous Substance List: **Copper**, Chromium, Manganese, Molybdenum, *Nickel, Sulfur , Silicon, and Phosphorus.*

Rhode Island-Hazardous Substance List:, Chromium, Copper Fume, Manganese, Molybdenum, Nickel, Sulfur , Silicon, and Phosphorus.

Texas-Hazardous Substance List: Chromium, Manganese, Copper Fume Molybdenum, Nickel, and Phosphorus.

West Virginia-Hazardous Substance List: Chromium, Phosphorus, Manganese, Molybdenum, Nickel, and Copper Fume.

Wisconsin-Toxic and Hazardous Substances: Chromium, Manganese, Molybdenum, Nickel, Copper Fume and Phosphorus.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Chromium and Nickel components of these products are on the California Proposition 65 List. **WARNING: These products may contain chemicals, and when used for welding may produce fumes or gases containing chemicals, known to the State of California to cause cancer, and/or birth defects (or other reproductive harm.)**

LABELING (Precautionary Statements):

WARNING:

PROTECT yourself and others. Read and understand this information.
FUMES AND GASES can be hazardous to your health.
ARC RAYS can injure your eyes and burn skin.
ELECTRIC SHOCK can kill.

- Before use, read and understand the manufacturer's instructions. Material Safety Data Sheets (MSDSs), and your employer's safety policies.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- See American National Standard Z49.1 *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126. OSHA Safety and Health Standards, *29 CFR 1910*, available from the U.S. Government Printing Office, Washington, DC 20402.

DO NOT REMOVE THIS INFORMATION.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of these products are on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: Not applicable.

CANADIAN WHMIS SYMBOLS: Class D2A/D2B: Materials Causing Other Toxic Effects-Contains Potential Sensitizer

16. OTHER INFORMATION

DATE OF PRINTING: February 17, 2004

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard (29 CFR 1910.1200). Other government regulations must be reviewed for applicability to these products. The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. To the best of the J.W. Harris Company, Inc.'s knowledge, the information and recommendations contained in this publication are reliable and accurate as of the date of issue. However, accuracy, suitability, or completeness are not guaranteed, and no warranty, guarantee, or representation, expressed or implied, is made by J.W. Harris Co., Inc. as to the absolute correctness or sufficiency of any representation contained in this and other publications; J.W. Harris Co., Inc. assumes no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures may not be required under particular or exceptional conditions or circumstances. Data may be changed from time to time. Be sure to consult the latest edition.

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.

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 causes 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:

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/m³** 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. 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:

This section explains the impact of various laws and regulations on the material. **U.S.: EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute (**ANSI Z129.1**). **CANADA: CEPA** is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDSL** are the Canadian Domestic/Non-Domestic Substances Lists. ***The CPR is the Canadian Product Regulations.*** *This* section also includes information on the precautionary warnings, which appear, on the materials package label.

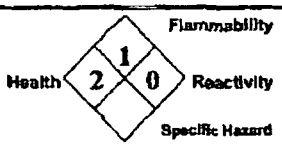
BAKER HUGHES
Baker Petrolite

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name	**SULFIX® 800 SCAVENGER**	**Code**	SX800
Supplier	Baker Petrolite A Baker Hughes Company 12645 W. Airport Blvd. (77478) P.O. Box 5050 Sugar Land, TX 77487-5050 For Product Information/MSDSs Call: 800-231-3606 (8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400	**Version**	2.0
Material Uses	Hydrogen Sulfide Scavenger.	**Effective Date**	1/13/2004
24 Hour Emergency Numbers	CHEMTREC 800-424-9300 (U.S. 24 hour) Baker Petrolite 800-231-3606 (001)281-276-5400 CANUTEC 613-996-6666 (Canada 24 hours) CHEMTREC Int'l 01-703-527-3887 (International 24 hour)	**Print Date**	1/13/2004

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



Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Alkanolamine/aldehyde condensate	4719-04-4	60-100	Not available.
Monoethanolamine	141-43-5	5-10	**ACGIH (United States).** TWA: 7.5 mg/m³ STEL: 15 mg/m³ TWA: 3 ppm STEL: 6 ppm **OSHA (United States).** TWA: 6 mg/m³ TWA: 3 ppm

Section 3. Hazards Identification

Physical State and Appearance	State: Liquid., Color: Light Yellow to light amber, Odor: Slight Amine like.
CERCLA Reportable Quantity	Not applicable.
Hazard Summary	WARNING. May cause chronic effects. May be irritating to eyes, skin and respiratory tract. May cause central nervous system (CNS) effects if inhaled.
Routes of Exposure	Skin (Contact), Eyes, Inhalation.
Potential Acute Health Effects	

Eyes May cause eye irritation.

Skin May be irritating to skin.

Inhalation May cause central nervous system (CNS) effects if inhaled. May be irritating to lungs.

Continued on Next Page

	Ingestion Not considered a likely route of exposure, however, may be harmful or cause irritation if swallowed.
Medical Conditions aggravated by Exposure	Exposure to this product may aggravate medical conditions involving the following: kidneys, nervous system, liver, respiratory tract, skin/epithelium, eyes.
See Toxicological Information (section 11)	
Additional Hazard Identification Remarks	Not available.

Section 4. First Aid Measures

Eye Contact	Flush eyes with plenty of water for 15 minutes, occasionally lifting upper and lower eyelids. Get medical attention immediately.
Skin Contact	Remove and launder or clean contaminated clothing and shoes. Wash with soap and water for at least 15 minutes or until no evidence of material remains. Get medical attention if irritation occurs.
Inhalation	Remove to fresh air. Oxygen may be administered if breathing is difficult. If not breathing, administer artificial respiration and seek medical attention. Get medical attention if symptoms appear.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never induce vomiting or give anything by mouth to a victim who is unconscious or having convulsions. Get medical attention if symptoms appear.
Notes to Physician	Not available.
Additional First Aid Remarks	Not available.

Section 5. Fire Fighting Measures

Flammability of the Product	Not regulated as flammable or combustible.
OSHA Flammability Class	IIIB
Autoignition temperature	Not available.
Flash Points	Closed cup: >94°C (201.2°F). (PMCC)
Flammable Limits	L.E.L. Not available. U.E.L. Not available.
Products of Combustion	These products are carbon oxides (CO, CO_2) nitrogen oxides (NO, NO_2...).
Fire Hazards In Presence of Various Substances	Open Flames/Sparks/Static. Heat.
Fire Fighting Media and Instructions	In case of fire, use foam, dry chemicals, or CO2 fire extinguishers. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public waterways.
Protective Clothing (Fire)	Do not enter fire area without proper personal protective equipment, including NIOSH approved self-contained breathing apparatus.
Special Remarks on Fire Hazards	Not available.

Continued on Next Page

Section 6. Accidental Release Measures

Spill	Put on appropriate personal protective equipment. Keep personnel removed and upwind of spill. Shut off all ignition sources; no flares, smoking, or flames in hazard area. Approach release from upwind. Shut off leak if it can be done safely. Contain spilled material. Keep out of waterways. Dike large spills and use a non-sparking or explosion proof means to transfer material to an appropriate container for disposal. For small spills add absorbent (soil may be used in absence of other suitable materials scoop up material and place in a sealed, liquid-proof container. Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Other Statements	Not applicable.
Additional Accidental Release Measures Remarks	Not available.

Section 7. Handling and Storage

Handling and Storage	Put on appropriate personal protective equipment. Avoid contact with eyes, skin and clothing. Avoid breathing vapors or spray mists. Use only with adequate ventilation. Protect from ignition. Store in a dry, cool and well ventilated area. Keep away from incompatibles. Keep container tightly closed and dry.
Additional Handling and Storage Remarks	Not available.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors or particles below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

Personal Protective Equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended to determine the level of personal protective equipment appropriate for these job tasks and conditions.

Eyes Chemical safety goggles.

Body Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory Respirator use is not expected to be necessary under normal conditions of use. In poorly ventilated areas, emergency situations or if exposure levels are exceeded, use NIOSH approved full face respirator.

Hands Chemical resistant gloves.

Feet Chemical resistant boots or overshoes.

Other information Nitrile or Neoprene gloves. 4H gloves.

Protective Clothing (Pictograms)

Additional Exposure Control Remarks	Not available.

Continued on Next Page

Section 9. Typical Physical and Chemical Properties

Physical State and Appearance	Liquid.	Odor	Slight Amine like.
pH	10 - 12 (5% of Product 75% water/25% isopropanol)	Color	Light Yellow to light amber
Specific gravity	1.131 - 1.143 @ 16°C (60°F)		
Density	9.42 - 9.52 lbs/gal @ 16°C (60°F)		
Vapor Density	>1 (Air = 1)		
Vapor Pressure	13.4 - mmHg @ 21°C (70°F) Calculated Value for all Components.		
Evaporation Rate	Not Available or Not Applicable for Solids.		
VOC	Not available.		
Viscosity	160 - 200 cps @ 25°C (77°F)		
Pour Point	-40°C (-40°F)		
Solubility (Water)	Soluble		
Boiling Point	Not available.		
Physical Chemical Comments	Not available.		

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Oxidizing material. Acid.
Hazardous Decomposition Products	Not applicable.
Hazardous Polymerization	Hazardous polymerization is not expected to occur.
Special Stability & Reactivity Remarks	Not available.

Section 11. Toxicological Information

Component Toxicological Information

Acute Animal Toxicity

Alkanolamine/aldehyde condensate	ORAL (LD50): Acute: 763 mg/kg [Rat]. DERMAL (LD50): Acute: >2000 mg/kg [Rat].
Monoethanolamine	ORAL (LD50): Acute: 700 mg/kg [Mouse]. 1720 mg/kg [Rat]. DERMAL (LD50): Acute: 1000 mg/kg [Rabbit].

Chronic Toxicity Data

Continued on Next Page

1) Alkanolamine/aldehyde condensate

Not available.

2) Monoethanolamine

Monoethanolamine is a component of this product. Chronic occupational exposure reportedly was associated with chronic bronchitis, liver damage, weakness, and fatigue (Sidorov & Timofeevskaya, 1979; Paustovskaya et al, 1973). Occupational asthma has also been reported with chronic exposure (Kabe, 1971). Rats chronically exposed to monoethanolamine had degenerative changes in the liver, heart, and lungs (Beyer et al, 1983). Rats exposed orally to 640 mg/kg/day or more had alterations in kidney and liver weights; deaths occurred at a dose of 1280 mg/kg/day (Knaak et al, 1997).

Monoethanolamine caused chromosome damage in C. capillaris (plant) seeds (Gukasyan et al, 1986). Substances which are strongly alkaline can sometimes produce false-positive results in short-term genetic assays.

Monoethanolamine was teratogenic and fetotoxic in rats when given by gavage at doses up to 500 mg/kg/day on days 6 to 15 of gestation (Mankes, 1986). Dose-related maternal toxicity was present in the form of skin irritation or lesions and changes in maternal body weight (Uberacki et al, 1996).

Product Toxicological Information	
Acute Animal Toxicity	Not available.
Target Organs	kidneys, nervous system, liver, respiratory tract, skin/epithelium, eyes.
Other Adverse Effects	Not available.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Biodegradable/OECD	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks	An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

Section 13. Disposal Considerations

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable federal, state and local regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change.

Additional Waste Remarks	Not available.

Section 14. Transport Information

DOT Classification	Not regulated by DOT.
DOT Reportable Quantity	Not applicable.

Continued on Next Page

Marine Pollutant	Not applicable.
Additional DOT Information	Not available.
Emergency Response Guide Page Number	Not applicable.

Section 15: Regulatory Information

HCS Classification	Target organ effects. Irritant.
U.S. Federal Regulations	
Environmental Regulations	Extremely Hazardous Substances: Not applicable to any components in this product. SARA 313 Toxic Chemical Notification and Release Reporting: Not applicable to any components in this product. SARA 302/304 Emergency Planning and Notification substances: Not applicable to any components in this product. Hazardous Substances (CERCLA 302): Not applicable to any components in this product. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: immediate health hazard; delayed health hazard; Clean Water Act (CWA) 307 Priority Pollutants: Not applicable to any components in this product. Clean Water Act (CWA) 311 Hazardous Substances: Not applicable to any components in this product. Clean Air Act (CAA) 112(r) Accidental Release Prevention Substances: Not applicable to any components in this product.
Threshold Planning Quantity (TPQ)	Not applicable.
TSCA Inventory Status	All components are included or are exempted from listing on the US Toxic Substances Control Act Inventory. This product does not contain any components that are subject to the reporting requirements of TSCA Section 12(b) if exported from the United States.
State Regulations	State specific information is available upon request from Baker Petrolite.
International Regulations	
Canada	All components are compliant with or are exempted from listing on the Canadian Domestic Substance List.
WHMIS (Canada)	D-2B
European Union	All components are included or are exempted from listing on the European Inventory of Existing Commercial Chemical Substances or the European List of Notified Chemical Substances.
	International inventory status information is available upon request from Baker Petrolite for the following countries: Australia, and Australia (NICNAS), China, Korea (TCCL), Philippines (RA6969), or Japan.
Harmonized Tariff Code	Not available.
Other Regulatory Information	No further regulatory information is available.

Continued on Next Page

Section 16. Other Information

Other Special Considerations	File 2445 1/13/03 Changes to Sections 1, 2, 3, 5, 8, 9, and 15

Baker Petrolite Disclaimer

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

MATERIAL SAFETY DATA SHEET

TOLI 5050 **DATE: August 23, 2005**

1. Chemical Product and Company Identification:

CBC AMERICA
TOLI INTERNATIONAL
55 MALL DRIVE
COMMACK, NY 11725

EMERGENCY PHONE:
631-864-9700

TRADE NAME: TOLI 5050
PRODUCT DESCRIPTION: Water Based Acrylic Rubber & Vinyl Flooring Adhesive

2. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS:

MATERIAL	CAS #	% BY WT.	OSHA EXPOSURE GUIDELINES TLV-TWA	PEL-STEL

No known hazardous ingredients at levels above 1% by weight

3. HAZARDS IDENTIFICATION:

EMERGENCY OVERVEIW: Can cause eye irritation

POTENTIAL HEALTH EFFECTS:
EYE CONTACT: May cause slight irritation.
SKIN CONTACT: No effect known.
INGESTION: Not likely to occur. If swallowed, no side effects known.
INHALATION: No effect known.

