MSDS

LAB

McCall Oil & Chemical
5480 N.W. Front Ave
Portland, Oregon 97210

MSDS
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McCall Oil & Chemical Co.
Revised 6/9/08 T. Zahler

1.) ACETONE

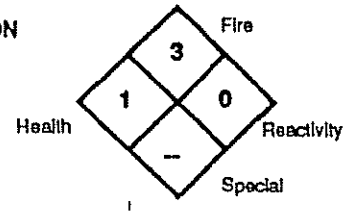
MATERIAL SAFETY DATA SHEET

GREAT WESTERN CHEMICAL COMPANY

ISSUE DATE: 02/15/94	SUPERSEDES: 04/16/90
GREAT WESTERN MSDS NUMBER: 35667	

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: ACETONE

GENERAL USE: Used as a solvent for organic chemical (e.g. fats, oils, varnishes). Used in the manufacture of numerous organic chemicals (e.g. methyl isobutyl ketone, chloroform).

PRODUCT DESCRIPTION: An organic solvent of the ketone family. Synonyms include: Dimethyl ketone, 2-propanone, methyl ketone and pyroacetic acid.

INFORMATION PROVIDED BY:

GREAT WESTERN CHEMICAL COMPANY
Corporate Office
808 S.W. 15th Avenue
Portland, OR 97205
PHONE: 503-228-2600 FAX: 503-221-5767

EMERGENCY PHONE NUMBERS

GREAT WESTERN:	800-GW-SPILL
CHEMTREC:	800-424-9300
CANUTEC:	612-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

COMPONENT	CAS #	OSHA HAZARD	Wt.%	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL
Acetone	000067-64-1	Flammable Liquid, Irritant, Nervous system toxin	100	750 ppm	1,000 ppm	750 ppm	1,000 ppm

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
A clear, colorless liquid with a sweet, fruity odor. Flammable liquid and vapors. Vapors, mists and liquid are irritating to eyes and skin. Inhalation of high concentrations may cause narcotic effects.

POTENTIAL HEALTH EFFECTS:

INHALATION: Exposure may cause mucous membrane irritation, headache, dizziness, incoordination, drowsiness and other symptoms related to central nervous system depression and a narcotic effect.

EYE CONTACT: Direct contact with liquid will cause irritation with symptoms of tearing, redness, and possible swelling. At high concentrations can cause impairment of vision, corneal damage and conjuctival injury.

SKIN CONTACT: Exposure to vapors, mists or liquid may cause drying of the skin with mild irritation.

INGESTION: Exposure may cause narcosis, gastroenteritis with possible nausea, vomiting, lethargy and diarrhea. In extreme situations ingestion may cause liver and kidney damage.

CHRONIC: Chronic exposure may cause defatting of the skin, leading to dermatitis. Otherwise, the chronic effects of exposure would be the same as for acute exposure.

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4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: Immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately

SKIN CONTACT: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, get medical attention.

INGESTION: If swallowed, DO NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS:
Treat exposure symptomatically.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: -17.8° C. (0° F.) Tagliabue Closed Tester (ASTM D 56-79)

Flammable Limits (in air, % by volume): **Lower:** 2.15% **Upper:** 13%

Autoignition Temperature: 465° C. (869° F.)

GENERAL HAZARD:
Vapors from this product may concentrate in confined spaces and form an explosive mixture. Product may produce hazardous fumes or hazardous decomposition products. Heated containers may rupture violently from excessive heat.

FIRE FIGHTING INSTRUCTIONS:
EXTINGUISING MEDIA: CO_2, dry chemical, water fog.
Use water to cool containers exposed to fire.

FIRE FIGHTING EQUIPMENT:
Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS:
Carbon monoxide and carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL:
Remove all ignition sources. Vapors are heavier than air and will be concentrated. Vapors may be depressed by the use of a water fog. Dike spill and absorb liquid in sand or a non-flammable absorbent. Pick up bulk of liquid and place in approved containers, using non-sparking tools. Flush spill area with water; collect rinsates and containerize for disposal.

WATER SPILL:
This material is soluble in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

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7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Store below 25° C. (80° F.) **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated place, away from all sources of ignition. Outside or detached storage is preferable. Inside storage should be in a standard flammable liquids storage room or cabinet. Do not store in plastic containers. Do not store near strong oxidizing agents, organic peroxides, or aliphatic amines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: Use local mechanical exhaust ventilation capable of maintaining emissions in the work area below the PEL or TLV.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: For exposure above the PEL or TLV, wear a NIOSH-approved full facepiece or half mask air-purifying cartridge cartridge respirator equipped with an organic vapor cartridge or supplied air.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979), unless a full facepiece respirator is worn.

GLOVES: Neoprene or Butyl gloves.

CLOTHING & EQUIPMENT: Wear a butyl or neoprene apron when handling product.

FOOTWEAR: Butyl or neoprene boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colorless	**Bulk Density:**	Not applicable
Physical State:	Liquid	**Vapor Pressure:**	226 mm Hg @ 25° C.
Odor:	sweet, fruity	**Vapor Density (air=1):**	2
Odor Threshold:	20 ppm in air	**Evaporation Rate (n-Butyl Acetate=1):**	7.7
Molecular Formula:	CH_3COCH_3	**VOC Content:**	791 grams/liter
Molecular Weight:	58.08	**% Volatile:**	100
Boiling Point:	56.2° C. (133° F.)	**Solubility in H_2O:**	Complete
Freezing/Melting Point:	-95.3° C. (-139.5° F.)	**Octanol/Water Partition Coefficient:**	Log P_{oct}: -0.24
Specific Gravity:	0.791 @ 20° C.	**pH (as is):**	Not applicable
Density:	6.594 pounds/gallon	**pH (1% solution):**	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: Hot storage

INCOMPATIBLE MATERIAL:
Oxidizing agents, organic peroxides, chromium trioxide, chromic acid solutions, potassium ter-butoxide, hydrogen peroxide, nitric acid and its mixture with sulfuric acid, per monosulfuric acid, chromyl chloride, nitrosyl perchlorate and chloride, bromine, bromine trifluoride, hypobromites, sulfur dichloride, dioxygen difluoride and aliphatic amines.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon monoxide and carbon dioxide.

SENSITIVITY TO MECHANICAL IMPACT:
This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE:
This product is sensitive to static discharge.

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11. TOXICOLOGICAL INFORMATION

Component by CAS#:	**000067-64-1**
Eye Contact:	Rabbit: 20 mg/24 hours MODERATE
Skin Contact:	Rabbit: 500 mg/24 hours MODERATE
Oral Rat LD_{50}:	5800 mg/kg
Dermal Rabbit LD_{50}:	20 g/kg
Inhalation Rat LC_{50}:	50,100 mg/m^3/8 hours
Human Data:	Oral TDLo: 2,857 mg/kg
Other Toxicological Data:	Inhalation-Man TDLo:10 mg/m^3/6 hours
Carcinogenicity:	No data available
Teratogenicity:	No data available
Mutagenicity:	No data available
Synergistic Products:	Chlorinated hydrocarbons
Target Organs:	Eyes, skin, CNS
Medical Conditions Aggravated by Exposure:	Chronic respiratory or skin diseases

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

This material is water soluble. It is a normal microcomponent in blood and urine. Material has a high vapor pressure and is listed as an air contaminant by OSHA.

ENVIRONMENTAL EFFECTS:

Aquatic toxicity: A concentration of 792 mg/l had no effect on minnows after 24 hours; bluegill were killed in tap water with an acetone concentration of 14,250 mg/l. The TLm values for mosquito fish in turbid water were 13,000 mg/l. The threshold values for immobilization of several aquatic invertebrates including Daphnia in Lake Erie water were greater than 5,000 mg/l.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Ignitable Waste

U.S. EPA WASTE NUMBER/DESCRIPTION: U002

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 due to its ignitability. If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: **Acetone**

DOT HAZARD CLASS: 3

UN NUMBER: UN1090

PACKING GROUP: II

DOT LABELS: **Primary:** Flammable Liquid **Subsidiary:** None Required

DOT PLACARDS: Flammable Liquid

CERCLA Reportable Quantity: Acetone RQ is 5,000 lbs. RQ for product is 5,000 lbs (758.3 gallons)

MARINE POLLUTANT: No

DOT Emergency Response Guidebook Number: 26

TDG PROPER SHIPPING NAME: **Acetone**

TDG HAZARD CLASS: 3 **Regulated Limit (RL):** Not applicable

UN NUMBER: UN1090

PACKING GROUP: II

TDG LABELS: **Primary:** Flammable Liquid **Subsidiary:** None Required

TDG PLACARDS: Flammable Liquid

CANUTEC Initial Emergency Response Guide Number: 14

Other Shipping Information:

None.

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15. REGULATORY INFORMATION

Component by CAS #: 000067-64-1

OSHA

Target Organ Effects: Eyes, Skin, CNS

Carcinogenic Potential:
Regulated by OSHA: No
Listed on NTP Report: No
IARC Listing: No

U.S. EPA Requirements

Release Reporting
CERCLA (40 CFR 302):
Listed Substance: Yes
Reportable Quantity: 5,000 lbs
Category: D
RCRA Waste No.: U002
Unlisted Substance: Not Applicable
Reportable Quantity: Not Applicable
Characteristic: Not Applicable
RCRA Waste No.: U002

SARA TITLE III

Section 302 & 303 (40 CFR 355)
Listed Substance: No
Reportable Quantity: Not Applicable
Planning Threshold: Not applicable

Section 311 & 312 (40 CFR 370)
Hazard Categories (product): **Fire:** Y **Sudden Release of Pressure:** N **Reactive:** N **Acute Health:** Y **Chronic Health:** Y
Planning Threshold: Not applicable

Section 313 (40 CFR 372)
Listed Toxic Chemical: Yes
Reporting Threshold: 10,000 lbs

U.S. TSCA STATUS

Listed (40 CFR 710): Yes

CANADIAN REGULATIONS

IDL Substance: Yes
Controlled Product: Yes
WHMIS Hazard Symbols: Flammable Material, Material Causing Other Toxic Effects.
WHMIS Class & Division: B.2, D.2B
Product Identification Number: UN1090
Domestic Substance List: Yes
CEPA Priority List: No
Carcinogenicity:
ACGIH Appendix A: No
A1 Confirmed Human: No
A1 Suspected Human: No
IARC Group: Group 3

STATE REGULATIONS:

State of California
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)
Carcinogen: No
Reproductive Toxin: No

OTHER REGULATIONS:

State Right To Know Laws: MA, PA

DEA Essential
Threshold = 500 gallons

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15. OTHER INFORMATION

EPA Registration number: Not Applicable
Approved Product Uses: Not Applicable

NFPA 704 Health: 1
Fire: 3
Reactivity: 0
Special: --

MSDS Revision Information: Form Revision made 02/09/94
Information Revised This Issue Date: New Format with additional information.

MSDS distributed by **Great Western Chemical Company**
Environmental Department
Phone: 800-547-1400 FAX: 503-221-5767

Prepared By:	David L. Bishop	Date Prepared:	February 15, 1994

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

2.) AMMONIUM DICHROMATE

SPECTRUM®

GARDENA, CA
NEW BRUNSWICK, NJ

Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment
2 1 Oxy	Health Hazard 2 Fire Hazard 1 Reactivity 1	See Section 15.

Section 1. Chemical Product and Company Identification

Page Number: 1

Common Name/ Trade Name	Ammonium dichromate	Catalog Number(s).	YY022, A1178, A1179
		CAS#	7789-09-5
Manufacturer	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	RTECS	HX7650000
		TSCA	TSCA 8(b) inventory: Ammonium dichromate
Commercial Name(s)	Not available.	CI#	Not available.
Synonym	Ammonium Bichromate; Dichromic acid, diammonium salt	IN CASE OF EMERGENCY CHEMTREC (24hr) 800-424-9300 CALL (310) 516-8000	
Chemical Name	Ammonium Dichromate		
Chemical Family	Not available.		
Chemical Formula	(NH4)2Cr2O7		
Supplier	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248		

Section 2. Composition and Information on Ingredients

		Exposure Limits			
Name	CAS #	TWA (mg/m³)	STEL (mg/m³)	CEIL (mg/m³)	% by Weight
1) Ammonium dichromate	7789-09-5	0.05			100

Toxicological Data on Ingredients

Ammonium dichromate
LD50: Not available.
LC50: Not available.

Section 3. Hazards Identification

Potential Acute Health Effects

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can result in death.

Potential Chronic Health Effects

Hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, liver.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

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Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get 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. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Serious Ingestion	Not available.

Section 5. Fire and Explosion Data

Flammability of the Product	May be combustible at high temperature.
Auto-Ignition Temperature	190°C (374°F)
Flash Points	Not available.
Flammable Limits	Not available.
Products of Combustion	Some metallic oxides.
Fire Hazards in Presence of Various Substances	Slightly flammable to flammable in presence of heat. Non-flammable in presence of shocks.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.
Fire Fighting Media and Instructions	Oxidizing material. Do not use water jet. Use flooding quantities of water. Avoid contact with organic materials.
Special Remarks on Fire Hazards	May ignite by friction with carbide. In contact with substances which are readilly oxidized, these can react rapidly enough to cause ignition.
Special Remarks on Explosion Hazards	Hydrazine is decomposed explosively by chromates. With finely divided oxidizable substances, combustion can be violent. Closed containers readily rupture at decomposition temperature.

Section 6. Accidental Release Measures

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: **Neutralize the residue with a dilute solution of sodium carbonate.**
Large Spill	Oxidizing material. Poisonous solid. Stop leak if without risk. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. **Neutralize the residue with a dilute solution of sodium carbonate.** Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

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Section 7. Handling and Storage

Precautions	Keep locked up.. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as combustible materials, organic materials, acids, alkalis.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers. Do not store above 24°C (75.2°F).

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	TWA: 0.05 (mg (Cr)/m^3) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid. (Crystals solid.)	Odor	Odorless.
Molecular Weight	252.1 g/mole	Taste	Not available.
pH (1% soln/water)	3.95 [Acidic.]	Color	Orange. Red.

Boiling Point	Not available.
Melting Point	Not available.
Critical Temperature	Not available.
Specific Gravity	2.155 (Water = 1)
Vapor Pressure	Not applicable.
Vapor Density	8.7(Air = 1)
Volatility	Not available.
Odor Threshold	Not available.
Water/Oil Dist. Coeff.	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water.
Solubility	Soluble in cold water, hot water. Insoluble in acetone. Soluble in alcohol.

Continued on Next Page

Section 10. Stability and Reactivity Data

Stability	Unstable.
Instability Temperature	Not available.
Conditions of Instability	Excess heat and incompatible materials
Incompatibility with various substances	Reactive with combustible materials, organic materials, acids, alkalis. Slightly reactive to reactive with moisture.
Corrosivity	Not available.
Special Remarks on Reactivity	It is an oxidizing material and combustible solid. Decomposes vigorously with luminescence around 200 C. Decomposes at about 180 C. Decomposition becomes self-sustaining at about 225 C with swelling and evolution of heat and nitrogen. It is incompatible with combustible, organic, or other readily oxidizable materials: Paper, wood, sulfur, aluminum, plastics, acids, bases, potassium chlorate, sodium nitrite, alcohols, ethylene glycol, water.
Special Remarks on Corrosivity	Not available.
Polymerization	Will not occur.

Section 11. Toxicological Information

Routes of Entry	Absorbed through skin. Inhalation. Ingestion.
Toxicity to Animals	LD50: Not available. LC50: Not available.
Chronic Effects on Humans	CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: blood, kidneys, liver.
Other Toxic Effects on Humans	Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).
Special Remarks on Toxicity to Animals	Lowest Published Lethal Dose LDL [Child] - Route: Oral; Dose: 99 mg/kg
Special Remarks on Chronic Effects on Humans	Not available.
Special Remarks on other Toxic Effects on Humans	Acute Potential Health Effects: Skin: Causes skin irritation. May be absorbed through skin Eyes: Causes eye irritation. Inhalation: Causes respiratory tract and mucous membrane irritation. It may destructive to the tissues of the mucous membranes Ingestion: May cause intense gastrointestinal tract irritation. May affect blood, Kidneys (urinary system), and liver. Symptoms of acute poisoning may include ulceration and corrosion, epigastric pain, nausea, vomiting, diarrhea, vertigo, fever, muscle cramps, hemorrhagic diathesis, toxic nephritis, renal failure, intravascular hemolysis, circulatory collapse, liver damage, peripheral vascular collapse, acute multisystem shock and coma, and even death depending on the dose. Chronic Potential Health Effects: Chronic poisoning usually results from inhalation or skin contact. May affect the blood, kidneys and liver. Signs and symptoms may include lacrimation, dermatitis, penetrating ulcers, perforation of nasal septum, pulmonary edema, congestion, chronic rhinitis, polyps of the upper respiratory tract, inflammation of the lung, emphysema, tracheitis, bronchitis, pharyngitis, adhesions of the diaphragm, inflammation of larynx, conjunctivitis, loss of appetite, nausea, vomiting, inflammation of liver or even acute hepatitis with jaundice, respiratory irritations, leukocytosis, leukopenia, monocytosis, and eosinophilia.

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Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short/long term degradation products are to be expected.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	Not available.

Section 13. Disposal Considerations

Waste Disposal	Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification	CLASS 5.1: Oxidizing material.
Identification	: Ammonium dichromate UNNA: 1439 PG: II
Special Provisions for Transport	Not available.
DOT (Pictograms)	

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations	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: Ammonium dichromate California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Ammonium dichromate Connecticut hazardous material survey.: Ammonium dichromate Illinois chemical safety act: Ammonium dichromate New York release reporting list: Ammonium dichromate Rhode Island RTK hazardous substances: Ammonium dichromate Pennsylvania RTK: Ammonium dichromate Massachusetts RTK: Ammonium dichromate Massachusetts spill list: Ammonium dichromate New Jersey: Ammonium dichromate New Jersey spill list: Ammonium dichromate Louisiana spill reporting: Ammonium dichromate California Director's List of Hazardous Substances: Ammonium dichromate TSCA 8(b) inventory: Ammonium dichromate CERCLA: Hazardous substances.: Ammonium dichromate: 10 lbs. (4.536 kg)
California Proposition 65 Warnings	California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Ammonium dichromate
Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances. Inventory lists for China, Japan, Korea, and Philippines.

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Other Classifications	WHMIS (Canada)	CLASS C: Oxidizing material. CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).	
	DSCL (EEC)	R8- Contact with combustible material may cause fire. R21- Harmful in contact with skin. R25- Toxic if swallowed. R26- Very toxic by inhalation. R37/38- Irritating to respiratory system and skin. R41- Risk of serious damage to eyes. R43- May cause sensitization by skin contact. R45- May cause cancer. R46- May cause heritable genetic damage.	S2- Keep out of the reach of children. S46- If swallowed, seek medical advice immediately and show this container or label. S53- Avoid exposure - obtain special instructions before use.

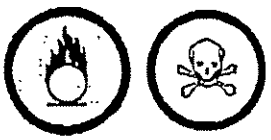
HMIS (U.S.A.)

Health Hazard	2
Fire Hazard	1
Reactivity	1
Personal Protection	(E

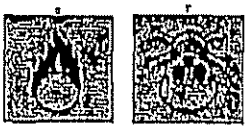
National Fire Protection Association (U.S.A.)

Health — Flammability — Reactivity — Specific hazard

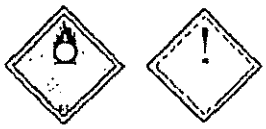
WHMIS (Canada) (Pictograms)



DSCL (Europe) (Pictograms)



TDG (Canada) (Pictograms)



ADR (Europe) (Pictograms)

Protective Equipment

Gloves.

Lab coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Splash goggles.

Continued on Next Page

Section 16. Other Information

MSDS Code	A5050
References	Not available.
Other Special Considerations	Not available.

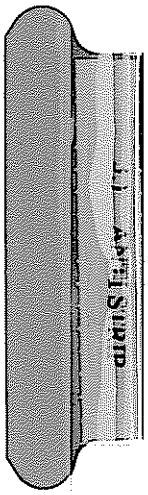
Validated by Sonia Owen on 8/11/2006.	Verified by Sonia Owen. Printed 9/8/2006.

CALL (310) 516-8000

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.

3



Anti Strip

Product Name: UNICHEM 8162W

Section: 01 PRODUCT IDENTIFICATION

UNICHEM
A DIVISION OF BJ SERVICES CO.
707 N. LEECH
HOBBS, NM 88241-1499

Emergency Telephone 505-393-7751
Previous Version Date 3/01/94
Date Prepared 10/01/96
Version: 0000006

Product Name: UNICHEM 8162W

Chemical Description:
Proprietary asphalt additive blend

Section: 02 HAZARDOUS INGREDIENTS

Component Name	CAS#	% Range
cracked heavy oil	64741-62-4	< 60%
other amines and nitriles		< 35%
flux	68512-62-9	< 30%
diesel #2	68476-34-6	< 10%
caprolactam	00105-60-2	< 5%

Section: 03 PHYSICAL DATA

Freezing Point: < 50 Deg.F.
Boiling Point, 760 mm Hg: 580 Deg.F
Specific Gravity(H2O=1) : 1.000 Solubility in water: Insoluble
Appearance and Odor: Dark brown liquid; slight amine odor.

Section: 04 FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): 230 Deg.F PMCC

Extinguishing Media

CO2, dry chemical, water spray or fog, or foam. Use water to keep containers cool. Isolate "fuel" supply from fire. Contain fire fighting liquids for proper disposal.

Special Fire Fighting Procedures

Fire fighters should wear self-contained breathing apparatus with a full facepiece operated in the pressure-demand or positive-pressure mode.

Unusual Fire and Explosion Hazards

None

Section: 05 HEALTH HAZARD DATA

Effects of Overexposure

Eye Contact: may cause irritation with tearing and blurring

Product Name: UNICHEM 8162W

Section: 05 HEALTH HAZARD DATA CONTINUED

of vision or corrosion with corneal or conjunctival ulceration if not promptly removed.

Skin Contact: prolonged or repeated exposure may cause skin irritation, discomfort, or rash. Exposures may lead to skin burns or ulceration. Limited evidence suggests that skin permeation can occur in amounts capable of producing the effects of systemic toxicity.

Inhalation: may cuase irritation of respiratory tract. Prolonged or excessive exposure to vapors may be toxic.

Ingestion: may be toxic. Ingestion may cause convulsions.

Sub-Chronic Effects: prolonged or repeated excessive exposure may cause anemia, liver damage, and disorders of bone marrow and lymphoid tissues.

Chronic Effects: heavy fuel oils are listed as possibly carcinogenic to humans by the IARC (category 2B)

Emergency and First Aid Procedures

SKIN

Wash with soap and water. Remove contaminated clothing and launder contaminated clothing before reuse. Get medical attention if redness or irritation develops.

EYES

Flush eyes immediately with large amounts of water for at least 15 minutes. Lift lower and upper lids occasionally. Get medical attention.

INHALATION

Remove victim to fresh air. Give artificial respiration if not breathing. If breathing is difficult, administer oxygen. Keep person warm, quiet and get medical attention.

INGESTION

Call a physician immediately. Give victim a glass of water. Do NOT induce vomiting unless instructed by a physician or poison control center. Never give anything by mouth to an unconscious person.

Section: 06 REACTIVITY DATA

Stable (Y=Yes/N=No): Y

Stability -- Conditions to Avoid

None known.

Incompatibility (Materials to Avoid)

Avoid contact with strong oxidizers or acidic materials.

Hazardous Decomposition Products

Carbon dioxide, carbon monoxide, oxides of sulfur and

Product Name: UNICHEM 8162W

Section: 06 REACTIVITY DATA CONTINUED

nitrogen.

Hazardous Polymerization May Occur(Y=Yes/N=No): N

Hazardous Polymerization -- Conditions to Avoid

None

Section: 07 SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled

Persons not wearing suitable personal protective equipment should be excluded from area of spill until clean-up has been completed. Shut off source of spill if possible to do so without hazard. Prevent material from entering sewers or watercourses. Provide adequate ventilation. Contain spilled material with sand or earth. Recovered undamaged or minimally contaminated material for reuse or reclamation. Place all collected material and spill absorbents into DOT approved containers.
Advise authorities. If this product is an EPA hazardous substance (see Section 10), notify the U.S.EPA or the National Response Center. Additional notification pursuant to SARA Section 302/304 (40 CFR 355) may also be required.

Waste Disposal Method

Treatment, storage, transportation and disposal must be in accordance with EPA or State regulations under authority of the Resource Conservation and Recovery Act (40 CFR 260-271).

Section: 08 SPECIAL PROTECTIVE INFORMATION

Respiratory Protection

If workplace exposure limit(s) of product or any component is exceeded, an NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure organic vapor type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

Ventilation

The use of mechanical dilution ventilation is recommended whenever this product is used in confined spaces, is heated above ambient temperatures or is agitated. When applicable, sufficient local ventilation should be provided to maintain employee exposures below safe working limits (TWA's).

Protective Gloves

Neoprene, nitrile, polyvinyl alcohol (PVA), polyvinyl chloride (PVC)

Product Name: UNICHEM 8162W

Section: 08 SPECIAL PROTECTIVE INFORMATION CONTINUED

Eye Protection

Chemical splash goggles or face shield in compliance with OSHA regulations is advised; however OSHA regulations also permits safety glasses under certain conditions. The use of contact lenses is not recommended.

Other Protective Equipment

Eye wash and safety shower

Section: 09 SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing

Avoid contact with eyes, skin or clothing. Avoid breathing vapors or mist.

Other Precautions

Containers of this material may be hazardous when emptied. Since emptied containers retain residues (vapor, liquid, or solid), all hazard precautions given in this data sheet must be observed. Do not transfer to improperly marked container. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Containers should not be washed out or used for other purposes.
FOR INDUSTRIAL USE ONLY

Section: 10 REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act Of 1986(SARA) Title III

Section 302/304-Extremely Hazardous Substances (40 CFR 355)

SARA requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312). These values are subject to change and the regulations should be consulted to verify current statutory requirements.

Components present in this product at a level which could require reporting under the statute are:

Component Name	RQ	TPQ	% Range
NONE			

Section 311/312 Chemical Inventory Reporting Requirements (40 CFR 370)

The Superfund Amendments and Reauthorization Act (SARA) may require submission of reports (chemical list, MSDS, Tier I & Tier II) to the State Emergency Response Commission, Local Emergency Response Committee and the local fire department. The SARA physical and health hazards related to this product are:

Product Name: UNICHEM 8162W

Section: 10 REGULATORY INFORMATION CONTINUED

X Acute Health Hazard
X Chronic Health Hazard
_ Sudden Release of Pressure
_ Reactive
_ Fire

Section 313-List of Toxic Chemicals (40 CFR 372)

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). This information should be included in all MSDSs that are copied and distributed for this material.

Component Name	CAS #	% Range
NONE		

CERCLA, 40 CFR 261 AND 302

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center 1-800-424-8802 of any release of a Hazardous Substances equal to or greater than the reportable quantities (RQs) listed in 40CFR 302.4. Values are given in pounds for the component and not the mixture, if applicable. (These values are subject to change and the regulations should be consulted to verify current statutory levels.)

Component Name	CAS #	CERCLA RQ
NONE		

OSHA Exposure Limits

Component Name
caprolactam
TWA ppm: 5.0 TWA MG/M3: 20.0 STEL ppm: 10.0 STEL MG/M3: 40.0

National Fire Protection Agency

2 Health
0 Reactive
1 Fire
____ Other

Department of Transportation Shipping Information

Proper Shipping Name: Nonregulated material
Hazardous Substance RQ: *NONE* Emergency Response Guide Number: 171
Labels: None

Toxic Substances Control Act (TSCA), 40 CFR 261

This product, or components if product is a mixture, is/are listed on the Toxic Substance Control Act (TSCA) inventory.

- -

Section 10 information is to remain attached to the material safety data sheet for this product.

- -

While UNICHEM believes that the above data is correct, UNICHEM expressly disclaims liability for any loss or injury arising out of the use of this information or the use of any materials designated.

Product Name: UNICHEM 8162W

Section: 10 REGULATORY INFORMATION CONTINUED

END OF MSDS

MATERIAL SAFETY DATA SHEET

BJ Chemical Services Product Catalog
MSDS FORM

Section: 01 PRODUCT IDENTIFICATION

BJ UNICHEM CHEMICAL SERVICES
707 N. LEECH
HOBBS, NM 88241-1499
TELEPHONE:(505)393-7751

Emergency Telephone CHEMTREC (800)424-9300
Previous Version Date 1/11/00
Date Prepared 1/25/00
Version: 0000010

Product Name: UNICHEM 8162W
Chemical Description:
Proprietary asphalt additive blend

Section: 02 HAZARDOUS INGREDIENTS

Component Name	CAS#	% Range
cracked heavy oil	064741-62-4	< 60%
flux	068512-62-9	< 35%
other amines and nitriles		< 20%
caprolactam	000105-60-2	< 5%

Section: 03 PHYSICAL DATA

Freezing Point: < 50 Deg.F.
Boiling Point, 760 mm Hg: 580 Deg.F
Specific Gravity(H2O=1) : 1.000 Solubility in water: Insoluble
Appearance and Odor: Dark brown liquid; slight amine odor.

Section: 04 FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): 230 Deg.F PMCC
Extinguishing Media
CO2, dry chemical, water spray or fog, or foam. Use water to keep containers cool. Isolate "fuel" supply from fire. Contain fire fighting liquids for proper disposal.
Special Fire Fighting Procedures
Fire fighters should wear self-contained breathing apparatus with a full facepiece operated in the pressure-demand or positive-pressure mode.
Unusual Fire and Explosion Hazards
None

Section: 05 HEALTH HAZARD DATA

Effects of Overexposure

Eye Contact: may cause burns, pain, tearing, blurred vision or corrosion with corneal or conjunctival ulceration which may lead to permanent blindness.

Skin Contact: may cause skin burns or ulceration, swelling, rash, dermatitis and redness. May permeate skin in amounts capable of producing the effects of systemic toxicity.

Inhalation: may cause headaches, confusion, disorientation, blurred vision, irritation of respiratory and digestive tracts with stomach pain, heartburn, nausea, vomiting or diarrhea. May also cause CNS depression, hallucinations, drowsiness or unconsciousness. Repeated or prolonged exposure may cause an asthma-like reaction with shortness of breath, wheezing or coughing, which may occur after re-exposure to low levels. May also cause liver abnormalities, cardiovascular irregularities such as abnormal blood test results and altered hormone levels. Seizure and coma occur from very high exposures and death may result from respiratory depression.

Ingestion: may cause irritation of the gastrointestinal tract with burning and pain. May cause nausea, diarrhea, heartburn, cramping, vomiting, dizziness, loss of coordination and of consciousness and convulsions. Prolonged exposure may cause pneumonia, pulmonary edema, hemorrhages, CNS depression and cardiovascular and respiratory effects.

Medical Conditions Aggravated by Exposure: increased susceptibility to the effects of this material may be

observed in persons with pre-existing disease of the CNS, skin and lungs.

Additional Information: this product contain trace amounts of naphthalene. Overexposure to naphthalene by inhalation, ingestion or skin contact may produce signs and symptoms of headache, fever, profuse sweating, nausea, abdominal pain, diarrhea, lethargy, tremors, convulsions, evidence of blood changes, including hematuria and hemoglobinuria, and optic neuritis. Lab animals given repeated oral doses of naphthalene have developed cataracts.

This product contains < 0.1% benzene which is known to the State of California to cause cancer. Benzene must be handled strictly in conformance with the OSHA Regulation set forth in Sec 1028, Part 1910 of Title 29 of the Code of Federal Regulations.

Target Organs: eyes, skin, CNS, lungs, liver, kidneys and circulatory system.

Emergency and First Aid Procedures

SKIN

Wash with soap and water. Remove contaminated clothing and launder contaminated clothing before reuse. Get medical attention if redness or irritation develops.

EYES

Flush eyes immediately with large amounts of water for at least 15 minutes. Lift lower and upper lids occasionally. Get medical attention.

INHALATION

Remove victim to fresh air. Give artificial respiration if not breathing. If breathing is difficult, administer oxygen. Keep person warm, quiet and get medical attention.

INGESTION

Call a physician immediately. Give victim a glass of water. Do NOT induce vomiting unless instructed by a physician or poison control center. Never give anything by mouth to an unconscious person.

Section: 06 REACTIVITY DATA

Stable (Y=Yes/N=No): Y

Stability -- Conditions to Avoid

None known.

Incompatibility (Materials to Avoid)

Avoid contact with strong oxidizers or acidic materials.

Hazardous Decomposition Products

Smoke, carbon dioxide, carbon monoxide, oxides of nitrogen.

Hazardous Polymerization May Occur(Y=Yes/N=No): N

Hazardous Polymerization -- Conditions to Avoid

None

Section: 07 SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled

Persons not wearing suitable personal protective equipment should be excluded from area of spill until clean-up has been completed. Shut off source of spill if possible to do so without hazard. Prevent material from entering sewers or watercourses. Provide adequate ventilation. Contain spilled material with sand or earth. Recovered undamaged or minimally contaminated material for reuse or reclamation. Place all collected material and spill absorbents into DOT approved containers.

Advise authorities. If this product is an EPA hazardous substance (see Section 10), notify the U.S.EPA or the National Response Center. Additional notification pursuant to SARA Section 302/304 (40 CFR 355) may also be required.

Waste Disposal Method

Treatment, storage, transportation and disposal must be in accordance with EPA or State regulations under authority of the Resource Conservation and Recovery Act (40 CFR 260-271).

Section: 08 SPECIAL PROTECTIVE INFORMATION

Respiratory Protection

If workplace exposure limit(s) of product or component is exceeded, an NIOSH/MSHA approved air supplied respirator is

advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure organic/amines vapor type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

Ventilation

The use of mechanical dilution ventilation is recommended whenever this product is used in confined spaces, is heated above ambient temperatures or is agitated. When applicable, sufficient local ventilation should be provided to maintain employee exposures below safe working limits (TWA's).

Protective Gloves

Neoprene, nitrile, polyvinyl alcohol (PVA), polyvinyl chloride (PVC)

Eye Protection

Chemical splash goggles or face shield in compliance with OSHA regulations is advised; however OSHA regulations also permits safety glasses under certain conditions. The use of contact lenses is not recommended.