CHRONIC EFFECTS / CARCINOGENICITY:
IARC: Not suspected as a human carcinogen.
OSHA: Not suspected as a human carcinogen.
NTP: Not suspected as a human carcinogen.
OTHER: None known.

4. FIRST AID MEASURES:

EYES: Immediately flush with water for 15 minutes. Contact a physician if irritation occurs.
SKIN: Wash with soap and water. Contact a physician if irritation occurs.
INGESTION: Induce vomiting, contact a physician.
INHALATION: Remove to fresh air. Contact a physician if irritation occurs.

Continued on next page:

5. FIRE FIGHTING MEASURES AND FIRE HAZARDS:

FLASH POINT (°) F: None.
LOWER FLAMMABLE LIMIT: None.
UPPER FLAMMABLE LIMIT: None.

FIRE-FIGHTING INSTRUCTIONS: Use protective clothing and self-contained breathing apparatus.

EXTINGUISHING MEDIA: Water fog, CO_2, dry chemical, and chemical foam.

DECOMPOSITION PRODUCTS: Dried material may produce CO, CO_2, H_2O, N_xO, and other products from the burning of aromatic hydrocarbons.

6. ACCIDENTAL RELEASE MEASURES:

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Dispense sand or vermiculite. Collect and place in waste container. Wash area thoroughly with water.

7. HANDLING AND STORAGE:

HANDLING: Use good hygienic practices. (Wash hands before eating, using washroom, or smoking.) Keep out of the reach of children.
STORAGE: Store above 40°F.

8. EXPOSURE CONTROLS / PERSONALPROTECTION

RESPIRATORY PROTECTION: Not normally required with good ventilation.
SKIN PROTECTION: Wear gloves if contact with material is likely.
EYE PROTECTION: Wear splash goggles if contact with material is likely.
ENGINEERING CONTROLS: Normal room ventilation.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE AND ODOR: White colored paste with little or no odor.
SPECIFIC GRAVITY (WATER = 1): 1.165
BOILING POINT (°F): 212
VAPOR PRESSURE: Same as water.
VAPOR DENSITY (air=1): Same as water.
% VOLATILE BY WEIGHT: 27
pH: 8.6

10. STABILITY AND REACTIVITY:

CHEMICAL STABILITY: Stable.
INCOMPATIBILE MATERIALS: None known.
HAZARDOUS DECOMPOSITION PRODUCTS: None known.
HAZARDOUS POLYMERIZATION: Will not occur.

Continued on next page:

11. TOXICOLOGICAL INFORMATION:

This product has been tested for toxicity (acute inhalation; acute dermal; skin irritation; oral) and has been found to be non-toxic as defined by The Federal Hazardous Substance Act, 16 CFR 1500.3.

12. ECOLOGICAL INFORMATION:

No information available.

13. DISPOSAL CONSIDERATIONS:

Dispose of in accordance with Federal, State and Local regulations.

PROPER WASTE DISPOSAL IS THE RESPONSIBILITY OF THE OWNER OF THE WASTE!

14. TRANSPORATION INFORMATION:

For domestic transportation purpose, this product is not designated as a hazardous material by the U.S. Department of Transportation (DOT).

15. REGULATORY INFORMATION:

TSCA: All ingredients are listed under the Toxic Substance Control Act

Volatile Organic Compounds: 0 lbs/gallon (SCAQMD Rule 1168)

HMIS RATINGS:	Health = 1	Flammability = 1
	Reactivity = 0	Personal Protective Equipment = B

Hazard Index: 0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe

16. OTHER INFORMATION:

All employees, contractors, etc., who use this product must have access to this Material Safety Data Sheet.
PREPARED BY: Toli International, Laboratory (rw)

17. DEFINITIONS

CFR: Code Of Federal Regulations. A collection of regulations established by law.
CARCINOGEN: A material that either causes cancer in humans, or is considered capable of causing cancer in humans.
COMBUSTIBLE: A term used to classify certain materials with low flash points that ignite easily. For OSHA it has a flash point >100°F but below 200°F.
D.O.T.: U.S. Dept. Of Transportation
FLASH POINT: The lowest point at which a liquid gives off sufficient vapor to form an ignitable mixture with air.
HAZARDOUS: Any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human.
IARC: International Agency for Research on Cancer
IRRITANT: A substance capable of causing an inflammatory effect on living tissue by chemical action at the site of contact.
LD50: LETHAL DOSE 50. The single dose of a substance that causes death of 50% of an animal population from exposure to the substance from any route other than inhalation.
L.E.L.: Lower Explosive Limit. The lowest concentration of vapor that burns or explodes when an ignition source is present at ambient temperatures.
L.F.L.: Lower Flammable Limit. Same as L.E.L.
N.A.: Not applicable or not available.
N.E.: Not established
N.F.P.A.: National Fire Protection Association
N.I.O.S.H.: National Institute of Occupational Safety And Health.
N.T.P. National Toxicology Program.
O.S.H.A.: The Occupational Safety And Health Administration
P.E.L.-S.T.E.L.: Permissible Exposure Limit, Short Term Exposure Limit.
T.L.V.-T.W.A.: Threshold Limit Value, Time Weighted Average
T.S.C.A.: Toxic Substance Control Act
TOXIC: Any chemical or material that has evidence of an acute or chronic health hazard and is listed in the NIOSH REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES.
V.O.C.: Volatile Organic Compound

ConocoPhillips

Transmix

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Transmix

MSDS Code: 163980

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

Customer Service: 800-640-1956

Technical Information: 800-255-9556

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: http://w3.conocophillips.com/NetMSDS/

Emergency Telephone Numbers: *Chemtrec:* 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

DANGER!
Extremely Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard
Possible Cancer Hazard

NFPA

Appearance: Bronze colored
Physical Form: Liquid
Odor: Gasoline

Potential Health Effects

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

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

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

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 respiratory tract, irritation of the digestive tract, nausea, vomiting, flushing, diarrhea, blurred vision, tremors, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), unconsciousness, convulsions and death.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and respiratory (asthma-like) disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect (see Section 4 - Note to Physicians).

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Fuel Oil No. 2	68476-30-2	100
Gasoline	NONE	100
Kerosene ..C9-16	8008-20-6	100
Ethyl Benzene	100-41-4	0-3
Benzene	71-43-2	0-3
Naphthalene	91-20-3	<1

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek 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.

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.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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 and 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Extremely flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical 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. 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 with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors (see Section 5). 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). Use water sparingly to minimize environmental contamination and reduce disposal requirements.

Methods for Containment and Clean-Up: Notify fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wash thoroughly after handling. Wear protective gloves. Use good personal hygiene practices and wear appropriate personal protective equipment.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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 any 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

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Fuel Oil No. 2	TWA: 100 mg/m³ Skin	—	—
Gasoline	TWA: 300 ppm TWA: 890 mg/m³ STEL:500 ppm STEL: 1480 mg/m³	—	—
Kerosene ..C9-16	TWA: 200 mg/m³ Skin	—	—
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	—
Ethyl Benzene	TWA: 100 ppm STEL: 125 ppm	TWA: 435 mg/m³ TWA: 100 ppm	—
Benzene	TWA: 0.5 ppm STEL: 2.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 1 ppm TWA: 10 ppm	—
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m³	TWA: 0.2 mg/m³ (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

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.

Personal Protective Equipment (PPE):

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

Respiratory: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

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.

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:	Bronze colored
Physical Form:	Liquid
Odor:	Gasoline

Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	350-760 mm Hg @ 100°F
Vapor Density (air=1):	>1
Boiling Point/Range:	84-649°F / 29-343°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.79 @ 68°F (20°C)
Bulk Density:	6.58 lbs/gal
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	No data
Flash Point:	<-45°F / <-43°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	1.4
UEL (vol % in air):	7.6
Autoignition Temperature:	883°F / 473°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Extremely flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents such as acids, chlorine, dichromates, or permanganates can cause fire or explosion.

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen and sulfur and benzene.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Fuel Oil No. 2

Carcinogenicity: Application of fuel oil No. 2 to mouse skin, three times a week (duration unspecified), resulted in an increased incidence of skin tumors. Fuel oil No. 2 has not been identified as a carcinogen by NTP, IARC, or OSHA.

Gasoline

Carcinogenicity: Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by IARC. Because solvent extracts of gasoline exhaust particulates caused skin cancer in laboratory animals, IARC has categorized gasoline engine exhaust as a possible human cancer hazard.

Target Organs: A two year inhalation study of wholly vaporized unleaded gasoline produced nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules, and necrosis and hyperplasia of surrounding cells. Follow-up studies suggest that these changes are unique to the male rat.

Reproductive: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation.

Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Xylenes

Target Organs: Rats exposed to 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

Reproductive: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions.

Toluene

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased fetal body weight and increased skeletal variations in both inhalation and oral studies.

Ethyl Benzene

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP, or OSHA.

Benzene

Carcinogenicity: Benzene is known to cause cancer of the blood-forming organs in humans, including acute myelogenous leukemia. It has been identified as a human carcinogen by NTP, IARC and OSHA.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive: Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body weight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.

Mutagenic Effects: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Naphthalene

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 been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Fuel Oil No. 2	14.5 ml/kg (rat)	No data	No data
Gasoline	18.75 ml/kg. (Rat)	>5 ml/kg (Rabbit)	300g/m^3/5M (rat, mouse, g.pig)
Kerosene ..C9-16	>5 g/kg (Rat)	>2,000 mg/kg (Rabbit)	>5000 ppm (rat)

12. ECOLOGICAL INFORMATION

Not evaluated.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Petroleum distillates, n.o.s., 3, UN1268, I ***or*** II
Non-Bulk Package Marking:	Petroleum distillates, n.o.s., UN1268
Non-Bulk Package Labeling:	Flammable liquid
Bulk Package/Placard Marking:	Flammable / 1268
Packaging - References:	49 CFR 173.150; 173.201; 173.243 ***[PG I]*** ***-or-*** 49 CFR 173.150; 173.202; 173.242 ***[PG II]*** ***(Exceptions; Non-bulk; Bulk)***
Hazardous Substance:	See Section 15 for RQ's
Emergency Response Guide:	128
Note:	***Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.***

International Maritime Dangerous Goods (IMDG)

Shipping Description:	UN1268, Petroleum distillates, n.o.s., 3, I ***or*** II, (
Non-Bulk Package Marking:	Petroleum distillates, n.o.s., UN1268
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable / 1268
Packaging - Non-Bulk:	P001
EMS:	F-E, S-E
Note:	Federal compliance requirements may apply. See 49 CFR 171.12.

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

UN/ID #:	UN1268
Proper Shipping Name:	Petroleum distillates, n.o.s.
Hazard Class/Division:	3
Subsidiary risk:	None
Packing Group:	I ***or*** II
Non-Bulk Package Marking:	Petroleum distillates, n.o.s., UN1268
Labels:	Flammable liquid
ERG Code:	3H
Note:	Federal compliance requirements may apply. See 49 CFR 171.11.

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	None - ***[PG I]*** Y305 - ***[PG II]***	302 - ***[PG I]*** 305 - ***[PG II]***	303 - ***[PG I]*** 307 - ***[PG II]***
Max. Net Qty. Per Package:	None ***[PG I]*** 1L ***[PG II]***	1L ***[PG I]*** 5 L ***[PG II]***	30 L ***[PG I]*** 60 L ***[PG II]***

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Xylenes	0-11	1.0%
Toluene	0-8	1.0%
Ethyl Benzene	0-3	0.1%
Benzene	0-3	0.1%
1,2,4-Trimethyl Benzene	0-3	1.0%
n-Hexane	0-2	1.0%
Cyclohexane	0-2	1.0%
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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 Benzene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Naphthalene	Cancer
Various Polycyclic Aromatic Hydrocarbons	Skin Cancer
Unleaded Gasoline (Wholly Vaporized)	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
B2 - Flammable Liquids
D2A
D2B

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

16. OTHER INFORMATION

Issue Date:	13-Dec-2007
Status:	Final
Previous Issue Date:	21-Jun-2007
Revised Sections or Basis for Revision:	Exposure limits (Section 8)
MSDS Code:	163980

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

Triton® 2000 GEO (All Grades)

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Triton® 2000 GEO (All Grades)
MSDS Code:	720330
Synonyms:	76 Triton® 2000 GEO 30 76 Triton® 2000 GEO 40
Intended Use:	Natural Gas Engine Oil
Responsible Party:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	888-766-7676
Technical Information:	800-255-9556
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: 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. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). 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: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

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

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Lubricant Base Oil (Petroleum)	VARIOUS	>90
Additives	PROPRIETARY	<10
*Alkarylphosphate		<0.5

*A component of:
HMIRC Registry Number: 6697
Filing Date: August 16, 2006
Claim for Exemption Granted: Pending

4. FIRST AID MEASURES

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

Skin: 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. 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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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 and 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.

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. The use of explosion-proof electrical 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. 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 with minimal risk. 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. 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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: 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.

"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.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	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.

Personal Protective Equipment (PPE):

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

Respiratory: 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other 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:	Amber
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	No data
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	No data
Bulk Density:	7.3 lbs/gal
Viscosity:	9.5 - 16.3 cSt @ 100°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>365°F / >185°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 storage and handling.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen and sulfur.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Alkarylphosphate

Reproductive: Recent studies have indicated some triarylphosphates cause adverse reproductive and/or developmental effects in laboratory animals following repeated oral exposure (ingesting or swallowing the material). The adverse findings seen for this alkarylphosphate were impaired fertility in male and female rats, adverse effects on reproductive tissues, and effects on postnatal development.