Other Protective Equipment

Eye wash and safety shower

Section: 09 SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing

Avoid contact with eyes, skin or clothing. Avoid breathing vapors or mist.

Other Precautions

Containers of this material may be hazardous when emptied. Since emptied containers retain residues (vapor, liquid, or solid), all hazard precautions given in this data sheet must be observed. Do not transfer to improperly marked container. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Containers should not be washed out or used for other purposes.

FOR INDUSTRIAL USE ONLY

Section: 10 REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act Of 1986(SARA) Title III

Section 302/304-Extremely Hazardous Substances (40 CFR 355)

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Components present in this product at a level which could require reporting under the statute are:

Component Name	RQ	TPQ	% Range
NONE			

Section 311/312 Chemical Inventory Reporting Requirements (40 CFR 370)

The Superfund Amendments and Reauthorization Act (SARA) may require submission of reports (chemical list, MSDS, Tier I & Tier II) to the State Emergency Response Commission, Local Emergency Response Committee and the local fire department. The SARA physical and health hazards related to this product are:

X Acute Health Hazard	Sudden Release of Pressure	Fire
X Chronic Health Hazard	Reactive	

Section 313-List of Toxic Chemicals (40 CFR 372)

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). This information should be included in all MSDSs that are copied and distributed for this material.

Component Name	CAS #	% Range
NONE		

CERCLA, 40 CFR 261 AND 302

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center 1-800-424-8802 of any release of a Hazardous Substances equal to or greater than the reportable quantities (RQs) listed in 40CFR 302.4. Values are given in pounds for the component and not the mixture, if applicable. (These values are subject to change and the regulations

should be consulted to verify current statutory levels.)

Component Name	CAS #	CERCLA RQ
NONE		

OSHA Exposure Limits

Component Name

caprolactam

TWA ppm: 5.0 TWA MG/M3: 20.0 STEL ppm: 10.0 STEL MG/M3: 40.0

National Fire Protection Agency

2 Health 1 Fire

0 Reactive Other

Department of Transportation Shipping Information

Proper Shipping Name: Nonregulated material

Hazardous Substance RQ: *NONE* Emergency Response Guide Number: 171

Labels: None

Toxic Substances Control Act (TSCA), 40 CFR 261

This product, or components if product is a mixture, is/are listed on the Toxic Substances Control Act (TSCA) inventory.

Section 10 information is to remain attached to the material safety data sheet for this product.

While UNICHEM believes that the above data is correct, UNICHEM expressly disclaims liability for any loss or injury arising out of the use of this information or the use of any materials designated.

END OF MSDS

MORLIFE™ 3300

Liquid Antistripping Additive

- MORLIFE 3300 is a premium performance product based on a new and innovative chemical alternative to traditional antistripping technologies.
- The elimination of traditional polyamine chemistry results in a low odor, non DOT corrosive asphalt additive.
- Dust Free - does not increase dust content and lower the voids in the mineral aggregate (VMA).
- Significantly improves Tensile Strength ratio results in AASHTO T-283 test procedure.
- Easily metered or pumped using a gear or displacement pump.
- The new chemistry provides a high performance liquid antistripping additive which is more viscous than less concentrated liquid additives.
- Available in 55 gallon drums, 250 gallon disposable totes or in various bulk quantities, FOB Cincinnati, OH

Physical Properties

Color	Dark Brown/Viscous Liquid
Viscosity @ 77°F cs	2000-4500
Specific Gravity @ 77°F	1.06 ± 0.04
Weight, lbs/gal @ 77°F	8.85 ± 0.04
Flash Point SetaFlash	170°C/338°F
Pour Point, ASTM D-97	7°C/45°F

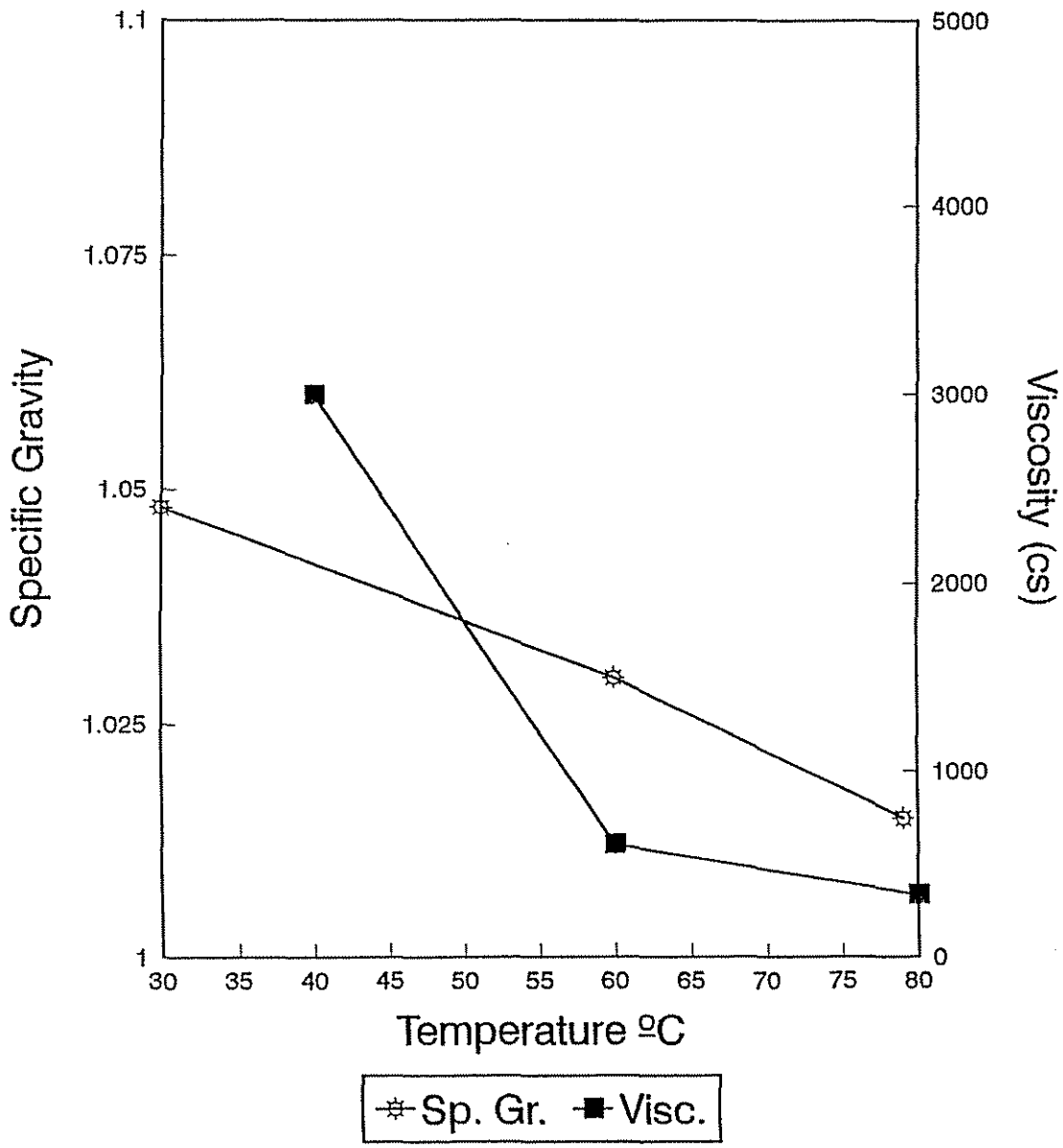
MORLIFE is a trademark of Morton International, Inc. *4/95*

To the best of our knowledge the information contained herein is correct. All products may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the product is the sole responsibility of the user. Users of the product should satisfy themselves that the conditions and methods of use assure that the product is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. Nothing herein is intended as a recommendation to use our products so as to infringe any patent. We assume no liability for customer's violation of patent or other rights. The customer should make his own patent investigation relative to his proposed use.

Morton®

Morton Performance Chemicals, 150 Andover Street, Danvers, MA 01923-1480 508/774-3100 Fax 508-750-9512

Viscosity and Specific Gravity for MORLIFE 3300



1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product ID: MORLIFE(R) 3300 with PaveChek(TM) Microtaggant
Generic Description: Polyamines and mixed polycycloaliphatic polyamines
Product Use: Asphalt additive

For customer service/technical information, contact:
Morton Adhesives & Chemical Specialties
2000 West Street
Cincinnati OH 45215
513-733-2100

HAZARD RATINGS		
	HMIS	NFPA
Health	2*	2
Fire	1	1
Reactivity	0	0
	* = Chronic	

MSDS prepared by:
Toxicology and Regulated Substance Compliance
David Wienckowski, D.A.B.T.
100 N. Riverside Plaza
Chicago IL 60606
312-807-3422

ChemTrec Emergency
1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMMON NAME	CAS #	Approximate % (w/w)
Polyalkylene glycol mixture	Proprietary	30 - 60
Alkyloxylated aliphatic polyamines	Proprietary	30 - 60
Aliphatic polyamines	Proprietary	30 - 60
Non-hazardous and other ingredients below reportable levels	Proprietary	Balance

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: CAUSES SEVERE EYE IRRITATION. CAUSES SEVERE SKIN IRRITATION. CAUSES SEVERE RESPIRATORY TRACT IRRITATION. CAUSES SEVERE DIGESTIVE TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED. See sections 3, 5, & 6.

PRIMARY ROUTES OF EXPOSURE: Eye. Skin. Inhalation (breathing).

EYE CONTACT: Causes severe irritation. Can cause burning sensation, tearing, and redness.

SKIN CONTACT: Causes severe irritation. Can cause redness, itching, and burning sensation.

INHALATION (Breathing): Severely irritating to the eyes, nose, and respiratory tract.

INGESTION (Swallowing): Severely irritating to the mouth, throat, and stomach.

TARGET ORGANS/CHRONIC EFFECTS: Lungs and respiratory system. Eyes. Skin.

CONDITIONS AGGRAVATED BY EXPOSURE: Lungs and respiratory system. Skin. Immune systems and/or specific chemical allergies.

ARCINOGENICITY:

	ACGIH	IARC	NTP	OSHA
Polyalkylene glycol mixture	No	No	No	No
Alkyloxylated aliphatic polyamines	No	No	No	No
Aliphatic polyamines	No	No	No	No

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.

SKIN CONTACT: Immediately flush with plenty of water for at least 15 minutes. For large exposures use an emergency shower. Remove contaminated clothing and shoes. Get immediate medical attention. Professionally wash clothing before re-use.

INHALATION (Breathing): Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration.

INGESTION (Swallowing): Obtain immediate medical attention.

NOTES TO PHYSICIANS: Treatment should be directed at preventing absorption, administering to symptoms (if they occur), and providing supportive therapy.

5. FIRE FIGHTING METHODS

lash Point...: 330F 165.5C Method.....: Setaflash Closed Cr
xplosive Lmts: LEL(%) Not Established UEL(%) Not Established
Autoignition..: Not Established

HAZARDOUS COMBUSTION AND DECOMPOSITION PRODUCTS: Smoke, soot, and toxic/irritating fumes (i.e., carbon dioxide, carbon monoxide, etc.). Oxides of nitrogen. Amines.

FIRE AND EXPLOSION HAZARDS: High temperatures can cause sealed containers to rupture due to a build up of internal pressure. Cool with water. During a fire, irritating and highly toxic gases may be generated during combustion or decomposition.

EXTINGUISHING MEDIA: SMALL FIRES: Water (spray, fog, or in some cases, stream), foam, dry chemical, or carbon dioxide. LARGE FIRES: Water (spray or stream) or foam.

FIRE FIGHTING PROCEDURES/EQUIPMENT: Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH-approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

EVACUATION: Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

CONTAINMENT: Safely stop discharge. Contain material, as necessary, with a ike or barrier. Stop material from contaminating soil, or from entering

sewers or bodies of water.

CLEAN-UP/PERSONAL PROTECTION EQUIPMENT: Appropriate safety measures and protective equipment should be used.

COLLECTION AND DISPOSAL: Stop discharge, if safe to do so. Use proper protective equipment. Cover spills with absorbent clay or sawdust and place in closed chemical waste containers. Dispose of according to applicable local, state and federal regulations.

REPORTING: Spills of this material in excess of a components's RQ must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.
No regulated ingredients.

7. HANDLING AND STORAGE

STORAGE CONDITIONS: Store in cool, dry, well ventilated area away from heat, ignition sources, and direct sunlight. Keep containers tightly closed.

TRANSFER: No special precautions are needed. Follow good manufacturing and handling practices.

PERSONAL HYGIENE: Wash thoroughly after handling, especially before eating, drinking, smoking, and using restroom facilities. Wash contaminated goggles faceshield, and gloves. Professionally launder contaminated clothing before re-use.

EMPTY CONTAINER PRECAUTIONS: Attention! This container can be hazardous when empty. 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

EXPOSURE GUIDELINES:

ACGIH - TLV - No regulated ingredients.

OSHA - PEL - No regulated ingredients.

ENGINEERING CONTROLS/VENTILATION: Local exhaust ventilation is recommended when vapors, mists, or dusts can be released.

EYE PROTECTION: Wear chemical splash goggles and a full-face shield. An eye wash facility should be readily available.

SKIN PROTECTION: Wear rubber boots and apron, protective clothing, and impervious gloves. Because a variety of protective gloves exist, consult glove manufacturer to determine the proper type for a specific operation. Butyl rubber gloves.

RESPIRATORY PROTECTION: Avoid breathing vapor and/or mists. Wear NIOSH/MSHA-approved equipment. Determine the appropriate type by consulting the respirator manufacturer. High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance....:	Brown, dark	Odor.....:	Slight
Physical State:	Liquid	Solubility....:	Miscible
pH.....:	Not Applicable	Boiling Point.:	716F 380C
Vapor Pressure:	Not Established	Vapor Density.:	Not Established
Evaporation Rt:	Not Established	VOC Material..:	Not Determined
Specific Grvty:	1.06	%Non-Vol(w/w).:	96.6

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under normal conditions of use.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: High temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Oxidizers. Acids. Ammonia.

11. TOXICITY INFORMATION

PRODUCT:
A similar item has been tested on laboratory animals and has been shown to be a severe irritant to eyes and skin.

COMPONENTS:

Polyalkylene glycol mixture:
Positive results were obtained in the micronucleus assay. Negative results were obtained in the Ames test. The Chinese Hamster Ovary (CHO) assay gave negative results. Weakly positive results obtained are difficult to assess for relevancy to human health. A bone marrow cytogenecity study in rats did not show any evidence of clastogenetic potential.

Alkyloxylated aliphatic polyamines:

Oral LD50	Rat	4,300 mg/kg
Dermal LD50	Rabbit	> 2,000 mg/kg

Aliphatic polyamines:
Corrosive! Causes eye and skin burns.

Oral LD50	Rat	620 mg/kg
Dermal LD50	Rabbit	> 1000 mg/kg

12. ECOLOGICAL INFORMATION
No data are available on this product.

13. DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with all local, state, and federal regulations.

GENERAL STATEMENTS: Federal regulations may apply to empty container. State and/or local regulations may be different.

GENERAL RECOMMENDATIONS: Of the methods of disposal currently available, it is recommended that an alternative be selected according to the following

order of preference, based upon environmental acceptability: (1) recycle or rework, if feasible; (2) incinerate at an authorized facility; or (3) treat at an acceptable waste treatment facility.

SPECIAL INSTRUCTIONS: Be sure to contact the appropriate government environmental agencies if further guidance is required.

14. TRANSPORT INFORMATION

Weight (lb)	Shipping Name	49 CFR	IATA	IMO
	Non-regulated	Y	Y	Y

DOT Label.....: Not applicable
DOT Label No..: NA

UN/NA Id Num..: Not Applicable

15. REGULATORY INFORMATION

FEDERAL:

This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SARA Title III - Section 311/312 - Hazard Categories:
N- Fire Hazard
N- Sudden Release of Pressure Hazard
N- Reactivity Hazard
Y- Immediate (acute) Health Hazard
N- Delayed (chronic) Health Hazard

Ozone-Depleting Chemicals - No regulated ingredients.

SARA Section 302 Extremely Hazardous Mat - No regulated ingredients.

SARA Section 313 Toxic Chemicals - No regulated ingredients.

STATE RIGHT-TO-KNOW:

Pennsylvania - New Jersey R-T-K

Polyalkylene glycol mixture	Proprietary	30 - 60
Alkyloxylated aliphatic polyamines	Proprietary	30 - 60
Aliphatic polyamines	Proprietary	30 - 60
Non-hazardous trade secret ingredient(s)	Proprietary	Balance

California - California Proposition 65 - No regulated ingredients.

CONEG - No data available.

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.

16. OTHER INFORMATION

USERS RESPONSIBILITY: A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide

a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information herein should be passed on to your customers or employees, as the case may be.

DISCLAIMER OF LIABILITY: The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

End of Material Safety Data Sheet

MORLIFE™ 500

Anti Strip

Liquid Antistripping Additive

- MORLIFE 500 is based on a new and innovative chemical alternative to traditional antistripping technologies.
- The elimination of traditional polyamine chemistry results in a low odor, non DOT corrosive asphalt additive.
- Dust Free - does not increase dust content and lower the voids in the mineral aggregate (VMA).
- Significantly improves Tensile Strength ratio results in AASHTO T-283 test procedure.
- Easily metered or pumped using a gear or displacement pump.
- The new chemistry provides a high performance liquid antistripping additive which is more viscous than less concentrated liquid additives.
- Available in 55 gallon drums, 250 gallon disposable totes or in various bulk quantities, FOB Cincinnati, OH.

Physical Properties

Color	Dark Brown/Viscous Liquid
Viscosity @ 77°F cs	7000-11000
Specific Gravity @ 77°F	1.10 ± 0.04
Weight, lbs/gal @ 77°F	9.20 ± 0.04
Flash Point SetaFlash	175°C/347°F
Pour Point, ASTM D-97	7°C/45°F

MORLIFE is a trademark of Morton International, Inc.

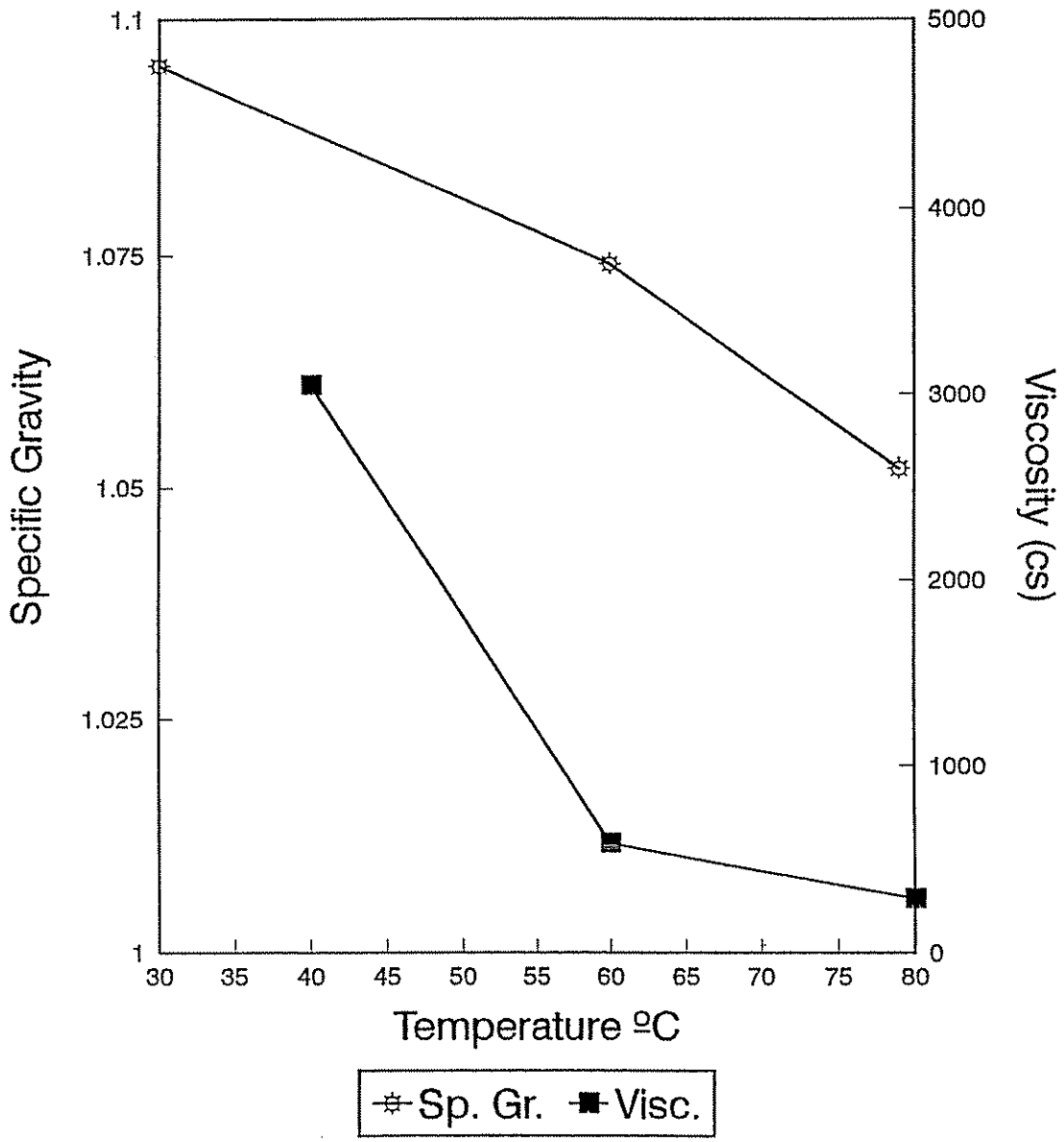
4/95

To the best of our knowledge the information contained herein is correct. All products may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the product is the sole responsibility of the user. Users of the product should satisfy themselves that the conditions and methods of use assure that the product is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. Nothing herein is intended as a recommendation to use our products so as to infringe any patent. We assume no liability for customer's violation of patent or other rights. The customer should make his own patent investigation relative to his proposed use.

Morton®

Morton Performance Chemicals, 150 Andover Street, Danvers, MA 01923-1480 508/774-3100 Fax 508-750-9512

Viscosity and Specific Gravity for MORLIFE 500



Material Safety Data Sheet

SECTION 1: PRODUCT INFORMATION

NAME: MORLIFE 500 ASPHALT ADDITIVE
DESCRIPTION: POLYCYCLOALIPHATIC AMINES
USE: ASPHALT ADDITIVE
MSDS NUMBER: P007454-MCDCIN
APPEARANCE AND ODOR: THICK, DARK BROWN LIQUID; SLIGHT ODOR
EMERGENCY TELEPHONE: 800-424-9300 24-HOURS - CHEMTREC
PRODUCT INFORMATION: 513-733-2100
EFFECTIVE DATE: 05/05/95
SUPERSEDES DATE: 03/07/95
PRODUCT CODE: 5329
REVISED IN SECTION: 1

SECTION 2: HAZARDOUS INGREDIENTS

A HAZARD EVALUATION OF THIS PRODUCT HAS BEEN PERFORMED. THE COMPONENTS LISTED BELOW ARE IDENTIFIED AS HAZARDOUS CHEMICALS UNDER THE CRITERIA OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

COMMON NAME/CHEMICAL NAME	CAS NUMBER	APPROXIMATE %
OXYGENATE	PROPRIETARY	30 - 60
ALIPHATIC POLYAMINES	PROPRIETARY	30 - 60

SECTION 3: EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:
FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. LIFT EYE LIDS FREQUENTLY. GET PROMPT MEDICAL ATTENTION.

SKIN CONTACT:
PROMPTLY REMOVE CONTAMINATED CLOTHING AND SHOES. FLUSH AFFECTED AREA WITH WATER FOR 15 MINUTES. CLEANSE SKIN WITH SOAP AND WATER. GET PROMPT MEDICAL ATTENTION. WASH CONTAMINATED CLOTHING SEPARATELY BEFORE REUSE.

INHALATION:
REMOVE TO FRESH AIR. IF SYMPTOMS DEVELOP, SEEK IMMEDIATE MEDICAL ATTENTION. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH TO MOUTH.

INGESTION:
SEEK MEDICAL ATTENTION. UNLESS ADVISED OTHERWISE, INDUCE VOMITING BY GIVING EITHER SYRUP OF IPECAC FOLLOWED BY 2 GLASSES OF WATER OR BY STICKING FINGER DOWN THROAT.

NOTE TO PHYSICIAN:
TREATMENT SHOULD BE DIRECTED AT PREVENTING ABSORPTION, ADMINISTERING TO THE SYMPTOMS AS THEY OCCUR, AND PROVIDING SUPPORTIVE THERAPY.

SECTION 4: HEALTH EFFECTS SUMMARY

PRIMARY ROUTE(S) OF EXPOSURE: EYE - YES SKIN - YES INHALATION - YES

EYE CONTACT:

CAUSES SEVERE IRRITATION.

THE SEVERITY OF REACTION DEPENDS ON DURATION OF EXPOSURE AND FIRST AID PROCEDURES ADMINISTERED.

SKIN CONTACT:

CAUSES SEVERE IRRITATION.

THE SEVERITY OF REACTION DEPENDS ON DURATION OF EXPOSURE AND FIRST AID PROCEDURES ADMINISTERED.

INHALATION:

DEPENDING ON THE AIRBORNE CONCENTRATION, MILD TO SEVERE IRRITATION CAN OCCUR. EXCESSIVE EXPOSURE TO MISTS(OR VAPORS) CAN BE CORROSIVE TO THE TISSUES OF THE RESPIRATORY TRACT.

INGESTION:

INGESTION CAUSES SEVERE IRRITATION OF THE MOUTH, THROAT, AND ESOPHAGUS.

CAN CAUSE NAUSEA, VOMITING, AND GASTROINTESTINAL UPSET.

ADDITIONAL EFFECTS (TARGET ORGANS):

EYE.
SKIN.

AGGRAVATION OF EXISTING CONDITIONS:

RESPIRATORY SYSTEM.
SKIN.
IMMUNE SYSTEM AND/OR SPECIFIC CHEMICAL ALLERGIES.

SECTION 5: TOXICOLOGIC INFORMATION

OXYGENATE

TOXIC EFFECTS:

CONTACT WITH EYES OR SKIN CAUSES MODERATE IRRITATION. INHALATION OF VAPOR OR MIST MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT.

OTHER TOXICITY STUDIES:

THIS MATERIAL WAS NEGATIVE TO THE AMES TEST. WHEN TESTED BY THE CHINESE HAMSTER OVARY (CHO) ASSAY NEGATIVE RESULTS WERE OBTAINED. HOWEVER, A WEAK POSITIVE INCREASE OF CHROMOSONAL ABERATIONS WERE OBSERVED. CLASTOGENIC POTENTIAL WAS CONFIRMED WITH A POSITIVE IN VIVO MICRONUCLEUS ASSAY. THESE WEAKLY POSITIVE RESULTS ARE DIFFICULT

TO ASSESS FOR RELEVANCE TO HUMAN HEALTH, AND A MORE RECENT BONE MARROW CYTOGENETIC STUDY IN RATS DID NOT PRODUCE ANY EVIDENCE OF CLASTOGENECITY.

CARCINOGENICITY - LISTED BY:
ACGIH: NO IARC MONOGRAPHS: NO NTP ANNUAL REPORT: NO OSHA: NO

ALIPHATIC POLYAMINES

TOXIC EFFECTS:
CONTACT WITH EYES AND SKIN CAUSES SEVERE IRRITATION, PAIN AND CHEMICAL BURNS. INGESTION WOULD BE EXPECTED TO CAUSE CORROSIVE EFFECTS TO THE GASTROINTESTINAL TRACT AND NAUSEA, HEADACHE AND VOMITING.

ACUTE TOXICITY STUDIES:

ORAL-RAT	LD50: 620 mg/kg
DERMAL-RABBIT	LD50: >1000 mg/kg

CARCINOGENICITY - LISTED BY:
ACGIH: NO IARC MONOGRAPHS: NO NTP ANNUAL REPORT: NO OSHA: NO

PRODUCT TOXICITY INFORMATION:

EYE AND/OR SKIN IRRITATION STUDIES:
BASED ON TESTING WITH LABORATORY ANIMALS THIS ITEM HAS BEEN SHOWN TO BE A SEVERE IRRITANT TO EYES AND SKIN.

SECTION 6: OCCUPATIONAL CONTROL PROCEDURES

EYE PROTECTION:
WEAR CHEMICAL SPLASH GOGGLES AND A FULL FACE SHIELD.

AN EYE WASH FACILITY SHOULD BE READILY AVAILABLE.

SKIN PROTECTION:
WEAR RUBBER BOOTS AND APRON, PROTECTIVE CLOTHING, AND IMPERVIOUS GLOVES. BECAUSE A VARIETY OF PROTECTIVE GLOVES EXIST, ALWAYS CONSULT GLOVE MANUFACTURER TO DETERMINE THE PROPER TYPE FOR SPECIFIC OPERATION.

THE FOLLOWING GLOVES AND/OR CLOTHING ARE RECOMMENDED:
BUTYL RUBBER GLOVES

RESPIRATORY PROTECTION:
AVOID BREATHING VAPOR AND/OR MIST.

WHEN AIRBORNE CONCENTRATIONS ARE EXCESSIVE, WEAR NIOSH/MSHA APPROVED EQUIPMENT. DETERMINE THE APPROPRIATE TYPE BY CONSULTING THE RESPIRATOR MANUFACTURER. OBSERVE THE RESPIRATOR USE LIMITATIONS SPECIFIED BY

NIOSH/MSHA OR THE MANUFACTURER.

HIGH AIRBORNE CONCENTRATIONS MAY NECESSITATE THE USE OF SELF-CONTAINED BREATHING APPARATUS (SCBA) OR A SUPPLIED AIR RESPIRATOR. IN ADDITION, RESPIRATORY PROTECTION PROGRAMS MUST BE IN COMPLIANCE WITH 29 CFR 1910.134.

VENTILATION:
LOCAL EXHAUST VENTILATION IS RECOMMENDED WHEN VAPORS, MISTS, OR DUSTS CAN BE RELEASED.

PERSONAL HYGIENE:
WASH THOROUGHLY AFTER HANDLING, ESPECIALLY BEFORE EATING, DRINKING, SMOKING, OR USING RESTROOM FACILITIES. WASH CONTAMINATED GOGGLES, FACESHIELD, AND GLOVES. PROFESSIONALLY LAUNDER CONTAMINATED CLOTHING. DISCARD CONTAMINATED SHOES.

AIRBORNE EXPOSURE LIMITS

OXYGENATE

ACGIH TLV-TWA: NOT ESTABLISHED
OSHA PEL: NOT ESTABLISHED

AIRBORNE EXPOSURE LIMITS

ALIPHATIC POLYAMINES

ACGIH TLV-TWA: NOT ESTABLISHED
OSHA PEL: NOT ESTABLISHED

SECTION 7: FIRE PROTECTION INFORMATION

FLASH POINT: > 347 F, 175 C TEST METHOD: SETAFLASH CLOSED CUP

EXPLOSIVE LIMITS: LEL (%) - NOT ESTABLISHED UEL (%) - NOT ESTABLISHED

AUTOIGNITION TEMPERATURE: NOT ESTABLISHED

EXTINGUISHING MEDIA:
SMALL FIRES: USE AGENTS APPROVED FOR CLASS B HAZARDS (E.G. DRY CHEMICAL, CARBON DIOXIDE, HALON, FOAM, STEAM) OR WATER FOG.
LARGE FIRES: USE WATER SPRAY, FOG, OR ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES:
FIRE FIGHTERS AND OTHERS WHO MAY BE EXPOSED TO THE PRODUCTS OF COMBUSTION SHOULD BE EQUIPPED WITH NIOSH APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) AND FULL PROTECTIVE CLOTHING.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
MAY LIBERATE IRRITATING OR TOXIC VAPORS DURING COMBUSTION OR DECOMPOSITION.

SECTION 8: REACTIVITY DATA

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND USE: YES

MATERIALS TO AVOID:
OXIDIZING AGENTS.
AMMONIA

HAZARDOUS POLYMERIZATION:
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

THERMAL DECOMPOSITION PRODUCTS:
IF HEATED TO HIGH TEMPERATURES, THIS PRODUCT MAY EMIT THE FOLLOWING COMPOUNDS:
HYDROGEN CYANIDE.
OXIDES OF NITROGEN.

SUPPLEMENTAL SECTION 8 INFORMATION:
ADDITIONAL INCOMPATIBLE MATERIALS: CHEMICALS WHICH REACT WITH AMINES.

SECTION 9: SPILL AND LEAK PROCEDURES

RESPONSE TO SPILLS:
STOP DISCHARGE, IF IT CAN BE PERFORMED SAFELY, AND CONTAIN MATERIAL. IF A SUBSTANTIAL QUANTITY IS SPILLED, RECOVER WITH PUMP OR VACUUM TRUCK. EXPLOSION-PROOF EQUIPMENT SHOULD BE USED IF THIS PRODUCT IS FLAMMABLE OR COMBUSTIBLE(SEE SECTION 7). OTHERWISE, USE AN ABSORBENT SUCH AS FULLER'S EARTH, CLAY, OR OTHER APPROPRIATE SYNTHETIC ABSORBENT. PLACE CONTAMINATED MATERIAL IN A SUITABLE CONTAINER FOR DISPOSAL. APPROPRIATE SAFETY MEASURES AND PROTECTIVE EQUIPMENT SHOULD BE USED (SEE SECTION 6).

DO NOT FLUSH TO STREAMS, RIVERS, OR OTHER BODIES OF WATER.

PRECAUTIONS:
NO SPECIAL PRECAUTIONS NECESSARY.

DISPOSAL METHODS:
IF DISCARDED IN ITS ORIGINAL UNUSED FORM, THIS PRODUCT SHOULD BE MANAGED (STORED/TREATED/DISPOSED/ETC.) AT AN AUTHORIZED FACILITY, IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS. BE SURE TO CONTACT APPROPRIATE GOVERNMENT ENVIRONMENTAL AGENCIES IF FURTHER DISPOSAL GUIDANCE IS REQUIRED.

OF THE METHODS OF DISPOSAL CURRENTLY AVAILABLE, IT IS RECOMMENDED THAT AN ALTERNATIVE BE SELECTED ACCORDING TO THE FOLLOWING ORDER OF PREFERENCE, BASED UPON ENVIRONMENTAL ACCEPTABILITY:

(1) RECYCLE OR REWORK IF AT ALL FEASIBLE,
(2) INCINERATE AT AN AUTHORIZED FACILITY, OR
(3) TREAT AT AN ACCEPTABLE WASTE TREATMENT FACILITY.

SECTION 10: SPECIAL PRECAUTIONS

RECOMMENDED STORAGE PRACTICE AND CONDITIONS:
STORE IN COOL, DRY, WELL VENTILATED AREA.

CONTAINER USE PROCEDURES:
NO SPECIAL PRECAUTIONS ARE NEEDED. FOLLOW GOOD MANUFACTURING AND HANDLING PRACTICES.

EMPTY CONTAINER PRECAUTIONS:
THIS CONTAINER CAN BE HAZARDOUS WHEN EMPTY, BECAUSE IT CAN RETAIN PRODUCT RESIDUES. THEREFORE, DO NOT REUSE CONTAINER FOR FOOD, CLOTHING, OR PRODUCTS FOR HUMAN OR ANIMAL CONSUMPTION OR WHERE SKIN CONTACT MAY OCCUR.

SUPPLEMENTAL SECTION 10 INFORMATION:
HMIS/NFPA CLASSIFICATION - HEALTH: 2*; FLAMMABILITY: 1; REACTIVITY: 0.
* = CHRONIC EFFECTS

SECTION 11: PHYSICAL DATA

% NON-VOLATILES (BY WEIGHT):	97.5
pH:	NOT ESTABLISHED
VAPOR DENSITY (AIR=1):	NOT ESTABLISHED
SOLUBILITY IN WATER:	MISCIBLE
EVAPORATION RATE:	NOT ESTABLISHED
VAPOR PRESSURE (mmHg @ 25 DEGREES C):	NOT ESTABLISHED
SPECIFIC GRAVITY (WATER=1):	1.103
APPROXIMATE BOILING POINT:	707 F, 375 C

SUPPLEMENTAL SECTION 11 INFORMATION:
VOC = NOT ESTABLISHED.

NOTE: THE PHYSICAL DATA PRESENTED ABOVE ARE TYPICAL VALUES AND SHOULD NOT BE CONSTRUED AS A SPECIFICATION.

SECTION 12: LABEL AND TRANSPORTATION INFORMATION

DOT SHIPPING NAME: NON-REGULATED
DOT LABEL: NOT APPLICABLE
DOT IDENTIFICATION NO.: NOT APPLICABLE
MORTON PRECAUTIONARY LABEL NO.: NOT ESTABLISHED

SECTION 13: REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT (TSCA)

CHEMICAL COMPONENT(S) IN THIS PRODUCT ARE ON THE SECTION 8(b) CHEMICAL SUBSTANCE INVENTORY LIST (40 CFR 710).

SARA TITLE III INFORMATION

SECTION 313 - TOXIC CHEMICALS

PURSUANT TO SECTION 313 OF SARA TITLE III, THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL IN EXCESS OF 1 PERCENT OF THE MIXTURE (0.1 PERCENT, IF THE LISTED TOXIC CHEMICAL IS A CARCINOGEN).

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES

PURSUANT TO SECTION 302 OF SARA TITLE III, THIS PRODUCT DOES NOT CONTAIN AN EXTREMELY HAZARDOUS SUBSTANCE.

SECTION 311/312 - HAZARD CATEGORIES

PURSUANT TO SECTION 311/312 OF SARA TITLE III, THE PHYSICAL AND HEALTH HAZARD CATEGORIES FOR THIS PRODUCT ARE IDENTIFIED BELOW:

FIRE HAZARD: NO
SUDDEN RELEASE OF PRESSURE HAZARD: NO
REACTIVITY HAZARD: NO
IMMEDIATE (ACUTE) HEALTH HAZARD: YES
DELAYED (CHRONIC) HEALTH HAZARD: NO

SUPPLEMENTAL SECTION 13 INFORMATION:

MOR-LIFE IS A TRADEMARK OF MORTON INTERNATIONAL, INC.

SECTION 14: USERS RESPONSIBILITY

A BULLETIN SUCH AS THIS CANNOT BE EXPECTED TO COVER ALL POSSIBLE INDIVIDUAL SITUATIONS. AS THE USER HAS THE RESPONSIBILITY TO PROVIDE A SAFE WORKPLACE, ALL ASPECTS OF AN INDIVIDUAL OPERATION SHOULD BE EXAMINED TO DETERMINE IF, OR WHERE, PRECAUTIONS - IN ADDITION TO THOSE DESCRIBED HEREIN - ARE REQUIRED. ANY HEALTH HAZARD AND SAFETY INFORMATION CONTAINED HEREIN SHOULD BE PASSED ON TO YOUR CUSTOMERS OR EMPLOYEES, AS THE CASE MAY BE.

DISCLAIMER OF LIABILITY

THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. HOWEVER, SINCE THE CONDITIONS OF HANDLING AND USE ARE BEYOND OUR CONTROL, WE MAKE NO GUARANTEE OF RESULTS, AND ASSUME NO LIABILITY FOR DAMAGES INCURRED BY USE OF THIS MATERIAL. ALL CHEMICALS MAY PRESENT UNKNOWN HEALTH HAZARDS AND SHOULD BE USED WITH CAUTION. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, WE CANNOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS WHICH EXIST. FINAL DETERMINATION OF SUITABILITY OF THE CHEMICAL IS THE SOLE RESPONSIBILITY OF THE USER. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS. IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

IF YOU HAVE QUESTIONS WITH REGARD TO HEALTH EFFECTS, OR OTHER INFORMATION PRESENTED IN THIS DOCUMENT, CONTACT:

DAVID B. WIENCKOWSKI, D.A.B.T.
MANAGER, PRODUCT SAFETY AND TOXICOLOGY
MORTON INTERNATIONAL, INC.
100 N. RIVERSIDE PLAZA
CHICAGO, IL 60606
312-807-3422

Material Safety Data Sheet

STATE OF CALIFORNIA ADDENDUM TO THE

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: MORLIFE 500 ASPHALT ADDITIVE
EFFECTIVE DATE: 05/05/95

THE CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986, OTHERWISE KNOWN AS PROPOSITION 65, REQUIRES THAT PERSONS POTENTIALLY EXPOSED TO CERTAIN SUBSTANCES BE MADE AWARE OF THE CHRONIC EFFECTS OF THE SUBSTANCES SPECIFIED BY THE STATE OF CALIFORNIA.

THIS PRODUCT IS NOT KNOWN TO CONTAIN SUBSTANCES "KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM."

COMMONWEALTH OF PENNSYLVANIA ADDENDUM TO THE

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: MORLIFE 500 ASPHALT ADDITIVE
EFFECTIVE DATE: 05/05/95

ALL OF THE MATERIALS IN THIS PRODUCT THAT ARE REQUIRED BY THE COMMONWEALTH OF PENNSYLVANIA TO BE IDENTIFIED ARE LISTED BELOW. IN ADDITION, SOME OF THE MATERIALS IDENTIFIED MAY HAVE BEEN PLACED BY THE COMMONWEALTH OF PENNSYLVANIA ON THEIR HAZARDOUS SUBSTANCE LIST.

INGREDIENTS	CAS NUMBER	WEIGHT %
OXYGENATE	PROPRIETARY	30 - 60
ALIPHATIC POLYAMINES	PROPRIETARY	30 - 60

THE SPECIFIC CHEMICAL IDENTITY OF ANY SUBSTANCE NOT IDENTIFIED WITH A CHEMICAL ABSTRACT SERVICE NUMBER IS BEING HELD AS A TRADE SECRET.

4.) ASPHALT CEMENT

MATERIAL SAFETY DATA SHEET

Issue Date: 02/15/03 Supersedes: 02/18/99

1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

Product name: **Asphalt Cement**
General Use: This product is used as a petroleum asphalt cement
Synonyms: PRODUCT GRADES: AC-5, AC-10, AC-15, AC-20, AC-30, Emulsion Base, AR-2000, AR-2000W, AR-4000, AR-4000W, AR-8000, PBA-1, PBA-2, PBA-4, PBA-5, 120/150, PG64-22, PG64-28, PG58-22, PG58-28, PG70-22

Responsible Party: McCall Oil and Chemical Corporation
5480 NW Front Avenue
Portland, Oregon 97210
Phone: 503-221-6400
Fax: 503-221-6414

24 Hour Emergency Phone Numbers:

McCall Oil:	503-219-0995
Foss Environmental:	503-283-1150

NFPA HAZARD CLASS:

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

2. COMPOSITION & INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% Volume	EXPOSURE GUIDELINES		
		Limits	Agency	Type
Asphalt	99.9+	5mg/m3	ACGIH	TWA-skin
CAS# 8052-42-4		(fumes)		
Eye, Skin, Respiratory Irritant; Thermal Hazard				
Hydrogen Sulfide	<0.10	10 ppm	ACGIH	TWA
CAS# 7783-06-4		15 ppm	ACGIH	STEL
Flammable Gas, Eye, Skin and Respiratory Irritant,		10 ppm	OSHA	TWA
Toxic by Inhalation		15 ppm	OSHA	STEL

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A black colored, hot, semi-solid having an asphalt odor. This product can ignite at elevated temperatures and will burn. When heated for shipment and use, fumes and vapors are moderately irritating to eyes and respiratory tract. Contact with heated liquid material can cause severe thermal burns to all tissue contacted. Heated material may release toxic hydrogen sulfide fumes.

3. HAZARDS IDENTIFICATION (continued)

POTENTIAL HEALTH EFFECTS:

INHALATION: When product is heated, exposure to fumes may be moderately irritating to the respiratory tract. Symptoms of exposure may include: headache, dizziness, nausea and vomiting. High fume concentration may result in hydrogen sulfide exposure.

EYE CONTACT: When product is heated, exposure to fumes, mists or vapors may cause mild eye irritation. Symptoms of exposure may include: watering, redness and a stinging sensation. Thermal burns may result from contact with hot material and may cause corneal damage or visual impairment.

SKIN CONTACT: When product is heated, exposure to fumes, mists vapors or fume condensates may cause moderate skin irritation. Symptoms of exposure may include: redness, swelling, chemical burns and discoloration. No published reports indicate this product is absorbed through the skin.

INGESTION: Ingestion is not expected to be a probable route of exposure for this product.

CHRONIC: Prolonged or repeated skin exposure to this product may cause the development of dermatitis. Possible cancer hazard. Contains material which may cause cancer based on animal data.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact with hot melted material, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention.

SKIN CONTACT: In case of contact with hot melted material, quickly cool in water. Do not try to peel the solidified material from the skin or use solvents or thinners to dissolve it. The use of vegetable oil or mineral oil is recommended for removal of the material from the skin. Remove contaminated clothing and shoes. If burns or irritation occurs get medical attention.

INGESTION: Ingestion is not expected to be a probable route of exposure for this product. First aid procedures for ingestion are not required.

NOTE TO PHYSICIANS: Exposure may result in hydrogen sulfide poisoning, which results in impairment of cellular oxidative phosphorylation producing neurotoxicity, metabolic acidosis and cardiovascular damage. Administration of 100% oxygen and supportive care constitute the preferred treatment for hydrogen sulfide poisoning.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: Greater than 232° C (450° F) Cleveland Open Cup

Flammable Limits (in air, % by volume): Lower: No data available Upper: No data available

Autoignition Temperature: Approximately 392° C (700° F)

GENERAL HAZARD: This product is not a combustible per OSHA or WHMIS criteria, but will ignite at elevated temperatures and will burn. Heated material may release hydrogen sulfide fumes.

FIRE FIGHTING INSTRUCTIONS: EXTINGUISHING MEDIA: Foam, CO2 and dry chemicals. Use water spray or water fog to cool containers exposed to fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition will produce toxic oxides of carbon and sulfur, with possible minute quantities of hydrogen sulfide gas and dense smoke.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: If liquid material is spilled, allow it to cool and solidify before proceeding with disposal methods. Place in approved containers for disposal. Flush spill area with water, collect rinsates and containerize for disposal. Prevent run-off from contaminating sewers, streams or other bodies of water.

WATER SPILL: This material is insoluble in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient
STORAGE PRESSURE: Ambient

GENERAL: Store in an area away from all sources of ignition and incompatible material. Avoid breathing fumes, vapors or mists from heated material. Use only with adequate ventilation. Protect eyes, skin and clothing from contact with heated material. Wear recommended protective equipment. Wash thoroughly after handling, before smoking, eating or drinking. Do not use solvents to clean hands and face. Use vegetable oils or mineral oil followed by a thorough washing with soap and water. Do not enter vapor spaces without proper respiratory equipment. Empty containers may be hazardous. They may contain organic residues that can be ignited and will burn. Do not cut, puncture or weld on or near empty containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: Not required for normal use of this product. If heated material generates fumes, vapors or mists, use local mechanical exhaust ventilation capable of maintaining emissions in the work area below a level where irritation is noticeable or below the ACGIH-TLV for asphalt or hydrogen sulfide.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: Not required for normal use of this product. If use generates vapors or mists, wear a NIOSH-approved half mask air-purifying cartridge respirator equipped with an organic vapor cartridge or supplied air.

EYES; Not required for normal use of this product. If material is used at elevated temperatures, wear chemical goggles (recommended by ANSI Z87.1-1979) or a face shield.

GLOVES: Use heat resistant gloves when handling material at elevated temperatures.

CLOTHING & EQUIPMENT: Normal work clothes should be sufficient when handling product. An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Normal work boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black colored
Physical State:	Solid at ambient temperatures
Odor:	Petroleum odor
Odor Threshold:	No data available
Molecular Formula:	Not applicable – Mixture
Molecular Weight:	Not applicable – Mixture
Boiling Point:	Greater than 400° C (700° F)
Melting Point:	37 to 57° C (100 to 135° F)
Specific Gravity:	1.0 to 1.04 @ 20° C
Density (pounds/gallon):	8.3 to 8.7
Bulk Density (lbs/cuft):	Not applicable
Vapor Pressure:	No data available
Vapor Density (air=1):	No data available
Evaporation Rate (n-Butyl Acetate+1):	No data available
VOC Content:	No data available
% Volatile:	Negligible
Solubility in H2O:	Insoluble
Octanol/Water Partition Coefficient:	No data available
PH (as is):	Not applicable
PH (1% solution):	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIAL: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating of this product may produce hydrogen sulfide gas.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

11. TOXICOLOGICAL INFORMATION SUMMARY

Estimate of product toxicological data based on available individual component information.

Eye Irritation: No specific data available – heated product should be a moderate irritant
Skin Irritation: No specific data available – heated product should be a moderate irritant
Oral Rat LD50: No specific data available
Dermal Rabbit LD50: No specific data available
Inhalation Rat LC50: No specific data available
Synergistic Products: None reported
Target Organs: Eyes, Skin, and Lungs (heated product)
Medical Conditions Aggravated by Exposure: Respiratory and skin disorders

Toxicological Notes: Petroleum and petrochemical products may contain trace amounts of chemicals known to cause cancer and/or birth defects or other reproductive harm. Trace contaminates may be naturally present in the raw materials, may result from the manufacturing process, or the product may become inadvertently contaminated during handling.

The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of asphalts in 1985 and again in 1987. They concluded there was inadequate evidence to decide that asphalts were carcinogenic to humans. Asphalt fume condensates and certain chemical components of asphalt fumes have been shown to cause cancer in mice when repeatedly applied to the skin and allowed to remain on the skin for a prolonged period of time. Asphalt fume condensates have been shown to be weakly positive in Ames mutagenicity tests.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
The environmental fate of this product is expected to be: **Land**: no biodegradation or leaching into the groundwater. **Water:** no volatilization and biodegradation. **Air:** not expected to exist in vapor phase. Product is not expected to bioaccumulate.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity information for this product is not available.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Not applicable

U.S. EPA WASTE NUMBER/DESCRIPTION: None

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of subpart C, nor is it listed as a hazardous waste under Subpart D. As a non-hazardous liquid waste, it should be disposed of in accordance with all local, state and federal regulations. Consult state or local officials for proper disposal method.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Shipped above 100° C but below the flash point: **Elevated Temperature Liquid, N.O.S.**
DOT HAZARD CLASS: below flash point - 9
UN NUMBER: below flash point – UN3257
PACKING GROUP: III
DOT LABELS: Primary: None required for bulk shipments Subsidiary: None required
DOT PLACARDS: below flash point – Class 9
DOT Reportable Quantity: None
MARINE POLLUTANT: No
1993 DOT Emergency Response Guidebook Number: 27
1996 North American Emergency Response Guidebook Number: 128

15. REGULATORY INFORMATION ON PRODUCT

Target Organs: Eyes, Skin and Lungs
Carcinogenic Potential:
Regulated by OSHA: Not applicable for this product
Listed on NTP Report: Not applicable for this product
IARC Listing: Product is listed as a Group 3
ACGIH Appendix A: Not applicable for this product
A1 Confirmed Human: Not applicable for this product
A1 Suspected Human: Not applicable for this product

U.S. EPA Requirements
Release Reporting under CERCLA (40 CFR 302):
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
RCRA Waste No: Not applicable for this product

SARA TITLE III
Section 302 & 303 (40 CFR 355)
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
Planning Threshold: Not applicable for this product

15. REGULATORY INFORMATION ON PRODUCT (continued)

SARA TITLE III (continued)
Section 311 & 312 (40 CFR 370)

Hazard Categories:	Fire: N
	Sudden Release of Pressure: N
	Reactive: N
	Acute Health: N
	Chronic Health: Y
Planning Threshold:	10,000 pounds

Section 313 (40 CFR 372)

Listed Toxic Chemical:	Product does not contain any listed components above the diminimus level
Reporting Threshold:	Not applicable for this product

U.S. TSCA STATUS

Listed (40 CFR 710):	All components of this product are listed in the TSCA Inventory

STATE REGULATIONS:
State of California
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)

Carcinogen:	Not applicable for this product
Reproductive Toxin:	Not applicable for this product

OTHER REGULATIONS

State Right to Know Laws:	Asphalt is listed on the MA, NJ, PA and MN Right to Know Listings

16. OTHER INFORMATION

Special Notes: WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum, if subjected to a sudden ingress of air, or outside process equipment operating under elevated pressure if a sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

MSDS Revision Information:	Form Revision made 05/02/95
Information Revised This Issue Date:	Combined product information and changed contact numbers
MSDS distributed by:	McCall Oil & Chemical Corporation Phone: 503-221-6400 Fax: 503-221-6414

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which McCall Oil & Chemical Corporation assumes legal responsibility. While McCall Oil & Chemical Corporation believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state and local regulations.

ConocoPhillips

MATERIAL SAFETY DATA SHEET

ConocoPhillips Superpave PG 64-22

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	ConocoPhillips Superpave PG 64-22
Product Code:	SUPERPAVE PG 64-22
Intended Use:	Asphalt
Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
Customer Service:	918-661-9476
Technical Information:	918-661-9476

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) 356-3219

Health Hazards/Precautionary Measures: Contact with hot asphalt will result in thermal burns. Avoid contact with hot material.May contain or liberate poisonous hydrogen sulfide gas. Harmful if inhaled.

Physical Hazards/Precautionary Measures: Hydrogen sulfide and other hazardous vapors can collect in the headspace of storage tanks or other enclosed vessels. Hydrogen sulfide is extremely flammable and poisonous. Avoid breathing vapors, fumes or mist. Wear respiratory protection when venting tanks.

Appearance:	Black, Viscous
Physical Form:	Semi-solid
Odor:	Asphalt

NFPA 704 Hazard Class:		**HMIS Hazard Class:**	
Health:	0 (Least)	**Health:**	1* (Slight)
Flammability:	1 (Slight)	**Flammability:**	1 (Slight)
Instability:	0 (Least)	**Physical Hazards:**	0 (Least)

* Indicates possible chronic health effects.

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. For contact with the molten material, gently open eyelids and flush affected eye(s) with cold water. Seek immediate medical attention.

Skin: For contact with hot asphalt, leave material on skin and immediately flush or immerse affected area(s) using cold, not icy, water for up to 10 minutes. No attempt should be made to remove the asphalt from the skin. Contaminated clothing may be removed provided it is not adhering to the skin. Seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required for the solid material; however, if molten material is swallowed, seek immediate medical attention.

Notes to Physician: Once cooled, adhered asphalt is not harmful to the skin, and in fact, provides a sterile cover over the affected area. The asphalt will detach itself within a few days as healing occurs. If it is necessary to remove the asphalt, only medically approved solvents or warm paraffin should be used to prevent further skin damage.

This material may contain or liberate hydrogen sulfide. In high doses hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. If unresponsive to supportive care, nitrites (amyl nitrite by inhalation or sodium nitrite IV) may be an effective antidote, if delivered within the first few minutes of exposure.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	480°F / 248°C (CC)
OSHA Flammability Class:	Not regulated
NFPA Flammability Class:	No data
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. Hot asphalt may ignite flammable mixtures on contact. If water is applied to heated material, it can cause violent foaming and boil over.

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.Water fog may be used on flat surfaces such as roads. Do not use water on asphalt fire in tank or other containers since it may cause violent eruption and spreading of burning asphalt.

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. Water or foam can cause frothing. 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

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

Appearance:	Black Viscous
Physical Form:	Semi-solid
Odor:	Asphalt
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure (mm Hg):	<1
Vapor Density (air=1):	>1
Boiling Point:	> 900°F / 482°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water):	No data
Specific Gravity:	1.02-1.05
Bulk Density:	8.47
Bulk Density Units	lbs/gal
Evaporation Rate (nBuAc=1):	<1
Flash Point:	480°F / 248°C
Test Method:	(CC)
LEL%:	No data
UEL%:	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). Toxic fumes can be released on heating. Do not allow contact of molten product with water or liquids as violent eruptions, splatter of hot material or ignition of flammable materials may result.

Materials to Avoid (Incompatible Materials): Avoid contact with fluorine, nitric acid, strong oxidizing agents.

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

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Bitumen - CAS: 8052-42-4
Carcinogenicity: Skin application of asphalt fume condensate fractions caused skin tumors in laboratory mice. Animal studies in which high concentrations of asphalt fumes were breathed for extended periods of time did not cause carcinogenic effects. Trace amounts of polynuclear aromatic hydrocarbons (PAHs) may be present in asphalts and can be generated upon excessive heating. Some PAHs have been identified as causing carcinogenic and reproductive effects.

The International Agency for Research on Cancer (IARC) has concluded: there is inadequate evidence that bitumens (asphalt) alone are carcinogenic in humans; that there is limited evidence for the carcinogenicity of undiluted, steam refined bitumens, and for cracking residue bitumens in laboratory animals; and that there is inadequate evidence for the carcinogenicity of extracts of undiluted air-refined bitumens in laboratory animals.

Acute Data:

Bitumen - CAS: 8052-42-4
Dermal LD50 = No information available
LC50 = No information available
Oral LD50 = No information available

MATERIAL SAFETY DATA SHEET

ASPHALT CEMENTS

MSDS PAGE NUMBERS

CA 1 - CA 4

"SAFETY FIRST"

CENEX REFINERY, P.O. Box 909, Laurel, MT, 59044, (406) 628-5200

SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

CHEMICAL NAME:
Petroleum Asphalt Cements

CAS NUMBER:
8052-42-4

COMMON NAMES:
Penetrating graded asphalt (AASHTO M-20); Viscosity graded asphalt (AASHTO M-226); paving asphalt. Viscosity graded: AC-, AC-2.5F, AC-2.5, AR2000W, AC-5F, AC-5, AC-10, AC-10F, AC-20, AC-20F, AC-120/150, AC-120/150F, AC-AR4000W, AC-AR4000WF. Penetration graded: AC-60/70, AC-85/100, AC-85/100F, AC-200/300, AC-200/300F; PBA-2, PBA-5; PG 58-28 and PG 64-22. Also, Roofing Flux.

PRODUCT APPEARANCE AND ODOR:
Semi-solid thermoplastic material; Viscous, hot liquid when heated above 90-130°F; Black color; Characteristic asphaltic odor.

EMERGENCY TELEPHONE NUMBERS:	CHEMTREC	1-800-424-9300
	CENEX REFINERY	1-406-628-5200

SECTION II COMPONENTS, HAZARD AND REGULATORY INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Asphalt	8052-42-4	99%
(1),(2),(3) Hydrogen Sulfide (H_2S)	7783-06-4	<0.1%

(If this material is heated at high temperatures, H_2S may exist in the head space of storage vessels and containers.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION and HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	Basis
1	2-3*	0	Recommended by National Fire Protection Association (NFPA) and CENEX. Least-0 Slight-1 Moderate-2 High-3 Extreme-4

*based on highest flammable mixtures

EXPOSURE LIMIT FOR TOTAL PRODUCT BASIS

5 mg/m3 For Oil Mist In Air	OSHA 1910.1000, TABLE Z-1-A
10 ppm, 8-hr TWA, H_2S	OSHA 1910.1000, TABLE Z-1-A
15 ppm, STEL, H_2S	OSHA 1910.1000, TABLE Z-1-A (ALSO SEE TABLE Z-2)

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUES:

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA SECTIONS 311-313)
(1) This product does not contain any listed chemicals, by weight, above the deminimis reporting levels.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CRF 355 (SARA SECTIONS 301-304)
(2) Not applicable.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA SECTION 102)
(3) Not applicable

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SECTION III PRIMARY ROUTES OF ENTRY, EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT:
If hot product is splashed into eyes, flush with cool, clear water and seek medical assistance immediately.

SKIN:
If skin is contacted with hot asphalt, thermal burns will result. In the case of a large surface area burn, the contaminated area should be treated similar to other thermal burns by cooling the affected area immediately with coolest available water. It is not usually advisable to immediately remove the asphalt material. Natural separation will occur in 48-72 hours. Removal should be attempted only under the direction of a physician. If removal is attempted mineral oil (not mineral spirits), mineral oil ointment, or commercial products specific for asphalt removal, such as, DESOLV-IT may be applied to soften the asphalt to facilitate removal. For serious burns, seek medical assistance immediately.

For small minor burns or if skin is contaminated with cool, solid asphalt, the contaminate area should be cleaned with waterless skin cleanser followed by soap and water. Treat minor burns using appropriate first aid procedures.

INHALATION:
If overcome by H_2S, immediately remove to fresh air and seek medical assistance immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION:
If ingested, DO NOT induct vomiting; seek medical assistance immediately.

SECTION IV FIRE & EXPLOSION HAZARD INFORMATION

FLASHPOINT (MINIMUM)
325°F COC
ASTM D 92
COMBUSTIBLE IIIB

AUTOIGNITION TEMPERATURE
Greater than 905°F

HANDLING PRECAUTIONS
Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
% LEL and % UEL not listed by NFPA. Flammable at temperatures above 500°F. Flammability may depend on H_2S concentration and residual solvents.

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (not straight streams), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialist.

Water or foam may cause "frothing". Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

In storage tanks, avoid gross contamination with water. Water in contact with hot asphalt may result in a violent reaction causing an increase in tank pressure and substantial foaming and frothing of the product.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition's products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. Do not cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition: they may explode and cause injury or death. All containers to be disposed of should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks, refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

"HOT WORK" PROCEDURES
A written "hot work" permit is required for any repair or maintenance operations on equipment, piping, container, or tank containing or contaminated with this chemical material, when any open flame, burning, acetylene cutting, arc welding, brazing, grinding, sand blasting, use of electrical power tools, or any spark producing operations are required for said repair or maintenance. The equipment, piping, container, or tank to be worked on shall be drained, steamed, water washed, isolated and/or blinded, ventilated, or any combination of these, as determined necessary, to provide a safe "hot work" environment. The equipment, piping, container, tank and the surrounding area shall be inspected and tested for the percent of the "lower explosive limit" and for toxic gas concentrations using appropriate testing equipment (i.e.., Gascope). Combustible material in the area shall be protected or removed. Proper "lockout/tagout" and "confined space entry" procedures shall be observed at all times. Each situation shall be evaluated on an individual basis by competent Safety personnel, who shall make all final determinations as to safety, proper PPE, and issuance of "hot work permits".

SECTION V HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (SIGNS AND SYMPTOMS OF EXPOSURE)

The Internal Agency for Research on Cancer, IRAC, conducted a thorough literature search in 1985 and determined that there is inadequate evidence for the carcinogens of undiluted asphalt in animals or humans. IARC also concluded that mouse skin painting studies showed that extracts of asphalts caused skin tumors. However, these extracts were derived by using benzene as the solvent and the resulting extract does not realistically characterize asphalt to which humans are exposed The same criticism applies to a recent study where roofing asphalt fumes condensate, dissolved in cyclohexane/actone, cause skin cancer in a similar mouse painting study. These animal data should be interpreted cautiously since the health effects may be dependent on variables such as solvent-extraction procedure, source of crude oil, manufacturing process, and that these studies involved repeated exposure of shaved skin which was never washed free of test material.

Inhalation of high vapor concentrations may cause eye and respiratory irritation, headaches, dizziness or nausea, unconsciousness and possibly death. Prolonged or repeated contact with product at warm or near ambient temperature may cause skin irritation. CAUTION: product normally shipped hot (approximately 225-350°F).

NATURE OF HAZARD AND TOXICITY INFORMATION

Skin contact with hot s. Prolonged or repeated contact with this product at warm or ambient temperatures may cause skin irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Eye contact with hot product may cause thermal burns. Contact with this product at warm or ambient temperatures may cause eye irritation but will not damage eye tissue.

CAUTION: Under certain circumstances, sulfur compounds in hot product may form hydrogen sulfide (H_2S) gas. Cooling product may continue to emit traces of H_2S temporarily from entrapped or dissolved gases. H_2S is a colorless, toxic and extremely flammable gas with an odor at low concentrations characteristic of rotten eggs and a sweetish odor at high concentrations. Odor cannot be relied upon as a means of detection because the sense of smell rapidly becomes insensitive to H_2S and the H_2S odor may be masked by the general odor of hot product. Because H_2S may accumulate in tanks and bulk transport compartments, personnel should stand upwind, keep their faces at least two feet from compartment openings, and avoid breathing vapors when opening hatches and dome covers. (In a large number of tests, permissible concentrations in the breathing zone were not exceeded by following this procedure.)

Signs and symptoms of overexposure to H_2S, conjunctivitis, olfactory fatigue, headache, dizziness, nausea, irritability, insomnia, tremors, weakness, numbness of extremities, unconsciousness and death.

Prolonged breathing to 50 to 100 ppm of H_2S may produce eye and respiratory tract irritation, headache, nervousness and nausea, and only a few breaths of high concentrations (e.g. 700 to 1000 ppm) may lead to unconsciousness, respiratory paralysis and could be fatal. To avoid possible inhalation toxicity, the American Conference of Governmental Industrial Hygienists (ACGIH) has adopted a threshold limit value for H_2S of 10 ppm in air as time-weighted average for an 8-hour workday. OSHA regulation 29 CFR 1910.1000 further lists a ceiling concentration of 20 ppm, and a maximum peak of 50 ppm for 10 minutes once per day if no other measurable exposure occurs. NIOSH-approved respiratory equipment should be used when permissible concentrations are exceeded.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mile to severe pulmonary injury and possible death.

This product is judged to have an acute oral LD_{50} (rat) greater than 5 g/kg of body weight, and an acute dermal LD_{50} (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE:

None recognized.

CARCINOGEN/POTENTIAL CARCINOGEN NTP: No IARC: CAT. 2B OSHA: No

SECTION VI PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILER RANGE (or IBP)

IPB approximately 900°F

SPECIFIC GRAVITY

1.0 to 1.1

POUR, CONGEALING OR MELTING POINT

131°F

Melting point by ASTM D 87

VAPOR PRESSURE

Less than 0.1 mm hg @ 20°C

VAPOR DENSITY (AIR = 1)

Greater than 5

SOLUBILITY IN WATER @ 1 ATM, AND 25°C(77°F)

Negligible: less than 0.1%

SECTION VII REACTIVITY INFORMATION

This product is stable. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite. Hot product in contact with water can cause foaming or sudden evolution of steam which could cause pressure build-up and possibly rupture a tank or vessel.

Hydrogen Sulfide (H_2S) from the product can react with the iron in an asphalt storage tank to form ferous sulfide which is pyrophoric.

SECTION VIII ENVIRONMENTAL INFORMATION

LAND AND WATER SPILLS

Toxic to aquatic life. Keep public away. Shut off source of leak if possible to do so without hazard. Eliminate all ignition sources. NO SMOKING! Advise National Response Center (800-424-8802) if product has entered a water course. Advise local and state emergency services agencies, if appropriate. Contain liquid with sand or soil or other suitable absorbent material. Dike or divert spill into natural containment areas. Recover and return free material to source. Use suitable sorbents to clean up residual liquids.

EPA HAZARD CLASSIFICATION CODE:

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

SECTION IX PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes when handling hot product, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed, or when H_2S exceeds permissible limits.

PROTECTIVE GLOVES

Protect against hot liquid. Use chemical-resistant gloves to avoid skin contact.

EYE PROTECTION

Safety glasses. Splash proof goggles or face shield if material may be readily splashed into eyes.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to protect against hot liquid and to avoid skin contact.

WORK PRACTICES/ENGINEERING CONTROLS

Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing and launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if unable to clean. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

SECTION X TRANSPORTATION & OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest department of transportation emergency response guidebook for hazardous materials incidents, DOT p. 5800.4.

US. DOT INFORMATION AND CLASSIFICATION:

Elevated Temperature .Liquid, n.o.s., (Asphalt), 9, UN 3257, III
Placarded: None
Labels: "HOT, 3257"

DOT, EMERGENCY RESPONSE GUIDEBOOK, 1993:

Guide #27

STORAGE TEMPERATURE, °F:

375°F (max.)

LOADING/UNLOADING TEMPERATURE, °F:

400°F (max.)

STORAGE/TRANSPORT PRESSURE, MMHG:

Atmospheric

VISC. AT LOADING/UNLOADING TEMP., CST:

Varies

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.

CA4
CA3

DANGER!!!!!

FLAMMABLE VAPORS

MAY FORM HYDROGEN SULFIDE (H_2S) WHEN HEATED
INHALATION OF H_2S MAY BE FATAL
EXTREMELY HOT PRODUCT MAY CAUSE SEVERE THERMAL BURNS

NOTE: PRODUCT LABEL WILL CONTAIN ADDITIONAL NON-OSHA RELATED INFORMATION.