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 Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data

12. ECOLOGICAL INFORMATION

Lubricant oil basestocks are complex mixtures of hydrocarbons (primarily branched chain alkanes and cycloalkanes) ranging in carbon number from C15 to C50. The aromatic hydrocarbon content of these mixtures varies with the severity of the refining process. White oils have negligible levels of aromatic hydrocarbons, whereas significant proportions are found in unrefined basestocks. Olefins are found only at very low concentrations. Volatilization is not significant after release of lubricating oil basestocks to the environment due to the very low vapor pressure of the hydrocarbon constituents. In water, lubricating oil basestocks will float and will spread at a rate that is viscosity dependent. Water solubilities are very low and dispersion occurs mainly from water movement with adsorption by sediment being the major fate process. In soil, lubricating oil basestocks show little mobility and adsorption is the predominant physical process.

Both acute and chronic ecotoxicity studies have been conducted on lubricant base oils. Results indicate that the acute aquatic toxicities to fish, Daphnia, Ceriodaphnia and algal species are above 1000 mg/l using either water accommodated fractions or oil in water dispersions. Since lubricant base oils mainly contain hydrocarbons having carbon numbers in the range C15 to C50, it is predicted that acute toxicity would not be observed with these substances due to low water solubility. Results from chronic toxicity tests show that the no observed effect level (NOEL) usually exceeds 1000 mg/l for lubricant base oils with the overall weight of experimental evidence leading to the conclusion that lubricant base oils do not cause chronic toxicity to fish and invertebrates.

Large volumes spills of lubricant base oils into water will produce a layer of undissolved oil on the water surface that will cause direct physical fouling of organisms and may interfere with surface air exchange resulting in lower levels of dissolved oxygen. Petroleum products have also been associated with causing taint in fish even when the latter are caught in lightly contaminated environments. Highly refined base oils sprayed onto the surface of eggs will result in a failure to hatch.

Extensive experience from laboratory and field trials in a wide range of crops has confirmed that little or no damage is produced as a result of either aerosol exposure or direct application of oil emulsion to the leaves of crop plants. Base oils incorporated into soil have resulted in little or no adverse effects on seed germination and plant growth at contamination rates up to 4%.

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: Federal compliance requirements may apply. See 49 CFR 171.12.

14. TRANSPORTATION INFORMATION

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

UN/ID #: Not regulated
Note: Federal compliance requirements may apply. See 49 CFR 171.11.

	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:
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
D2A

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

Issue Date:	01-Feb-2008
Status:	Final
Previous Issue Date:	13-Sep-2006
Revised Sections or Basis for Revision:	NFPA ratings (Section 2)
MSDS Code:	720330

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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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Triton Synthetic Transoil 50

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Triton Synthetic Transoil 50
MSDS Code:	778796
Intended Use:	Automotive Gear Lubricant
Responsible Party:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	888-766-7676
Technical Information:	800-255-9556
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA

Appearance: Amber
Physical Form: Liquid
Odor: Characteristic 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): Expected to have a low degree of toxicity by inhalation.

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

Signs and Symptoms: Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

NON-HAZARDOUS COMPONENTS

Component	CAS	Concentration (wt %)
Synthetic Lubricant Base Oil	PROPRIETARY	75-95
Additives	PROPRIETARY	5-25

4. FIRST AID MEASURES

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

Skin: 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. 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: 1 **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. Vapors are heavier than air and can accumulate in low areas.

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

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.

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.

Spill precautions: 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).

Environmental precautions: 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. Spilled material may be absorbed into an appropriate absorbent material.

Methods for cleaning up: Immediate cleanup of any spill is recommended. Notify fire authorities and appropriate federal, state, and local agencies. 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

7. HANDLING AND STORAGE

Handling: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practices.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	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.

Personal Protective Equipment (PPE):

Eye/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.

Skin: The use of gloves impervious to the specific material handled, such as nitrile, is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Amber
Physical Form:	Liquid

Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	< 1
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	No data
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.85 - 0.87 @ 60°F (15.6°C)
Bulk Density:	7.08 - 7.24 lbs/gal
Viscosity:	17.0 - 18.5 cSt @ 100°C; 125 - 140 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	No data
Flash Point:	374°F / 190°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
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 storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): strong acids bases and oxidizing agents Avoid contact with strong oxidizing agents

Hazardous Decomposition Products: Combustion can yield oxides of carbon, nitrogen, sulfur and phosphorus Hydrogen sulfide may also be released.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated.

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

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: Additional Federal compliance requirements may apply. See 49 CFR 171.12.

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

Proper Shipping Name: Not regulated
Note: Additional Federal compliance requirements may apply. See 49 CFR 171.11.

	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 contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

EPA (CERCLA) Reportable Quantity (in pounds):
This material contains the following chemicals subject to the reporting requirements:

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):

Aniline – Cancer
Ethyl Acrylate – Cancer
2-Naphthylamine – Cancer
1-Naphthylamine – 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 CPR.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are listed on the US TSCA Inventory.
This product contains one or more components on the NDSL (Non-Domestic Substances List) which are subject to Canada's New Substance Notification requirements if exported quantities of component exceed 1000 kg/yr. All other components are on the DSL.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	22-Jan-2007
Status:	Final
Revised Sections or Basis for Revision:	Periodic review and update
MSDS Code:	778796

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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

Two-Loop Motor Oil (All Grades)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Two-Loop Motor Oil (All Grades)
Synonyms:	Two-Loop Motor Oil 5W-30 Two-Loop Motor Oil 10W-30 Two-Loop Motor Oil 10W-40 Two-Loop Motor Oil 20W-50
Intended Use:	Crankcase Oil
Chemical Family:	Petroleum Hydrocarbon
Responsible Party:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	888-766-7676
Technical Information:	800-435-7761

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) 356-3219

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance:	Clear amber
Physical Form:	Liquid
Odor:	Characteristic petroleum

NFPA 704 Hazard Class:

Health:	1 (Slight)
Flammability:	1 (Slight)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Zinc Compound(s) PROPRIETARY	0.5-1.5	NE	NE	NE	NE

NON-HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Lubricant Base Oil (Petroleum) VARIOUS	76-86	5mg/m³ TWA 10 mg/m³ STEL	5 mg/m³ TWA	2500 mg/m³ IDLH	as Oil Mist, if Generated 5 mg/m³ NOHSC TWA
Additives PROPRIETARY	14-24	NE	NE	NE	NE

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-83-7; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

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.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

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. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

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

Signs and Symptoms: Effects of overexposure may include irritation of the respiratory tract, irritation of the digestive tract, nausea, diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin 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: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. 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. 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): 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

Flammable Properties:

Flash Point:	365°F / 185°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010 (minimum)
OSHA Flammability Class:	Not applicable
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data

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. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

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

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. 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. Spilled material may be absorbed into an appropriate absorbent 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: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as 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. Use good personal hygiene practices.

"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.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Storage temperatures above 113°F may lead to thermal decomposition, resulting in the generation of hydrogen sulfide and other sulfur containing gases. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be 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 NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is 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 warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Clear amber
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure (mm Hg):	<1

Vapor Density (air=1):	>1
Boiling Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.85-0.88
Bulk Density:	7.08-7.33
Viscosity cSt @ 100°C:	10.4-19.0
Viscosity cSt @ 40°C:	59-181
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	365°F / 185°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010 (minimum)
LEL%:	No data
UEL%:	No data
Autoignition Temperature:	No data
Decomposition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

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

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen, sulfur, phosphorus, and zinc oxides. Thermal decomposition may produce hydrogen sulfide and other sulfur-containing gases at temperatures greater than 113°F.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Lubricant Base Oil (Petroleum) - CAS: VARIOUS
Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and therefore none are listed as a carcinogen by NTP, IARC, or OSHA.

Acute Data:

Lubricant Base Oil (Petroleum) - CAS: VARIOUS
Dermal LD50 = >2 g/kg
LC50 = No information available
Oral LD50 = >5 g/kg

Additives - CAS: PROPRIETARY
Dermal LD50 = No information available
LC50 = No information available
Oral LD50 = No information available

Zinc Compound(s) - CAS: PROPRIETARY
Dermal LD50 = No information available
LC50 = No information available
Oral LD50 = No information available

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may 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 a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT Proper Shipping Description: Not classified as hazardous

Note: Material is unregulated unless in container of 3500 gallons or more, then provisions of 49 CFR Part 130 apply for land shipment.

IMDG Shipping Description: Not regulated

ICAO/IATA Shipping Description: Not regulated

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

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

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Zinc Compound(s).....PROPRIETARY.....0.5-1.5%

EPA (CERCLA) Reportable Quantity (in pounds):
--None Known--

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:
-- 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):

Used engine oils, 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.

Used motor oil has been identified as a possible skin carcinogen by IARC.

TSCA:
All components are listed on the TSCA inventory.

16. OTHER INFORMATION

Issue Date:	11-Aug-2005
Previous Issue Date:	28-Mar-2002
Revised Sections or Basis for Revision:	Product name (Section 1) Responsible party (Section 1) Composition (Section 2) Physical Properties (Section 9)
Previous Product Code:	3322010400
MSDS Code:	725980

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.

MAPEI® Material Safety Data Sheet (MSDS) - North America *Read complete MSDS prior to using product.*

Product Name: ***Ultrabond ECO™ 575***

Product Description: Premium Cove Base Adhesive

IN THE EVENT OF A CHEMICAL EMERGENCY INVOLVING A SPILL, LEAK, FIRE, EXPLOSION, EXPOSURE OR ACCIDENT CONTACT THE FOLLOWING NUMBERS:

EMERGENCY 24 HOUR NUMBER (USA) CHEMTREC 1-800-424-9300 (Canada) CANUTEC 1-613-996-6666

CONSUMER STATEMENT:

CAUTION - EYE IRRITANT. NON-TOXIC.

WORK AND HYGIENE PRACTICE:

Remove contaminated clothing immediately. Wash hands, after each use and before eating, drinking, or using toiletries. Minimize contact of product on skins.

I - GENERAL INFORMATION

MANUFACTURER:

USA and Puerto Rico	Canada
MAPEI CORPORATION	MAPEI INC.
1144 East Newport Center Drive	2800 Francis-Hughes Avenue
Deerfield Beach, FL 33442	Laval, QC H7L 3J5
Ph: (954) 246-8888	Ph: (450) 662-1212

MSDS PREPARED BY:

Regulatory Affairs Department - MAPEI North America

REVISION DATE (YYYY/MM/DD): 2006/07/15

For most current MSDS, download document from: www.mapei.com

II - PHYSICAL CHARACTERISTICS

Calculated VOC (See below.)	**0 g/L**
Boiling Point	>212°F (>100°C)
Vapor Pressure (mmHg)	1,0
Vapor Density (AIR=1)	1,10 - 1,20
Specific Gravity (H20=1)	1,00 - 1,30
Melting/Freezing Point (F)	N/E
Evaporation Rate (Butyl Acetate=1)	Same as water.
Solubility in water	Soluble
pH (paste/liquid)	8,0 - 10,0
Appearance and Odor	Beige paste. Slight odor of latex.

(VOC per CA South Coast Air Quality Management District, Rule 1168)

III - HAZARD ASSESSMENT

Hazardous Components (specific chemical identity; common names):	OSHA (PEL)	ACGIH (TLV-TWA)	Other Limits Recommended	% Percent (Optional)

THIS PRODUCT CONTAINS NO HAZARDOUS INGREDIENTS AS DEFINED BY US OSHA HAZARD COMMUNICATION STANDARD - 29 CFR 1910.1200 OR SECTION 13 OF THE CANADIAN HAZARDOUS PRODUCTS ACT.

For California (Proposition 65): This product contains no chemicals reportable under Proposition 65.

All ingredients are listed within or exempted from US TSCA and Canadian DSL.

(USA) - HMIS (Hazardous Materials Identification System) Rating: Health - 1 Fire - 0 Reactivity - 0 Protection - B "*" = chronic effect

(Canada) - WHMIS (Workplace Hazardous Materials Information System) Classifications: Not regulated under WHMIS.

IV - TRANSPORTATION

By GROUND - USA and Puerto Rico (DOT):
Not Regulated

By GROUND - Canada (TDG):
Not Regulated

By SEA (IMDG):
Not Regulated

By AIR (IATA):
Not Regulated

V - FIRE AND EXPLOSION HAZARD DATA

Flash Point: >212°F (>100°C) Lower Explosive Limit (%) - N/E Upper Explosive Limit (%) - N/E

Unusual Fire and Explosion Hazards - Some decomposition products may be harmful.

Extinguishing Media:

Will not burn except under extreme temperatures. Water spray, carbon dioxide, dry chemical or foam.

Special Fire Fighting Procedures:

Wear standard fire fighting gear with self-contained breathing apparatus.

VI - REACTIVITY DATA

Stability: Stable **Conditions to Avoid:** None known.

Incompatibility (Materials to Avoid): Strong oxidizing agents, strong acids, and strong bases.

Hazard Decomposition of By-products: Carbon monoxide, carbon dioxide, oxides of nitrogen, and other unidentified organic compounds.

Polymerization: Will Not Occur **Conditions to Avoid:** None known.

VII - HEALTH HAZARD DATA

Routes of entry during normal usage: Inhalation? YES Skin? YES Ingestion? NO

Health Hazards:

Acute: No effects are suspected under normal professional use.

Chronic: None known.

Carcinogenicity: NTP - NO IARC - NO OSHA - NO

Signs and Symptoms of Overexposure:

No effects are suspected under normal professional use.

Medical Conditions That Can Be Aggravated by Exposure:

Allergies, skin and respiratory disorders. Product sensitivity.

VIII - EMERGENCY AND FIRST AID PROCEDURE

Eyes: Flush with cool water for 15 minutes while holding eyelid open. If irritation persists, seek medical attention immediately.

Skin: Avoid contact with skin. Remove contaminated clothing. Wash affected area thoroughly with soap and water. If irritation persists, seek immediate medical attention.

Inhalation: Remove to fresh air if allowable concentrations of any of the hazardous ingredients are exceeded. If not breathing, trained personnel should initiate artificial respirations and immediate medical attention should be obtained.

Ingestion: Do not induce vomiting. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.

IX - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken if Material is Leaked or Spilled:

Wear protective equipment. Contain by diking with inert absorbent materials and put into an approved waste container.

Waste Disposal Method: Dispose in accordance to local environmental regulation.

Precautions to be taken during Handling and Storage:

Keep container closed when not in use. Store at 60-95°F (15-35°C) and out of the sun. Use adequate ventilation to avoid breathing vapors when cover is removed.

Other Precautions: Avoid prolonged skins contact.

X - CONTROL MEASURES

Respiratory Protection:

If workplace exposure limit of product is exceeded, a NIOSH/MSHA approved air supplied respirator is required in absence of proper environmental control. Engineering or administrative controls should be implemented to reduce exposure.

Ventilation:	Local Exhaust -	Use in WELL VENTILATED areas only.	Mechanical -	Use only intrinsically safe devices.
	Special -	N/A	Other -	N/A

Eye Protection: Safety glasses or goggles as necessary to prevent eye contact.

Protective Gloves: Impervious. (Nitrile, rubber, or better)

Other Protective Equipment: As needed to minimize contact with skin.

N/A="Not Applicable" N/E="Not Established"

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. MAPEI assumes no responsibility for personal injury or property damage to vendees, users, or third parties caused by the material. Such vendees or users assume all risks associated with the use of the material.

ConocoPhillips

Unbranded Conventional Gasoline

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

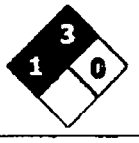
Product Name:	Unbranded Conventional Gasoline
MSDS Code:	724020
Synonyms:	Gasoline, Unleaded, Conventional (All Grades); Gasoline, Low Sulfur Unleaded (All Grades)
Intended Use:	Fuel
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	800-640-1956
Technical Information:	800-255-9556
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/
Emergency Telephone Numbers:	Chemtrec: 800-424-9300 (24 Hours) California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

DANGER!
Extremely Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard

NFPA



Appearance: Clear to amber
Physical Form: Liquid
Odor: Gasoline

Potential Health Effects

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

Skin: Skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): Low to moderate 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 nausea, vomiting, flushing, blurred vision, tremors, respiratory failure, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), unconsciousness, convulsions, death.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, respiratory (asthma-like) disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect (see Section 4 - Note to Physicians).

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Gasoline	NONE	100
Benzene	71-43-2	0-5

4. FIRST AID MEASURES

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

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate 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.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: This material is extremely flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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. 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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Extremely flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Spill precautions: 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).

Environmental precautions: 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 absorbent material.

Methods for cleaning up: Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended.

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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Wash thoroughly after handling. 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.

"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.

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Gasoline	300 ppm TWA 890 mg/m^3 TWA 500 ppm STEL 1480 mg/m^3 STEL	---	---
Xylenes	TWA: 100 ppm STEL: 150 ppm	TWA: 100 ppm TWA: 435 mg/m^3	---
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	---
Benzene	TWA: 0.5 ppm STEL: 2.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 1 ppm TWA: 10 ppm	---

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.

Contains benzene. If exposure concentrations exceed the 0.5 ppm action level, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028). Also see Section 4.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits additional engineering controls 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):

Eye/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.

Skin: The use of nitrile 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, nitrile apron and/or arm covers may be necessary.

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an oxygen-deficient atmosphere, 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 warrant a respirator's use.

If benzene values equal or exceed applicable exposure limits the use of respiratory protection should comply with the requirements in OSHA 29 CFR 1910.1028-Benzene.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

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 to amber
Physical Form:	Liquid
Odor:	Gasoline
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	350-750 mm Hg @ 100°F / 7-25 psia (Reid VP) @ 100°F
Vapor Density (air=1):	>1
Boiling Point/Range:	81-441°F / 26-227°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.72-0.75 @ 60°F (15.6°C)
Bulk Density:	6.17 lbs/gal
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	>1
Flash Point:	<-49°F / <-45°C
Test Method:	(estimate)
LEL (vol % in air):	1.4
UEL (vol % in air):	7.6
Autoignition Temperature:	833°F / 445°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Extremely 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): strong oxidizing agents such as acids, chlorine, dichromates, or permanganates can cause fire or explosion.

Hazardous Decomposition Products: The use of hydrocarbon fuel 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.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Gasoline

Carcinogenicity: Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by IARC. Because solvent extracts of gasoline exhaust particulates caused skin cancer in laboratory animals, IARC has categorized gasoline engine exhaust as a possible human cancer hazard.

Target Organs: A two year inhalation study of wholly vaporized unleaded gasoline produced nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules, and necrosis and hyperplasia of surrounding cells. Follow-up studies suggest that these changes are unique to the male rat.

Reproductive: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation.

Xylenes

Target Organs: Rats exposed to 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

Reproductive: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions.

Toluene

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased fetal body weight and increased skeletal variations in both inhalation and oral studies.

Ethyl Benzene

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP, or OSHA.

Benzene

Carcinogenicity: Benzene is known to cause cancer of the blood-forming organs in humans, including acute myelogenous leukemia. It has been identified as a human carcinogen by NTP, IARC and OSHA.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive: Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body weight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.

Mutagenic Effects: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Gasoline	18.75 ml/kg. (Rat)	>5 ml/kg (Rabbit)	300g/m^3/5M (rat, mouse, g.pig)

12. ECOLOGICAL INFORMATION

The individual hydrocarbon components of this material are differentially soluble in water with aromatic hydrocarbons tending to be more water soluble than aliphatic hydrocarbons. If spilled, the more volatile components will evaporate rapidly. Factors such as local environmetnal conditions (temperature, wind, soil type, mixing or wave action in water, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, contribute to the weathering of spilled material. Because of their differential solubility, the occurrence of hydrocarbons in groundwater will be at different proportions than the parent material.

The potential for bioaccumulation and/or long term persistence of these materials in the environment is low to non-existent. In laboratory soil column experiments, the half-time of unleaded gasoline was reported as 1.2 to 2.7 days in sand, loam or clay soils. Microorganisms prsent in sediments and in the water are capable of degrading gasoline and naphtha containing hydrocarbons. Simpler hydrocarbons are more readily degraded than complex molecules. Adaption of bacteria in gasoline-contaminated groundwater to the soluble constituents has been reported.

In general, naphtha streams exhibit some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components most likely causing toxicity are also highly volatile and can be readily biodegraded by microorganisms.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Gasoline, 3, UN1203, II
Non-Bulk Package Marking:	Gasoline, UN1203
Non-Bulk Package Labeling:	Flammable liquid
Bulk Package/Placard Marking:	Flammable/1203
Packaging - References:	49 CFR 173.150; 173.202; 173.242
Emergency Response Guide:	128

International Maritime Dangerous Goods (IMDG)

Shipping Description:	UN1203, Gasoline, 3, II , (-45° C cc)
Non-Bulk Package Marking:	Gasoline, UN 1203
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable/1203

14. TRANSPORTATION INFORMATION

Packaging - Non-Bulk: P001
EMS: F-E, S-E

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: UN1203
Proper Shipping Name: Gasoline
Hazard Class/Division: 3
Packing Group: II
Non-Bulk Package Marking: Gasoline, UN1203
Labels: Flammable liquid
ERG Code: 3H

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Xylenes	0-21	1.0%
Toluene	0-15	1.0%
Ethyl Benzene	0-5	0.1%
Benzene	0-5	0.1%
1,2,4-Trimethyl Benzene	0-5	1.0%
n-Hexane	0-4	1.0%
Cyclohexane	0-2	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Unleaded Gasoline (Wholly Vaporized)	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 CPR.

WHMIS Hazard Class
B2 - Flammable Liquids
D2A - Very Toxic Material

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

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date:	21-Jun-2007
Status:	Final
Previous Issue Date:	23-May-2007
Revised Sections or Basis for Revision:	Exposure limits (Section 8)
MSDS Code:	724020

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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.

ConocoPhillips

Unbranded Gasoline Reformulated with Ethanol

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Unbranded Gasoline Reformulated with Ethanol
MSDS Number:	724060
Synonyms:	Arizona Clean Burning Gasoline (CBG) (All Grades) CARB Gasoline with Ethanol (All Grades) Conventional Unleaded Gasoline with Ethanol (All Grades) Reformulated Gasoline with Ethanol (All Grades)
Intended Use:	Fuel
Manufacturer/Supplier:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	800-640-1956
Technical Information:	800-255-9556
MSDS Information:	Phone: 800-762-0942 Email: MSDS@conocophillips.com Internet: http://w3.conocophillips.com/NetMSDS/

2. HAZARDS IDENTIFICATION

Emergency Overview

DANGER!

Extremely Flammable Liquid and Vapor
Eye and Skin Irritant
Aspiration Hazard

NFPA

Appearance: Clear to amber
Physical Form: Liquid
Odor: Gasoline

Potential Health Effects

Eye: Eye irritant. Contact may cause stinging, watering, redness, and swelling.

Skin: Skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): Low to moderate 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 respiratory tract, irritation of the digestive tract, nausea, vomiting, flushing, blurred vision, drunkenness, stupor, tremors, respiratory failure, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), unconsciousness, convulsions and death.

Other Comments: Most adverse health effects associated with ethanol, a component of this material, are related to the chronic ingestion of alcoholic beverages. Alcoholism has been associated with liver, stomach, heart, and nervous system damage, cancer, adverse reproductive effects, and effects on the developing fetus. Many of these effects may be related to metabolic changes that result from constantly high blood levels of alcohol. This exposure pattern is significantly different from that of persons handling industrial ethanol in the workplace or from refueling cars with gasoline containing ethanol.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, respiratory (asthma-like) disorders and liver disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect (see Section 4 - Note to Physicians).

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration*
Gasoline	NONE	>90
Ethanol	64-17-5	< 10
Benzene	71-43-2	0-5

* 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. Remove contact lenses if present and easy to do. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. If irritation persists, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air in a position comfortable for breathing. If respiratory symptoms or other symptoms of exposure develop, seek immediate 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.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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 an alcohol resistant aqueous film forming 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. 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, 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 nitrogen and sulfur may also be formed.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Extremely flammable. The use of explosion-proof electrical equipment is recommended. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. 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 foam on spills to minimize vapors (see Section 5). 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: 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.
Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended.

7. HANDLING AND STORAGE

Precautions for safe handling: Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. 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 discharge. The use of explosion-proof electrical 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 as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"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.

Conditions for safe 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 any incompatible material (see Section 10). Protect container(s) against physical damage. Portable Containers: Static electricity may ignite gasoline vapors when filling portable containers. To avoid static buildup do not use a nozzle lock open device. Use only approved containers for the storage of gasoline. Place the container on the ground before filling. Keep the nozzle in contact with the container during filling. Do not fill any portable container in or on a vehicle or marine craft. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	US-ACGIH	OSHA	Other
Gasoline	TWA: 300 ppm TWA: 890 mg/m³ STEL:500 ppm STEL: 1480 mg/m³	—	—
Ethanol	TWA: 1000 ppm	TWA: 1000 ppm TWA: 1900 mg/m³	—
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	—
Xylenes	TWA: 100 ppm STEL: 150 ppm	TWA: 100 ppm TWA: 435 mg/m³	—
Benzene	TWA: 0.5 ppm STEL: 2.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 1 ppm TWA: 10 ppm	—

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 (such as splash goggles) that meets or exceeds ANSI Z.87.1 is recommended when there is potential liquid contact to the eye. 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 organic vapor cartridges/canisters 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).

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

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.

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 to amber
Physical Form:	Liquid

Odor:	Gasoline
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	330-775 mm Hg @ 100°F
Vapor Density (air=1):	>1
Boiling Point/Range:	81-437°F / 26-225°C
Melting/Freezing Point:	No data
Solubility in Water:	Approximately 10%
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.68-0.78 @ 60°F (15.6°C)
Bulk Density:	5.66-6.50 lbs/gal
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	>1
Flash Point:	<-49°F / <-45°C
Test Method:	(estimate)
LEL (vol % in air):	1.4
UEL (vol % in air):	7.6
Autoignition Temperature:	833°F / 445°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Extremely flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition.

Materials to Avoid (Incompatible Materials): strong oxidizing agents such as acids, chlorine, dichromates, or permanganates can cause fire or explosion.

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

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Gasoline

Carcinogenicity: Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by IARC. Because solvent extracts of gasoline exhaust particulates caused skin cancer in laboratory animals, IARC has categorized gasoline engine exhaust as a possible human cancer hazard.

Gasoline

Target Organs: A two year inhalation study of wholly vaporized unleaded gasoline produced nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules, and necrosis and hyperplasia of surrounding cells. Follow-up studies suggest that these changes are unique to the male rat.
Reproductive: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation.

Ethanol

Carcinogenicity: Ingestion of alcoholic beverages has been classified by IARC as "carcinogenic to humans" (Group 1). Occupational exposures to ethanol and exposures other than by ingestion (i.e., dermal and inhalation) have not been associated with cancer in humans.
Target Organs: Chronic alcoholism has been associated with damage to the liver in humans (e.g., cirrhosis of the liver). Excessive consumption of alcoholic beverages has also been associated with adverse effects on the central nervous system, digestive system and cardiovascular system.

Reproductive: Excessive consumption of alcoholic beverages during pregnancy has been associated with effects on the developing fetus referred to collectively as the fetal alcohol syndrome. The effects most frequently manifested include psychomotor dysfunction, growth retardation and a characteristic cluster of facial anomalies. t also affects the reproductive system including reduced sperm count and motility and loss of libido in men, abnormal menstrual function, and decreased plasma estradiol and progesterone levels in women.

Mutagenic Effects: Excessive consumption of alcoholic beverages has been associated with chromosomal aberrations in white blood cells. Depending on the animal species being tested, ethanol may produce chromosomal damage, DNA damage and mutation in both somatic and germ cells.

Xylenes

Target Organs: Rats exposed to 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.
Reproductive: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions.

Toluene

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.
Reproductive: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased fetal body weight and increased skeletal variations in both inhalation and oral studies.

Ethyl Benzene

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP, or OSHA.