The information and recommendations contained herein are, to the best of CENEX, Inc.'s knowledge and belief, accurate and reliable as of the date issued. CENEX, Inc. does not warrant or guarantee their accuracy or reliability, and CENEX, Inc. shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure that proper health, safety and other necessary information is included on the he container.

The Environmental Information included under Section VIII hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with CENEX, Inc.'s interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
Environmental Health & Safety Department
(EH&S Department)
Cenex Refinery
P.O. Box 909
Laurel, Montana 59044
(406) 628-5200

FOR OTHER PRODUCT INFORMATION CONTACT:
Marketing Department
Cenex
P.O. Box 909
Laurel, Montana 59044
(406) 628-5200

PREPARED BY:	DATE PREPARED:	SUPERSEDES ISSUE DATED:
H. Russell Lowe, EH&S Dept.	April 17, 1999	October 15, 1997

FILE: MSDS-ASPHALT CEMENTS

5.) ASPHALT CEMENT
W/ POLYMER

MATERIAL SAFETY DATA SHEET

Issue Date: 09/21/07 Supersedes: 02/15/03

1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

Product name: **Asphalt Cement with Polymer Additives**
General Use: This product is used as a petroleum asphalt cement
Synonyms: PRODUCT GRADES: PG 70-28, PG 76-28, PG 70-22 ER, PG 76-22 ER PG 64-28 ER

Responsible Party: McCall Oil and Chemical Corporation
5480 NW Front Avenue
Portland, Oregon 97210
Phone: 503-221-6400
Fax: 503-221-6414

24 Hour Emergency Phone Numbers:

McCall Oil:	503-219-0995
Foss Environmental:	503-283-1150

NFPA HAZARD CLASS:

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

2. COMPOSITION & INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% Volume	EXPOSURE GUIDELINES Limits	Agency	Type
Asphalt CAS# 8052-42-4 Eye, Skin, Respiratory Irritant; Thermal Hazard	95+	5mg/m3 (fumes)	ACGIH	TWA-skin
Hydrogen Sulfide CAS# 7783-06-4 Flammable Gas, Eye, Skin and Respiratory Irritant, Toxic by Inhalation	<0.10	10 ppm	ACGIH	TWA
		15 ppm	ACGIH	STEL
		10 ppm	OSHA	TWA
		15 ppm	OSHA	STEL
Polymer Additive Consisting of either: Styrene-butadiene-styrene; or Ethylene-vinyl Acetate base; or Styrene-butadiene-rubber; or Styrene-ethylene-butadiene-styrene; or Styrene-butadiene copolymer CAS # Proprietary Eye, Skin and Respiratory Irritant	<5	None		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A black colored, hot, semi-solid having an asphalt odor. This product can ignite at elevated temperatures and will burn. When heated for shipment and use, fumes and vapors are moderately irritating to eyes and respiratory tract. Contact with heated liquid material can cause severe thermal burns to all tissue contacted. Heated material may release toxic hydrogen sulfide fumes.

POTENTIAL HEALTH EFFECTS:

INHALATION: When product is heated, exposure to fumes may be moderately irritating to the respiratory tract. Symptoms of exposure may include: headache, dizziness, nausea and vomiting. High fume concentration may result in hydrogen sulfide exposure.

EYE CONTACT: When product is heated, exposure to fumes, mists or vapors may cause mild eye irritation. Symptoms of exposure may include: watering, redness and a stinging sensation. Thermal burns may result from contact with hot material and may cause corneal damage or visual impairment.

SKIN CONTACT: When product is heated, exposure to fumes, mists vapors or fume condensates may cause moderate skin irritation. Symptoms of exposure may include: redness, swelling, chemical burns and discoloration. No published reports indicate this product is absorbed through the skin.

INGESTION: Ingestion is not expected to be a probable route of exposure for this product.

CHRONIC: Prolonged or repeated skin exposure to this product may cause the development of dermatitis. Possible cancer hazard. Contains material which may cause cancer based on animal data.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact with hot melted material, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention.

SKIN CONTACT: In case of contact with hot melted material, quickly cool in water. Do not try to peel the solidified material from the skin or use solvents or thinners to dissolve it. The use of vegetable oil or mineral oil is recommended for removal of the material from the skin. Remove contaminated clothing and shoes. If burns or irritation occurs get medical attention.

INGESTION: Ingestion is not expected to be a probable route of exposure for this product. First aid procedures for ingestion are not required.

NOTE TO PHYSICIANS: Exposure may result in hydrogen sulfide poisoning, which results in impairment of cellular oxidative phosphorylation producing neurotoxicity, metabolic acidosis and cardiovascular damage. Administration of 100% oxygen and supportive care constitute the preferred treatment for hydrogen sulfide poisoning.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: Greater than 232° C (450° F) Cleveland Open Cup

Flammable Limits (in air, % by volume): Lower: No data available Upper: No data available

Autoignition Temperature: Approximately 392° C (700° F)

GENERAL HAZARD: This product is not a combustible per OSHA or WHMIS criteria, but will ignite at elevated temperatures and will burn. Heated material may release hydrogen sulfide fumes.

FIRE FIGHTING INSTRUCTIONS: EXTINGUISHING MEDIA: Foam, CO2 and dry chemicals. Use water spray or water fog to cool containers exposed to fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition will produce toxic oxides of carbon and sulfur, with possible minute quantities of hydrogen sulfide gas and dense smoke.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: If liquid material is spilled, allow it to cool and solidify before proceeding with disposal methods. Place in approved containers for disposal. Flush spill area with water, collect rinsates and containerize for disposal. Prevent run-off from contaminating sewers, streams or other bodies of water.

WATER SPILL: This material is insoluble in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient
STORAGE PRESSURE: Ambient

GENERAL: Store in an area away from all sources of ignition and incompatible material. Avoid breathing fumes, vapors or mists from heated material. Use only with adequate ventilation. Protect eyes, skin and clothing from contact with heated material. Wear recommended protective equipment. Wash thoroughly after handling, before smoking, eating or drinking. Do not use solvents to clean hands and face. Use vegetable oils or mineral oil followed by a thorough washing with soap and water. Do not enter vapor spaces without proper respiratory equipment. Empty containers may be hazardous. They may contain organic residues that can be ignited and will burn. Do not cut, puncture or weld on or near empty containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: Not required for normal use of this product. If heated material generates fumes, vapors or mists, use local mechanical exhaust ventilation capable of maintaining emissions in the work area below a level where irritation is noticeable or below the ACGIH-TLV for asphalt or hydrogen sulfide.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: Not required for normal use of this product. If use generates vapors or mists, wear a NIOSH-approved half mask air-purifying cartridge respirator equipped with an organic vapor cartridge or supplied air.

EYES; Not required for normal use of this product. If material is used at elevated temperatures, wear chemical goggles (recommended by ANSI Z87.1-1979) or a face shield.

GLOVES: Use heat resistant gloves when handling material at elevated temperatures.

CLOTHING & EQUIPMENT: Normal work clothes should be sufficient when handling product. An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Normal work boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black colored
Physical State:	Solid at ambient temperatures
Odor:	Petroleum odor
Odor Threshold:	No data available
Molecular Formula:	Not applicable – Mixture
Molecular Weight:	Not applicable – Mixture
Boiling Point:	Greater than 400° C (700° F)
Melting Point:	37 to 57° C (100 to 135° F)
Specific Gravity:	1.0 to 1.04 @ 20° C
Density (pounds/gallon):	8.3 to 8.7
Bulk Density (lbs/cuft):	Not applicable
Vapor Pressure:	No data available
Vapor Density (air=1):	No data available
Evaporation Rate (n-Butyl Acetate+1):	No data available
VOC Content:	No data available
% Volatile:	Negligible
Solubility in H2O:	Insoluble
Octanol/Water Partition Coefficient:	No data available
PH (as is):	Not applicable
PH (1% solution):	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIAL: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating of this product may produce hydrogen sulfide gas.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

11. TOXICOLOGICAL INFORMATION SUMMARY

Estimate of product toxicological data based on available individual component information.

Eye Irritation: No specific data available – heated product should be a moderate irritant
Skin Irritation: No specific data available – heated product should be a moderate irritant
Oral Rat LD50: No specific data available
Dermal Rabbit LD50: No specific data available
Inhalation Rat LC50: No specific data available
Synergistic Products: None reported
Target Organs: Eyes, Skin, and Lungs (heated product)
Medical Conditions Aggravated by Exposure: Respiratory and skin disorders

Toxicological Notes: Petroleum and petrochemical products may contain trace amounts of chemicals known to cause cancer and/or birth defects or other reproductive harm. Trace contaminates may be naturally present in the raw materials, may result from the manufacturing process, or the product may become inadvertently contaminated during handling.

The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of asphalts in 1985 and again in 1987. They concluded there was inadequate evidence to decide that asphalts were carcinogenic to humans. Asphalt fume condensates and certain chemical components of asphalt fumes have been shown to cause cancer in mice when repeatedly applied to the skin and allowed to remain on the skin for a prolonged period of time. Asphalt fume condensates have been shown to be weakly positive in Ames mutagenicity tests.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
The environmental fate of this product is expected to be: **Land**: no biodegradation or leaching into the groundwater. **Water:** no volatilization and biodegradation. **Air:** not expected to exist in vapor phase. Product is not expected to bioaccumulate.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity information for this product is not available.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Not applicable

U.S. EPA WASTE NUMBER/DESCRIPTION: None

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of subpart C, nor is it listed as a hazardous waste under Subpart D. As a non-hazardous liquid waste, it should be disposed of in accordance with all local, state and federal regulations. Consult state or local officials for proper disposal method.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Shipped above 100° C but below the flash point: **Elevated Temperature Liquid, N.O.S.**
DOT HAZARD CLASS: below flash point - 9
UN NUMBER: below flash point – UN3257
PACKING GROUP: III
DOT LABELS: Primary: None required for bulk shipments Subsidiary: None required
DOT PLACARDS: below flash point – Class 9
DOT Reportable Quantity: None
MARINE POLLUTANT: No
1993 DOT Emergency Response Guidebook Number: 27
1996 North American Emergency Response Guidebook Number: 128

15. REGULATORY INFORMATION ON PRODUCT

Target Organs: Eyes, Skin and Lungs
Carcinogenic Potential:
Regulated by OSHA: Not applicable for this product
Listed on NTP Report: Not applicable for this product
IARC Listing: Product is listed as a Group 3
ACGIH Appendix A: Not applicable for this product
A1 Confirmed Human: Not applicable for this product
A1 Suspected Human: Not applicable for this product

U.S. EPA Requirements
Release Reporting under CERCLA (40 CFR 302):
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
RCRA Waste No: Not applicable for this product

SARA TITLE III
Section 302 & 303 (40 CFR 355)
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
Planning Threshold: Not applicable for this product

15. REGULATORY INFORMATION ON PRODUCT (continued)

SARA TITLE III (continued)
Section 311 & 312 (40 CFR 370)

Hazard Categories:	Fire: N
	Sudden Release of Pressure: N
	Reactive: N
	Acute Health: N
	Chronic Health: Y
Planning Threshold:	10,000 pounds

Section 313 (40 CFR 372)

Listed Toxic Chemical:	Product does not contain any listed components above the diminimus level
Reporting Threshold:	Not applicable for this product

U.S. TSCA STATUS

Listed (40 CFR 710):	All components of this product are listed in the TSCA Inventory

STATE REGULATIONS:
State of California
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)

Carcinogen:	Not applicable for this product
Reproductive Toxin:	Not applicable for this product

OTHER REGULATIONS

State Right to Know Laws:	Asphalt is listed on the MA, NJ, PA and MN Right to Know Listings

16. OTHER INFORMATION

Special Notes: WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum, if subjected to a sudden ingress of air, or outside process equipment operating under elevated pressure if a sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

MSDS Revision Information:	Form Revision made 05/02/95
Information Revised This Issue Date:	Combined product information and changed contact numbers
MSDS distributed by:	McCall Oil & Chemical Corporation Phone: 503-221-6400 Fax: 503-221-6414

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which McCall Oil & Chemical Corporation assumes legal responsibility. While McCall Oil & Chemical Corporation believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state and local regulations.

6.) ARR-MAZ

MATERIAL SAFETY DATA SHEET

Manufacturer

ARR-MAZ PRODUCTS, INC.
621 Snively Avenue
Winter Haven, Fl 33880

Emergency Phone Number

813-293-7884

PRODUCT INFORMATION

Trade Name:	AD-here LOF 65-00		
Chemical Family:	Amines		
Composition:	Modified Fatty Amidoamine		
HMIS RATING:	Health Hazard	2	Moderate
	Flammability Hazard	1	Slight
	Reactivity Hazard	0	Minimal
D.O.T. Shipping Classification:	Not Regulated		

PHYSICAL DATA

Boiling Point (°F):	> 300°F
Solubility in Water:	Slight
Vapor Pressure (mmHg at 25°C):	N/D
Vapor Density (Air = 1):	> 1
Appearance:	Dark brown liquid
Odor:	Mild
Specific Gravity (at 77°F):	0.96 to 0.98

FIRE EXPLOSION

Flash Point (PMCC°F):	> 200°F
Extinguishing Media:	CO_2, foam, or dry chemical
Special Fire Fighting Procedures:	Wear NIOSH/MSHA approved self-contained breathing equipment and protective clothing.

CODE: Z-9061

HEALTH HAZARD INFORMATION

EYE

Effect: Causes irritation or burns, may cause blindness.

First Aid: Immediately flush with plenty of water for at least 15 minutes. Contact a physician immediately.

Protection: Chemical resistant splash proof goggles or a full face shield.

SKIN

Effect: Local irritation or sensitivity can develop from repeated contact.

First Aid: Immediately flush with water for 15 minutes followed by soap and water. If a rash develops contact a physician.

Protection: Exercise normal safety practices. Remove contaminated clothing immediately, wash before reuse.

INHALATION

Effect: Irritation of the respiratory system may occur.

First Aid: Remove to fresh air. If breathing is difficult give oxygen and contact a physician. If not breathing, give mouth to mouth artificial respiration. Immediately call a physician.

Protection: Use where local exhaust or other adequate ventilation is present.

INGESTION

Effect: Harmful when swallowed. May cause burns to the digestive system.

First Aid: Contact a physician or a poison control center immediately.

REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizers and materials that will react with amine compounds.
Hazardous Decomposition Products:	CO, CO2, NOx, and other thermal decomposition by-products.

SPILL, LEAK, AND DISPOSAL PROCEDURES

Spills and Leaks:	Isolate then absorb with earth, vermiculite, or other inert absorbent material. Collect in drums or other containers.
Waste Disposal:	Incinerate or bury in certified landfill according to federal, state and local regulations.

SPECIAL PROTECTION INFORMATION

Respiratory Protection:	Use organic filter respirator.
Protective Gloves:	Impervious rubber or plastic.
Eye Protection:	Chemical resistant splash proof goggles or a full face shield.
Other Protective Equipment:	Eye wash and safety shower should be easily accessible.

STORAGE AND SPECIAL PRECAUTIONS

Storage Precautions:	Avoid storage temperatures near or above flash point. Use standard handling and safety practices.
Other Precautions:	Avoid frequent or prolonged skin contact.

CODE: Z-9061

----------DISCLAIMER OF EXPRESSED OR IMPLIED WARRANTS----------

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but can not guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

Disk: Asphalt Products #2 update
Revision Date: January 19, 1993

CODE: Z-9061

MATERIAL SAFETY DATA SHEET

Manufacturer
ARR-MAZ PRODUCTS, L.P.
621 Snively Avenue
Winter Haven, Fl 33880
Emergency Phone Number
941-293-7884

PRODUCT INFORMATION

Trade Name:	AD-here 240	
Chemical Family:	Liquid anti-strip	
Composition:	Fatty Amidoamine	
HMIS RATING:	Health Hazard	2 Moderate
	Flammability Hazard	1 Slight
	Reactivity Hazard	0 Minimal
D.O.T. Shipping Classification:	Not regulated	

PHYSICAL DATA

Boiling Point (°F):	> 300°F
Solubility in Water:	Slight
Vapor Pressure (mmHg at 25°C):	N/D
Vapor Density (Air = 1):	> 1
Appearance:	Dark brown liquid
Odor:	Ammoniacal
Specific Gravity (at 77°F):	0.96

FIRE EXPLOSION

Flash Point PM Closed Cup °F:	>200 °F
Extinguishing Media:	CO_2, foam, or dry chemical
Special Fire Fighting Procedures:	Wear NIOSH/MSHA approved self-contained breathing equipment and protective clothing.

HEALTH HAZARD INFORMATION

EYE

Effect: Causes severe irritation or burns, may cause blindness.

First Aid: Immediately flush with plenty of water for at least 15 minutes. Contact a physician immediately.

Protection: Chemical resistant splash proof goggles or a full face shield.

SKIN

Effect: Local irritation or sensitivity can develop from repeated contact.

First Aid: Immediately flush with water for 15 minutes followed by soap and water. If a rash develops contact a physician.

Protection: Exercise normal safety practices. Remove contaminated clothing immediately, wash before reuse.

INHALATION

ffect: Irritation of the respiratory system may occur.

First Aid: Remove to fresh air. If breathing is difficult give oxygen and contact a physician. If not breathing, give mouth to mouth artificial respiration. Immediately call a physician.

Protection: Use where local exhaust or other adequate ventilation is present.

INGESTION

Effect: Harmful when swallowed. May cause burns to the digestive system.

First Aid: Contact a physician or a poison control center immediately.

REACTIVITY DATA

Stability: Stable

Hazardous Polymerization: Will not occur.

Incompatibilities: Strong oxidizers and materials that will react with amine compounds.

Hazardous Decomposition Products: CO, C02, NOx, and other thermal decomposition by-products.

SPILL, LEAK, AND DISPOSAL PROCEDURES

Spills and Leaks: Isolate, then absorb with earth, vermiculite, or other inert absorbent material. Collect in drums or other containers.

Waste Disposal: Incinerate or bury in certified landfill according to federal, state and local regulations.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use organic filter respirator.

Protective Gloves: Impervious rubber or plastic.

Eye Protection: Chemical resistant splash proof goggles or a full face shield.

Other Protective Equipment: Eye wash and safety shower should be easily accessible.

STORAGE AND SPECIAL PRECAUTIONS

Storage Precautions: Avoid storage temperatures near or above flash point. Use standard handling and safety practices.

Other Precautions: Avoid frequent or prolonged skin contact.

DISCLAIMER OF EXPRESSED OR IMPLIED WARRANT

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but can not guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

MATERIAL SAFETY DATA SHEET

Manufacturer

ARR-MAZ PRODUCTS, L. P.
621 Snively Avenue
Winter Haven, Fl 33880

Emergency Phone Number
941-293-7884

PRODUCT INFORMATION

Trade Name:	**AD-here 64-00**	
Chemical Name:	**Amine Mixture**	
HMIS RATING:	**Health Hazard**	**2 Moderate**
	Flammability Hazard	**1 Slight**
	Reactivity Hazard	**0 Minimal**
D.O.T. Shipping Classification:	**Alkaline, Corrosive Liquid, N.O.S.** **UN 1760** **PG III**	
D.O.T. Placard:	**Corrosive 8**	
D.O.T. Label:	**Corrosive 8**	

PHYSICAL DATA

Boiling Point (°F):	**> 300**
Solubility in Water:	**Soluble**
Vapor Pressure (mmHg at 25°C):	**N/D**
Vapor Density (Air = 1):	**> 1**
Appearance:	**Dark brown liquid**
Odor:	**Ammoniacal**
Specific Gravity (at 100°F):	**1.036 ± 1.016**

FIRE EXPLOSION

Flash Point (PM Closed Cup °F):	**> 400**
Extinguishing Media:	**CO2, foam, or dry chemical**
Special Fire Fighting Procedures:	**WearNIOSH/MSHA approved self-contained breathing equipment and protective clothing.**

HEALTH HAZARD INFORMATION

EYE

Effect: Causes severe irritation or burns, may cause blindness.

First Aid: Immediately flush with plenty of water for at least 15 minutes. Contact physician immediately.

Protection: Chemical resistant splash proof goggles or a full face shield.

SKIN

Effect: Local irritation or sensitivity can develop from repeated contact.

First Aid: Immediately flush with water for 15 minutes followed by soap and water. If a rash develops contact a physician.

Protection: Exercise normal safety practices. Remove contaminated clothing immediately, wash before reuse.

INHALATION

Effect: Irritation of the respiratory system may occur

First Aid: Remove to fresh air. If breathing is difficult give oxygen and contact a physician. If not breathing, give mouth to mouth artificial respiration. Immediately call a physician.

Protection: Use where local exhaust or other adequate ventilation is present.

INGESTION

Effect: Harmful when swallowed. May cause burns to the digestive system.

First Aid: Contact a physician or a poison control center immediately.

REACTIVITY DATA

Stability: Stable

Hazardous Polymerization: Will not occur.

Incompatibilities: Strong oxidizers and materials that will react with amine compounds.

Hazardous Decomposition Products: CO, C02, NOx, and other thermal decomposition by-products.

SPILL, LEAK, AND DISPOSAL PROCEDURES

Spills and Leaks: Isolate then absorb with earth, vermiculite, or other inert absorbent material. Collect in drums or other containers.

Waste Disposal: Incinerate or bury in certified landfill according to federal, state and local regulations.

SARA TITLE III: Reportable chemicals - none.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use organic filter respirator.

Protective Gloves: Impervious rubber or plastic.

Eye Protection: Chemical resistant splash proof goggles or a full face shield.

Other Protective Equipment: Eye wash and safety shower should be easily accessible.

STORAGE AND SPECIAL PRECAUTIONS

Storage Precautions: Avoid storage temperatures near or above flash point. Use standard handling and safety practices.

Other Precautions: Avoid frequent or prolonged skin contact.

DISCLAIMER OF EXPRESSED OR IMPLIED WARRANTS

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but can not guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

7.) ASPHALT SOLUTIONS

/ CHERRY

MATERIAL SAFETY DATA SHEET

Asphalt Solutions, Inc.
P.O. Box 354
Litchfield Park, AZ. 85340

FOR INFORMATION CALL 800-323-1301
IN ILLINOIS CALL 630-932-8100
DURING TRANSPORTATION CALL 800-535-5053

DATE PREPARED: 1/22/01

MATERIAL ID: 180072

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: ASPHALT SOLUTIONS CHERRY
FORMULA : 180072
CAS NUMBER : MIXTURE

SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

COMPONENTS	CAS NUMBER	% BY WEIGHT	OSHA PEL (ppm)	ACGIH TLV (ppm)	*NOTE*
AMYL ACETATE	628-63-7	15	100	100	

NOTES - THE FOLLOWING INFORMATION ONLY APPLIES WHEN A NUMBER APPEARS IN THE RIGHT HAND NOTE COLUMN.

1.) PEL/TLV NOT ESTABLISHED FOR THIS MATERIAL.
2.) THIS CHEMICAL IS LISTED AS A TOXIC CHEMICAL SUBJECT TO THE SARA 313 (SUPERFUND AMENDMENTS & REAUTHORIZATION ACT OF 1986) TOXIC CHEMICAL RELEASE REPORTING REQUIREMENT.
3.) THIS CHEMICAL IS CONSIDERED A CARCINOGEN BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), BY THE NATIONAL TOXICOLOGY PROGRAM (NTP) OR THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC).

SECTION III - PHYSICAL DATA

BOILING POINT: DATA NOT AVAILABLE SPECIFIC GRAVITY: 0.99 (+/-.05)

VAPOR PRESSURE: DATA NOT AVAILABLE VAPOR DENSITY (AIR=1):HEAVIER

SOLUBILITY IN WATER: INSOLUBLE

APPEARANCE AND ODOR:
A CLEAR COLORLESS TO YELLOW LIQUID HAVING A CHERRY ODOR.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (TAG CLOSED CUP): 113 DEG. F.

asphalt solutions.
Asphalt Cement Additive
623-853-2273
www.asphaltsolutions.com

FLAMMABLE LIMITS (% VOLUME IN AIR) LEL: NOT KNOWN UEL: NOT KNOWN

EXTINGUISHING MEDIA:
CARBON DIOXIDE, DRY CHEMICAL OR UNIVERSAL-TYPE FOAM APPLIED ACCORDING TO MANUFACTURER'S TECHNIQUES.

SPECIAL FIRE-FIGHTING PROCEDURES:
WEAR SELF-CONTAINED BREATHING APPARATUS AND COMPLETE PERSONAL PROTECTIVE EQUIPMENT.

UNUSUAL FIRE AND/OR EXPLOSION HAZARDS:
CLOSED CONTAINERS MAY BUILD UP PRESSURE AT ELEVATED TEMPERATURES. IF POSSIBLE, CONTAINERS SHOULD BE COOLED WITH A WATER SPRAY.

NFPA CODES - HEALTH: 1 FLAMMABILITY: 2 REACTIVITY: 1

SECTION V - REACTIVITY DATA

STABILITY:
STABLE. AVOID HEAT, SPARKS AND OPEN FLAMES.

INCOMPATIBILITY:
AVOID CONTACT WITH STRONG ALKALIES AND OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
BURNING CAN PRODUCE CARBON DIOXIDE AND/OR CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

SECTION VI - HEALTH AND HAZARD DATA / FIRST AID

EFFECTS OF OVER-EXPOSURE

EYES:
MAY CAUSE EYE IRRITATION BY DIRECT CONTACT OR FROM FUMES.

SKIN:
PROLONGED CONTACT MAY LEAD TO IRRITATION AND DERMATITIS.

BREATHING:
MAY CAUSE RESPIRATORY TRACT IRRITATION.

SWALLOWING:
HARMFUL IF SWALLOWED.

EMERGENCY FIRST AID PROCEDURES

EYES:
FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, CONTACT A DOCTOR.

SKIN:
WASH SKIN WITH SOAP AND PLENTY OF WATER. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE WEARING AGAIN.

asphalt solutions.
623-853-2272
www.asphaltsolutions.com

BREATHING:
REMOVE VICTIM TO FRESH AIR.

SWALLOWING:
IF SWALLOWED, DRINK MILK OR WATER AND CONTACT A DOCTOR IMMEDIATELY.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

STORE IN TIGHTLY SEALED CONTAINERS IN A COOL DRY PLACE THAT IS WELL VENTILATED.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

SMALL SPILL:
COVER WITH A NON-COMBUSTIBLE MATERIAL AND REMOVE TO AN APPROVED DISPOSAL CONTAINER. WASH AREA WITH SOAP AND WATER.

LARGE SPILL:
AVOID SOURCES OF IGNITION. CONTAIN SPILLED MATERIAL. COVER WITH A NON-COMBUSTIBLE MATERIAL AND REMOVE TO AN APPROVED DISPOSAL CONTAINER. AVOID INHALATION OF VAPORS. IF IN A CONFINED AREA, NIOSH APPROVED RESPIRATORY PROTECTION MAY BE REQUIRED. WASH AREA WITH SOAP AND WATER. DRY PRODUCTS SHOULD BE SWEPT UP AND REMOVED TO AN APPROVED DISPOSAL CONTAINER. WASH AREA WITH SOAP AND WATER.

WASTE DISPOSAL METHOD

INCINERATE, BURY IN APPROVED MANNER OR DISPOSE OF USING ANY PROCEDURE WHICH IS IN CONFORMANCE WITH PERTINENT FEDERAL, STATE OR LOCAL REGULATIONS.

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION:
IN WELL VENTILATED AREAS, RESPIRATORY PROTECTION IS NOT NORMALLY REQUIRED.

VENTILATION:
PROVIDE ADEQUATE VENTILATION USING A MECHANICAL EXHAUST FAN.

PROTECTIVE GLOVES:
CHEMICAL RESISTANT GLOVES RECOMMENDED.

EYE PROTECTION:
CHEMICAL SAFETY GOGGLES RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:
EYE WASH STATION AND SAFETY SHOWER SHOULD BE EASILY ACCESSIBLE.

NOTE - THE INFORMATION CONTAINED HEREIN IS FURNISHED WITHOUT WARRANTY OF ANY KIND. EMPLOYERS SHOULD USE THIS INFORMATION ONLY AS A SUPPLEMENT TO OTHER INFORMATION GATHERED BY THEM AND MUST MAKE INDEPENDENT DETERMINATIONS OF SUITABILITY AND COMPLETENESS OF INFORMATION FROM ALL SOURCES TO ASSURE PROPER USE OF THESE MATERIALS AND THE SAFETY AND HEALTH OF EMPLOYEES.

3.) BATH OIL

Material Safety Data Sheet

Manufacturer's Name	Cannon Instrument Company	Emergency Telephone No.	800-424-9300 Chemtrec #
Address	PO Box 16 State College, PA 16804-0016	Other Information Calls	814-353-8000
Signature of Person Responsible for Preparation		Date Prepared	July 22, 1998

SECTION 1 - IDENTITY

Common Name:(used on label)
(Trade Name & Synonyms) Inhibited Bath Oil

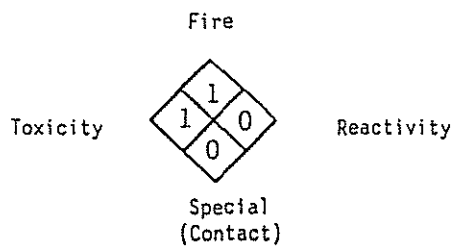
Chemical Name	White Mineral Oil	Cas No.	8042-47-5
Formula	N/A	Chemical Family	Hydrocarbon

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)(chemical & common name(s))	%	Threshold Limit Value (units)
2, 6-di-tert-butyl-p-cresol (CAS No. 128-37-0)	0.5	TLV 10 mg/m^3 (ACGHI)
THIS ITEM IS CONTAINED IN THE TSCA INVENTORY.		Oral toxicity: LD50(rats)->2g/kg

HAZARD RATING

N	4 - Extreme
F	3 - High
P	2 - Moderate
A	1 - Slight
	0 - Insignificant



SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

Boiling Point	670°F	Specific Gravity(H_2O=1)	<1
Vapor Pressure (mm Hg)	N/A	Percent Volatile by Volume (%)	Negligible
Vapor Density (Air = 1)	N/A	Evaporation Rate (_____ = 1)	<1
Solubility in Water	Insoluble	Reactivity in Water	None
Appearance and Odor	Clear transparent liquid, odorless.		
Flash Point	445°F COC	Flammable Limits in Air % by Volume	Lower: Unknown; Upper:
Extinguisher Media	Dry Chemical, or Carbon Dioxide	Auto-Ignition Temperature	Unknown

Special Fire Fighting Procedures: Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid.

Unusual Fire and Explosion Hazards: Dense smoke may be generated while burning. Carbon monoxide, carbon dioxide, and other oxides may be generated as products of combustion.

SECTION 4 - PHYSICAL HAZARDS

Stability Unstable ☐ Stable ■ Conditions to avoid: None

Incompatability (Materials to Avoid) Strong oxidizers

Hazardous Decomposition Products None

Hazardous Polymerization May Occur ☐ Will Not Occur ■ Conditions to Avoid None

SECTION 5 - HEALTH HAZARDS

Threshold Limit Value Mineral oil mists have an inhalation time weighted coverage TLV not to exceed 5 mg/m³ in any 8-hour shift.

Signs and Symptoms of Exposure

1. Acute Overexposure: Over-exposure to mist or fumes may cause aspiration pneumonia. No effect of liquid on skin contact.
2. Chronic Overexposure: Unknown

Medical Conditions Generally Aggravated by Exposure Unknown

Chemical Listed as Carcinogen or Potential Carcinogen N/A

National Toxicology Program Yes ☐ No ■ | I.A.R.C. Monographs Yes ☐ No ■ | OSHA Yes ☐ No ■

OSHA Permissible Exposure Limit 5 mg/m³ | **ACGIH Threshold Limit Value** 5 mg/m³ | **Other Exposure Limit Used** N/A

Emergency and First Aid Procedures Follow procedures below, then seek medical attention.

1. Inhalation: Remove to fresh air if exposure is above safe limits.
2. Eyes: Flush eye for 15 minutes with large amounts of water. If material is hot, treat for thermal burns.
3. Skin: Remove contaminated clothing. If material is hot, submerge injured area in cold water.
4. Ingestion: May act as a laxative. Do NOT induce vomiting.

SECTION 6 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) None required under normal use. If vapor or mist is generated, use NIOSH approved respirator.

Ventilation N/A | **Local Exhaust** N/A

Mechanical (General) N/A | **Special** N/A | **Other** N/A

Protective Gloves Insulated if material is hot. | **Eye Protection** Face shield or safety goggles.

Other Protective Clothing or Equipment Apron and protective sleeves if material is hot.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage Keep away from heat.

Other Precautions N/A

Steps to be Taken in Case Material is Released or Spilled Contain spill. Wipe up or absorb on suitable material.

Waste Disposal Methods Incinerate or discard in landfill in accordance with local, state, and federal regulations.

IMPORTANT

Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.

9.) BIODIESEL

MATERIAL SAFETY DATA SHEET

Revision Date: 10/31/2006
MSDSUSA/ANSI/EN/150000066586/Version 3.0

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	Biodiesel
Product Identification Number(s)	30144-00, P3014400, P301440C, P3014499, E3014401, P301440S, P3014402, P301440D, P301440E
Manufacturer/Supplier	FutureFuel Chemical Company 2800 Gap Road, Hwy 394 South Batesville, AR 72501 US
MSDS Prepared by	Product Safety and Health
Chemical Name	not applicable
Synonym(s)	30144-00 984021
Molecular Formula	not applicable
Molecular Weight	not applicable
Product Use	fuel
OSHA Status	hazardous

For emergency health, safety and environmental information, telephone 870-612-2896.

For emergency transportation information, telephone CHEMTREC at 800-424-9300 or FutureFuel Chemical Company at 870-612-2896.

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

Weight %	Component	CAS Registry No.
100%	biodiesel	67784-80-9 and/or 67762-26-9

3. HAZARDS IDENTIFICATION

WARNING!
HARMFUL IF SWALLOWED - MAY ENTER LUNGS IF SWALLOWED OR VOMITED
CAN DECOMPOSE AT ELEVATED TEMPERATURES

HMIS® Hazard Ratings: Health - 1, Flammability -1, Chemical Reactivity - 1

HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. FIRST-AID MEASURES

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms persist.
Eyes: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if symptoms persist.
Skin: Wash with soap and water. Get medical attention if symptoms occur.
Ingestion: Call a physician or poison control center immediately. Do NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration.