Benzene

Carcinogenicity: Benzene is known to cause cancer of the blood-forming organs in humans, including acute myelogenous leukemia. It has been identified as a human carcinogen by NTP, IARC and OSHA.
Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.
Reproductive: Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body weight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.
Mutagenic Effects: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.
Reproductive: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Cyclohexane

Gasoline

Reproductive: Two-generation reproduction and developmental toxicity studies using rats and rabbits exposed (whole-body) to atmospheric concentrations up to 7000 ppm cyclohexane did not detect evidence of developmental toxicity in either species.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Gasoline	18.75 ml/kg. (Rat)	>5 ml/kg (Rabbit)	300g/m³/5M (rat, mouse, g.pig)
Ethanol	6.2-13.7 g/kg (Rat); LD50 = 6300 mg/kg (Rabbit)	9.4 ml/kg (Rabbit)	20,000 ppm/10 hr. (Rat)

12. ECOLOGICAL INFORMATION

The individual hydrocarbon components of this material are differentially soluble in water with aromatic hydrocarbons tending to be more water soluble than aliphatic hydrocarbons. If spilled, the more volatile components will evaporate rapidly. Factors such as local environmetnal conditions (temperature, wind, soil type, mixing or wave action in water, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, contribute to the weathering of spilled material. Because of their differential solubility, the occurrence of hydrocarbons in groundwater will be at different proportions than the parent material.

The potential for bioaccumulation and/or long term persistence of these materials in the environment is low to non-existent. In laboratory soil column experiments, the half-time of unleaded gasoline was reported as 1.2 to 2.7 days in sand, loam or clay soils. Microorganisms prsent in sediments and in the water are capable of degrading gasoline and naphtha containing hydrocarbons. Simpler hydrocarbons are more readily degraded than complex molecules. Adaption of bacteria in gasoline-contaminated groundwater to the soluble constituents has been reported.

In general, naphtha streams exhibit some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components most likely causing toxicity are also highly volatile and can be readily biodegraded by microorganisms.

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. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. 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.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Gasoline, 3, UN1203, II
Non-Bulk Package Marking:	Gasoline, UN1203
Non-Bulk Package Labeling:	Flammable liquid
Bulk Package/Placard Marking:	Flammable / 1203
Packaging - References:	49 CFR 173.150; 173.202; 173.242
Emergency Response Guide:	128

International Maritime Dangerous Goods (IMDG)

Shipping Description:	UN1203, Gasoline, 3, II, (-45°C cc)
Non-Bulk Package Marking:	Gasoline, UN 1203

14. TRANSPORTATION INFORMATION

Labels: Flammable liquid
Placards/Marking (Bulk): Flammable / 1203
Packaging - Non-Bulk: P001
EMS: F-E, S-E

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

UN/ID #: UN1203
Proper Shipping Name: Gasoline
Hazard Class/Division: 3
Packing Group: II
Non-Bulk Package Marking: Gasoline, UN1203
Labels: Flammable liquid
ERG Code: 3H

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L

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

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Xylenes	0-21	1.0%
Toluene	0-15	1.0%
Ethyl Benzene	0-5	0.1%
Benzene	0-5	0.1%
1,2,4-Trimethyl Benzene	0-5	1.0%
n-Hexane	0-4	1.0%
Cyclohexane	0-4	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Unleaded Gasoline (Wholly Vaporized)	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
B2 - Flammable Liquids
D2A

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

Issue Date:	18-Jun-2008
Status:	Final
Previous Issue Date:	21-Jun-2007
Revised Sections or Basis for Revision:	Fire Fighting information (Section 5)
MSDS Number:	724060

MSDS Legend:
ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-DFG = Deutsche Forschungsgemeinschaft; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; N/A = Not Applicable; N/D = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

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.

ConocoPhillips

MATERIAL SAFETY DATA SHEET

Unbranded Gasoline Reformulated with Ethers

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Unbranded Gasoline Reformulated with Ethers
Synonyms:	Conventional Gasoline with Ethers (All Grades) Conventional Unleaded Gasoline with Ethers (All Grades) EPA RFG (CBG) with Ethers (All Grades) RFG (All Grades)
Intended Use:	Fuel
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
MSDS Information:	800-762-0942 MSDS@conocophillips.com
Customer Service:	800-527-5476
Technical Information:	800-527-5476

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) 356-3219

Health Hazards/Precautionary Measures: Cancer hazard. Contains benzene. Causes eye and skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with ventilation adequate to keep exposure below recommended limits, if any. Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Wear appropriate personal protective equipment. Do not taste or swallow.

Physical Hazards/Precautionary Measures: Extremely flammable liquid and vapor. Vapor can cause flash fire. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance:	Clear to amber
Physical Form:	Liquid
Odor:	Gasoline

NFPA 704 Hazard Class:

Health:	1 (Slight)
Flammability:	3 (High)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Gasoline NONE	84 - 95	300 ppm TWA 890 mg/m^3 TWA 500 ppm STEL 1480 mg/m^3 STEL	NE	NE	—
Methyl tert-Butyl Ether 1634-04-4	5 - 16	50 ppm TWA	NE	NE	—
Xylenes 1330-20-7	0 - 14	100 ppm TWA 434 mg/m^3 TWA 150 ppm STEL 651 mg/m^3 STEL	100 ppm TWA 435 mg/m^3 TWA	900 ppm IDLH	—
Toluene 108-88-3	0 - 9	50 ppm TWA SKIN	200 ppm TWA 300 ppm CEIL 500 ppm 10 min. peak	500 ppm IDLH	—
Ethyl Benzene 100-41-4	0 - 5	100 ppm TWA 434 mg/m^3 TWA 125 ppm STEL 543 mg/m^3 STEL	100 ppm TWA 435 mg/m^3 TWA	800 ppm IDLH	—
1,2,4-Trimethyl Benzene 95-63-6	0 - 5	25 ppm TWA 123 mg/m^3 TWA	NE	NE	Mixed Isomers
n-Hexane 110-54-3	0 - 4	50 ppm TWA SKIN	500 ppm TWA	1100 ppm IDLH	—
Cyclohexane 110-82-7	0 - 4	100 ppm TWA	300 ppm TWA 1050 mg/m^3 TWA	1300 ppm IDLH	—
Benzene 71-43-2	0 - 1.3	0.5 ppm TWA-SKIN 2.5 ppm STEL-SKIN	1 ppm TWA ppm STEL	500 ppm IDLH	—

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.

1%=10,000 PPM.
NE=Not Established

Contains benzene. If exposure concentrations exceed the 0.5 ppm action level, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028). Also see Section 4.

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Eye irritant. Contact may cause stinging, watering, redness, and swelling.

Skin: Skin irritant. Contact may cause redness, itching, burning, and skin damage. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin, leading to dermatitis (inflammation). Not acutely toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): Low to moderate degree of toxicity by inhalation.

Ingestion (Swallowing): Low to moderate 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 digestive tract, irritation of the respiratory tract, coughing, nausea, vomiting, flushing, diarrhea, blurred vision, shortness of breath, tremors, respiratory failure, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), unconsciousness, convulsions, death.

Cancer: This material is a possible cancer hazard (see Sections 11 and 15).

Target Organs: Inadequate evidence available for this material. See Section 11 for target-organ toxicity information of individual components, if any.

Developmental: Inadequate evidence available for this material. See Section 11 for developmental toxicity information of individual components, if any.

Other Comments: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as Solvent or Painters' Syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, respiratory (asthma-like) disorders.

Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect (see Section 4 - Note to Physicians).

4. FIRST AID MEASURES

Eye: Move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek medical attention. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. Seek medical attention.

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek 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 medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate 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.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	-49°F / -45°C
Test Method:	Test Method Unknown
OSHA Flammability Class:	Flammable Liquid
LEL%:	1.4
UEL%:	7.6
Autoignition Temperature:	833°F / 444°C

Unusual Fire & Explosion Hazards: This material is extremely flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, 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. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

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

Extremely flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical 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 absorbent material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended.

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 discharge. The use of explosion-proof electrical 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 as 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).

Wash thoroughly after handling. 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.

"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.

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 any 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.

Portable Containers: Static electricity may ignite gasoline vapors when filling portable containers. To avoid static buildup do not use a nozzle lock open device. Use only approved containers for the storage of gasoline. Place the container on the ground before filling. Keep the nozzle in contact with the container during filling. Do not fill any portable container in or on a vehicle or marine craft.Keep away from any 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 concentrations below the established exposure limits (see Section 2), additional engineering controls 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: The use of respiratory protection is advised when concentrations are expected to exceed the established exposure limits (see Section 2). Depending on the airborne concentration, use a respirator with appropriate cartridges (NIOSH certified) or supplied-air equipment.

If benzene values equal or exceed applicable exposure limits the use of respiratory protection should comply with the requirements in OSHA 29 CFR 1910.1028-Benzene.

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.

Eye/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: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Clear to amber
Physical Form:	Liquid
Odor:	Gasoline
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure (mm Hg):	350-760 @ 100°F
Vapor Density (air=1):	>1
Boiling Point:	80-440°F / 26-227°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.72 - 0.75 @ 60°F
Bulk Density:	6.17 lbs/gal
Evaporation Rate (nBuAc=1):	>1
Flash Point:	-49°F / -45°C
Test Method:	Test Method Unknown
LEL%:	1.4
UEL%:	7.6
Autoignition Temperature:	833°F / 444°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Extremely 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): Contact with strong oxidizing agents such as acids, chlorine, dichromates, or permanganates can cause fire or explosion.

Hazardous Decomposition Products: The use of hydrocarbon fuel 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. See Section 11 for additional information on hazards of engine exhaust.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Gasoline - NONE

Carcinogenicity: Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by IARC. Because solvent extracts of gasoline exhaust particulates caused skin cancer in laboratory animals; IARC has categorized gasoline engine exhaust as a possible human cancer hazard.

Target Organs: A two year inhalation study of wholly vaporized unleaded gasoline produced nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules, and necrosis and hyperplasia of surrounding cells. Follow-up studies suggest that these changes are unique to the male rat. Although prolonged exposure to n-hexane, a component of gasoline, has resulted in adverse male reproductive effects in experimental animal studies, no adverse male reproductive effects were found in studies conducted with gasoline.

Developmental: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation.

Methyl tert-Butyl Ether - 1634-04-4

Carcinogenicity: Exposure of Fischer-344 rats to MTBE vapor concentrations of 400, 3000, and 8000 ppm, 6 hrs. per day, 5 days per week for two years, caused an increased incidence of kidney tumors and benign testicular tumors in high dose males. Follow-up research suggests that the kidney tumors result from protein accumulation in tubular cells and may be unique to male rats. Benign testicular tumors are a common age-related lesion which occur at a high incidence in control (untreated) rats. An increased incidence of liver tumors was also reported in female CD-1 mice at 8000 ppm. Because liver tumors can occur spontaneously at a high rate in untreated animals, the significance of these findings for human health is unclear.

Target Organs: A two year inhalation study of MTBE in Fischer-344 rats produced an exposure-related increase in incidence and severity of kidney changes indicative of chronic nephropathy. The lesions were consistent with kidney damage associated with accumulation of protein in cells, an effect which may be unique to the male rat.

Developmental: Inhalation exposure to MTBE vapor concentrations up to 8000 ppm caused developmental toxicity in mice, but only at maternally toxic concentrations. No developmental toxicity was seen in rabbit studies conducted at similar concentrations, even in the presence of maternal toxicity.

Xylenes - 1330-20-7

Target Organs: Rats exposed to 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

Developmental: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions.

Toluene - 108-88-3

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Developmental: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased fetal body weight and increased skeletal variations in both inhalation and oral studies.

Ethyl Benzene - 100-41-4

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP, or OSHA.

Target Organs: In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilic foci, hypertrophy, necrosis), thyroid (hyperplasia) and pituitary (hyperplasia).

n-Hexane - 110-54-3

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene - 71-43-2

Carcinogenicity: Benzene is known to cause cancer of the blood-forming organs in humans, including acute myelogenous leukemia. It has been identified as a human carcinogen by NTP, IARC and OSHA.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Developmental: Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body weight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.

Mutagenic Effects: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

Acute Data:

Gasoline - CAS: NONE
Dermal LD50 = >5 ml/kg (Rabbit)
LC50 = > 4500 ppm (Rat)
Oral LD50 = 18.75 ml/kg. (Rat)

Methyl tert-Butyl Ether - CAS: 1634-04-4
Dermal LD50 = > 10 g/kg (Rabbit)
LC50 = 32576 ppm/4 hr. (Rat)
Oral LD50 = 4 g/kg (Rat)

Xylenes - CAS: 1330-20-7
Dermal LD50 = >3.16 ml/kg (Rabbit)
LC50 = 5000 ppm/4 hr. (Rat)
Oral LD50 = 4300 mg/kg (Rat)

Toluene - CAS: 108-88-3
Dermal LD50 = 14 g/kg (Rabbit)
LC50 = 8,000 ppm; 49 g/m^3 (4-hr., Rat)
Oral LD50 = 2.5 - 7.9 g/kg (Rat)

Ethyl Benzene - CAS: 100-41-4
Dermal LD50 = 17,800 mg/kg (Rabbit)
LC50 = 4000 ppm/4 hr.; 13367 ppm (Rat)
Oral LD50 = 3500 mg/kg (Rat)

1,2,4-Trimethyl Benzene - CAS: 95-63-6
Dermal LD50 = No data available
LC50 = 18 gm/m^3/4hr (Rat)
Oral LD50 = 3-6 g/kg (Rat)

n-Hexane - CAS: 110-54-3
Dermal LD50 = >2,000 mg/kg (Rabbit)
LC50 = >3,367 ppm (4-hr., Rat)
Oral LD50 = = 25,000 g/kg (Rat): 28.7 g/kg(Rat)

Cyclohexane - CAS: 110-82-7
Dermal LD50 = >180.2 g/kg (Rabbit)
LC50 = 18,500 ppm (Rabbit)
Oral LD50 = >12.7 g/kg (Rat)

Benzene - CAS: 71-43-2
Dermal LD50 = > 9400 mg/kg (Rabbit)
LC50 = 10000 ppm/7hr. (Rat)
Oral LD50 = 930 mg/kg (Rat)

12. ECOLOGICAL INFORMATION

The individual hydrocarbon components of this material are differentially soluble in water with aromatic hydrocarbons tending to be more water soluble than aliphatic hydrocarbons. If spilled, the more volatile components will evaporate rapidly. Factors such as local environmetnal conditions (temperature, wind, soil type, mixing or wave action in water, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, contribute to the weathering of spilled material. Because of their differential solubility, the occurrence of hydrocarbons in groundwater will be at different proportions than the parent material.