5. FIRE FIGHTING MEASURES

Extinguishing Media: water spray, carbon dioxide, dry chemical, foam
Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool.
Hazardous Combustion Products: carbon dioxide, carbon monoxide
Unusual Fire and Explosion Hazards: Elevated temperatures can cause decomposition.

6. ACCIDENTAL RELEASE MEASURES

Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.
For Large Spills: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.

7. HANDLING AND STORAGE

Personal Precautionary Measures: Do not taste or swallow.
Prevention of Fire and Explosion: Exercise caution if heating, especially in a closed container. Keep from contact with oxidizing materials.
Storage: Keep container closed. Store in a cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Country specific exposure limits have not been established or are not applicable unless listed below.

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory and eye protection may be needed in special circumstances; such as poorly ventilated spaces, heating, evaporation of liquids from large surfaces, spraying of mists, mechanical generation of dusts, drying of solids, etc.
Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.
Eye Protection: It is a good industrial hygiene practice to minimize eye contact.
Skin Protection: It is a good industrial hygiene practice to minimize skin contact.
Recommended Decontamination Facilities: eye bath, washing facilities

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: liquid
Color: gold
Odor: oily
Specific Gravity: 0.88 (20 °C)

Vapor Pressure: 22.2 °C; <7 mbar
Boiling Point: > 204 °C
Evaporation Rate: <0.005 (n-butyl acetate = 1)**Viscosity:** 1.9 - 6.0 mPa.s (40 °C) ,
Solubility in Water: negligible
Flash Point: 160.6 °C (Pensky-Martens closed cup)
Thermal Decomposition Temperature: 352.3 °C ; 110.8 J/g (DSC)

10. STABILITY AND REACTIVITY

Stability:	Stable. Material can decompose at elevated temperatures. Use caution when storing or processing material above 151 °C.
Incompatibility:	Material reacts with strong oxidizing agents.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

This material has not been tested for environmental effects.

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

DOT (USA)

Class not regulated

Sea - IMDG (International Maritime Dangerous Goods)

Class not regulated

Air - ICAO (International Civil Aviation Organization)

Class not regulated

15. REGULATORY INFORMATION

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

SARA 313: none, unless listed below

Carcinogenicity Classification (components present at 0.1% or more): none, unless listed below

TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.
DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL. Any impurities present in this product are exempt from listing.
EINECS (European Inventory of Existing Commercial Chemical Substances): This product is listed on EINECS or otherwise complies with EINECS requirements.
AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.
ECL (Korean Toxic Substances Control Act): This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.
Inventory of Existing Chemical Substances in China: All components of this product are listed on the Inventory of Existing Chemical Substances in China (IECSC).

16. OTHER INFORMATION

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information. Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment.

Highlighted areas indicate new or changed information

MATERIAL SAFETY DATA SHEET

Issue Date: July 25, 2006

1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

Product Name: Biodiesel (B100)
Chemical Name: Fatty Acid Methyl Esters
Product Description: Methyl Esters derived from oils and fats
Formula: C14-C24 Methyl Esters
Chemical Family: CAS No. 67784-80-9

Responsible Party: McCall Oil and Chemical Corporation
5480 NW Front Avenue
Portland, Oregon 97210
Phone: 503-221-6400
Fax: 503-221-6414

24 Hour Emergency Phone Numbers:

McCall Oil:	503-219-0995
Foss Environmental:	503-283-1150

2. INGREDIENTS AND HAZARDOUS CLASSIFICATION

Ingredient Percent
Typical Composition: C14-C24 Methyl Esters 99%
OSHA PEL: None
ACGH/TLV: None
SARA Title III Section 313: Not listed – **This product contains no hazardous material**

3. PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point: >4000 F @ 72 mm Hg
Vapor Pressure: < 1mm Hg @ 720 F
Evaporation Rate: less than .005 (Butyl Acetaate = 1)
Specific Gravity: 0.88 @ 770 F (Water = 1)
Solubility in Water: Insoluble
Appearance: Light to dark yellow oily liquid at room temperature.

4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): >2700 F (PMCC)
Flammability Limits in Air, % by vol. lower: Not Applicable
Flammability Limits in Air, % by vol. upper: Not Applicable
NFPA Rating: Class IIIB Combustible Liquid
HMIS Rating: Health (0) Fire (1) Reactivity (0)
Extinguishing Media: Water spray, Dry Chemical, Foam or Carbon Dioxide
Firefighting Procedures: Water may be ineffective but should be used to keep fire-exposed containers cool. If a spill or leak has not ignited, use water to disperse vapors. Water spray may be used to flush spills away from sources of possible ignition.
Fire & Explosion Hazards: Rags soaked in product can cause spontaneous combustion, and should be stored in a UL listed container or be washed with soap and water prior to storage. Fire Fighters should not enter enclosed or confined spaces without the proper protective equipment, including a full self contained breathing apparatus in the positive pressure demand mode.

5. REACTIVITY DATA

Chemcial Stability: Stable
Hazardous Polymerization: will not occur
Conditions and Materials to Avoid: avoid contact with strong oxidizers
Hazardous Decomposition Products: carbon monoxide and carbon dioxide

6. HEALTH HAZARD DATA

Inhalation: Negligible unless liquid is heated to produce vapor. Vapor mist may cause irritation of mucous membranes, dizziness and nausea.
Ingestion: No hazard anticipated from ingestion incidental to industrial exposure
Eye Contact: May cause slight irritation.
Skin Contact: Not classified as a primary skin irritant or corrosive material

Emergency First Aid Procedure:

Inhalation: Remove to fresh air. Seek medical care if symptoms persist
Ingestion: Give one or two glasses of water to drink. Contact physician or poison control center if gastro-intestinal symptoms develop.
Eye Contact: Irrigate eyes with water for at least 15 minutes
Skin Contact: Wash affected area with soap and water

7. PRECAUTIONS FOR SAFE HANDLING AND USE

Environmental Precautions: Avoid uncontrolled release of this material where spills are possible. A comprehensive spill response plan should be developed and implemented.
Spill or Leak Precautions: Contain spilled materials and transfer to secure containers. Use absorbent materials if necessary. In the event of an uncontrolled release, the user should determine if the release is reportable under applicable laws and regulations.
Waste Disposal: All recovered material should be packaged, labeled, transported and disposed or reclaimed in conformance with applicable laws and regulations, and in conformance with good engineering practice.

8. EXPOSURE CONTROL/PERSONAL PROTECTION MEASURES

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. PVC or other petroleum compatible gloves are recommended.

Ventilation: Mechanical

9. TRANSPORTATION INFORMATION:

UN Hazard Class: N/A

NMFC (National Motor Freight Classification):

Proper Shipping Name: Fatty Acid Ester

Identification Number: 144920

Shipping Classification: 65

Listed in TSCA inventory: Yes

10. REGULATORY INFORMATION:

OSHA Status: This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. Thermal processing and decomposition fumes from this product may be hazardous as noted in sections 5 and 6.

TSCA Status: Listed with TSCA

CERCLA (Comprehensive Response Compensation and Liability Act): Not reportable

SARA Title 3 (Superfund Amendments and Reauthorization Act): Not reportable

RCRA Status: This product is not considered a hazardous waste either by listing or characteristic. 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 considered a hazardous waste.

California Proposition 65: This product contains no chemicals known to the state of California to cause cancer.

11. OTHER INFORMATION

The information in this document pertains only to the product described in Section 1, and is not valid for material blended with or otherwise combined with the product described in Section 1. The information and recommendations contained in this publication represent the best current information and opinion at the time of publication. Because individual conditions of use may vary, McCall Oil & Chemical Corp. makes no guarantee, expressed or implied, as to the accuracy, reliability or completeness of the information contained in this publication, and assumes no responsibility for any loss, damage or expense, direct or consequential, arising out of its use. It is the responsibility of the user to determine the suitability of this publication to their particular use, and to comply with federal and state agencies.

10.) BIODIESEL ANTI-GEL

VALVTECT A DIVISION OF
KOP-COAT, INC.
3400 DUNDEE ROAD
NORTHBROOK
IL 60062

EMERGENCIES
HEALTH/SPILLS.....: 800-548-0489
CHEMTREC ASSISTANCE: 800-424-9300
CHEMTREC OUTSIDE US: 703-527-3887
CANUTEC.....: 613-996-6666

VALVTECT A DIVISION OF
PRODUCT INFORMATION: 847-272-2278
OUTSIDE USA.....: 847-272-2278

1 PRODUCT IDENTIFICATION

PRODUCT NAME: BioDiesel 100 Antigel
PRODUCT USE.: Fuel Additive
APPEARANCE..: Clear liquid
CAS NUMBER..: Mixture
SYNONYMS....: None

REVISION...: 1
DATE.....: 9/19/06
MSDS NUMBER: BD100AGWBK

2 HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	REG AGENCY	PPM	NOTES	MG/M3	NOTES
Vinyl acetate	ACGIH STEL	15		53	
CAS NUMBER:108-05-4	ACGIH TWA	10		35	
PERCENT BY WGT: < 1	NIOSH-C	4		15	
	OSHA-STEL	20		60	
	OSHA-TWA	10		30	
Petroleum distillates	OSHA-PEL	100		-	
CAS NUMBER:64742-95-6					
PERCENT BY WGT: 95 TO 100					

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Combustible liquid and vapor. Harmful or fatal if swallowed, can enter lungs and cause damage.

EYES: May cause mild to moderate eye irritation. Not expected to cause permanent damage if promptly rinsed from eyes.

SKIN: May cause skin irritation. Prolonged and/or repeated contact with the skin may cause irritation characterized by redness, cracking and blistering.

3 HAZARDS IDENTIFICATION

May be absorbed in toxic amounts through the skin and cause systemic effects.

INHALATION: Inhalation of high concentrations of vapors may cause respiratory tract irritation and central nervous system depression. Symtoms include headache, weakness, dizziness, nausea and loss of coordination. Continued inhalation may result in unconsciousness or death. Reports have associated repeated and prolonged overexposure to solvents with permanent brain, nervous system, liver and kidney damage or may cause cardiac arrhythmia.

INGESTION: Swallowing small amounts during normal handling is not likely to cause adverse effects. Swallowing larger amounts may cause gastrointestinal disturbances such as nausea, vomiting, and diarrhea. Aspiration of this product into the lungs may cause chemical pneumonitis, which can be fatal.

Individuals with pre-existing disease in or a history of ailments involving the skin, eyes, respiratory tract, liver, kidney, or central nervous system are at a greater than normal risk of developing adverse effects when exposed to this material.

Vnyl acetate is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence of carcinogenicity in xperimental animals.

4 FIRST AID MEASURES

EYE CONTACT: Immediately flush the eyes with lukewarm, gently flowing water for at least 20 minutes, while holding the eyelids open. Take care not to rinse contaminated water into the unaffected eye or face. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

SKIN CONTACT: Wash affected areas immediately with non-abrasive soap and lukewarm water for 15-20 minutes. Under running water, remove contaminated clothing, shoes, and leather goods (i.e. watchbands, belts). Call a poison control center or doctor for treatment advice. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

INHALATION: Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema may be delayed up to 48 hours after exposure. Call a poison control center or doctor for treatment advice.

INGESTION: Call a poison control center or doctor immediately for treatment advice. Have person rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have person drink 8-10 oz (240-300 mL) of water to dilute material in stomach. If milk is available, it may be administered AFTER the water has been given. If vomiting occurs naturally, have victim lean forward to reduce risk of

4 FIRST AID MEASURES

aspiration. Repeat administration of water. Quickly transport person to emergency care facility.

NOTE TO PHYSICIAN: Pulmonary aspiration hazard if swallowed. Treat symptomatically.

5 FIRE FIGHTING MEASURES

FLASH POINT: 147F/64C
AUTOIGNITION TEMPERATURE: No information found.
FLAMMABLE LIMITS (% by volume/air)
Lower Limit: No information found.
Upper Limit: No information found.

EXTINGUISHING MEDIA: Use dry chemical, carbon dioxide, foam or water spray (fog)

FIRE FIGHTING PROCEDURES: As in any fire, wear complete fire service protective equipment, including full-face MSHA/NIOSH approved or equivalent self-contained breathing apparatus. Use water to cool fire-exposed container/structure/protect personnel. Toxic vapors may be given off in a fire. Contain run-off from fire.

FIRE AND EXPLOSION HAZARDS: Containers may explode if exposed to extreme heat.

6 SPILL AND LEAK PROCEDURES

SMALL SPILL: Stop the flow of material. Absorb with non-flammable suitable absorbent such as sand or earth. Scoop/shovel absorbed material into container.

LARGE SPILL: Dike and contain spill. Pump to storage or salvage vessels. Contain run-off from fire control and dilution water. Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities that a spill has occurred. Eliminate ALL sources of ignition. Ventilate area.

7 HANDLING AND STORAGE

Handling Procedures: Avoid prolonged or repeated skin contact with this material. Avoid eye contact with this material. Avoid prolonged or repeated breathing of this material. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Use this product with adequate ventilation.

Storage Procedures: Do not store near heat, sparks, open flame or strong oxidizing agents. Do not store this material in open, unlabeled containers.

10 STABILITY AND REACTIVITY DATA

STABILITY: Stable
HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.
INCOMPATIBILITY: Strong oxidizers and fluorine.
HAZARDOUS DECOMPOSITION PRODUCT(S): Aldehydes, acetic acid, vinyl acetate, carbon dioxide, carbon monoxide, oxides of nitrogen, and other toxic organic compounds.

11 TOXICOLOGICAL INFORMATION

Vinyl acetate (CAS# 108-05-04): In 1995, the International Agency for Research on Cancer (IARC) designated vinyl acetate as a Group 2B carcinogen, meaning possibly carcinogenic to humans. There was inadequate evidence in humans for establishing carcinogenicity and limited evidence in experimental animals. However, because vinyl acetate is metabolized to acetaldehyde, a substance previously classified as Group 2B, IARC classified vinyl acetate as Group 2B. However, the tumors that were observed in laboratory animals at very high exposure concentrations for their lifetimes are not considered to be of relevance to humans exposed to low concentrations under typical use conditions. (Vinyl Acetate Safe Handling Guide, March 2005, Vinyl Acetate Council, Washington, D.C. 2005, page 2-3).

12 ECOLOGICAL INFORMATION

Product has not been tested for ecotoxicity.

13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state and federal regulations.

14 TRANSPORTATION INFORMATION

DOT SHIPPING INFORMATION FOR GROUND TRANSPORTATION ONLY:
DOT PROPER SHIPPING NAME: Combustible liquid, n.o.s. (contains petroleum distillates)
DOT HAZARD CLASS: 3
PACKING GROUP III
DOT IDENTIFICATION NUMBER: NA1993

IATA SHIPPING INFORMATION FOR AIR TRANSPORTATION: Not regulated

15 REGULATORY INFORMATION

15 REGULATORY INFORMATION

SARA TITLE III SECTION 313 CHEMICALS
Vinyl acetate

Ultra Low Sulfur Diesel Additives: The sulfur content of this Diesel Fuel Additive does not exceed 15 parts per million (ppm).
References: Code of Federal Regulations Title 40 Part 80 - EPA 2006 Regulation of Fuels and Fuel Additives, and EPA document EPA40-F-05-013.

16 OTHER INFORMATION

ACGIH categorizes Vinyl Acetate as Group A3: Animal Carcinogen.

NOTICE: This document is generated for the purpose of distributing health, safety and environmental data. The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. Kop-Coat makes no warranty with respect thereto and disclaims all liability from reliance thereon.

PREPARED BY: Manager of Health, Safety and Environmental Affairs.

VALVTECT A DIVISION OF
KOP-COAT, INC.
3400 DUNDEE ROAD
NORTHBROOK
IL 60062

EMERGENCIES
HEALTH/SPILLS.....: 800-548-0489
CHEMTREC ASSISTANCE: 800-424-9300
CHEMTREC OUTSIDE US: 703-527-3887
CANUTEC.....: 613-996-6666

VALVTECT A DIVISION OF
PRODUCT INFORMATION: 847-272-2278
OUTSIDE USA.....: 847-272-2278

1 PRODUCT IDENTIFICATION

PRODUCT NAME: High Performance BioDiesel Antigel
PRODUCT USE.: Fuel Additive
APPEARANCE..: Clear liquid
CAS NUMBER..: Mixture
SYNONYMS....: None

REVISION...: 1
DATE.....: 9/19/06
MSDS NUMBER: BDAGDWBK

2 HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	REG AGENCY	PPM	NOTES	MG/M3	NOTES
Ethylbenzene	ACGIH STEL	125		543	
CAS NUMBER:100-41-4	ACGIH-TWA	100		434	
PERCENT BY WGT: 5 TO 10	NIOSH	100		435	
	NIOSH STEL	125		545	
	OSHA STEL	125		545	
	OSHA TWA	100		435	
Vinyl acetate	ACGIH STEL	15		53	
CAS NUMBER:108-05-4	ACGIH TWA	10		35	
PERCENT BY WGT: < 1	NIOSH-C	4		15	
	OSHA-STEL	20		60	
	OSHA-TWA	10		30	
Xylene	ACGIH STEL	150		651	
CAS NUMBER:1330-20-7	ACGIH-TWA	100		434	
PERCENT BY WGT: 1 TO 5	NIOSH	100		435	
	NIOSH STEL	150		655	
	OSHA STEL	150		655	
	OSHA TWA	100		435	
Dipropylene glycol methyl ether (skin)	ACGIH STEL	150		909	
	ACGIH TWA	100		606	

2 HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	REG AGENCY	PPM	NOTES	MG/M3	NOTES
CAS NUMBER:34590-94-8	NIOSH	100		600	
PERCENT BY WGT: 10 TO 15	NIOSH STEL	150		900	
	OSHA STEL	150		900	
	OSHA TWA	100		600	
Mineral spirits	ACGIH TWA	100		525	
CAS NUMBER:64742-47-8	NIOSH	-		350	
PERCENT BY WGT: 40 TO 45	NIOSH STEL	-		1800	4
	OSHA TWA	100		525	
Petroleum distillates	OSHA-PEL	100		-	
CAS NUMBER:64742-95-6					
PERCENT BY WGT: 35 TO 40					
Naphthalene	ACGIH STEL	15		79	
CAS NUMBER:91-20-3	ACGIH TWA	10		52	
PERCENT BY WGT: < 1	NIOSH	10		50	
	NIOSH STEL	15		75	
	OSHA STEL	15		75	
	OSHA TWA	10		50	

NOTES:
4) The short term exposure limit (STEL) is a 15-minute TWA exposure that should not be exceeded at any time during a workday.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Combustible liquid and vapor. Harmful or fatal if swallowed, can enter lungs and cause damage.

EYES: May cause mild to moderate eye irritation. Not expected to cause permanent damage if promptly rinsed from eyes.

SKIN: May cause skin irritation. Prolonged and/or repeated contact with the skin may cause irritation characterized by redness, cracking and blistering. May be absorbed in toxic amounts through the skin and cause systemic effects.

INHALATION: Inhalation of high concentrations of vapors may cause respiratory tract irritation and central nervous system depression. Symtoms include headache, weakness, dizziness, nausea and loss of coordination. Continued inhalation may result in unconsciousness or death. Reports have associated repeated and prolonged overexposure to solvents with permanent brain, nervous system, liver and kidney damage or may cause cardiac arrhythmia.

INGESTION: Swallowing small amounts during normal handling is not likely to cause adverse effects. Swallowing larger amounts may cause gastrointestinal

3 HAZARDS IDENTIFICATION

disturbances such as nausea, vomiting, and diarrhea. Aspiration of this product into the lungs may cause chemical pneumonitis, which can be fatal.

Individuals with pre-existing disease in or a history of ailments involving the skin, eyes, respiratory tract, liver, kidney, or central nervous system are at a greater than normal risk of developing adverse effects when exposed to this material.

Ethylbenzene, napthalene and vinyl acetate are classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence of carcinogenicity in experimental animals.

4 FIRST AID MEASURES

EYE CONTACT: Immediately flush the eyes with lukewarm, gently flowing water for at least 20 minutes, while holding the eyelids open. Take care not to rinse contaminated water into the unaffected eye or face. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

SKIN CONTACT: Wash affected areas immediately with non-abrasive soap and lukewarm water for 15-20 minutes. Under running water, remove contaminated clothing, shoes, and leather goods (i.e. watchbands, belts). Call a poison control center or doctor for treatment advice. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

INHALATION: Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema may be delayed up to 48 hours after exposure. Call a poison control center or doctor for treatment advice.

INGESTION: Call a poison control center or doctor immediately for treatment advice. Have person rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have person drink 8-10 oz (240-300 mL) of water to dilute material in stomach. If milk is available, it may be administered AFTER the water has been given. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Repeat administration of water. Quickly transport person to emergency care facility.

NOTE TO PHYSICIAN: Pulmonary aspiration hazard if swallowed. Treat symptomatically.

5 FIRE FIGHTING MEASURES

FLASH POINT: 120 F/ 49 C

5 FIRE FIGHTING MEASURES

AUTOIGNITION TEMPERATURE: Not determined.
FLAMMABLE LIMITS (% by volume/air)
Lower Limit: Not determined.
Upper Limit: Not determined.

EXTINGUISHING MEDIA: Use dry chemical, carbon dioxide, or foam.

FIRE FIGHTING PROCEDURES: As in any fire, wear complete fire service protective equipment, including full-face MSHA/NIOSH approved or equivalent self-contained breathing apparatus. Use water to cool fire-exposed container/structure/protect personnel. Do not put in contact with oxidizing or caustic materials.

FIRE AND EXPLOSION HAZARDS: Product is combustible. Product vapors may travel considerable distance to a source of ignition and flash back.

6 SPILL AND LEAK PROCEDURES

SMALL SPILL: Stop the flow of material. Absorb with non-flammable suitable absorbent such as sand or earth. Scoop/shovel absorbed material into container.

LARGE SPILL: Dike and contain spill. Pump to storage or salvage vessels. Contain run-off from fire control and dilution water. Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities that a spill has occurred. Eliminate ALL sources of ignition. Ventilate area.

7 HANDLING AND STORAGE

Handling Procedures: Avoid prolonged or repeated skin contact with this material. Avoid eye contact with this material. Avoid prolonged or repeated breathing of this material. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Use this product with adequate ventilation.

Storage Procedures: Do not store near heat, sparks, open flame or strong oxidizing agents. Do not store this material in open, unlabeled containers. Keep in a closed, labeled container within a cool (well-shaded), dry, ventilated area. Protect from physical damage. Empty containers retain product residue (liquid or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode. Follow appropriate grounding procedures, as applicable.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide sufficient general / local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits and below flammable vapor concentrations. Ventilation rates should be matched to use conditions. Supplementary local exhaust ventilation may be needed in poorly ventilated spaces, during spraying, heating or other non-routine activities.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION: Industrial safety glasses, side shields, and as neccesary, faceshield.

HAND/SKIN PROTECTION: As required, chemical resistant, flexible-type gloves (neoprene, nitrile or equal) to prevent contact. Gloves should be rinsed and removed immediately after use. Wash hands after removing gloves. Wear chemical resistant garments if contact is unavoidable.

RESPIRATORY PROTECTION: Respiratory protection may be necessary under certain use conditions. A NIOSH-approved respirator should be selected on the basis of the form and concentration of the contaminant.

OTHER: Facilities utilizing this material should be equipped with an eyewash station and safety shower. Thoroughly clean shoes and wash contaminated clothes before reuse.

9 PHYSICAL AND CHEMICAL PROPERTIES

Weight Per Gallon (lbs):	7.760	% VOL by Weight.:	Not determined
Vapor Density.:	Not determined	Boiling Point...:	Not determined
Vapor Pressure:	Not determined	Evaporation Rate:	Not determined
pH.....:	Not determined	Specific Gravity:	0.934
Solubility In Water:	Insoluble	Viscosity.....:	Not determined

VOC Content.....: Not determined

10 STABILITY AND REACTIVITY DATA

STABILITY: Stable
HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.
INCOMPATIBILITY: Strong oxidizers and fluorine.
HAZARDOUS DECOMPOSITION PRODUCT(S): Aldehydes, acetic acid, vinyl acetate, carbon dioxide, carbon monoxide, oxides of nitrogen, and other toxic organic compounds.

11 TOXICOLOGICAL INFORMATION

11 TOXICOLOGICAL INFORMATION

No data available on the product as a whole.

Xylene: Laboratory animals exposed to high levels of xylene showed evidence of effects on the liver, kidneys, lungs, spleen, and caused hearing loss. Rats exposed during pregnancy to xylene showed fetotoxic effects.

Naphthalene: Laboratory animals exposed to high levels of naphthalene showed evidence of red blood cell destruction with anemia, fever, jaundice and kidney and liver damage. Napthalene caused an increased incidence of tumors in the nose in rats.

Ethylbenzene: 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.

Vinyl acetate: Vinyl acetate is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and limited evidence in experimental animals, but limited evidence of carcinogenicity in experimental animals to a metabolite of vinyl acetate, acetaldehyde. However, the tumors that were observed in laboratory animals at very high exposure concentrations for their lifetimes are not considered to be of relevance to humans exposed to low concentrations under typical use conditions. (Vinyl Acetate Safe Handling Guide, March 2005, Vinyl Acetate Council, Washington, D.C., page 2-3).

12 ECOLOGICAL INFORMATION

Product has not been tested for ecotoxicity.

13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state and federal regulations.

14 TRANSPORTATION INFORMATION

DEPARTMENT OF TRANSPORTATION REPORTABLE QUANTITIES

REPORTABLE QTY (LBS)	HAZARDOUS SUBSTANCE
1000	Ethylbenzene
100	Xylene
10	Benzene
100	Naphthalene

14 TRANSPORTATION INFORMATION

DOT SHIPPING INFORMATION FOR GROUND TRANSPORTATION ONLY:
DOT PROPER SHIPPING NAME: Combustible liquid, n.o.s. (contains petroleum distillates)
DOT HAZARD CLASS: 3
PACKING GROUP III
DOT IDENTIFICATION NUMBER: NA1993

DOT SHIPPING INFORMATION FOR AIR TRANSPORTATION (IATA):
DOT PROPER SHIPPING NAME: Flammable liquid, n.o.s. (contains petroleum distillates)
DOT HAZARD CLASS: 3
PACKING GROUP: III
DOT IDENTIFICATION NUMBER: UN1993

15 REGULATORY INFORMATION

SARA TITLE III SECTION 313 CHEMICALS
Ethylbenzene
Vinyl acetate
Xylene
Naphthalene

WARNING: THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Ultra Low Sulfur Diesel Additives: The sulfur content of this Diesel Fuel Additive does not exceed 15 parts per million (ppm).
References: Code of Federal Regulations Title 40 Part 80 - EPA 2006 Regulation of Fuels and Fuel Additives, and EPA document EPA40-F-05-013.

16 OTHER INFORMATION

ACGIH categorizes Vinyl Acetate as Group A3: Animal Carcinogen.

NOTICE: This document is generated for the purpose of distributing health, safety and environmental data. The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding correctness. Some

16 OTHER INFORMATION

information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. Kop-Coat makes no warranty with respect thereto and disclaims all liability from reliance thereon.

PREPARED BY: Manager of Health, Safety and Environmental Affairs.

11.) BREATHING AIR

Airgas

Airgas – Nor Pac, Inc.
2043 South 35th
Tacoma, WA 98409

CERTIFICATE OF ANALYSIS
OSHA GRADE "D" BREATHING AIR

This certificate is being supplied to you to help you meet the requirements of OSHA's revised Respiratory Protection Standard (29 CFR, 1910.134).

Breathing Air, Lot Number _PV00U275A_meets the standards for OSHA Grade "D" breathing air as follows:

Oxygen (volume/volume) = 19.5% to 23.5%
Hydrocarbon (condensed) $\leq$ 5 mg/m of air
Carbon Monoxide: $\leq$ 10 ppm
Carbon Dioxide: $\leq$ 1,000 ppm
Odor: Lack of noticeable odor
Dew Point: -50 deg.F at 1 atmosphere pressure

Please keep this certificate of analysis on file.

Not Khong — Signature

10-02-07 — Date

12.) BUNKER FUEL

USX Engineers and Consultants, Inc.
4000 Tech Center Drive
Monroeville, PA 15146
412-825-2931 - for all Administrative Calls 8:00a. m. to 5:00p.m. Mon. - Fri.

Material Safety Data Sheet

Emergency Contact Number: CHEMTRECK 1-800-424-9300
703-527-3887 (International Collect)

BUNKER FUEL OIL

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

Minor change in Composition Section 9.

1. PRODUCT IDENTIFICATION

CAUTION! - HEATING MAY RELEASE HYDROGEN SULFIDE GAS (H2S)
- PROLONGED OR REPEATED SKIN CONTACT CAN BE HARMFUL
- COMBUSTIBLE
- KEEP OUT OF REACH OF CHILDREN

SYNONYM: Bunker Fuel Oil

2. FIRST AID

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.
INHALATION:
If any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor. If there are signs or symptoms as described in this document due to breathing hydrogen sulfide, move the person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor. Note to Physician: In addition to the use of 100% oxygen and supportive care, suggested treatment for hydrogen sulfide poisoning includes the use of nitrites. This is based on similar mechanisms of toxicity between hydrogen sulfide and hydrogen cyanide. The nitrite-induced methemoglobin is thought to bind the toxic hydrosulfide ion. Initial inhalation of amyl nitrite pearls for 15 to 30 seconds of each minute should be initiated until 10 ml of a 3% solution of sodium nitrite can be administered intravenously at 2.5 to 5 ml per minute. While the efficacy of nitrites in hydrogen sulfide poisoning has not been unequivocally demonstrated, their use is recommended as part of the treatment regimen. Hyperbaric oxygen therapy has been used for cyanide poisoning with some success and may be of benefit in hydrogen sulfide poisoning if other measures are ineffective.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. Consult medical personnel before inducing vomiting. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

3. IMMEDIATE HEALTH EFFECTS - (ALSO SEE SECTIONS 11 & 12)

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.
SKIN IRRITATION:
Expected to cause no more than minor skin irritation, but prolonged or frequently repeated skin contact may be harmful. Read the Additional Health Data section (12) of this document for more information. This hazard evaluation is based on data from similar materials.
DERMAL TOXICITY:
If absorbed through the skin, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.

RESPIRATORY/INHALATION:
Prolonged breathing of vapors can cause central nervous system effects. Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination. If inhaled at ambient temperatures, this substance is considered practically non-toxic to internal organs. If heated, hazardous hydrogen sulfide may be evolved. This substance contains sulfur compounds which may form hydrogen sulfide. The rotten eggs odor of hydrogen sulfide is unreliable as an indicator of concentration. Signs and symptoms of overexposure to hydrogen sulfide include respiratory tract irritation, headaches, dizziness, nausea, gastrointestinal disturbances, coughing, a sensation of dryness and pain in the nose, throat and chest, confusion and unconsciousness. Hydrogen sulfide concentrations of 1000-2000 ppm can be extremely hazardous. This hazard evaluation is based on data from similar materials.
INGESTION:
If swallowed, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended. Note; If any of the applicable hydrogen sulfide standards are likely to be exceeded, positive supplied-air respiratory protection must be used. The ACGIH TWA for hydrogen sulfide is 10 ppm. The OSHA STEL is 15ppm.
VENTILATION:
Use this material only in well ventilated areas.

5. FIRE PROTECTION

FLASH POINT: (P-M) 150F (65C) Min.
AUTOIGNITION: NDA
FLAMMABILITY: NDA
EXTINGUISHING MEDIA:
CO_2, dry chemical, foam and water fog.
NFPA RATINGS: Health 2; Flammability 2; Reactivity 0; Special NDA;
HMIS RATINGS: Health 2; Flammability 2; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard

evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.

FIRE FIGHTING PROCEDURES:

Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85 F.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur. Incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA.

STABILITY:

Stable.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

SPECIAL PRECAUTIONS:

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

Toxic quantities of hydrogen sulfide (H_2S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H_2S is present. See Protective Equipment (Section 4). DO NOT ATTEMPT RESCUE WITHOUT WEARING APPROVED SUPPLIED-AIR OR selfcontained breathing equipment.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Heavy, black oil.
BOILING POINT: NDA
MELTING POINT: NA
EVAPORATION: NDA
SPECIFIC GRAVITY: 1.02 @ 15.6/15.6C (Min.)
VAPOR PRESSURE: NA

PERCENT VOLATILE (VOLUME %): NDA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: 380 - 480 cSt @ 50C Range

8. ENVIRONMENTAL CONCERNS, SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.

Eliminate all open flame in vicinity of spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Protective Equipment. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS#	COMPONENT/REGULATORY LIMITS
100.0 %	BFO
CONTAINING	
100.0 % CAS68553004	Bunker Fuel Oil
	INCLUDING
< 3.8 % CAS7704349	SULFUR

TLV - Threshold Limit Value PEL - Permissible Exposure Limit

STEL - Short-term Exposure Limit
RQ - Reportable Quantity
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: Bunker Fuel Oil
DOT HAZARD CLASS: COMBUSTIBLE LIQUID
DOT IDENTIFICATION NUMBER:

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

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

SULFUR 02,10,11,

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1
07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
SKIN IRRITATION:
NDA. The hazard evaluation was based on data from similar materials.
DERMAL TOXICITY:
NDA. The hazard evaluation was based on data from similar materials.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data from similar materials.
INGESTION:
NDA. The hazard evaluation was based on data from similar materials.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product may contain significant amounts of polynuclear aromatic hydrocarbons (PNA's) which have been shown to cause skin cancer after prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing of mists or vapors should be reduced to a minimum.

This product contains a mixture of petroleum hydrocarbons called middle distillates (which means they boil between approximately 350F and 700F). Because of this broad description, many products are considered middle distillates yet they are produced by a variety of different petroleum refining processes. Toxicology data developed on some middle distillates found that they caused positive responses in some mutagenicity tests and caused skin cancer when repeatedly applied to mice over their lifetime. This product may contain some middle distillates found to cause those adverse effects.

****

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

USX Engineers and Consultants (UEC) believes that the information contained herein (including data and statements) is accurate as of the date hereof. NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE AS CONCERNS THE INFORMATION HEREIN PROVIDED. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use of the product and information referred to herein are beyond the control of UEC, UEC expressly disclaims any and all liability as to any results obtained or arising from any use of the product or such information. Not statement made herein shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.