The potential for bioaccumulation and/or long term persistence of these materials in the environment is low to non-existent. In laboratory soil column experiments, the half-time of unleaded gasoline was reported as 1.2 to 2.7 days in sand, loam or clay soils. Microorganisms prsent in sediments and in the water are capable of degrading gasoline and naphtha containing hydrocarbons. Simpler hydrocarbons are more readily degraded than complex molecules. Adaption of bacteria in gasoline-contaminated groundwater to the soluble constituents has been reported.

In general, naphtha streams exhibit some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components most likely causing toxicity are also highly volatile and can be readily biodegraded by microorganisms.

MTBE is water soluble. It does not adsorb to sediment or suspended particulate matter. It tends to travel faster in groundwater and soil than most other gasoline components. MTBE does not readily degrade once in groundwater or below grade soil. It readily degrades if it evaporates into air. MTBE is not expected to bioconcentrate in aquatic organisms.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not a RCRA "listed" hazardous waste. However, it should be fully characterized for ignitability (D001) and benzene (D018) prior to disposal (40 CFR 261). Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with property characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT

Shipping Description: Gasoline, 3 UN1203, II
Bulk Package/Placard Marking: Flammable/1203
Non-Bulk Package Marking: Gasoline, UN1203
Non-Bulk Package Labeling: Flammable
Packaging - References (Exceptions, Non-Bulk, Bulk): 49 CFR 173.150, 173.202, 173.242
Hazardous Substance: None
Emergency Response Guide: 128

IMDG

Shipping Description: UN1203, Gasoline, 3, II (<-45°C)
Non-Bulk Package Marking: Gasoline, UN 1203
Labels: Flammable
Placards/Marking (Bulk): Flammable/1203
Packaging - Non-Bulk: P001
EMS: F-E, S-E

ICAO/IATA

UN/ID #: UN1203
Proper Shipping Name: Gasoline
Hazard Class/Division: 3
Packing Group: II
Subsidiary risk: None
Non-Bulk Package Marking: Gasoline, UN1203

Labels: Flammable
ERG Code: 3H

	LTD. QTY.	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

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

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Methyl tert-Butyl Ether.....1634-04-4.....5 - 16%
Xylenes.....1330-20-7.....0 - 14%
Toluene.....108-88-3.....0 - 9 %
Ethyl Benzene.....100-41-4.....0 - 5%
1,2,4-Trimethyl Benzene.....95-63-6.....0 - 5%
n-Hexane.....110-54-3.....0 - 4%
Cyclohexane.....110-82-7.....0 - 4%
Benzene.....71-43-2.....0 - 1.3%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

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:
– 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):
Benzene – Cancer, Developmental and Reproductive Toxicant
Toluene – Developmental Toxicant
Unleaded Gasoline (wholly vaporized) – Cancer

Carcinogen Identification:
Unleaded gasoline has been identified as a carcinogen by IARC. For carcinogenicity information on individual components, see Section 11.

TSCA:
All components are listed on the TSCA inventory.

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 CPR.

Domestic Substances List: Listed
WHMIS Hazard Class:
B2 - Flammable Liquids
D2A - Materials Causing Other Toxic Effects - Very Toxic Material
D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	25-Oct-2005
Previous Issue Date:	1/1/2003
Previous Product Code:	Multiple
Revised Sections or Basis for Revision:	Periodic review and update
MSDS Code:	724050

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

For Chemicals, Coatings and related materials
"Essentially similar" to form OSHA-20

REVISED 2/17/05

MANUFACTURER

NAME: UNITED COLOR MANUFACTURING, INC.
ADDRESS: 660 Newtown-Yardley Road
Newtown PA 18940

EMERGENCY TELEPHONE NUMBERS:
MEDICAL OR CHEMTREC (24 HRS)
TRANSPORTATION: (800)424-9300
INFORMATION: (215)860-2165

SECTION I - PRODUCT INFORMATION

PRODUCT NAME: UNISOL® Liquid Red BK-50
DESCRIPTION: Red Dye Concentrate
CLASS: Liquid

H M I S HAZARD CODES
Health: 2 (Moderate)
Flammability: 3 (Serious)
Reactivity: 0 (Minimal)
Personal Protective Equipment: B

SECTION IIA - HAZARDOUS INGREDIENTS

INGREDIENT MATERIAL DESCRIPTION	PERCENT* BY WEIGHT	C.A.S. REGISTRY NO.	VAPOR PRESSURE LEL	VAPOR PRESSURE mmHg @ 68 F
Kerosene	50.0	8008-20-6	0.7	N/A
†Dimethylbenzenes	13.4	1330-20-7	N/A	6.1
†Ethylbenzenes	2.6	100-41-4	N/A	N/A

* These figures are typical properties, they do not constitute a specification.
†Spillages of dye containing these materials may be notifiable under SARA Title 3, Section 313. For details, see SECTION XII of this MSDS.

SECTION IIB - NON HAZARDOUS INGREDIENTS

INGREDIENT MATERIAL DESCRIPTION	PERCENT* BY WEIGHT	C.A.S. REGISTRY NO.	VAPOR PRESSURE LEL	VAPOR PRESSURE mmHg @ 68°F
C.I. Solvent Red 164**	34.0	See Below	N/A	N/A

* These figures are typical properties, they do not constitute a specification.
** 2-Naphthalenol (Phenylazo) Phenyl Azo Alkyl Derivatives. TSCA Accession #35371.

SECTION III - PHYSICAL DATA

BOILING RANGE: 279-302 F
VAPOR PRESSURE: 5.1mm @ 68 F
SPECIFIC GRAVITY: 0.91
EVAPORATION RATE: Slower (relative to n-butyl acetate)
FREEZING POINT: < -20 F
VAPOR DENSITY: Heavier than air
H_2O SOLUBILITY: Insoluble
% VOLATILE BY VOLUME: 16
N-OCTANOL/WATER PARTITION COEFFICIENT: Log $P_{o/w}$ expected to be greater than 3
APPEARANCE AND ODOR: Dark Red Aromatic Liquid

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT: 90 -100 F
METHOD USED: TAG

EXPLOSIVE LIMITS:	LEL	UEL(% V IN AIR)
	1.0%	6.6%

FLAMMABILITY CLASSIFICATION:
OSHA: Flammable liquid-Class 1B
DOT: Flammable liquid

EXTINGUISHING MEDIA:
Alcohol Foam, Carbon Dioxide(CO2), Dry Chemical. Water Spray: May be used for controlling fumes, protecting exposed material or on overheated containers. Be sure water does not spread fire.

SPECIAL FIRE FIGHTING PROCEDURES:
Wear NIOSH-MSHA approved self-contained breathing apparatus. Wear impervious clothing. Use water spray to cool and protect exposed material or overheated containers. Take care not to spread fire with water.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Solvent vapors are an explosion hazard. Keep material away from all sources of ignition: extreme heat, open flame and any situation which may produce static or electric discharge, sparks or sparks resulting from frictional contact. Closed containers may explode from vapor pressure increases when exposed to extreme heat. Cool overheated containers with water spray, but do not spread the fire with cooling water. Vapors may travel great distances and ignite and flashback to source. See Section VIII for possible hazardous decomposition materials.

SECTION V - TOXICOLOGICAL INFORMATION

DEFINITIONS:

N/A - Not Available and/or Not Applicable
Tag - Tag Closed Cup (TCC)
PEL - Units of mg/cubic meter
(*) - SARA Section 313 listed. IF CHEMICAL SYMBOL * IN () MATERIAL IS A COMPOUND. Example: (*Cu) - report as copper compound

NOTE: Please refer to the end of Section IX for Regulatory Information pertaining to the determination for the listing of ingredients, CAS numbers, percentages and other information.

INGREDIENT	TLV (twa)		LD50 (g/kg) (rat)	LC50 (ppm) (rabbit)	(rat)
MATERIAL DESCRIPTION	PEL	mg/m³	ORAL	DERMAL	INHAL.
Kerosene	100	N/A	N/A	N/A	N/A
Colorant	N/A	N/A	N/A	N/A	N/A
Dimethylbenzenes (Xylene)*	100	100	4.3	3.16	5,000
Ethylbenzenes*	N/A	N/A	N/A	N/A	N/A

SECTION VI - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

PRIMARY ROUTE(S) OF EXPOSURE/ENTRY: Eye contact, skin contact, inhalation, ingestion.

EYES	Vapors may irritate the eyes. Liquid is irritating and potentially damaging to the eyes.
SKIN	Liquid may irritate and dry the skin. Prolonged contact may lead to burns and blisters and may aggravate dermatitis.
INHALATION	Vapors may irritate the respiratory tract. May lead to headache, dizziness, nausea, vomiting and unconsciousness. High vapor concentrations are anesthetic and may have other central nervous system effects including death.
INGESTION	May lead to headache, dizziness, nausea and abdominal pain.
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.
MOBILITY	Liquid under most environmental conditions. Floats on water. If it enters soil, it will absorb to soil particles and will not be mobile.

SECTION VI - HEALTH HAZARD DATA (cont.)

DEGRADABILITY	Not established
BIOACCUMULATION	Has the potential to bioaccumulate
ECOTOXICITY	Not established. Insoluble in water.

SECTION VII - EMERGENCY AND FIRST AIR PROCEDURES

EYE CONTACT: Immediately flush with large amounts of water for 10-15 minutes. SEEK PROMPT MEDICAL ATTENTION !!!

SKIN CONTACT: Promptly remove all contaminated clothing, shower if necessary. Remove from skin with proprietary water less hand cleaner or cold cream. Discard contaminated clothing and shoes.

INHALATION: If dizzy, drowsy or overcome, remove to fresh air. If breathing has stopped,apply artificial respiration. GET MEDICAL ATTENTION AS SOON AS POSSIBLE !!!

INGESTION: DO NOT INDUCE VOMITING!! GET MEDICAL ATTENTION IMMEDIATELY!!

SECTION VIII - REACTIVITY DATA

STABILITY:	Stable
CONDITIONS TO AVOID:	Extreme heat, open flames or sparks
INCOMPATIBILITY (MATERIALS TO AVOID):	Strong oxidizing agents, strong reducing agents, Acids
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of Carbon, Oxides of Nitrogen
HAZARDOUS POLYMERIZATION:	Will not occur
POLYMERIZATION CONDITIONS TO AVOID:	Material not known to polymerize

SECTION IX - REGULATORY INFORMATION

This MSDS is in compliance with the OSHA Hazard Communication Standard 29CFR1910.1200.

This MSDS has also been prepared to be in compliance with the Commonwealth of Pennsylvania's Right-to-Know regulations for chemical manufacturers and should satisfy many other state Right-to-Know laws.

The chemical ingredient reporting rules for Pennsylvania are more detailed than OSHA regulations and this MSDS lists the common chemical name and CAS number in Section II for:

Specifically hazardous ingredient	>0.01%	(OSHA is >0.1%)
Hazardous Ingredient	>1.0%	(OSHA is the same)
Nonhazardous ingredient	>3.0%	(OSHA does not regulate)

SECTION IX - REGULATORY INFORMATION Cont...

PROPRIETARY entered in the CAS number column declares that the exact identity of the ingredient(s) listed is proprietary information to United Color Manufacturing, Inc. and/or to our suppliers. Percentages of ingredients are approximate values for the purpose of hazard and SARA determination by the product's uses and are not necessarily exact specifications.

TSCA INVENTORY STATUS: All ingredients in this product appear on the TSCA inventory.

EC CLASSIFICATION: Classified as flammable liquid under EC criteria as per DOT Regulations in SECTION IV.

EINECS: All components in compliance.

DEPARTMENT OF TRANSPORTATION (DOT):

DOT Shipping Description:

Flammable liquid NOS

Hazard Class 3, (3.3 for sea shipments), UN1993, III

CERCLA: If this product is accidentally spilled, the incident maybe subject to the provisions of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and must be reported to the National Response Center by calling 800-424-8802. This product contains Xylenes.

SARA TITLE III: Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Delayed Health. This information may be subject to the provisions of the Community Right-To-Know Reporting Requirements (40 CFR 370) if threshold quantity criteria are met. This product contains the following Section 313 Reportable Ingredients:

Component	CAS NO.	Maximum %	Threshold Spillage (LBS)
Xylene & Ethylbenzenes	1330-20-7	16	624

CANADA: This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS). Class D Division 2 Sub-Division B

CEPA-NPRI - No regulated ingredients.

SECTION X - SPILL OR LEAK PROCEDURES

STEPS FOR MATERIAL SPILLAGE:

Remove all sources of ignition (flame, hot surfaces and any producers of electrical, static or frictional sparks). Wear appropriate protective clothing (See Section X). Ventilate area and try to contain spill by diking with sand or other absorbent material. Collect spill for disposal be scooping up liquids (if a large spill) and absorbing with sand or other approved absorbent materials and dispose of in accordance with local, state and federal regulations.

WASTE DISPOSAL METHODS:

Dispose of in accordance with local, state and federal regulations.

SECTION XI - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	OSHA/NIOSH approved self-contained breathing apparatus or vapor cartridge respirator. (Must be worn if PEL & TLV levels are exceeded)
VENTILATION:	Provide adequate cross air ventilation to keep dust and/or vapor levels below the PEL & TLV values. (See: Section V)
PROTECTIVE GLOVES:	Impervious gloves (rubber or neoprene) to avoid direct skin contact.
EYE PROTECTION:	Spleshproof safety goggles
OTHER PROTECTIVE EQUIPMENT:	Eyewash station, emergency shower.

SECTION XII - SPECIAL PRECAUTIONS

HANDLING AND SPECIAL PRECAUTIONS:

Overheating may cause container to rupture. Use explosion-proof electrical equipment Container must be kept closed and ventilation provided to prevent vapor concentration buildup. Store in a cool, dry place. Do not breathe vapor of get liquid in eyes or on skin or clothing. Keep away from heat or sources of ignition.