TK 29

MATERIAL SAFETY DATA SHEET

BJ Chemical Services Product Catalog
MSDS FORM

Section: 01 PRODUCT IDENTIFICATION

BJ UNICHEM CHEMICAL SERVICES
707 N. LEECH
HOBBS, NM 88241-1499
TELEPHONE:(505)393-7751

Emergency Telephone CHEMTREC (800)424-9300
Previous Version Date 1/11/00
Date Prepared 1/25/00
Version: 0000010

Product Name: UNICHEM 8162W
Chemical Description:
Proprietary asphalt additive blend

Section: 02 HAZARDOUS INGREDIENTS

Component Name	CAS#	% Range
cracked heavy oil	064741-62-4	< 60%
flux	068512-62-9	< 35%
other amines and nitriles		< 20%
caprolactam	000105-60-2	< 5%

Section: 03 PHYSICAL DATA

Freezing Point: < 50 Deg.F.
Boiling Point, 760 mm Hg: 580 Deg.F
Specific Gravity(H2O=1) : 1.000 Solubility in water: Insoluble
Appearance and Odor: Dark brown liquid; slight amine odor.

Section: 04 FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): 230 Deg.F PMCC
Extinguishing Media
CO2, dry chemical, water spray or fog, or foam. Use water to keep containers cool. Isolate "fuel" supply from fire. Contain fire fighting liquids for proper disposal.
Special Fire Fighting Procedures
Fire fighters should wear self-contained breathing apparatus with a full facepiece operated in the pressure-demand or positive-pressure mode.
Unusual Fire and Explosion Hazards
None

Section: 05 HEALTH HAZARD DATA

Effects of Overexposure

Eye Contact: may cause burns, pain, tearing, blurred vision or corrosion with corneal or conjunctival ulceration which may lead to permanent blindness.

Skin Contact: may cause skin burns or ulceration, swelling, rash, dermatitis and redness. May permeate skin in amounts capable of producing the effects of systemic toxicity.

Inhalation: may cause headaches, confusion, disorientation, blurred vision, irritation of respiratory and digestive tracts with stomach pain, heartburn, nausea, vomiting or diarrhea. May also cause CNS depression, hallucinations, drowsiness or unconsciousness. Repeated or prolonged exposure may cause an asthma-like reaction with shortness of breath, wheezing or coughing, which may occur after re-exposure to low levels. May also cause liver abnormalities, cardiovascular irregularities such as abnormal blood test results and altered hormone levels. Seizure and coma occur from very high exposures and death may result from respiratory depression.

Ingestion: may cause irritation of the gastrointestinal tract with burning and pain. May cause nausea, diarrhea, heartburn, cramping, vomiting, dizziness, loss of coordination and of consciousness and convulsions. Prolonged exposure may cause pneumonia, pulmonary edema, hemorrhages, CNS depression and cardiovascular and respiratory effects.

Medical Conditions Aggravated by Exposure: increased susceptibility to the effects of this material may be

observed in persons with pre-existing disease of the CNS, skin and lungs.

Additional Information: this product contain trace amounts of naphthalene. Overexposure to naphthalene by inhalation, ingestion or skin contact may produce signs and symptoms of headache, fever, profuse sweating, nausea, abdominal pain, diarrhea, lethargy, tremors, convulsions, evidence of blood changes, including hematuria and hemoglobinuria, and optic neuritis. Lab animals given repeated oral doses of naphthalene have developed cataracts.

This product contains < 0.1% benzene which is known to the State of California to cause cancer. Benzene must be handled strictly in conformance with the OSHA Regulation set forth in Sec 1028, Part 1910 of Title 29 of the Code of Federal Regulations.

Target Organs: eyes, skin, CNS, lungs, liver, kidneys and circulatory system.

Emergency and First Aid Procedures

SKIN

Wash with soap and water. Remove contaminated clothing and launder contaminated clothing before reuse. Get medical attention if redness or irritation develops.

EYES

Flush eyes immediately with large amounts of water for at least 15 minutes. Lift lower and upper lids occasionally. Get medical attention.

INHALATION

Remove victim to fresh air. Give artificial respiration if not breathing. If breathing is difficult, administer oxygen. Keep person warm, quiet and get medical attention.

INGESTION

Call a physician immediately. Give victim a glass of water. Do NOT induce vomiting unless instructed by a physician or poison control center. Never give anything by mouth to an unconscious person.

Section: 06 REACTIVITY DATA

Stable (Y=Yes/N=No): Y

Stability -- Conditions to Avoid

None known.

Incompatibility (Materials to Avoid)

Avoid contact with strong oxidizers or acidic materials.

Hazardous Decomposition Products

Smoke, carbon dioxide, carbon monoxide, oxides of nitrogen.

Hazardous Polymerization May Occur(Y=Yes/N=No): N

Hazardous Polymerization -- Conditions to Avoid

None

Section: 07 SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled

Persons not wearing suitable personal protective equipment should be excluded from area of spill until clean-up has been completed. Shut off source of spill if possible to do so without hazard. Prevent material from entering sewers or watercourses. Provide adequate ventilation. Contain spilled material with sand or earth. Recovered undamaged or minimally contaminated material for reuse or reclamation. Place all collected material and spill absorbents into DOT approved containers.

Advise authorities. If this product is an EPA hazardous substance (see Section 10), notify the U.S.EPA or the National Response Center. Additional notification pursuant to SARA Section 302/304 (40 CFR 355) may also be required.

Waste Disposal Method

Treatment, storage, transportation and disposal must be in accordance with EPA or State regulations under authority of the Resource Conservation and Recovery Act (40 CFR 260-271).

Section: 08 SPECIAL PROTECTIVE INFORMATION

Respiratory Protection

If workplace exposure limit(s) of product or component is exceeded, an NIOSH/MSHA approved air supplied respirator is

advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure organic/amines vapor type) under specified conditions. Engineering or administrative controls should be implemented to reduce exposure.

Ventilation

The use of mechanical dilution ventilation is recommended whenever this product is used in confined spaces, is heated above ambient temperatures or is agitated. When applicable, sufficient local ventilation should be provided to maintain employee exposures below safe working limits (TWA's).

Protective Gloves

Neoprene, nitrile, polyvinyl alcohol (PVA), polyvinyl chloride (PVC)

Eye Protection

Chemical splash goggles or face shield in compliance with OSHA regulations is advised; however OSHA regulations also permits safety glasses under certain conditions. The use of contact lenses is not recommended.

Other Protective Equipment

Eye wash and safety shower

Section: 09 SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing

Avoid contact with eyes, skin or clothing. Avoid breathing vapors or mist.

Other Precautions

Containers of this material may be hazardous when emptied. Since emptied containers retain residues (vapor, liquid, or solid), all hazard precautions given in this data sheet must be observed. Do not transfer to improperly marked container. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Containers should not be washed out or used for other purposes.

FOR INDUSTRIAL USE ONLY

Section: 10 REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act Of 1986(SARA) Title III

Section 302/304-Extremely Hazardous Substances (40 CFR 355)

SARA requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312). These values are subject to change and the regulations should be consulted to verify current statutory requirements.

Components present in this product at a level which could require reporting under the statute are:

Component Name	RQ	TPQ	% Range
NONE			

Section 311/312 Chemical Inventory Reporting Requirements (40 CFR 370)

The Superfund Amendments and Reauthorization Act (SARA) may require submission of reports (chemical list, MSDS, Tier I & Tier II) to the State Emergency Response Commission, Local Emergency Response Committee and the local fire department. The SARA physical and health hazards related to this product are:

X Acute Health Hazard	Sudden Release of Pressure	Fire
X Chronic Health Hazard	Reactive	

Section 313-List of Toxic Chemicals (40 CFR 372)

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). This information should be included in all MSDSs that are copied and distributed for this material.

Component Name	CAS #	% Range
NONE		

CERCLA, 40 CFR 261 AND 302

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center 1-800-424-8802 of any release of a Hazardous Substances equal to or greater than the reportable quantities (RQs) listed in 40CFR 302.4. Values are given in pounds for the component and not the mixture, if applicable. (These values are subject to change and the regulations

should be consulted to verify current statutory levels.)

Component Name	CAS #	CERCLA RQ
NONE		

OSHA Exposure Limits

Component Name

caprolactam

TWA ppm: 5.0 TWA MG/M3: 20.0 STEL ppm: 10.0 STEL MG/M3: 40.0

National Fire Protection Agency

2 Health 1 Fire

0 Reactive Other

Department of Transportation Shipping Information

Proper Shipping Name: Nonregulated material

Hazardous Substance RQ: *NONE* Emergency Response Guide Number: 171

Labels: None

Toxic Substances Control Act (TSCA), 40 CFR 261

This product, or components if product is a mixture, is/are listed on the Toxic Substances Control Act (TSCA) inventory.

Section 10 information is to remain attached to the material safety data sheet for this product.

While UNICHEM believes that the above data is correct, UNICHEM expressly disclaims liability for any loss or injury arising out of the use of this information or the use of any materials designated.

END OF MSDS

13.) CALCIUM CHLORIDE

HPC SCIENTIFIC & TECHNOLOGY
MSDS for CALCIUM CHLORIDE

1 - Site Specific Information

NO Site Specific Information on file for this Chemical

2 - Section I (General Information)

MANUFACTURER'S NAME:
HPC SCIENTIFIC & TECHNOLOGY

EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

INFORMATION TELEPHONE NUMBER:
(503) 249-2985

ADDRESS:
2730 NE RIVERSIDE WAY
PORTLAND, OREGON 97211

HEMICAL NAME:
CALCIUM CHLORIDE

COMMON SYNONYMS:
N/A

CHEMICAL FAMILY:
CALCIUM COMPOUNDS

FORMULA:
CACL2

DATE OF PREPARATION:
3/10/92
REVISION DATE:
5/3/95

THE INFORMATION HEREIN IS BELIEVED TO BE ACCURATE, HOWEVER HPC SCIENTIFIC & TECHNOLOGY MAKES NO REPRESENTATION AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND THE CONTROL OF HPC SCIENTIFIC & TECHNOLOGY AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA TO THEIR OPERATING CONDITIONS AND SUITABILITY FOR PARTICULAR PURPOSE.

3 - Section II - Hazardous Ingredients

MATERIAL	CAS NUMBER	%	TLV (Units)
CALCIUM CHLORIDE	10043-52-4	94-96	N/E
SODIUM CHLORIDE	7647-14-5	1-2	N/E
POTASSIUM CHLORIDE	7447-40-7	2-3	N/E
STRONTIUM CHLORIDE	10476-85-4	<1	N/E

4 - Section III - Physical Data

BOILING POINT: N/A

VAPOR PRESSURE(mm Hg): N/A

VAPOR DENSITY (AIR = 1): N/A

SPECIFIC GRAVITY (H2O=1): 2.15

PERCENT VOLATILE BY VOLUME (%): 0

VAPORATION RATE: N/A

SOLUBILITY IN WATER: APPRECIABLE (>10%)

APPEARANCE AND ODOR: WHITE PELLETS. ODORLESS.

5 - Section IV - Fire and Explosion Hazard Data

FLASH POINT: N/A

FLAMMABLE LIMITS:
LEL: N/A
UEL: N/A

EXTINGUISHING MEDIA:
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

5 - Section IV - Fire and Explosion Hazard Data (continued)

NONE IDENTIFIED.

6 - Section V - Health Hazard Data

THRESHOLD LIMIT VALUE:
NOT ESTABLISHED.

CARCINOGENICITY:
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE:
INHALATION: IRRITATION OF UPPER RESPIRATORY TRACT.

SKIN CONTACT: PROLONGED CONTACT MAY CAUSE IRRITATION.

EYE CONTACT: IRRITATION, BURNS.

SKIN ABSORPTION: NONE IDENTIFIED.

INGESTION: GASTROINTESTINAL IRRITATION.

CHRONIC EFFECTS: NONE IDENTIFIED.

TARGET ORGANS
EYES.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED.

PRIMARY ROUTES OF ENTRY
EYE CONTACT, SKIN CONTACT, INHALATION, INGESTION.

EMERGENCY AND FIRST AID PROCEDURES
INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, GIVE LARGE AMOUNTS OF WATER. INDUCE VOMITING.

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION IF BREATHING IS DIFFICULT, GIVE OXYGEN.

SKIN CONTACT: FLUSH SKIN WITH WATER.

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

6 - Section V - Health Hazard Data (continued)

THIS MATERIAL IS INCLUDED IN THE TSCA INVENTORY.

7 - Section VI - Reactivity Data

STABILITY:
STABLE.

CONDITIONS TO AVOID:
MOISTURE.

INCOMPATIBILITY:
MOST COMMON METALS, WATER, ALUMINUM.

HAZARDOUS DECOMPOSITION PRODUCTS:
HYDROGEN CHLIORIDE.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

8 - Section VII - Spill or Leak Procedures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE:
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE ENVIRONMENTAL REGULATIONS.

9 - Section VIII - Special Protection Information

RESPIRATORY PROTECTION:
NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.

VENTILATION:
USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.

9 - Section VIII - Special Protection Information (continued)

EYE/SKIN PROTECTION:
SAFETY GOGGLES, UNIFORM, RUBBER GLOVES ARE RECOMMENDED.

10 - Section IX - Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. MATERIAL IS HYGROSCOPIC. CAUSES IRRITATION. MAY CAUSE EYE BURNS. AVOID CONTACT WITH EYES, SKIN, CLOTHING. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. AVOID BREATHING DUST.

14.) CALCIUM SULFATE

1 -PRODUCT IDENTIFICATION

PRODUCT NAME: DRIERITE(R)
COMMON SYNONYMS: CALCIUM SULFATE, ANHYDROUS
CHEMICAL FAMILY: CALCIUM COMPOUNDS
FORMULA: CASO4
FORMULA WT.: N/A
CAS NO.: 7778-18-9
NIOSH/RTECS NO.: N/A
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: L056

CHEMTREC # (800) 424-9300
NATIONAL RESPONSE CENTER # (800) 424-8802
J.T.BAKER INC.
222 RED SCHOOL LANE
PHILLIPSBURG, NJ 08865
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151

EFFECTIVE: 03/09/92 ISSUED: 04/03/93
REVISION #04

PRECAUTIONARY LABELING

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	1	SLIGHT
FLAMMABILITY	-	0	NONE
REACTIVITY	-	0	NONE
CONTACT	-	1	SLIGHT

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES; LAB COAT

U.S. PRECAUTIONARY LABELING

CAUTION

MAY CAUSE IRRITATION.
DURING USE AVOID CONTACT WITH EYES, SKIN, CLOTHING. WASH THOROUGHLY AFTER HANDLING. WHEN NOT IN USE KEEP IN TIGHTLY CLOSED CONTAINER.

INTERNATIONAL LABELING

AVOID CONTACT WITH EYES. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH PLENTY OF WATER. KEEP CONTAINER TIGHTLY CLOSED.

SAF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

2 -COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
CALCIUM SULFATE, ANHYDROUS	7778-18-9	98-100	15 MG/M3	10 MG/M3

3 -PHYSICAL DATA

BOILING POINT: N/A

VAPOR PRESSURE (MMHG): N/A

MELTING POINT: 1450 C (2642 F)
(AT 760 MM HG)

VAPOR DENSITY (AIR=1): N/A

SPECIFIC GRAVITY: 2.96
(H2O=1)

EVAPORATION RATE: N/A

SOLUBILITY(H20): SLIGHT (0.1-1%)

% VOLATILES BY VOLUME: 0
(21 C)

PH: N/A

OR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: SOLID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: CRYSTALS. ODORLESS.

4 -FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS: UPPER - N/A LOWER - N/A

FIRE EXTINQUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

UNUSUAL FIRE & EXPLOSION HAZARDS
NONE IDENTIFIED.

4 -FIRE AND EXPLOSION HAZARD DATA (continued)

TOXIC GASES PRODUCED
SULFUR DIOXIDE

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT
NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE
NONE IDENTIFIED.

5 -HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 10 MG/M3

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

PERMISSIBLE EXPOSURE LIMIT (PEL): NOT ESTABLISHED

TOXICITY OF COMPONENTS

NO INFORMATION IS AVAILABLE
CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: IRRITATION OF UPPER RESPIRATORY TRACT

SKIN CONTACT: NONE IDENTIFIED

EYE CONTACT: IRRITATION

SKIN ABSORPTION: NONE IDENTIFIED

INGESTION: NONE IDENTIFIED

CHRONIC EFFECTS: NONE IDENTIFIED

TARGET ORGANS
NONE IDENTIFIED

5 -HEALTH HAZARD DATA (continued)

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY
INHALATION, EYE CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: IF SWALLOWED AND THE PERSON IS CONSCIOUS, IMMEDIATELY GIVE LARGE AMOUNTS OF WATER. GET MEDICAL ATTENTION.

INHALATION: IF A PERSON BREATHES IN LARGE AMOUNTS, MOVE THE EXPOSED PERSON TO FRESH AIR.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

ACUTE: YES CHRONIC: YES FLAMMABILITY: NO PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: NO
CERCLA HAZARDOUS SUBSTANCE: NO
SARA 313 TOXIC CHEMICALS: NO
TSCA INVENTORY: YES

6 -REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: AIR, MOISTURE, DUSTING

INCOMPATIBLES: STRONG ACIDS, ALUMINUM

DECOMPOSITION PRODUCTS: OXIDES OF SULFUR

7 -SPILL & DISPOSAL PROCEDURES

EPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.

7 -SPILL & DISPOSAL PROCEDURES (continued)

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

8 -INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION EXCEEDS TLV, A DUST/MIST RESPIRATOR IS RECOMMENDED. IF CONCENTRATION EXCEEDS CAPACITY OF RESPIRATOR, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GOGGLES, RUBBER GLOVES ARE RECOMMENDED.

9 -STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

STORAGE REQUIREMENTS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA.

10 -TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)
MARINE POLLUTANTS: NO

AIR (I.C.A.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

10 -TRANSPORTATION DATA AND ADDITIONAL INFORMATION (continued)

U.S. CUSTOMS HARMONIZATION NUMBER: 38220000000

N/A = NOT APPLICABLE OR NOT AVAILABLE
N/E = NOT ESTABLISHED

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN, CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES.

EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL.

BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET.

NOTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE NUMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL NON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE (1-800-JTBAKER) ASSISTANCE.

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

CHEM-SOLV(tm)

Material Safety Data Sheet

Mallinckrodt Inc.
Science Products Division
P.O. Box M
Paris, Kentucky 40361

Emergency Telephone Number
314-982-5000

Effective Date: 04-06-89 Supersedes 01-13-88

PRODUCT IDENTIFICATION:

Synonyms: Sodium hydroxide/methyl alcohol mixture; Laboratory glassware cleaner

Formula CAS No.: Not applicable to mixtures.

Molecular Weight: Not applicable.

Hazardous Ingredients:
Sodium hydroxide CAS# 1310-73-2
Propylene glycol CAS# 57-55-6
Methyl alcohol CAS# 67-56-1
Triton X-100 CAS# 9002-93-1

Chemical Formula: Not applicable.

PRECAUTIONARY MEASURES

DANGER! MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH S N. CAUSES SEVERE BURNS. MAY CAUSE BLINDNESS.

Avoid contact with eyes.
Avoid breathing vapor.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
This substance is classified as a POISON under the Federal Caustic Poison Act.

EMERGENCY FIRST AID

If swallowed, give several glasses of water or milk to drink. Vomiting may occur spontaneously, but DO NOT INDUCE! Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. In all cases call a physician.
SEE SECTION 5.

DOT Hazard Class: Corrosive Material

Physical Data

Appearance: Viscous tan liquid.

Odor: Slight characteristic odor.

Solubility: Miscible with water.

Boiling Point: No information found.

Melting Point: -4 to-1 C (25-30 F).

D sity: 1.23 pH: ca. 11.5; ca. 12.5 as a 2% solution.

Vapor Density (Air=1):No information found.

Vapor Pressure (mm Hg):No information found.

Evaporation Rate:No information found.

Fire and Explosion Information — SECTION 2

Fire:	Not considered to be a fire hazard. Can react with metals to release flammable hydrogen gas.
Explosion:	Not considered to be an explosion hazard.
Fire Extinguishing Media:	Use any means suitable for extinguishing surrounding fire.
Special Information:	In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Reactivity Data — SECTION 3

Stability:	Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:	Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:	This substance does not polymerize.
Incompatibilities:	Strong oxidizing agents and acids.

Leak/Spill Disposal Information — SECTION 4

Ventilate area of leak or spill. Clean-up personnel require protective clothing. Contain and recover liquid when possible. Larger Spills: absorb with vermiculite, dry sand, earth, or similar material for disposal as hazardous waste in a RCRA approved facility. Do Not Flush To Sewer. Reportable Quantity (RW)(CWA/CERCLA): 1000 lbs. Sodium hydroxide

Ensure compliance with local, state and federal regulations.

Health Hazard Information — SECTION 5

A. Exposure/Health Effects

Inhalation:	Chem Solv mist is strongly alkaline and could irritate the respiratory passages. Toxic effects of methyl alcohol exerted upon nervous system, particularly the optic nerve. Once absorbed into the body, it is very slowly eliminated. Symptoms of overexposure may include headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma, and death. A person may get better but then worse again up to 30 hours later.
Ingestion:	Toxic, corrosive. Methyl alcohol is a systemic poison capable of causing blindness Symptoms parallel inhalation. Usual fatal dose: 100-125 milliliters Methyl alcohol. Sodium hydroxide component can cause burns and possible destruction of tissue in the mouth and esophagus, abdominal pain, nausea, vomiting and general distress. The other components are not considered significantly toxic.
Skin Contact:	Corrosive. Strong caustic action causes inflammation, pain and possible damage to the skin on prolonged contact. Methyl alcohol component may be absorbed through skin with symptoms paralleling inhalation.
Eye Contact:	Corrosive. Contact with eye tissue can cause pain and possible damage to tissue. The action is that of a strong caustic solution.
Chronic Exposure:	Repeated contact may cause skin drying and possible contact dermatitis. Marked impairment of vision and enlargement of the liver has been reported for chronic exposure to methyl alcohol.
Aggravation of Pre-existing Conditions:	Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

B. FIRST AID

Inhalation:	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:	Give several glasses of water or milk, if available, to drink. Vomiting may occur spontaneously, but DO NOT INDUCE! Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Exposure: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.

Eye Exposure: Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY (RTECS, 1982)

Soduim hydroxide: Irritation eye rabbit: 1% severe mutation reference cited Propylene glycol: Oral rat LD50: 20gm/kg skin rabbit LD50: 20.8g/kg reproductive effects & mutation references cited Methyl alcohol: Oral rat LD50: 5628mg/kg inhalation rat LC50: 64000 ppm/4H skin rabbit LD50: 20gm/kg reproductive effects & mutation reference cited Triton X-100: Oral rat LD50: 1800mg/kg

Occupational Control Measures — SECTION 6

Airborne Exposure Limits:	-OSHA Permissible Exposure Limit (PEL): Sodium Hydroxide: 2mg/m3 Ceiling Methyl Alcohol: 200 ppm (TWA), 250 ppm (STEL) skin ACGIH Threshold Limit Value (TLV): Soduim Hydroixide: 2mg/m3 Ceiling Methyl Alcohol: 200 ppm (TWA) 250 ppm (STEL) skin
Ventilation System:	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.
Personal Respirators (NIOSH Approved)	If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.
Skin Protection:	Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.
Eye Protection:	Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

Storage and Special Information — SECTION 7

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Store at temperatures above 15 C (60 F).

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The information contained herein is provided in good faith and is believed to be correct as of the date hereof. However, Mallinckrodt, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, Mallinckrodt, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. NO REPRESENTATIONS, OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR TO THE PRODUCT TO WHICH THE INFORMATION REFERS.
** **********

Addendum to Material Safety Data Sheet

REGULATORY STATUS

This Addendum Must Not Be
Detached from the MSDS
Identifies SARA 313 substance(s)

Any copying or redistribution of the MSDS
must include a copy of this addendum

Hazard Categories for SARA
Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			

Product or Components of Product:	SARA EHS Sec. 302 RQ	SARA EHS Sec. 302 TPQ	SARA Sec. 313 Chemicals Name List	SARA Sec. 313 Chemicals Chemical Category	CERCLA Sec.103 RQ lbs	RCRA Sec. 261.33
CHEM-SOLV (tm)						
[illegible]lium hydroxide ([illegible]-73-2) 20-30%	No	No	Yes	No	1000	No
1,2-Propanediol (57-55-6)	No	No	No	No	No	No
Methyl alcohol (67-56-1) 20-30%	No	No	Yes	No	5000	U154
Triton X-100 (9002-93-1)	No	No	No	No	No	No

Actual concentrations proprietary

SARA Section 302 EHS RQ:
Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA Section 302 EHS TPQ:
Threshold Planning Quantity of Extremely Hazardous substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA Section 313 Chemicals:
Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA Sec. 103:
Comprehensive Enviromental Response, Compensation and Liability Act (Superfund).

Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center,

(800-424-8802); Listed at 40 CFR 302.4

RCRA:
Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

"HELV . CHEM-SOLV(tm)

16.) CHROMIUM TRIOXIDE

HIGH PURITY CHEMICAL, INC.
MSDS for CHROMIUM TRIOXIDE

1 - Site Specific Information

NO Site Specific Information on file for this Chemical

2 - Section I (General Information)

MANUFACTURER'S NAME:
HIGH PURITY CHEMICAL, INC.

EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

INFORMATION TELEPHONE NUMBER:
(503) 249-2985

ADDRESS:
2730 NE RIVERSIDE WAY
PORTLAND OREGON 97211

CHEMICAL NAME:
CHROMIUM TRIOXIDE

COMMON SYNONYMS:
CHROMIUM (VI) OXIDE; CHROMIC ACID; CHROMIUM ANHYDRIDE

CHEMICAL FAMILY:
CHROMIUM COMPOUNDS

FORMULA:
CR03

DATE OF PREPARATION:
6/2/92

PREPARED BY:
BRUCE BROMLEY

THE INFORMATION HEREIN IS BELIEVED TO BE ACCURATE, HOWEVER HIGH PURITY MAKES NO REPRESENTATION AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND HIGH PURITY'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFYT THIS DATA TO THEIR OPERATING CONDITIONS AND SUITABILITY FOR PARTICULAR PURPOSE.

3 - Section II - Hazardous Ingredients

MATERIAL	CAS NUMBER	%	TLV (Units)
CHROMIUM TRIOXIDE	1333-82-0	98-100	N/E

4 - Section III - Physical Data

BOILING POINT: N/A

VAPOR PRESSURE(mm Hg): N/A

VAPOR DENSITY (AIR = 1): N/A

SPECIFIC GRAVITY (H2O=1): 2.70

PERCENT VOLATILE BY VOLUME (%): N/A

EVAPORATION RATE: N/A

SO 3ILITY IN WATER: APPRECIABLE (>10%)

APPEARANCE AND ODOR: DARK RED CRYSTALS. ODORLESS.

5 - Section IV - Fire and Explosion Hazard Data

FLASH POINT: N/A

FLAMMABLE LIMITS:
LEL: N/A
UEL: N/A

EXTINGUISHING MEDIA:
USE WATER SPRAY.

SPECIAL FIRE-FIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
STRONG OXIDIZER. CONTACT WITH COMBUSTIBLE MATERIALS, FLAMMABLE MATERIALS, OR POWDERED METALS CAN CAUSE FIRE OR EXPLOSION. CAN REACT VIOLENTLY WITH

5 - Section IV - Fire and Explosion Hazard Data (continued)

SHOCK, FRICTION, OR HEAT.

NFPA RATING:
HEALTH - 3; FLAMMABILITY - 0; REACTIVITY - 1; SPECIAL HAZARD - OXY.

6 - Section V - Health Hazard Data

THRESHOLD LIMIT VALUE:
0.05 MG/M3.

TLV IS FOR CHROMIUM (VI) COMPOUNDS, WATER SOLUBLE, AS CR.

CARCINOGENICITY:
THIS SUBSTANCE IS LISTED AS A NTP HUMAN CARCINOGEN AND AN IARC HUMAN CARCINOGEN (GROUP 1).

EFFECTS OF OVEREXPOSURE:
INHALATION: EXCESSIVE INHALATION IS IRRITATING, MAY CAUSE RESPIRATORY SYSTEM DAMAGE, ULCERATION OF MUCOUS MEMBRANES.

SKIN CONTACT: SEVERE IRRITATION OR BURNS.

EYE CONTACT: SEVERE IRRITATION OR BURNS.

SKIN ABSORPTION: NONE IDENTIFIED.

INGESTION: SEVERE GASTROINTESTINAL IRRITATION, BURNS TO MOUTH AND THROAT.

CHRONIC EFFECTS: NONE IDENTIFIED.

TARGET ORGANS
BLOOD, RESPIRATORY SYSTEM, LUNGS, LIVER, KIDNEYS, EYES, SKIN.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY
INHALATION, INGESTION, SKIN CONTACT, EYE CONTACT.

EMERGENCY AND FIRST AID PROCEDURES
INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.

6 - Section V - Health Hazard Data (continued)

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE RE-USE.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

THIS MATERIAL IS INCLUDED IN THE TSCA INVENTORY.

7 - Section VI - Reactivity Data

STABILITY:
STABLE

CONDITIONS TO AVOID:
HEAT

INCOMPATIBLES:
COMBUSTIBLE MATERIALS, STRONG REDUCING AGENTS, ORGANIC MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS:
NONE IDENTIFIED

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

8 - Section VII - Spill or Leak Procedures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. KEEP COMBUSTIBLES (WOOD, PAPER, OIL, ETC.) AWAY FROM SPILLED MATERIAL. WITH CLEAN SHOVEL, CAREFULLY PLACE SPILLED MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

WASTE DISPOSAL PROCEDURE:
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE ENVIRONMENTAL REGULATIONS.

8 - Section VII - Spill or Leak Procedures (continued)

EPA HAZARDOUS WASTE NUMBER:
D001 (IGNITABLE WASTE)

9 - Section VIII - Special Protection Information

RESPIRATORY PROTECTION:
RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP TO 1 PPM, A HIGH-EFFICIENCY PARTICULATE RESPIRATOR IS RECOMMENDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

VENTILATION:
USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

EYE/SKIN PROTECTION:
SAFETY GOGGLES, UNIFORM, APRON, PROPER GLOVES ARE RECOMMENDED.

- Section IX - Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
KEEP CONTAINER TIGHTLY CLOSED. STORE SEPARATELY AND AWAY FROM FLAMMABLE AND COMBUSTIBLE MATERIALS. HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE BURNS OR EXTERNAL ULCERS. CONTAINS CHROMIUM (VI), CANCER HAZARD. STRONG OXIDIZER. KEEP FROM CONTACT WITH CLOTHING AND OTHER COMBUSTIBLE MATERIALS. DO NOT STORE NEAR COMBUSTIBLE MATERIALS. DO NOT GET IN EYES, ON SKIN OR CLOTHING. DO NOT BREATHE DUST. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

17.) CONCENTRATE

Jim Charnes

CENEX REFINERY MSDS BOOK PAGE NO.:	REA:	

MATERIAL SAFETY DATA SHEET

POLYMODIFIED ASPHALT CEMENT

CENEX REFINERY, P.O. Box 909, Laurel, MT, 59044, (406) 628-5200

CHEMICAL NAME:
PETROLEUM POLYMODIFIED ASPHALT CEMENTS

CAS NUMBER: N/A

COMMON NAMES: PMAC, POLYMER MODIFIED

CHEMICAL NAME: N/A
CAS NUMBER: N/A
HAZARD RATING: HEALTH - 1 FIRE - 1 REACTIVITY - 0 FOURTH -
ADDITIONAL COMMENTS: CAUTION! MAY IRRITATE THE SKIN AND EYES; OVEREXPOSURE MAY CAUSE DERMATITIS.

EMERGENCY TELEPHONE NUMBERS:	CHEMTREC	1-800-424-9300
	CENEX REFINERY	1-406-628-5200

SECTION II INGREDIENTS

INGREDIENTS	CAS NO.	%	OSHA	PEL	ACGIH	TLV	KOCH	LIMIT
PETROLEUM ASPHALT	8052-42-4	>80	NE	PPM.	5	MGM	NE	PPM.
POLYMER ADDITIVE		< 6	NE	PPM.	NE	PPM.	NE	PPM.

ADDITIONAL COMMENTS:
THOUGH FURTHER DETAIL ON CONTENTS MAY BE CONFIDENTIAL, ALL PERTINENT HAZARDS ARE ADDRESSED I N THIS MSDS.

SECTION III HEALTH HAZARD DATA

ROUTE OF ENTRY

LEGEND: A = HEALTH EFFECT B = PERSONAL PROTECTION C = EMERGENCY FIRST AID PROCEDURES

INHALATION

A FUMES FROM HOT ASPHALT MAY CAUSE IRRITATION OF MUCOUS MEMBRANES. HYDROGEN SULFIDE, MAY BE RELEASED AND ACCUMULATE IN ENCLOSED SPACES. IT IS EXTREMELY IRRITATING AND MAY CAUSE COMA, CONVULSIONS, AND DEATH AT HIGH CONCENTRATIONS. CHRONIC OVEREXPOSURE TO ASPHALT MAY CAUSE PNEUMONITIS, CONGESTION, BRONCHIAL DILATION, ABSCESS FORMATION, AND NECROSIS.

B PROVIDE EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.

C REMOVE VICTIM FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP VICTIM WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN

A DIRECT CONTACT WITH HOT FUMES MAY CAUSE SKIN IRRITATION AND THERMAL BURNS. REPEATED OR PROLONGED EXPOSURE TO FUMES MAY CAUSE IRRITATION, DERMATITIS, AND ACNE-LIKE LESIONS.

B EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE IMPERVIOUS CLOTHING, GLOVES, AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

	C	IF CONTACT IS NOT WITH HOT MATERIALS, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY, WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT, AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF MATERIAL REMAINS (15-20 MINUTES). BURNS FROM CONTACT WITH HOT MATERIAL SHOULD BE TREATED LIKE THERMAL BURNS. COOL AFFECTED AREA AS QUICKLY AS POSSIBLE BY DRENCHING OR IMMERSION IN COOL WATER UNTIL THE MATERIAL SOLIDIFIES. GET MEDICAL ATTENTION IMMEDIATELY.
INGESTION	A	MAY CAUSE NAUSEA, GASTRO-INTESTINAL IRRITATION, AND VOMITING.
	C	TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY. IF VOMITING OCCUR LOWER HEAT TO PREVENT ASPIRATION.
EYES	A	CONTACT WITH EYES MAY CAUSE REDNESS, IRRITATION, AND THERMAL BURNS. REPEATED OR PROLONGED EXPOSURE TO FUMES MAY CAUSE CONJUNCTIVITIS.
	B	EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST- RESISTANT SAFETY GOGGLES OR FACE SHIELD.
	C	WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER. LIFT UPPER AND LOWER LIDS UNTIL NO EVIDENCE OF MATERIAL REMAINS (15-20 MINUTES). COVER WITH STERILE BANDAGES. GET MEDICAL ATTENTION IMMEDIATELY.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
NO ADVERSE REACTIONS EXPECTED AT CONCENTRATIONS NORMALLY ENCOUNTERED.
ARCINOGENICITY;
THERE IS INADEQUATE EVIDENCE THAT ASPHALT ALONE IS CARCINOGENIC TO HUMANS.

SECTION IV FIRE & EXPLOSION DATA

FLASH POINT & METHOD:	>400	°F	NA	°C	(PMCC)
AUTOIGNITION TEMPERATURE:	>900	°F	NA	°C	
FLAMMABLE LIMITS IN AIR:	ND				

EXTINGUISHING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY, OR REGULAR FOAM.
FIRE FIGHTING PROCEDURES:
MOVE CONTAINERS FROM FIRE AREA IF POSSIBLE. COOL FIRE-EXPOSED CONTAINERS WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM STORAGE TANK ENDS. FOR MASSIVE FIRE IN STORAGE AREA, USE UNMANNED HOSE HOLDER OR MONITOR. USE FLOODING AMOUNTS OF WATER AS A FOG, AS SOLID STREAMS MAY BE INEFFECTIVE. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF STORAGE VESSEL DUE TO FIRE. EXTINGUISH ONLY IF FLOW CAN BE STOPPED. WATER OR FOAM MAY CAUSE FROTHING. AVOID BREATHING TOXIC VAPORS AND KEEP UPWIND.
ADDITIONAL COMMENTS:
REPRESENTS A SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

SECTION V REACTIVITY DATA

STABILITY/CONDITIONS TO AVOID:
MATERIAL IS STABLE UNDER NORMAL TEMPERATURE AND PRESSURE. DO NOT EXPOSE TO HEAT, SPARKS, OR OTHER IGNITION SOURCES. VAPORS MAY BE EXPLOSIVE. OVERHEATED CONTAINERS MAY RUPTURE.
INCOMPATIBILITY/MATERIALS TO AVOID:
FLUORINE - BURNS WITH SPLATTERING AND SMALL FLAMES.
NAPHTHA - READILY IGNITES
VOLATILE SOLVENTS - READILY IGNITES
HAZARDOUS POLYMERIZATION/CONDITIONS TO AVOID:
NONE EXPECTED UNDER NORMAL TEMPERATURES AND PRESSURES.
HAZARDOUS BY-PRODUCTS OF DECOMPOSITION:
THERMAL DECOMPOSITION MAY RELEASE HAZARDOUS GASES

SECTION VI PHYSICAL/CHEMICAL DATA

BOILING POINT:	>700	°F	NA	°C	SPECIFIC GRAVITY (H20 = 1):	1.1
BOILING RANGE:	ND	°F	ND	°F	VAPOR DENSITY (AIR = 1):	ND
BOILING RANGE:	ND	°C	ND	°C	EVAPORATION RATE:	ND
SOLUBILITY:	INSOLUBLE IN WATER				PH:	ND

APPEARANCE & ODOR:
BLACK OR BROWN MASS, OR HIGHLY VISCOUS LIQUID.

ADDITIONAL COMMENTS:
SOLUBLE IN: PETROLEUM SOLVENTS, OIL, TURPENTINE, CARBON DISULFIDE, ETHER, CHLOROFORM, ACETONE.

SECTION VII SAFE USAGE INFORMATION

HANDLING, STORAGE, AND OTHER PRECAUTIONS:
KEEP AWAY FROM HEAT, SPARKS, AND OXIDIZING AGENTS. KEEP CONTAINER CLOSED WHEN NOT IN USE. OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN HANDLING, STORING OR DISPOSING OF THIS MATERIAL.

ACTION TO BE TAKEN IN CASE OF SPILL OR RELEASE (INCLUDING DISPOSAL):
SHUT OFF AREA IGNITION SOURCES. STOP LEAK IF IT CAN BE DONE WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, USE ABSORBENT MATERIAL AND PLACE INTO CONTAINER. DIKE AHEADOF LARGE SPILL FOR LATER DISPOSAL. PROHIBIT SMOKING IN AFFECTED AREA. ISOLATE AREA AND RESTRICT ENTRY.

SECTION VIII CONTROL MEASURES INFORMATION

VENTILATION REQUIREMENTS:
PROVIDE EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.

WORK HYGIENE PRACTICES:
RESPIRATOR: SELECTION OF RESPIRATORY PROTECTION MUST BE BASED UPON THE AIRBORNE LEVEL OF SUSPECTED CONTAMINANT. LEVELS FOUND IN THE WORK PLACE MUST NOT EXCEED THE WORKING LIMIT OF THE RESPIRATOR UTILIZED.
DERMAL: WORKERS MUST WEAR APPROPRIATE PROTECTIVE CLOTHING, GLOVES, AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED CONTACT WITH THE SKIN.
EYES: PROPER EYE/FACE PROTECTION MUST BE UTILIZED TO PROTECT AGAINST SPLASHES AND VAPORS.

SECTION IX TRANSPORTATION

BILL OF LADING DESCRIPTION (49 CFR 172,202):
ELEVATED TEMPERATURE MATERIAL, LIQUID, N.O.S., 9, NA 9259, III

LEGEND:
NE = NONE ESTABLISHED
ND = NO DATA AVAILABLE
NA = NOT APPLICABLE

IMPORTANT NOTICE:
THE INFORMATION CONTAINED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN ACCORDANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD, CFR1910 1200. THIS INFORMATION RELATES SPECIFICALLY TO THE PRODUCT DESIGNATED AND MAY NOT BE VALID FOR THE PRODUCT WHEN USED IN COMBINATIONS WITH ANY OTHER MATERIALS OR PRODUCTS OR IN A PARTICULAR PROCESS. THE INFORMATION IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO USER SHOULD REVIEW THIS INFORMATION, SATISFY ITSELF AS TO ITS SUITABILITY AND COMPLETENESS, AND PASS ON THE INFORMATION TO ITS EMPLOYEES OR CUSTOMERS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL HAZARD COMMUNICATIONS REQUIREMENTS. WE DO NOT ACCEPT RESPONSIBILITY FOR ANY LOSS OR DAMAGE WHICH MAY OCCUR FROM THE USE OF THIS INFORMATION.

PREPARED BY:	DATE PREPARED:	SUPERSEDES ISSUE DATED:
ROBBIN G. NAUMAN	MAY 13, 1996.	MAY 13, 1996

SemMaterials℠

MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME(S)	**STYLINK (REG. TM) 206**
CAS NUMBER	MIXTURE
MSDS NUMBER	7853
PRODUCT CODE	ND
SYNONYM(S)	HEAVY ASPHALT
MANUFACTURER / SUPPLIER	SemMaterials, L.P. P.O. Box 702366 Tulsa , OK 74170

TELEPHONE NUMBERS - 24 HOUR ASSISTANCE

EMERGENCY ASSISTANCE

Call Chemtrec: 1-800-424-9300
Reference SemMaterials, L.P.
Code: SEML

TELEPHONE NUMBERS - GENERAL ASSISTANCE

Product Information

Call Manufacturer: 1-877-388-2629

For technical assistance regarding this product, contact your local SemMaterials representative.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
PETROLEUM ASPHALT	8052-42-4	50 - 100 %	Asphalt Fumes: 0.5 mg/m3 8-Hour TWA (ACGIH)
PETROLEUM BITUMEN	8052-42-4	50 - 100 %	Asphalt Fumes: 0.5 mg/m3 8-Hour TWA (ACGIH)
PETROLEUM DISTILLATES	PROPRIETARY	< 20 % **	ND
POLYMER MODIFIER	PROPRIETARY	0 - 25 %	ND
ADDITIVES	PROPRIETARY	0 - 3 %	ND
ANTI-STRIP	PROPRIETARY	0 - 2 %	ND
VULCANIZING AGENT	PROPRIETARY	0 - 2 %	ND

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
HYDROGEN SULFIDE	7783-06-4	0 - 1 %	20 ppm CEILING (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

The specific identities of some of the components of this product are being withheld as trade secrets. However, all pertinent hazards are addressed in this MSDS.

Asphalt products can contain hydrogen sulfide, because it is naturally occurring in crude oil from which asphalt is derived. Hydrogen sulfide can also be present as a by-product of asphalt processing.

Material may contain polycyclic aromatic hydrocarbons (PAHs).

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING!

HEALTH HAZARDS
MAY CAUSE SEVERE SKIN IRRITATION
MAY BE IRRITATING TO THE EYES AND RESPIRATORY TRACT
MAY BE HARMFUL IF SWALLOWED OR ABSORBED THROUGH THE SKIN
FUMES FROM HEATED MATERIAL MAY BE IRRITATING AND HAZARDOUS
MAY CAUSE ALLERGIC SKIN REACTION
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE
HEATED MATERIAL MAY CAUSE THERMAL BURNS
POTENTIAL REPRODUCTIVE HAZARD
CONTAINS MATERIAL WHICH MAY CAUSE CANCER
SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION

FLAMMABILITY HAZARDS
UNDEFINED (FLASH POINT > 200° F)
PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS
STABLE

POTENTIAL HEALTH EFFECTS, SKIN

SEVERELY IRRITATING. Contact may cause reddening, pain, itching, inflammation and possible tissue damage. Defatting agent.

Contains a component(s) that may cause allergic skin reactions in some individuals. May cause photoirritation in some individuals.

Absorption from prolonged or repeated skin contact may cause systemic toxicity.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, EYE

IRRITATING. Exposure to vapors, fumes or mists may cause irritation. Direct contact may cause irritation, redness, tearing and blurred vision. Prolonged or repeated exposure may cause irritation and conjunctivitis.

Contact with heated material may cause thermal burns, destruction of eye tissue and possible permanent injury or blindness.

POTENTIAL HEALTH EFFECTS, INHALATION

Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure. Fumes or vapors from the heated material may be irritating to the respiratory tract.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, nausea, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

May release hydrogen sulfide gas which is highly toxic. Hydrogen sulfide can cause respiratory paralysis and death, depending on the concentration and duration of exposure. Do not rely on ability to smell vapors, since odor fatigue rapidly occurs. Effects of overexposure include irritation of the nose and throat, nausea, vomiting, diarrhea, abdominal pain and signs of nervous system depression (e.g. headache, drowsiness, dizziness, loss of coordination and fatigue), irregular heartbeats, pulmonary edema, weakness and convulsions.

See Storage & Handling (Section 7) for more information.

Contains a component(s) which may cause allergic or asthma-like reactions in certain individuals.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Other specific symptoms of exposure are listed under "Toxicological Information" (Section 11).

POTENTIAL HEALTH EFFECTS, INGESTION

May cause severe irritation with intense burning of the mouth and throat followed by abdominal pain and distress, nausea, vomiting, and diarrhea. Symptoms may include salivation, pain, nausea, vomiting and diarrhea

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Other specific symptoms of exposure are listed under "Toxicological Information" (Section 11).

4 FIRST AID MEASURES

SKIN

For hot material, immerse or flush skin with large amounts of the coldest water possible. Cover with clean cotton sheeting or gauze. Remove clothing if not sticking to skin. DO NOT try to remove solidified material from the skin as the damaged flesh can be easily torn. DO NOT try to dissolve with solvents or thinners. GET IMMEDIATE MEDICAL ATTENTION.

For cold material, immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

Burns due to contact with heated material require immediate medical attention.

INHALATION

Safely remove the victim from exposure to fresh air. DO NOT ATTEMPT TO RESCUE WITHOUT ADEQUATE PROTECTIVE GEAR AND PROPER TRAINING. Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

Gastric lavage should be performed only by qualified medical personnel. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

Hydrogen sulfide is primarily a respiratory toxin inhibiting the cytochrome oxidase system; it is probably more potent than HCN. The lifetime of sulfide in oxygenated blood is short and sulfmethemoglobin is rapidly detoxified by red blood cells and the liver. If nitrites have been used for detoxification, check methemoglobin levels. Follow fluid and electrolyte balance carefully since metabolic acidosis may occur from increased anaerobic metabolism. Watch for pulmonary edema and aspiration pneumonia during convalescence.

For skin contact with hot asphalt material, do not peel the solidified material from the skin, or use solvents such as gasoline, kerosene, or paint thinner to remove. Cooled asphalt may adhere so tenaciously to the skin that attempted removal may cause severe distress to the patient. Covering the affected area using commercially available preparations containing the emulsifying agent polysorbate (Tween 80), or an antibiotic cream in a polysorbate base is the most effective method to dissolve the solidified asphalt. Asphalt can also be slowly dissolved with vegetable oil, baby oil or mineral oil.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce COx, NOx, SOx,irritating vapors and hydrogen sulfide.

EXTINGUISHING MEDIA

Use dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES

Material will burn in a fire. Exercise extreme care when using water spray on asphalt tank fires. When water is mixed with hot asphalt, steam may rapidly develop resulting in violent asphalt foaming and possible tank eruptions from increased pressure.

Evacuate area and fight fire from a safe distance.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Hydrogen sulfide can react with the iron in an asphalt storage tank to form iron sulfide. Iron sulfide is pyrophoric. When exposed to air, iron sulfide is capable of igniting spontaneously.

Flash Point	> 446 ° F
Autoignition Temperature	ND
Flammability Limits in Air, Lower, % by Volume	ND
Flammability Limits in Air, Upper, % by Volume	ND

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Control/Personal Protection - Section 8).

ENVIRONMENTAL PRECAUTIONS

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep unnecessary people away. Isolate area for at least 50-100 meters (160-330 feet) to preserve public safety. For large spills, consider initial evacuation for at least 300 meters (1000 feet).

Keep ignition sources out of area and shut off all ignition sources. For spills on land, dike ahead of spill to contain. Scrape up spilled material for disposal. To reclaim, mix with gravel, dirt or rock. For spills on water, contain as much as possible with booms and begin recovery as soon as possible. If material sinks or becomes dispersed, consult with local, state and regional authorities for approved clean up procedures. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Hydrogen sulfide can build up in the head space of storage vessels containing any type of asphalt product. Use appropriate respiratory protection to prevent exposure. See Exposure Controls/Personal Protection (Section 8).

When entering a storage vessel that has previously contained any type of asphalt product, it is recommended that the atmosphere be monitored for the presence of hydrogen sulfide. See Composition Information (Section 2) for exposure limits.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

Consult NIOSH (National Institute for Occupational Safety and Health) for more information on guidelines for engineering controls for .

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Keep away from eyes. Eye contact can be avoided by wearing a face shield and safety glasses with side shields, or a face shield and safety goggles.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Use appropriate chemical protective gloves when handling at room temperature . Use gloves that protect against thermal burns when handling at high temperatures. At a minimum, wear long-sleeved cotton shirt buttoned at the collar and full-length cotton pants. Synthetic fibers tend to melt and adhere to the skin when heated. Do not fold back or roll up cuffs. Additional protection may be necessary to prevent skin contact including use of apron, armcovers, face shield, or boots.

Strict hygiene practices are essential.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an appropriate cartridge, canister, and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. The use of air purifying respirators is not recommended where hydrogen sulfide levels may exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

DARK BROWN TO BLACK VISCOUS LIQUID WITH ASPHALT ODOR

Boiling Point	> 250 ° F
Specific Gravity	0.8 - 1.2
Percent Volatile	< 5 % AT 77 °F (25 °C) AFTER 1 HOUR
Vapor Pressure	< 10 mmHg AT 77 °F (25 °C)
Vapor Density	ND
Bulk Density	ND
Solubility in Water	INSOLUBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	ND
pH Value	ND
Freezing Point	ND
Viscosity	ND
Evaporation Rate	ND
Molecular Formula	ND
Molecular Weight	ND
Chemical Family	ASPHALT
Odor Threshold	ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, irritating vapors and hydrogen sulfide.

11 TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE

Inhalation, ingestion, skin and eye contact.

TOXICOLOGICAL DATA

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, liver, skin, thymus, blood elements, lymph nodes, spleen, bone marrow, respiratory and nervous system.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: fatigue, oil acne, and melanosis.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Irritating and toxic hydrogen sulfide gas may be found in confined vapor space. WARNING - "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure since odor fatigue readily occurs. Odor sensation lost immediately at concentrations greater than 150 ppm. Avoid exposures to hydrogen sulfide gases. Hydrogen sulfide causes rapid death due to metabolic asphyxiation. Case reports suggest that toxic amounts can enter the body through a punctured eardrum, even while wearing some types of respiratory protective equipment.

CARCINOGENICITY

This material contains petroleum asphalt. IARC has determined that there is inadequate evidence that undiluted, air-refined asphalt is carcinogenic to experimental animals, and there is only limited evidence that undiluted steam-refined and cracking-residue asphalts are carcinogenic to animals. Additionally, IARC has concluded that there is inadequate evidence that asphalts alone are carcinogenic to humans.

In solution, solvent extracts of asphalts can produce skin cancer in animals following prolonged and repeated contact. IARC has concluded that there is sufficient evidence for the carcinogenicity of asphalt extracts in experimental animals. Therefore, asphalts that are diluted, dissolved, or liquefied in hydrocarbon solvents, may also be implicated as potentially carcinogenic. While brief or intermittent skin contact with this type of product is not expected to cause harm, those workers who do not practice good personal hygiene and who are exposed repeatedly via skin contact may be at risk. It is important that all precautionary measures outlined in this MSDS be followed.

Asphalt fumes from heated material may cause eye, respiratory tract and skin irritation, as well as nausea and headaches. These fumes may cause dermatitis and acne-like lesions as well as mild keratoses on prolonged and repeated exposure. Condensed asphalt fumes, which have been generated under laboratory conditions and which are chemically different from those found during typical asphalt operations, have been reported to cause bacterial mutations as well as cause skin tumors in animals following repeated, lifetime skin contact without washing. However, inhalation of asphalt fumes by laboratory animals, during controlled studies, did not produce lung cancer. Additionally, human studies to date have not established a link between asphalt fume exposure and lung cancer.

This material may contain trace amounts of polynuclear aromatic hydrocarbons (PAHs) as naturally occurring constituents of crude oils from which asphalt is derived. Repeated or prolonged exposure to some PAHs has been associated with effects to the liver, kidneys, immune system and skin with warty growths, skin burns, pigmentation of the bare skin and cornification of the surface layers. They have also been associated with anemia, photosensitivity, leukoplakia (white patches on the tongue, cheek or gums), edema of the eyelids, conjunctival hyperemia, lacrimation, photophobia, headache, loss of appetite, vital powers and strength, cough, bronchitis and nausea. Some PAHs have been shown to be carcinogenic after prolonged or repeated skin contact in laboratory animals.

This material may contain untreated or mildly treated mineral oils. .
This material may contain solvent extract oils. . IARC has determined that there is sufficient evidence for

the carcinogenicity of these oils in experimental animals.

Some of the components of this product are hazardous in the dust form. These components include crystalline silica, which is a suspected humancarcinogen. However, because of the physical nature of this product, dust generation is not expected, so the health effects associated with the dusts are unlikely to occur.

TERATOGENICITY, MUTAGENICITY, OTHER REPRODUCTIVE EFFECTS

This product may contain components which may cause adverse reproductive and/or development effects.

Pregnant women may be at an increased risk from exposure.

Consumption of alcoholic beverages may enhance toxic effects.

SENSITIZATION TO MATERIAL

The possibility of allergic sensitization should be considered.

PRE-EXISTING CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing medical conditions which may be aggravated by exposure include disorders of the kidney, liver, skin, blood, respiratory and nervous system.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product as supplied, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261). Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

ND

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Elevated Temperature Liquid, N.O.S., (Heavy Asphalt)		
Hazard Class	9	UN/NA Code	UN3257
Packaging Group	PG III		
Labels Required	Class 9		
Placards Required	HOT, UN3257		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	NA		
Hazard Class	NA	UN/NA Code	NA
Packaging Group	NA		
Labels Required	NA		
Placards Required	NA		
Reportable Quantity	See Regulatory Information (Section 15)		

See Bill of Lading for proper shipping description, or consult 49 CFR 172.101 for specific shipping information.

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All ingredients are either on the TSCA inventory or are not required to be listed on the TSCA inventory.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

SARA TITLE III RATINGS

Immediate Hazard:	X	Delayed Hazard:	X	Fire Hazard:	-	Pressure Hazard:	-
Reactivity Hazard:	-						

NFPA RATINGS

Health	1	Flammability	1	Reactivity	0	Special Hazards	0

HMIS RATINGS * - Indicates chronic health hazard

Health	1*	Flammability	1	Reactivity	0

Following ingredients of this product are listed in SARA313

SARA Listed Ingredient Name	CAS Number	Maximum %
POLYCYCLIC AROMATIC COMPOUNDS	NA	1.0

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Current Revision Date 06/01/2007

Replaces Sheet Dated

Completed By SemMaterials EH&S

18.) DIESEL

MATERIAL SAFETY DATA SHEET

Issue Date: 01/22/00 Supersedes: 07/01/07

1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

Product name: **No. 2 Diesel Fuel**
Product Code: Multiple
Synonyms: EPA Ultra-Low Sulfur Diesel Fuel (15 PPM) - Dyed or Undyed
EPA Low Sulfur Diesel Fuel (500 PPM) - Dyed or Undyed
EPA Off Road High Sulfur Diesel – Dyed (500+ PPM)
#2 Fuel Oil
#2 Heating Oil – Dyed and Marked (500 + PPM)
#2 LS Nonroad, Locomotive and Marine (NRLM) – Dyed (500 PPM)

Responsible Party: McCall Oil and Chemical Corporation
5480 NW Front Avenue
Portland, Oregon 97210
Phone: 503-221-6400
Fax: 503-221-6414

24 Hour Emergency Phone Numbers:

McCall Oil:	503-219-0995
Foss Environmental:	503-283-1150

NFPA HAZARD CLASS:

Health:	2 (Moderate)
Flammability:	2 (Moderate)
Reactivity:	0 (Insignificant)

2. COMPOSITION & INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% Volume	EXPOSURE GUIDELINES Limits	Agency	Type
Diesel Fuel No. 2	99+	100*mg/m^3	ACGIH	TWA-skin
CAS# 068476-34-6				
Combustible Liquid, Eye, Skin and Respiratory Irritant				
Naphthalene	<0.5	10 ppm	ACGIH	TWA
CAS# 000091-20-3		15 ppm	ACGIH	STEL
Combustible Liquid, Eye, Skin and Respiratory Irritant,		10 ppm	OSHA	TWA
Toxic by Ingestion		15 ppm	OSHA	STEL
Benzene	Trace	10 ppm	ACGIH	TWA
CAS# 000071-43-2		10 ppm	OSHA	TWA
Flammable Liquid, Eye, Skin, and Respiratory Irritant, CNS Toxin, Carcinogen per OSHA, IRAC, and NTP				

*Proposed ACGIH (1999)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A clear bright liquid with a petroleum odor. Can be straw-colored to dyed red. Combustible liquid and vapors. Vapors from this product may concentrate in confined spaces and form an explosive mixture. Vapors, mists and liquid are moderately irritating to eyes, skin and respiratory tract. Inhalation of high concentrations may cause a narcotic effect.

POTENTIAL HEALTH EFFECTS:

INHALATION: Exposure to vapors or mists may be moderately irritating to the respiratory tract. Symptoms of exposure may include: headache, dizziness, drowsiness, nausea, vomiting, and loss of coordination. Use in poorly ventilated areas or confined spaces may result in unconsciousness and asphyxiation.

EYE CONTACT: Exposure to vapors, mists or liquids may cause mild eye irritation. Symptoms of exposure may include watering, redness and a stinging sensation. Exposure is not expected to cause corneal damage or visual impairment.

SKIN CONTACT: Prolonged exposure to vapors, mists or liquid may cause moderate skin irritation. Symptoms of exposure may include redness, swelling, chemical burns, blister formation and possible tissue destruction. Product may be absorbed through the skin in harmful amounts.

INGESTION: Aspiration hazard. This product can enter the lungs and cause severe lung damage during swallowing or vomiting. Symptoms of exposure may include nausea, vomiting, diarrhea and abdominal pain.

CHRONIC: Prolonged or repeated exposure to this product may cause the development of dermatitis. Possible cancer hazard. Contains material which may cause cancer based on animal data.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration. **Do not use mouth to mouth method** if victim ingested or inhaled the substance; use the Holger Nielsen method (back pressure – arm lift) or proper respiratory medical device. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention if irritation persists.

SKIN CONTACT: In case of contact, cleanse affected area thoroughly by washing with mild soap and water. Remove contaminated clothing and shoes. If irritation occurs and persists, get medical attention.

INGESTION: Aspiration hazard. If swallowed, **DO NOT INDUCE VOMITING** or give anything by mouth. This material can enter the lungs and cause severe damage if vomited. If victim is drowsy or unconscious, place on left side with the head down. Get medical attention immediately.

NOTE TO PHYSICIANS: Direct treatment of overexposure to control symptoms. Lung injury may have occurred if material was aspirated. Emesis should not be induced by mechanical or pharmacological means. If evacuation of the stomach contents is necessary, this should be done by gastric levage in the presence of endotracheal intubation.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: 52° C (125.6° F) Pensky-Martens Closed Cup (ASTM D 93)

Flammable Limits (in air, % by volume): Lower: 0.5% Upper: 4.1%

Autoignition Temperature: 256° C (494° F)

GENERAL HAZARD: The Uniform Fire Code physical hazard rating for this product is: Class III-A Combustible Liquid. Combustible liquid and vapor. Vapors from this product may concentrate in confined spaces and form an explosive mixture. Heated containers may rupture violently from excessive heat.

FIRE FIGHTING INSTRUCTIONS: EXTINGUISHING MEDIA: Water spray, foam CO2 and dry chemicals. Use water spray to cool containers exposed to fire. This product may produce a floating fire hazard.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition will produce carbon monoxide and carbon dioxide, with possible minute quantities of hydrogen sulfide and toxic oxides of sulfur.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Remove all ignition sources. Vapors are heavier than air and will be concentrated at ground level. Vapors may be depressed by the use of a water fog. Wear recommended protective clothing. Dike spill and pick up bulk of liquid using non-sparking tools or absorb liquid in sand or a non-flammable absorbent. Place in approved containers for disposal. Flush spill area with water, collect rinsates and containerize for disposal. Prevent run-off from contaminating sewers, streams or other bodies of water.

WATER SPILL: This material has negligible solubility in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

NOTIFICATION: Any spill or release, or substantial threat of release, of this material to navigable water sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800-424-8802), as required by U.S. Coast Guard regulations (33 CFR part 153) and EPA regulations (40 CFR part 110). Failure to report may result in substantial civil and criminal penalties.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient
STORAGE PRESSURE: Ambient

GENERAL: Store in a cool, dry area away from all sources of ignition and incompatible material. Ground and bond containers prior to transferring contents to reduce the possibility of static spark-initiated fire or explosion. Avoid breathing vapors, mists or aerosols. Use only with adequate ventilation. Protect eyes, skin and clothing from contact with product. Wear recommended protective equipment. Wash thoroughly after handling. Do not enter vapor spaces without proper respiratory equipment. Empty containers may be hazardous. They may contain combustible residues and vapors. Do not cut, puncture or weld on or near empty containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: General mechanical room ventilation is sufficient for normal use of this product. If use generates vapors, mists or aerosols, use local mechanical exhaust ventilation capable of maintaining emissions in the work area below a level where irritation is noticeable or below the OSHA and ACGIH levels for the trace component.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:
RESPIRATOR: Not required for normal use of this product. If use generates vapors, mists or aerosols, wear a NIOSH-approved half mask air-purifying cartridge respirator equipped with an organic vapor cartridge or supplied air.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979).

GLOVES: Nitrile rubber gloves.

CLOTHING & EQUIPMENT: Wear a nitrile apron or protective suit when handling material . An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Nitrile or neoprene boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Straw-colored to dyed red
Physical State:	Liquid
Odor:	Petroleum odor
Odor Threshold:	No data available
Molecular Formula:	Not applicable – Mixture
Molecular Weight:	Not applicable – Mixture
Boiling Point:	343.3° C (650° F)
Freezing/Melting Point:	No data available
Specific Gravity:	0.852 @ 20° C
Density (pounds/gallon):	7.10
Bulk Density (pounds/cuft):	Not applicable
Vapor Pressure:	Less than 10 mm HG @ 20° C
Vapor Density (air=1):	No data available
Evaporation Rate (n-Butyl Acetate+1):	No data available
VOC Content:	Very low
% Volatile:	Negligible
Solubility in H2O:	Negligible
Octanol/Water Partition Coefficient:	No data available
PH (as is):	Not applicable
PH (1% solution):	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur

CONDITIONS TO AVOID: Avoid prolonged excessive heat.

INCOMPATIBLE MATERIAL: Strong oxidating agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition will produce carbon monoxide and carbon dioxide, with possible minute quantities of hydrogen sulfide and toxic oxides of sulfur.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is sensitive to static discharge.

11. TOXICOLOGICAL INFORMATION SUMMARY

Estimate of product toxicological data based on available individual component information.

Eye Irritation: No specific data available – product should be a mild irritant
Skin Irritation: No specific data available – product should be a moderate to severe irritant
Oral Rat LD50: Estimated at 8 gm/kg
Dermal Rabbit LD50: Estimated at 4 gm/kg
Inhalation Rat LC50: No specific data available
Synergistic Products: None reported
Target Organs: Eyes, Skin, and Lungs
Medical Conditions Aggravated by Exposure: Respiratory and skin disorders
Toxicological Notes: Petroleum and petrochemical products may contain trace amounts of chemicals known to cause cancer and/or birth defects or other reproductive harm. Trace contaminates may be naturally present in the raw materials, may result from the manufacturing process, or the product may become inadvertently contaminated during handling.

This product contains middle distillates which have caused skin irritation and skin cancer in laboratory animals when repeatedly applied and left in place between applications. Studies to further evaluate the carcinogenic potential of middle distillates are currently underway. Kidney damage has also been observed in laboratory animals exposed to middle distillates.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
The environmental fate of this product is expected to be: **Land:** biodegradation with some leaching into the groundwater. **Water:** volatilization and biodegradation. **Air:** expected to exist in vapor phase only due to low vapor pressure. Product is not expected to bioaccumulate.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity information for this product is not available.

NOTIFICATION: Any spill or release, or substantial threat of release, of this material to navigable water sufficient to cause a visible sheen upon the water must be reported immediately to the **National Response Center** (800-424-8802), as required by U.S. Coast Guard regulations (33CFR part 153) and EPA regulations (40 CFR part 110). Failure to report may result in substantial civil and criminal penalties.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Not applicable

U.S. EPA WASTE NUMBER/DESCRIPTION: None

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waster of subpart C, nor is it listed as a hazardous waste under Subpart D. As a non-hazardous liquid waste, it should be disposed of in accordance with all local, state and federal regulations. Consult state or local officials for proper disposal method.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: FUEL OIL
DOT HAZARD CLASS: 3
UN NUMBER: NA1993
PACKING GROUP: III
DOT LABELS: Primary: Flammable Liquid Subsidiary: None required
DOT PLACARDS: Flammable Liquid
CERCLA Reportable Quantity: 10 pounds for Benzene. For product: 11,111.1 pounds (1,546.9gallons)
MARINE POLLUTANT: No
DOT Emergency Response Guidebook Number: 27

15. REGULATORY INFORMATION ON PRODUCT

Target Organs: Eyes, Skin and Lungs
Carcinogenic Potential:
Regulated by OSHA: No
Listed on NTP Report: No
IARC Listing: Benzene is listed as a Group 1
ACGIH Appendix A: Product contains trace amounts of benzene
A1 Confirmed Human: Product contains trace amounts of benzene
A1 Suspected Human: Not applicable for any of the components of this product

U.S. EPA Requirements
Release Reporting under CERCLA (40 CFR 302):
Listed Substance: Benzene and 1-methylethylbenzene
Reportable Quantity: 10 pounds (benzene) 5,000 pounds (1-methylethylbenzene)
RCRA Waste No: U019 (benzene) UO55 (1-methylethylbenzene)

SARA TITLE III
Section 302 & 303 (40 CFR 355)
Listed Substance: Not applicable for any of the components of this product
Reportable Quantity: Not applicable for any of the components of this product
Planning Threshold: Not applicable for any of the components of this product

Section 311 & 312 (40 CFR 372)
Hazard Categories: Fire: Y
Sudden Release of Pressure: N
Reactive: N
Acute Health: Y
Chronic Health: Y
Planning Threshold: 10,000 pounds

15. REGULATORY INFORMATION ON PRODUCTS (continued)

SARA TITLE III (continued)
Section 313 (40 CFR 372)
Listed Toxic Chemical: Product does not contain any listed components above the diminimus level
Reporting Threshold: Not applicable for any of the components of this product

U.S. TSCA STATUS
Listed (40 CFR 710): All components of this product are listed in the TSCA Inventory

STATE REGULATIONS:
State of California
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)
Carcinogen: Product contains trace amounts of benzene
Reproductive Toxin: Not applicable for any of the components of this product

OTHER REGULATIONS
State Right to Know Laws: Benzene and 1-Methylethylbenzene are listed on the CT, FL, IL, LA, MA, NJ, PA,RI and MI listings

16. OTHER INFORMATION

Special Notes: WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum, if subjected to a sudden ingress of air, or outside process equipment operating under elevated pressure if a sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

NOTE: This product contains trace amount of benzene, 1-methylethylbenzene and 1,2,4-trimethyl benzene. Actual concentrations range between 0.01 and 0.09% by weight.