OTHER PRECAUTIONS:

Check all containers for leaks. Wear protective clothing as in Section XI. Avoid prolonged breathing of vapors of contact with skin. Ensure that all equipment is grounded to prevent static discharge. Containers of this material may be hazardous when emptied due to solid or vapor residue. All hazard precautions given in this data sheet must be observed for empty containers.

UNISOL® LIQUID RED BK-50

SECTION XIII - CONTACT INFORMATION

TECHNICAL CONTACT PERSON:	Dr. Michael P. Hinton
TECHNICAL CONTACT NUMBER:	Telephone 215-860-2165 Fax 215-860-8560

ISSUED: 8/2/97 REVISED: 2/17/05

Material Safety Data Sheet

UNIVERSAL GEAR LUBE GL-4, SAE 90 AND 140

1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

UNIVERSAL GEAR OIL GL-4, SAE 90 AND 140

MSDS Code: LUBC0397 Created: 17-July-2001

Product Use: Automotive Gear Oil

MANUFACTURER/DISTRIBUTOR

Conoco Inc.
PO Box 2197
Houston, TX 77252

PHONE NUMBERS

Product Information	: 1-281-293-5550
Transport Emergency	: CHEMTREC 1-800-424-9300 (domestic) 1-703-527-3887 (international; call collect)
Medical Emergency	: 1-800-342-5119 or 1-281-493-2767
WEB SITE	: www.conoco.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	%
Distillates	64742-54-7	40-50
Bright stock	64742-01-4	44-96
Olefin sulfide	Not available	0.1-1
Proprietary Additives	Mixture	4-5

If oil mist is generated, exposure limits apply. See Section 8.

3. HAZARDS IDENTIFICATION

--- EMERGENCY OVERVIEW ---

APPEARANCE / ODOR

Brown (clear & bright) viscous liquid/mild petroleum hydrocarbon odor.

OSHA REGULATORY STATUS

This material is not known to be hazardous under OSHA Regulations.

HMIS RATING

Health: 1; Flammability: 1; Reactivity: 0

Potential Health Effects

Primary Routes of Entry: Skin, Inhalation

The product, as with many petroleum products, may cause minor skin, eye, and lung irritation, but good hygienic practices can minimize these effects.

Normal use of this product does not result in generation of an oil mist. However if an oil mist is generated, overexposure can cause minor and reversible irritation to the eyes, skin, and especially the lungs. Proper personal protective equipment and sufficient ventilation can provide adequate protection.

Carcinogenicity Information
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.

4. FIRST AID MEASURES

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

Skin Contact
Wash skin thoroughly with soap and water. If irritation develops and persists, consult a physician.

Eye Contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Ingestion
Material poses an aspiration hazard. If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration.

Notes to Physicians
Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 grams activated charcoal in 400 mL water and mix thoroughly. Administer 5 mL/kg, or 350 mL for an average adult.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point (SAE 90)	: 193 C (Minimum) 210 C (Typical)
Flash Point (SAE 140)	: 204 C (Typical)
Method	: Cleveland Open Cup - COC.
NFPA Rating	: Health 0; Flammability 1; Reactivity 0

Extinguishing Media
Water Spray, Foam, Dry Chemical, CO2.

Fire Fighting Instructions
Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water may be used to flush spills away from exposures.

Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

6. ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Remove source of heat, sparks, and flame.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

7. HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Wash contaminated clothing prior to reuse.

Handling (Physical Aspects)

Close container after each use. Handling temperature should not exceed 82.2 C. Do not pressurize, cut, weld, braze, solder, grind, or drill on or near full or empty container. Empty container retains residue (liquid and/or vapor) and may explode in heat of a fire.

Storage

Store in accordance with National Fire Protection Association recommendations. Store away from heat, sparks and flames, oxidizers. Storage temperature should not exceed 65.5 C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

VENTILATION

Normal shop ventilation.

Personal Protective Equipment

RESPIRATORY PROTECTION

None normally required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below acceptable limits. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respirator protection factors.

PROTECTIVE GLOVES

Should be worn when the potential exists for prolonged or repeated

skin contact. NBR or neoprene recommended.

EYE PROTECTION
Safety glasses with side shields.

OTHER PROTECTIVE EQUIPMENT
Coveralls with long sleeves if splashing is probable.

Applicable Exposure Limits
If oil mist is generated, exposure limits apply.

U.S. OSHA PEL	: 5 mg/m3, 8 Hr. TWA
U.S. ACGIH TLV	: 5 mg/m3, 8 Hr. TWA, STEL 10 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: Not Available
Vapor Pressure	: Nil
Vapor Density	: >1 (Air=1.0)
% Volatiles	: Nil
Evaporation Rate	: Nil
Solubility in Water	: Insoluble
Odor	: Petroleum Hydrocarbon (mild)
Form	: Viscous Liquid
Color	: Brown (clear & bright)
Specific Gravity	: 0.89 @ 16 C
Density	: 7.4 lb/gal @ 16 C

10. STABILITY AND REACTIVITY

Chemical Stability
Stable.

Conditions to Avoid
Heat, sparks, and flames.

Incompatibility with Other Materials
Incompatible or can react with strong oxidizers.

Decomposition
Normal combustion forms carbon dioxide; incomplete combustion may produce carbon monoxide.

Polymerization
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Animal Data
Mouse skin painting studies have shown that highly solvent-refined petroleum distillates similar to ingredients in this product have not caused skin tumors.

Animal studies have shown that a component of this product can cause skin sensitization.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information

No specific aquatic data available for this product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Container Disposal

Empty drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All other containers should be disposed of in an environmentally safe manner.

14. TRANSPORTATION INFORMATION

Shipping Information

DOT: Not regulated.
ICAO/IMO: Not restricted.

15. REGULATORY INFORMATION

INVENTORIES:

AUSTRALIAN Inventory:	All components listed.
CHINESE Inventory:	May require registration.
JAPANESE ENCS:	All components listed.
KOREAN Inventory:	All components listed.
PHILIPPINE Inventory (PICCS):	May require registration.
U.S. Inventory (TSCA):	All components listed.

U.S. OSHA HAZARD DETERMINATION

This material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

CANADIAN REGULATIONS

This is not a WHMIS Controlled Product.

16. OTHER INFORMATION

Sales Office Numbers:

Australia
Office Manager
Office Hours 8 a.m.-5 p.m.
Monday-Friday (excluding holidays)
Tel: 61-7-5452 9900
Fax: 61-7-5452 9999

India
Tel: 91-80-227 7462/7463
Fax: 91-80-221 5513

Malaysia
Tel: 60-3-202 5233
Fax: 60-3-202 5266

Mexico
Tel: 0-1-800-709-1200
Fax: 52-5-722-1455

Singapore
Tel: 65-536 0010
Fax: 65-536 0012

Thailand
Tel: 66-2-955-0195
Fax: 66-2-955-0190

Other

Tel: 281-293-5768
Fax: 281-293-2287

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS	: MSDS Coordinator
Address	: Conoco Inc.
>	: PO Box 2197
>	: Houston, TX 77252
Telephone	: 1-281-293-5550

# Indicates updated section.

End of MSDS

R.T. Vanderbilt Company, Inc.
INDUSTRIAL MINERALS AND CHEMICALS

Material Safety Data Sheet

chemusa

Section I. Chemical Product and Company Identification

Product Name/ Trade Name	VANLUBE® SL	Code	51008
		CAS#	68921-45-9
Supplier	R.T. VANDERBILT COMPANY, INC. 30 WINFIELD STREET NORWALK, CT 06855	In Case of Emergency	Call: (203) 853-1400
Synonym	Not available.		
Chemical name	Mixture of alkylated diphenylamines		
Chemical Family	Not available.		
Chemical Formula	C20H27N		
Material Uses	Industrial applications: Antioxidant.		
TSCA Status	TSCA 8(b) Inventory: VANLUBE® SL		

Section II. Composition and Information on Ingredients

Name	CAS #	% by Weight
benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene.	68921-45-9	>98
diphenylamine	122-39-4	<2

Section III. Hazards Identification

Emergency Overview	Amber liquid. Vapor or mist may be harmful if inhaled. May cause eye and/or skin irritation

Section IV. First Aid Measures

Eye Contact	Flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention
Ingestion	Do not induce vomiting. Immediately give two glasses of water, a little at a time. Never give anything by mouth to an unconscious person. Call a physician. If vomiting occurs spontaneously, lower head below waist to prevent fluid from entering the lungs

Continued on Next Page

Section IX. Physical and Chemical Properties

Appearance	Amber. Liquid.
Molecular Weight	281.45
pH (1% soln/water)	Not applicable.
Boiling/Condensation Point	>198°C (388.4°F)
Melting Point	7°C (44.6°F)
Specific Gravity	0.97 (Water = 1)
Density	1.01 g/ml at 15.6°C (60.1°F)
Vapor Pressure	Not available.
Vapor Density	Not available.
Volatility	0.5% (v/v).
Odor	Amine like. (Slight.)
Evaporation Rate	Not available.
Viscosity	Dynamic: 16.28 cP
Water/Oil Dist. Coeff.	Not available.
Solubility	Insoluble in cold water. Very soluble in alcohol and toluene.

Section X. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Strong oxidizing agents such as permanganates, perchlorates and hydrogen peroxide.
Corrosivity	Not available.
Special Remarks on Reactivity	Not available.

Section XI. Toxicological Information

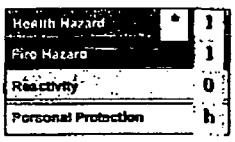
Routes of Entry	Dermal contact. Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 15000 mg/kg [Rat]
Special Remarks on Toxicity to Animals	Not available.
Acute Effects	
Eye Contact	This product may irritate eyes upon contact.
Skin Contact	Prolonged or repeated contact may cause irritation.
Sensitization	This product is not expected to be a skin sensitizer.
Ingestion	This product may be an ingestion hazard.
Inhalation	Vapors generated from hot processes may be irritating.

Continued on Next Page

Section XV. Other Regulatory Information and Pictograms

Classification	HCS (USA)	Class: Irritating substance. Class: Target organ effects. OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
	Federal and State Regulations	Illinois chemical safety act: diphenylamine Rhode Island RTK hazardous substances: diphenylamine Pennsylvania RTK: diphenylamine Florida: diphenylamine Minnesota: diphenylamine Massachusetts RTK: diphenylamine Massachusetts spill list: diphenylamine New Jersey: diphenylamine TSCA 8(b) inventory: VANLUBE® SL TSCA 8(a) PAIR: diphenylamine TSCA 8(d) H and S data reporting: diphenylamine: 3-11-94 SARA 313 toxic chemical notification and release reporting: diphenylamine: 1%
	Remarks	Not available.

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



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

Other regulatory specifications

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

CEPA DSL: VANLUBE® SL

Australia: VANLUBE® SL

China: VANLUBE® SL

Korea (TCCL): VANLUBE® SL

Philippines (RA6969): VANLUBE® SL

Japan (MITI): VANLUBE® SL

New Zealand: VANLUBE® SL

Protective Clothing (Pictograms)

Section XVI. Other Information

References	Not available.
Other Special Considerations	Not available.

Validated by Erin A. Bendig on 8/16/2004. Previous Validation Date: No Previous Validation.	Verified by Erin A. Bendig. Printed 5/24/2005.

Information Contact (203) 853-1400
Corporate Risk Management Department

Continued on Next Page

R.T. Vanderbilt Company, Inc.
INDUSTRIAL MINERALS AND CHEMICALS

Material Safety Data Sheet

chemusa

Section I: Chemical Product and Company Identification

Product Name/ Trade Name	VANLUBE® NA	Code	50508
		CAS#	68608-77-5
Supplier	R.T. VANDERBILT COMPANY, INC. 30 WINFIELD STREET NORWALK, CT 06855	In Case of Emergency	Call: (203) 853-1400
Synonym	Alkylated diphenylamines.		
Chemical name	Benzenamine, 2-ethyl-N-(2-ethylphenyl)-, (tripropenyl) derivs.		
Chemical Family	Not available.		
Chemical Formula	Not applicable.		
Material Uses	Color stable aromatic amine antioxidant for petroleum lubricants.		
TSCA Status	TSCA Inventory VANLUBE® NA		

Section II: Composition and Information on Ingredients

Name	CAS #	% by Weight
alkylated diphenylamines	68608-77-5	100

Section III: Hazards Identification

Emergency Overview	Amber liquid. May cause eye irritation. Vapors generated during heat may be irritating to the respiratory tract. Prolonged or repeated exposure may cause skin irritation.

Section IV: First Aid Measures

Eye Contact	Flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention
Ingestion	Do not induce vomiting. Immediately give two glasses of water, a little at a time. Never give anything by mouth to an unconscious person. Call a physician. If vomiting occurs spontaneously, lower head below waist to prevent fluid from entering the lungs.

Continued on Next Page

Section V: Fire and Explosion Data

Flammability of the Product	No specific information is available in our database regarding the flammability of this product in presence of various materials.
Autoignition Temperature	Not available.
Flash Point	OPEN CUP: 213°C (415.4°F). (Cleveland.).
Flammable Limits	Not available.
Products of Combustion	Not available.
Explosion Hazards in Presence of Various Substances	of oxidizing materials.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: CO2 may be ineffective on larger fires due to lack of cooling capacity which may result in reignition.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Section VI: Accidental Release Measures

Small Spill	Absorb with an inert material and put the spilled material in an appropriate waste disposal
Large Spill	Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements. Prevent entry into sewers, basements or confined areas; dike if needed.

Section VII: Handling and Storage

Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Store at room temperature to prevent crystallization.
Handling Procedures and Equipment	Manipulate in a well-ventilated area. Do not breathe gas, fumes, vapor or spray. Avoid contact with skin and eyes. After handling, always wash hands thoroughly with soap and water.

Section VIII: Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Be sure to use a MSHA approved respirator or equivalent. Gloves (impervious).
TLV / PEL	Not available.

Continued on Next Page

Section IX: Physical and Chemical Properties

Appearance	Amber.	Liquid.
Molecular Weight	Not applicable.	
pH (1% soln/water)	Not applicable.	
Boiling/Condensation Point	Not available.	
Melting Point	Not available.	
Specific Gravity	0.935 (Water = 1)	
Density	Not available.	
Vapor Pressure	Not available.	
Vapor Density	Not available.	
Volatility	0.5% (v/v).	
Odor	Not available.	
Evaporation Rate	Not available.	
Viscosity	Not available.	
Water/Oil Dist. Coeff.	Not available.	
Solubility	Insoluble in cold water.	

Section X: Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with Various Substances	of oxidizing materials
Corrosivity	No specific information is available in our database regarding the corrosivity of this product in presence of various materials.
Special Remarks on Reactivity	No additional remark.

Section XI: Toxicological Information

Routes of Entry	Absorbed through skin. Eye contact. Inhalation. Ingestion
Toxicity to Animals	Acute oral toxicity (LD50): 34000 mg/kg [Rat]. Acute dermal toxicity (LD50): 3000 mg/kg [Rabbit]
Special Remarks on Toxicity to Animals	No additional remark.
Acute Effects	
Eye Contact	This product may irritate eyes upon contact.
Skin Contact	Slight skin irritant.
Sensitization	No data available.
Ingestion	Low acute oral toxicity based on animal data.
Inhalation	Vapors generated during heating may cause irritation.

Continued on Next Page

Remarks	No additional remark.
Chronic Effects on Humans	**CARCINOGENIC EFFECTS** Not available. **MUTAGENIC EFFECTS** Not available. **DEVELOPMENTAL TOXICITY** Not available. **REPRODUCTIVE TOXICITY** Not available.
Remarks	No additional remark.

Section XII: Ecological Information

Ecotoxicity	Not available.
BOD and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Biodegradability	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Section XIII: Disposal Considerations

Waste Information	Waste must be disposed according to applicable regulations.
Waste Stream	Not available.

Section XIV: Transport Information

DOT	Not a DOT controlled material (United States).
Remarks	Not applicable.
Maritime transportation	Not available.

Section XV: Other Regulatory Information and Pictograms

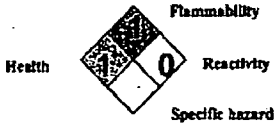
Classification	HCS (USA)	Not controlled under the HCS (United States).
	Federal and State Regulations	TSCA inventory: **VANLUBE® NA**
	Remarks	**Not applicable.**

Continued on Next Page

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

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	j

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



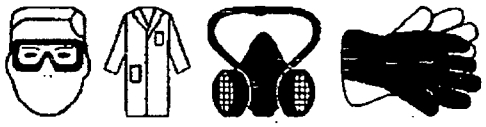
Other regulatory specifications

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

CEPA DSL: VANLUBE® NA

Australia: VANLUBE® NA
Korea (TCCL): VANLUBE® NA
Philippines (RA6969): VANLUBE® NA
Japan (MITI): VANLUBE® NA
China: : VANLUBE® NA

Protective Clothing (Pictograms)



Section XVI: Other Information

References Not available.

Other Special Considerations No additional remark.

Validated by Erin A. Bendig on 7/22/2003.
Previous Validation Date: 6/2/2003.

Verified by Erin A. Bendig.

Printed 7/22/2003.

Information Contact **David Bower, Ph.D. (203) 853-1400 ext. 233**
Corporate Risk Management

Notice to Reader

Information presented herein has been compiled from sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or any product in violation of any patent or in violation of any law or regulation. It is the user's responsibility to determine for himself the suitability of any material for a specific purpose and to adopt such safety precautions as may be necessary. We make no warranty as to the results to be obtained in using any material and, since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any material supplied by us.

NOVAGARD
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Versilube® G321
GENERIC DESCRIPTION: Silicone Grease

MANUFACTURED BY: NSCG, Inc.
5109 Hamilton Avenue
Cleveland, OH 44114
216-881-8111

EMERGENCY PHONE NUMBER: CHEMTREC 800-424-9300 (24 hour)

REVISED: 10-03-02 **PREPARED BY:** Brian Chambers

COMPONENT	CAS No.	WT %	OSHA-PEL		ACGIH-TLV	
			TWA	STEL	TWA	STEL
Lithium Stearate	4485-12-5	10- 30	10 mg/m^3	NE	10 mg/m^3	NE
Lithium Hydroxide	1310-65-2	<1	2 mg/m^3	NE	2 mg/m^3	NE

Potential Health Effects

Eye: May irritate eyes
Skin: May cause mild skin irritation
Inhalation: Not anticipated during industrial use
Oral: Not anticipated during industrial use

Special Hazards

Carcinogens: This product does not contain any ingredients listed by IARC, NTP or OSHA as chemical carcinogens.
Teratogens: None known
Mutagens: None known
Reproductive Toxins: None known

Eye: Contact with the eyes may cause temporary irritation. Flush eyes with copious amounts of water for a minimum of 15 minutes. If chronic irritation develops contact a physician.
Skin: Contact with skin is not expected to cause irritation. Wash contacted areas with soap and water.
Oral: If ingested do not induce vomiting. Get prompt medical attention.

NOVAGARD
MATERIAL SAFETY DATA SHEET

Flash Point: >260 ° C , >500 ° F (method - COC)
Flammability Limits in Air: Upper - Not Determined Lower - Not Determined
Extinguishing Media: Water, CO_2 ,Dry Chemical, Foam.
Special Fire Fighting Procedures: None
Sensitivity to static discharge: None

Product contains Methylphenylpolysiloxanes which can generate formaldehyde at approximately 300° F and above, in atmospheres which contain oxygen. Formaldehyde is a skin and respiratory sensitizer, eye and throat irritant, acute toxicant, and potential cancer hazard.

Disposal of collected product, residues and cleanup materials may be governmentally regulated. Observe all applicable local, state and federal waste management regulations. Scrape up and contain for salvage or disposal. Wash all walking surfaces with detergent and water to reduce slipping hazard. Observe all personal and protection equipment recommendations described in Section 5 and 8. Local, state and federal reporting requirements may apply to spills or releases of this matter into the environment. See applicable regulatory compliance information in Section 15.

Precautions: Keep container closed when not in use. Avoid contact with skin and eyes.

Engineering Controls

Local exhaust: None needed General ventilation: None needed Eyewash stations: Recommended

Personal Protective Equipment for Routine Handling

Eyes: Safety glasses
Skin: Wash after any contact. Cloth/rubber gloves
Inhalation: None should be needed

Physical form	Paste	**Odor:**	Odorless
Specific Gravity @25°C:	0.93	**Boiling Point (@ 760 mm Hg)**	Not applicable
Freezing/melting point	Not applicable	**Vapor pressure:**	Not applicable
Evaporation rate:	Not applicable	**Volatile content:**	Not applicable
Odor threshold	Not applicable	**Percent Volatile by volume:**	Not applicable
VOC (EPA method 24):	Not applicable	**Evaporation Rate**	
Solubility in water:	< 1%	**(butyl acetate =1):**	Not applicable
Solubility in organic solvent:	Mineral spirits		

NOVAGARD
MATERIAL SAFETY DATA SHEET

Chemical stability:	Stable
Hazardous polymerization:	Will not occur
Conditions to avoid:	None known
Materials to avoid:	None known
Conditions to avoid:	None known
Hazardous thermal decomposition and combustion by-products:	Carbon monoxide, carbon dioxide, silicon dioxide, and formaldehyde

Ames Test:

Product Information

Acute oral LD 50 (mg/kg)	unknown
Acute dermal LD50 (mg/kg)	unknown
Acute inhalation	unknown
Other	unknown

OPTIONAL SECTION - complete information not yet available

Disposal method: Disposal should be made in accordance with federal, state and local regulations.

DOT shipping name:	Not Regulated	DOT hazard class:	Not Regulated
DOT labels:	None	UN/NA number:	None
Placards:	None	IATA:	None
IMO IMDG -code:	NA		

European Class:

RID (OCTI):	NA
ADR (ECE):	NA
RAR(IATA):	NA

NOVAGARD
MATERIAL SAFETY DATA SHEET

TSCA Status:

All chemical substances found in this product comply with the Toxic Substances Control act Inventory reporting requirements

EPA SARA Title III Chemical Listings:

40 CFR 355 Section 302
Extremely Hazardous Substance List: None found

Section 312, 311 Hazard Class: None

40 CFR 372.65 Section 313
Toxic Chemical List: None found

WHMIS Hazard class:

Not regulated

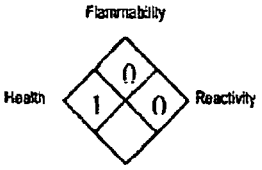
Hazard Rating System:

HMIS: Flammability 0, Reactivity 0, Health 1
NFAPA: Flammability 0, Reactivity 0, Health 1

California Proposition 65:

None

The information presented in this Material Safety Data Sheet relates only to the specific product designated herein, and no warranty, or guarantee, either expressed or implied is made regarding the performance and conditions of this product. This information is based upon information that Novagard believes to be true and accurate; however, it is the responsibility of each user to review this information within the specific context of their intended application.



HMIS Rating
WHMIS Hazard
Class: Non-Hazardous

MATERIAL SAFETY DATA SHEET

GENERAL INFORMATION

PRODUCT NAME OR NUMBER (as it appears on label)	CATALOG NUMBER
YELLOW 77® Wire Pulling Lubricant	All "31 Series
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
IDEAL INDUSTRIES, INC.	**(815) 895-5181**
ADDRESS (Number, Street, City, State, Zip Code)	
Becker Place, Sycamore, IL 60178	
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD CLASS, HAZARD ID NO (49 CFR 172.101)	
None	
CHEMICAL DESCRIPTION	FORMULA
Water-Wax Emulsion	Proprietary

SECTION I - INGREDIENTS

CAS REGISTRY NO.	%W	CHEMICAL NAME(S)*	Listed as a carcinogen in NTP, IARC or OSHA 1910(z) (specify)
7732-18-5	<90	Water	No
64742-43-4	<5	Paraffin Wax	No
8009-03-8	<3	Petrolatum	No
64742-53-6	<3	Napthenic Mineral Oil (See *A)	No
9005-08-7	<4	Polyethylene Glycol Ester	No
61791-44-4	<1	Ethoxylated Tallow Amine	No
25265-71-8	<0.1	Perfume	No
8042-47-5 24838-91-8	<1	Acrylamide Sodium Acrylate Copolymer with Trideceth-6	No
52-51-7	<0.1	Antimicrobial Agent	No
6358-31-2	<0.1	Yellow Pigment	No

SECTION II - PHYSICAL DATA

BOILING POINT	SPECIFIC GRAVITY (H_2O=1)	PERCENT VOLATILE BY VOLUME (%)
212°F 100°C	0.98	<90
SOLUBILITY IN WATER	pH ca	PERCENT SOLID BY WEIGHT (%)
Moderate	7.0 - 8.5	~20
APPEARANCE AND ODOR		IS MATERIAL: LIQUID SOLID GEL GAS PASTE POWDER
Yellow paste, slight perfume odor		

SECTION III - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None method used C.O.C.	FLAMMABLE LIMITS	LEL	UEL
		None	None
EXTINGUISHING MEDIA			
Use extinguishing media suitable for surrounding materials.			
SPECIAL FIRE FIGHTING PROCEDURES			
Self-contained respiratory protection should be provided for fire fighters. Keep fire exposed containers cool with water.			
UNUSUAL FIRE AND EXPLOSION HAZARDS			
None			

* None of the chemical raw materials contained in this formulation are considered hazardous under the Federal Hazards Communication Standard 29 C. F. R 1910.1200

*A Oil is Severely hydrotreated with a polymorphonuclear content at less than 0.1% and meets OSHA 29 C.F.R. 1910.1200.

SECTION IV - HEALTH HAZARD INFORMATION

EFFECTS OF OVEREXPOSURE - Conditions to Avoid None normally expected. Upon prolonged contact, may cause temporary eye discomfort.
THRESHOLD LIMIT VALUE N.E.
PRIMARY ROUTES OF ENTRY Inhalation ☐ Skin Contact ☒ Other (specify)
EMERGENCY FIRST AID PROCEDURES SKIN CONTACT: Wash with soap and water for 15 minutes. EYE CONTACT: Flush with water for 15 minutes. Inhalation - Move to fresh air. INGESTION: Induce vomiting. Consult physician or local poison control center.

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: None
	STABLE	X	
INCOMPATIBILITY (materials to avoid): Avoid strong oxidizers.			
HAZARDOUS DECOMPOSITION PRODUCTS: Excessive heat and burning may release oxides of carbon and nitrogen.			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: None
	WILL NOT OCCUR	X	

SECTION VI - SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED Wipe up, shovel or vacuum spilled material. Clean up spills immediately as they can be dangerously slippery.
WASTE DISPOSAL METHOD Comply with Federal, state and local regulations for solid landfill.
CERCLA (Superfund) REPORTABLE QUANTITY (in lbs) None Required
RCRA HAZARDOUS WASTE NO. (40CFR 261.33) None Required
VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water) None
* Theoretical _____ lb/gal N/A — * Analytical _____ lb/gal N/A

SECTION VII - PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): None normally required.				
VENTILATION	LOCAL EXHAUST (Specify Rate)	None	SPECIAL	None
	MECHANICAL (General) (Specify Rate): Recommended in closed areas		OTHER	None
PROTECTIVE GLOVES (specify type): None normally needed -Neoprene if necessary		EYE PROTECTION (specify type): Safety glasses or splash goggles		
OTHER PROTECTIVE EQUIPMENT: Eye fountain in work area is recommended.				

SECTION VIII - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Store at temperatures between 40 - 120° F. Avoid freezing.
OTHER PRECAUTIONS Keep away from children, infants and pets.

SECTION IX - ADDITIONAL INFORMATION

If material is used in extreme heat (>120° F), prolonged and repeated exposure could pose a risk of pulmonary disease. Exposure below mist TLV (5mg/m) appears to be without risk.

All components used in this product are exempt from the T.O.S.C.A. chapter 15 reporting requirements.

N/A = Not Applicable, N.E. = None Established

THIS MATERIAL SAFETY DATA SHEET PREPARED BY:		
NAME	James R. MacMurdo	SIGNATURE
TITLE	Director, Corporate Quality Assurance	
DATE	12/21/2005	