MSDS Revision Information: Form Revision made 05/02/95
Information Revised This Issue Date: Combined product information and changed contact numbers
MSDS distributed by: McCall Oil & Chemical Corporation
Phone: 503-221-6400 Fax: 503-221-6414

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which McCall Oil & Chemical Corporation assumes legal responsibility. While McCall Oil & Chemical Corporation believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state and local regulations.

USX ENGINEERS & CONSULTANTS, INC.
Fuels and Lubrication Laboratory
4000 Tech Center Drive
Monroeville, PA 15146

MATERIAL SAFETY DATA SHEET

Emergency Contact Number: CHEMTREC 1-800-424-9300
703-527-3887 (International Collect)

BLEND CONTAINING DIESEL

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDA must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

GENERAL			
Trade Name:	Blend Containing Diesel	Telephone Number UEC – Administrative Questions	412-825-2931 8:00 AM to 5:00 PM
Other Company Names	None		
Chemical Family	Petroleum Hydrocarbon		
DOT Hazardous Material Proper Shipping Name	Blend Containing Diesel	DOT Hazard Class 2 Combustible Liquid	DOT Reportable Quantity (Based on Material) Not Applicable
		MSDS Class P	UN/NA ID No.
TSCA Inventory Status	Components Listed		

SUMMARY OF HAZARDS	
Physical Hazards	Moderately combustible
Acute Health Effects (Short-Term)	Slight inhalation hazard Slight eye irritant Slight ingestion hazard Moderate skin irritant Slight skin absorption hazard
Chronic Health Effects (Long-Term)	Repeated or prolonged contact with skin may cause dermatitis
Component Name/Comments	No additional toxicology information is available for the components of this material

FIRE AND EXPLOSION		
FLASH POINT >154°F	Autoignition Temperature AP 500°F	Flammable Limits Lower: AP.52 (% vol in air) Upper: AP 4.1 (% vol in air)
Fire and Explosion Hazards	When heated above the flash point, releases flammable vapors. When mixed with air and exposed to ignition source vapors can burn in open or explode if confined. Vapors may be heavier than air. May travel long distances along the ground before igniting and flashing back to vapor source. Fine spray/mists may be combustible at temperatures below normal flash point.	
Extinguishing Media	Dry chemical CO_2 Water Spray Foam	
Special Firefighting Procedures	Do not enter fire area without proper protection. Fight fire from a safe distance/ protected location. Heat may build enough pressure to rupture closed containers/spreading fire/increasing risk of burns/injuries. Do not use solid water stream/may spread fire. Use water spray/fog for cooling. Avoid frothing/stream explosion. Burning liquid may float on water. Notify authorities immediately if liquid enters sewer/public waters.	

Revision Number: 3
NDA – No Data Available

Revision Date 1/23/01
NA – Not Applicable

PROTECTIVE EQUIPMENT AND OTHER CONTROL MEASURES	
Respiratory	No occupational exposure limits have been developed for this material. Where exposure through inhalation may occur from use, National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA) approved respiratory protection equipment is recommended.
Eye	Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquids, airborne particles, or vapor. Contact lenses must not be worn.
Skin	When skin contact is possible, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn. The equipment must be cleaned thoroughly after each use.
Engineering Controls	No special ventilation is recommended under anticipated conditions of normal use beyond that needed for normal comfort control
Other Hygienic Practices	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing, wash thoroughly before reuse. Shower after work using plenty of soap and water.

OCCUPATIONAL EXPOSURE LIMITS					
Substance	Source Date	Type	Value/Units	Time	Skin
No occupational exposure limit(s) have been established for this material or its components					
Exposure Limit Comments	No additional Occupational Exposure Limit information available				

EMERGENCY AND FIRST AID	
Inhalation	If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.
Eye Contact	In case of eye contact, immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain emergency medical attention if pain, blinking, tears or redness persists.
Skin Contact	Immediately remove contaminated clothing. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.
Ingestion	If large quantity swallowed, give lukewarm water (pint/ ½ liter) if victim completely conscious/alert. DO NOT INDUCE VOMITING. Risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

SPILL AND DISPOSAL

Precautions if Material is Spilled or Released

Release can cause fire or explosion and human health hazard. Liquids/vapors may ignite. Evacuate/limit access. Equip responders with proper protection. Extinguish all ignition sources. Stop release. Prevent flow to sewer/public waters. Notify fire and environmental authorities. Impound and recover large land spill; soak up small spill with inert solids. Use suitable disposal containers. On water, material is insoluble and floats. Contain/collect rapidly to minimize dispersion. Disperse residue to reduce aquatic harm. Report per regulatory requirements.

Waste Disposal Methods

Contaminated product/soil/water may be U. S. Resource Conservation and Recovery Act (RCRA)/U.S. Occupational Safety and Health Administration (OSHA) hazardous waste due to potentially low flash point. (See 40 U.S. Code of Federal Regulations (CFR) 261 and 29 CFR 1910). Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids. Avoid flame-outs. Assure emissions comply with applicable regulations. Dilute aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

UEC
USX Engineers & Consultants, Inc.

COMPONENTS

(This may not be a complete list of components) (Compositions given are typical values, not specifications)

Component Name	CAS NO.	Composition Amount	Carcinogen ###
Diesel Fuel No. 2	68476-34-6	AP 100 %	2

###1 = U.S. National Toxicological Program 2 = International Agency for Research on Cancer 3 = U. S. Occupational Health and Safety Administration 4 = American Conference of Governmental Industrial Hygienists 9 = Other

PHYSICAL AND CHEMICAL DATA

Boiling Point AP 490 to 700°F	Viscosity AP 3 CS (at 100°F)	Dry Point No Data Available
Freezing Point No Data Available	Vapor Pressure Low	Volatile Characteristics Not Available
Specific Gravity AP .852 (H_2O = 1.0 at 39.2°F)	Vapor Specific Gravity No Data Available	Solubility in Water Negligible (less than .1 Percent)
pH Not applicable	Hazardous Polymerization Not expected to occur	Stability Stable

Other Chemical Reactivity	Reacts with strong alkali Reacts with strong oxidizing agents
Other Physical and Chemical Properties	No additional information available
Appearance and Odor	Clear, colorless to slightly yellow; Liquid; Diesel Odor
Conditions to Avoid	Heat, sparks, open flame, and other ignition sources
Materials to Avoid	Strong alkalies; Strong oxidizing agents
Hazardous Decomposition Products	Incomplete combustion may produce oxides of carbon and irritating aldehydes and ketones

HAZARDS RATING INFORMATION

National Fire Protection Association
Health = , Flammability = , Reactivity = 0, Special Hazard - None

National Paint and Coatings Association

Hazardous Material Information System (HMIS)
No hazards ratings information is available for this system

ADDITIONAL PRECAUTIONS

Handling and Storage Procedures
Handle empty containers with care – residue may be combustible and burn if exposed to head/sparks/open flame. In addition to the fire/explosion hazard, residual vapor and liquid may also be toxic. Keep container tightly closed when not in use. Store away from heat, sparks, open flames, strong oxidizing agents and direct sunlight. Keep out of reach of children.

Decontamination Procedures
No applicable information is available.

GENERAL COMMENTS

General Comments
Some of the information presented and conclusions drawn herein are from sources other than direct test data on the material itself

Note Qualifications	EQ = Equal	AP = Approximately	N/P = No Applicable Information Found
	LT = Less Than	UK = Unknown	N/AP = Not Applicable
	GT = Greater Than	TR = Trace	N/DA = No Data Available

USX Engineers and Consultants (UEC) believe that the information contained herein (including data and statements) is accurate as of the date hereof. NO WARRANTY OF MECHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE AS CONCERNS THE INFORMATION HEREIN PROVIDED. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use of the product and information referred to herein are beyond the control of UEC, UEC expressly disclaims any and all liability as to any results obtained or arising from any use of the product or such information. No statement made herein shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.

19.) DIESEL DYE

Diesel Dye Standards

Material Safety Data Sheet BT DT 1503

NOTE. This product, BT DT 1503, contains three (3) solutions, a 5 parts per million (PPM) [ASTM O] standard, a 12 PPM [ASTM 2] standard, and a 0 PPM [ASTM 4] standard. The 5 PPM [ASTM 0] standard has it's own MSDS. One MSDS covers the remaining two standards.

5 PPM [ASTM 0] CHECK STANDARD

1. PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	Boston Advanced Technologies, Inc.,
ADDRESS	257 Cedar Hill Street,
	Marlborough, MA, 01752
TELEPHONE	(508) 480 9999
EMERGENCY TELEPHONE NUMBER	(800) 535 5053
TRADE/CHEMICAL NAME	BT DT 1503
PRODUCT USE	Instrument Check Standard
PIN NUMBER	None
WHMINS CLASS	not established
ORIGINAL DATE	August 5, 1997
REVISION DATE	August 5, 1998

2. COMPOSITION/INFORMATION ON COMPONENTS

COMPONENT NAME	CAS NUMBER	WEIGHT %
Clear Diesel	64742-46-7	99+%
SR 26 Red Dye	4477-79-6	<1%

3. HAZARD IDENTIFICATION

Emergency Overview - Light/intermediate middle distillates, such as this product, are Group 3 substances. This product is not carcinogenic according to the OSHA Hazard Communication Standard.

Eyes – Avoid eye contact. This product is minimally irritating to the eyes upon direct contact. This product has a low vapor pressure and does not present a hazard to the eyes at ambient conditions. Exposure to high concentrations of vapors may be irritating to the eyes.

Material Safety Data Sheet **BT DT 1503**(CONT'D)

5 PPM [ASTM 0] CHECK STANDARD

3. HAZARD IDENTIFICATION (cont'd)

Skin Contact – Avoid skin contact. This product is minimally irritating to the skin upon direct contact. Prolonged or repeated exposure may result in contact dermatitis, which is characterized by dryness, chapping, and reddening. This condition may make the skin more susceptible to other irritants, sensitizes, and disease. Pre – existing skin conditions may make the skin more susceptible and facilitate uptake by this route.

Swallowing – Do not ingest. Ingestion of small quantities is usually non -fatal unless aspiration occurs. Aspiration may lead to chemical pneumonitis, which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking, and gagging are often noted at the time of aspiration. Gastrointestinal discomfort may develop, followed by vomiting with a further risk of aspiration. Ingestion may cause gastrointestinal distress. Severe oral intoxication will lead to intense burning of the throat and may result in drowsiness, dullness, numbness, and headache followed by dizziness, weakness, and nausea. Loss of consciousness and convulsions followed by death may result.

Breathing – Avoid prolonged inhalation of mist or vapors. This product has a low vapor pressure, and does not present an inhalation hazard at ambient conditions. Caution should be taken to avoid aerosolization or misting of this product. Acute and chronic overexposures may be irritating to the respiratory tract. Severe oral intoxication may lead to drowsiness, dullness, numbness, and headache, followed by dizziness, weakness, and nausea.

4. FIRST-AID MEASURES

Eyes - In case of contact with eyes, rinse immediately with copious amounts of water. If irritation persists, seek medical advice.
Skin Contact - In case of contact, rinse immediately, and wash skin with soap and copious amounts of water. If irritation persists, seek medical advice.
Swallowing – Do not induce vomiting due to aspiration hazard. If vomiting occurs lower head below knees to avoid aspiration. Seek immediate medical attention.
Breathing – Remove victim from exposure. If breathing has stopped, or is irregular, administer artificial respiration and supply oxygen if it is available. If victim is unconscious, remove to fresh air and seek medical attention.

5. FIRE FIGHTING MEASURES

Flash Point: 120 C (250 F) Test Method: PMCC

Material Safety Data Sheet **BT DT 1503**(CONT'D)

5 PPM [ASTM 0] CHECK STANDARD

5. FIRE FIGHTING MEASURES (cont'd)

Autoignition Temperature: 220 C (425 F) Test Method: ASTM E-659
Flammable limits in air % by volume Lower: 1.1 Upper: 6.0

EXTINGUISHING MEDIA – Carbon Dioxide, Dry Chemical Powder, or appropriate foam.

SPECIAL FIREFIGHTING PROCEDURES – Water may be ineffective but can be used to cool containers exposed to heat or flame.

UNUSUAL FIRE AND EXPLOSIVE CONDITIONS – Dense smoke may be generated while burning. Carbon Monoxide, Carbon Dioxide, and other oxides may be generated as products of combustion.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE OF SPILL - Consult HAZARD IDENTIFICATION in Section 3, FIRST AID MEASURES in Section 4, FIRE FIGHTING MEASURES in Section 5, and STABILITY AND REACTIVITY in Section 10. Contain spill immediately. Do not allow spill to enter sewers or watercourses. Remove all sources of ignition. Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area, and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Do not transfer to unmarked containers. Store in a cool, well ventilated area in closed containers away from heat, sparks, open flame or oxidizing materials. This product is classified as combustible under DOT regulations. Fire extinguishers should be kept readily available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical safety goggles.
Compatible chemical resistant gloves.
NIOSH/MSHA approved respirator.
Safety shower and eye bath.
Mechanical exhaust required.
Avoid inhalation.
Avoid contact with eyes, skin, and clothing.
Avoid prolonged or repeated exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (cont'd)

Severe eye irritant.
Wash thoroughly after handling.
Keep tightly closed.
Store in a dry, cool place.
Consumption of food and beverage should be avoided in work areas where hydrocarbons are present.
Always wash hands and face with soap and water before eating, drinking, and smoking.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR – A red liquid with a faint hydrocarbon odor.
SPECIFIC GRAVITY – 0.817 @ 20 C
PERCENT VOLATILE – 100
BOILING POINT - 230 C – 395 C (450 F – 625 F)
MELTING POINT – No data
VAPOR DENSITY (relative to air) – 8.2
VAPOR PRESSURE – MAX @ 20 C < 0.10
EVARORATION RATE – No data
SOLUBILITY – Insoluble in water. Soluble in Hydrocarbons.

10. STABILITY AND REACTIVITY

STABLE - Yes
STRONG OXIDIZER - No
HAZARDOUS POLYMERIZATION – Will not occur.
CONDITIONS TO AVOID – None
INCOMPATIBILITY MATERIALS TO AVOID – May react with strong oxidizing agents.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS – None

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS – May be harmful by inhalation, ingestion, or skin absorption.
Causes severe eye irritation.
Causes skin irritation.
May be irritating to mucous membranes and upper respiratory tract.

Material Safety Data Sheet **BT DT 1503**(CONT'D)

5 PPM [ASTM 0] CHECK STANDARD

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION – Not available
CHEMICAL FATE – Not available

13. WASTE DISPOSAL

Dispose or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe federal, state, and local environmental regulations.

14.TRANSPORT INFORMATION

UN # 1202 Class 3 Flammable liquid Class 6.1 Toxic substance
Packaging Group III
Contact Boston Advanced Technologies for further information.

15. REGULATORY INFORMATION

Contact Boston Advanced Technologies for regulatory information.

16. OTHER INFORMATION

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL-INCLUSIVE AND SHALL ONLY BE USED AS A GUIDE. BOSTON ADVANCED TECHNOLOGIES SHALL NOT BE LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

Diesel Dye Standards

Material Safety Data Sheet
PAGE 1 OF 4

BT DT 1503

NOTE. This product, BT DT 1503, contains three (3) solutions, a 5 parts per million (PPM) [ASTM 0] standard, a 12 PPM [ASTM 2] standard, and a 0 PPM [ASTM 4] standard. The 5 PPM [ASTM 0] component has it's own MSDS sheets. One MSDS covers the remaining two standards.

0 PPM [ASTM 4] CHECK STANDARD
12 PPM [ASTM 2] CHECK STANDARD

1. PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	Boston Advanced Technologies, Inc.,
ADDRESS	257 Cedar Hill Street, Marlborough, MA, 01752
TELEPHONE	(508) 480 9999
EMERGENCY TELEPHONE NUMBER	(800) 535 5053
TRADE/CHEMICAL NAME	BT DT 1503
PRODUCT USE	Instrument Check Standards
PIN NUMBER	None
WHMINS CLASS	Not established
ORIGINAL DATE	August 5, 1997
REVISION DATE	August 5, 1998

2. COMPOSITION/INFORMATION ON COMPONENTS

0 PPM [ASTM 4] CHECK STANDARD

COMPONENT NAME	CAS NUMBER	WEIGHT %
Mineral Oil	8020-83-5	94-97%
SR 26 Red Dye	4477-79-6	3-6%

12 PPM [ASTM 2] CHECK STANDARD

COMPONENT NAME	CAS NUMBER	WEIGHT %
Mineral Oil	8020-83-5	94-97%
Xylenes	1330-20-7	2-3%
SR 26 Red Dye	4477-79-6	1-2%

3. HAZARD IDENTIFICATION

Emergency Overview - Irritant. Viscous red liquid with slight odor.
Eyes - Risk of serious damage to eyes.

Material Safety Data Sheet **BT DT 1503**(CONTD)

0 PPM [ASTM 4] CHECK STANDARD
12 PPM [ASTM 2] CHECK STANDARD

3. HAZARD IDENTIFICATION(cont'd)

Skin Contact - May cause skin irritation. Wear protective clothing.
Swallowing - May be harmful if swallowed.
Breathing - Irritant.

4. FIRST-AID MEASURES

Eyes - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Skin Contact - In case of contact, rinse immediately, wash skin with soap and copious amounts of water and seek medical advice.
Swallowing – If swallowed, wash out mouth with water provided person is conscious. Call a physician.
Breathing – If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA – Water spray, Carbon Dioxide, Dry Chemical Powder, or appropriate foam.

SPECIAL FIREFIGHTING PROCEDURES – Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.
Absorb on sand or vermiculite and place in closed containers for disposal.
Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Refer to Section 8.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical safety goggles.
Compatible chemical resistant gloves.

Material Safety Data Sheet **BT DT 1503**(CONTD)

0 PPM [ASTM 4] CHECK STANDARD
12 PPM [ASTM 2] CHECK STANDARD
PAGE 3 OF 4

8. EXPOSURE CONTROLS/PERSONAL PROTECTION(cont'd)

NIOSH/MSHA approved respirator.
Safety shower and eye bath.
Mechanical exhaust required.
Avoid inhalation.
Avoid contact with eyes, skin, and clothing.
Avoid prolonged or repeated exposure.
Severe eye irritant.
Wash thoroughly after handling.
Keep tightly closed.
Store in a dry, cool place.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR – A viscous red liquid with a faint hydrocarbon odor.
PHYSICAL PROPERTIES – FLASHPOINT >109 degrees C (230 degrees F).
SPECIFIC GRAVITY – 0.83

10. STABILITY AND REACTIVITY

STABLE - Yes
INCOMPATIBILITIES - Oxidizing agents
CONDITIONS TO AVOID – Keep from oxidizing agents.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS – Toxic fumes of Carbon Monoxide, Carbon Dioxide.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS – May be harmful by inhalation, ingestion, or skin absorption.
Causes severe eye irritation.
Causes skin irritation.
May be irritating to mucous membranes and upper respiratory tract.

IRRITATION DATA

Skin – RBT 100 MG/24H MLD	CTOIDG 94(8), 41, 79
Eye – RBT 5 MG SEV	AJOPAA 29, 1363, 46
SKN – GPG 100 MG/24H MLD	CTOIDG 94 (8), 41, 79

Material Safety Data Sheet **BT DT 1503**(CONTD)

0 PPM [ASTM 4] CHECK STANDARD
12 PPM [ASTM 2] CHECK STANDARD
PAGE 4 OF 4

11. TOXICOLOGICAL INFORMATION(cont'd)

TOXICITY DATA
ORL – MUS LD50 : 22 GM/KG ATXKA8 30, 243, 73

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION – Not available
CHEMICAL FATE – Not available

13. WASTE DISPOSAL

Dispose or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe federal, state, and local environmental regulations.

14.TRANSPORT INFORMATION

UN # 1202 Class 3 Flammable liquid Class 6.1 Toxic substance
Packaging Group 3
Contact Boston Advanced Technologies for further information.

15. REGULATORY INFORMATION

Contact Boston Advanced Technologies for regulatory information.

16. OTHER INFORMATION

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL-INCLUSIVE AND SHALL ONLY BE USED AS A GUIDE. BOSTON ADVANCED TECHNOLOGIES SHALL NOT BE LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

20.) ELECTRODE FILL SOLUTION

ELECTRODE FILL SOLUTION

CORNING

Corning Incorporated
Science Products Division
Corning, NY 14831 USA

MATERIAL SAFETY DATA SHEET

Manufacturer: Mettler-Toledo Process Analytical, Inc.
Address: 261 Ballardvale Street
Wilmington, MA 01887

Telephone : (508) 658-7615
Fax: (508) 658-6973

Date Prepared: 11/12/96
Last Revised: 08/01/91

SECTION I - PRODUCT IDENTIFICATION

Part Number:	477006
Product Name:	3 Molar Potassium Chloride Solution
Chemical Name:	None
Formula:	KCl and Water
Formula Weight:	N/A
CAS Number:	N/A
Chemical Family/Product Type:	Aqueous Salt Solution

SECTION II - COMPOSITION

Chemical Component	%	CAS. No.	Nature of Hazard

No hazardous ingredients according to OSHA definition.

SECTION III - PHYSICAL DATA

State:	Liquid	Appearance:	Clear Liquid
Boiling Point:	≅ 100°C	Melting Point:	≅ 0°C
Specific Gravity:	≅ 1.0	Vapor Pressure:	N/A
Odor:	None	Vapor Density:	N/A
Evaporation Rate:	As Water	Solubility in Water:	Complete
Storage Precautions:	None		

SECTION IV - FIRE AND EXPLOSION DATA

Flash Point:	N/A			
FPA Codes:		Health = N/A	Flammability = N/A	Reactivity = N/A
Toxic Gases Produced:	None			
Extinguishing Media:	N/A			

SECTION V - HEALTH HAZARD DATA

Exposure Limit (TLV/TWA):	N/A
Toxicity: LD50 (oral-rat):	N/A
Primary Routes of Entry:	Inhalation, ingestion, skin.
Carcinogens:	None

Effects of Overexposure: May cause eye, skin or mucous membrane irritation. If ingested, may cause vomiting, sore throat, abdominal pain and diarrhea.

Precautionary Steps: Wear protective rubber gloves and safety glasses. Avoid contact with eyes, skin and clothing.

Emergency and First Aid Procedures: In case of contact with eyes, immediately flush with large amounts of water. For contact with skin, remove contaminated clothing, wash exposed area with soap and water. If ingested, give 2-4 glasses of water, induce vomiting. Get medical attention promptly.

SECTION VI - REACTIVITY DATA

Stability:	Stable	Hazardous Polymerization:	Will not occur
Conditions to be Avoided:	N/A	Incompatibility (Materials to Avoid):	N/A
Decomposition Products:	N/A		

SECTION VII - SPILL AND DISPOSAL PROCEDURES

Effects of Overexposure: May cause eye, skin or mucous membrane irritation. If ingested, may cause vomiting, sore throat, abdominal pain and diarrhea.

Precautionary Steps: Wear protective rubber gloves and safety glasses. Avoid contact with eyes, skin and clothing.

Emergency and First Aid Procedures: In case of contact with eyes, immediately flush with large amounts of water. For contact with skin, remove contaminated clothing, wash exposed area with soap and water. If ingested, give 2-4 glasses of water, induce vomiting. Get medical attention promptly.

SECTION VI - REACTIVITY DATA

Stability:	Stable	Hazardous Polymerization:	Will not occur
Conditions to be Avoided:	N/A	Incompatibility (Materials to Avoid):	N/A
Decomposition Products:	N/A		

SECTION VII - SPILL AND DISPOSAL PROCEDURES

Steps to be Taken in Case of Leaks or Spills: Absorb on vermiculite or other suitable material.

Disposal: Dispose in accordance with all applicable federal, state, and local environmental regulations.

SECTION VIII - TRANSPORTATION DATA

Proper Shipping Name:	N/A
Hazard Class:	N/A
UN Number:	N/A

SECTION IX - OTHER INFORMATION

These reduced reprints of the MSDS's are provided for your information and in compliance with U.S. Department of Labor OSHA guidelines/standards.

The information herein has been compiled from data presented in various technical sources believed to be accurate. We make no warranty and assume no liability in connection with the use of this information. It is the user's responsibility to determine the suitability of this information and to assure the adoption of necessary safety precautions.

N/A - Not Applicable or Not Available

21.) EMULSION

MATERIAL SAFETY DATA SHEET

Issue Date: 02/15/03 Supersedes: 05/15/95

1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

Product name: **Emulsified Asphalt**
General Use: This product is used in highway repair and maintenance as a tack coat or as a fog seal for asphalt cement
Synonyms: CSS-1, CSS-1h

Responsible Party: McCall Oil and Chemical Corporation
5480 NW Front Avenue
Portland, Oregon 97210
Phone: 503-221-6400
Fax: 503-221-6414

24 Hour Emergency Phone Numbers:

McCall Oil:	503-219-0995
Foss Environmental:	503-283-1150

NFPA HAZARD CLASS:

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

2. COMPOSITION & INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% Volume	EXPOSURE GUIDELINES		
		Limits	Agency	Type
Asphalt CAS# 8052-42-4 Eye, Skin and Respiratory Irritant	56 to 65	5mg/m3 (fumes)	ACGIH	TWA-skin
Hydrogen Sulfide CAS# 7783-06-4 Flammable Gas, Eye, Skin and Respiratory Irritant, Toxic by Inhalation	<0.10	10 ppm 15 ppm 10 ppm 15 ppm	ACGIH ACGIH OSHA OSHA	TWA STEL TWA STEL
Emulsifiers CAS# Mixture Mild Eye, Skin and Respiratory Irritant	<1			
Water CAS# 007732-18-5 Non-hazardous	35 to 44			

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A black liquid with an asphalt odor. Mists, vapors and liquid may cause mild irritation to eyes, skin and respiratory tract. Heated material may release toxic hydrogen sulfide fumes.

POTENTIAL HEALTH EFFECTS:

INHALATION: Exposure to vapors or mists may be mildly irritating to the respiratory tract. Symptoms of exposure may include: headache, dizziness, nausea and vomiting. High fume concentration may result in hydrogen sulfide exposure.

EYE CONTACT: Exposure to mists, vapors or liquids may cause mild eye irritation. Symptoms of exposure may include: watering, redness and a stinging sensation. Exposure is not expected to cause corneal damage or visual impairment.

SKIN CONTACT: Exposure to mists, vapors or liquid may cause mild skin irritation. Symptoms of exposure may include: redness, swelling, and a stinging sensation. No published reports indicate this product is absorbed through the skin.

INGESTION: Ingestion may cause mild irritation to the gastrointestinal tract. Symptoms of exposure may include: nausea, vomiting and abdominal pain.

CHRONIC: Prolonged or repeated skin exposure to this product may cause the development of dermatitis. Possible cancer hazard. Contains material which may cause cancer based on animal data.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention.

SKIN CONTACT: In case of contact, cleanse affected area thoroughly by washing with mild soap and water. Remove contaminated clothing and shoes. If irritation occurs and persists, get medical attention.

INGESTION: If swallowed, give plenty of water to drink. Call a physician. **DO NOT** induce vomiting unless directed to do so by medical personnel. Never give anything by mouth with an unconscious person.

NOTE TO PHYSICIANS: Exposure may result in hydrogen sulfide poisoning, which results in impairment of cellular oxidative phosphorylation producing neurotoxicity, metabolic acidosis and cardiovascular damage. Administration of 100% oxygen and supportive care constitute the preferred treatment for hydrogen sulfide poisoning.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: Product does not flash.

Flammable Limits (in air, % by volume): Lower: Not applicable Upper: Not applicable

Autoignition Temperature: Not applicable

GENERAL HAZARD: Product is an aqueous solution. Product may produce hazardous fumes or hazardous decomposition products. Heated material may release hydrogen sulfide fumes.

FIRE FIGHTING INSTRUCTIONS: EXTINGUISHING MEDIA: Foam, CO2 and dry chemicals. Use water spray or water fog to cool containers exposed to fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: When heated to dryness, thermal decomposition will produce toxic oxides of carbon and sulfur, with possible minute quantities of hydrogen sulfide gas and dense smoke.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Wearing recommended protective clothing, dike spill using soil, sand or compatible commercial absorbent. Pick up bulk of liquid using pumps or vacuum truck or absorb liquid in sand or commercial absorbent. Place in approved containers for disposal. Flush spill area with water, collect rinsates and containerize for disposal. Prevent run-off from contaminating sewers, streams or other bodies of water.

WATER SPILL: This material is moderately soluble in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient
STORAGE PRESSURE: Ambient

GENERAL: Store in an area away from incompatible material. Protect product from freezing. Avoid breathing vapors, mists or aerosols. Use only with adequate ventilation. Protect eyes, skin and clothing from contact with material. Wear recommended protective equipment. Wash thoroughly after handling. Do not enter vapor spaces without proper respiratory equipment. Empty containers may be hazardous. They may contain organic residues that can be ignited and will burn. Do not cut, puncture or weld on or near empty containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: Not required for normal use of this product. If material generates vapors, mists or aerosols use local mechanical exhaust ventilation capable of maintaining emissions in the work area below a level where irritation is noticeable or below the ACGIH-TLV for asphalt or hydrogen sulfide.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: Not required for normal use of this product. If use generates vapors, mists or aerosols, wear a NIOSH-approved half mask air-purifying cartridge respirator equipped with an organic vapor cartridge or supplied air.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979) or a face shield.

GLOVES: Use butyl rubber gloves.

CLOTHING & EQUIPMENT: Normal work clothes should be sufficient when handling product. An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Normal work boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black colored
Physical State:	Liquid
Odor:	Petroleum odor
Odor Threshold:	No data available
Molecular Formula:	Not applicable – Mixture
Molecular Weight:	Not applicable – Mixture
Boiling Point:	100° C (212° F)
Melting Point:	0° C (32° F)
Specific Gravity:	Approximately 1.0 @ 20° C
Density (pounds/gallon):	8.3
Bulk Density (lbs/cuft):	Not applicable
Vapor Pressure:	No data available
Vapor Density (air=1):	No data available
Evaporation Rate (n-Butyl Acetate+1):	No data available
VOC Content:	No data available
% Volatile:	Less than 45%
Solubility in H2O:	Moderately
Octanol/Water Partition Coefficient:	No data available
PH (as is):	Not applicable
PH (1% solution):	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIAL: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating of this product may produce hydrogen sulfide gas.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

11. TOXICOLOGICAL INFORMATION SUMMARY

Estimate of product toxicological data based on available individual component information.

Eye Irritation: No specific data available – product should be a mild irritant
Skin Irritation: No specific data available – product should be a mild irritant
Oral Rat LD50: No specific data available
Dermal Rabbit LD50: No specific data available
Inhalation Rat LC50: No specific data available
Synergistic Products: None reported
Target Organs: Eyes, Skin, and Lungs
Medical Conditions Aggravated by Exposure: Respiratory and skin disorders

Toxicological Notes: Petroleum and petrochemical products may contain trace amounts of chemicals known to cause cancer and/or birth defects or other reproductive harm. Trace contaminates may be naturally present in the raw materials, may result from the manufacturing process, or the product may become inadvertently contaminated during handling.

The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of asphalts in 1985 and again in 1987. They concluded there was inadequate evidence to decide that asphalts were carcinogenic to humans. Asphalt fume condensates and certain chemical components of asphalt fumes have been shown to cause cancer in mice when repeatedly applied to the skin and allowed to remain on the skin for a prolonged period of time. Asphalt fume condensates have been shown to be weakly positive in Ames mutagenicity tests.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
The environmental fate of this product is expected to be: **Land**: biodegradation with some leaching into the groundwater. **Water:** volatilization or biodegradation. **Air:** not expected to exist in vapor phase. Product is not expected to bioaccumulate.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity information for this product is not available.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Not applicable

U.S. EPA WASTE NUMBER/DESCRIPTION: None

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of subpart C, nor is it listed as a hazardous waste under Subpart D. As a non-hazardous liquid waste, it should be disposed of in accordance with all local, state and federal regulations. Consult state or local officials for proper disposal method.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: NOT REGULATED

DOT HAZARD CLASS: None
UN NUMBER: None
PACKING GROUP: None
DOT LABELS: Primary: None required Subsidiary: None required
DOT PLACARDS: None required
DOT Reportable Quantity: None
MARINE POLLUTANT: No
1993 DOT Emergency Response Guidebook Number: Not applicable
1996 North American Emergency Response Guidebook Number: Not applicable

15. REGULATORY INFORMATION ON PRODUCT

Target Organs: Eyes, Skin and Lungs
Carcinogenic Potential:
Regulated by OSHA: Not applicable for this product
Listed on NTP Report: Not applicable for this product
IARC Listing: Asphalt is listed as a Group 3
ACGIH Appendix A: Not applicable for this product
A1 Confirmed Human: Not applicable for this product
A1 Suspected Human: Not applicable for this product

U.S. EPA Requirements
Release Reporting under CERCLA (40 CFR 302):
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
RCRA Waste No: Not applicable for this product

SARA TITLE III
Section 302 & 303 (40 CFR 355)
Listed Substance: Not applicable for this product
Reportable Quantity: Not applicable for this product
Planning Threshold: Not applicable for this product

15. REGULATORY INFORMATION ON PRODUCT (continued)

SARA TITLE III (continued)
Section 311 & 312 (40 CFR 370)

Hazard Categories:	Fire: N
	Sudden Release of Pressure: N
	Reactive: N
	Acute Health: N
	Chronic Health: Y
Planning Threshold:	10,000 pounds

Section 313 (40 CFR 372)

Listed Toxic Chemical:	Product does not contain any listed components above the diminimus level
Reporting Threshold:	Not applicable for this product

U.S. TSCA STATUS

Listed (40 CFR 710):	All components of this product are listed in the TSCA Inventory

STATE REGULATIONS:
State of California
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)

Carcinogen:	Not applicable for this product
Reproductive Toxin:	Not applicable for this product

OTHER REGULATIONS

State Right to Know Laws:	Asphalt is listed on the MA, NJ, PA and MN Right to Know Listings

16. OTHER INFORMATION

Special Notes: WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum, if subjected to a sudden ingress of air, or outside process equipment operating under elevated pressure if a sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

MSDS Revision Information:	Form Revision made 05/02/95
Information Revised This Issue Date:	Changed contact numbers
MSDS distributed by:	McCall Oil & Chemical Corporation
	Phone: 503-221-6400 Fax: 503-221-6414

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which McCall Oil & Chemical Corporation assumes legal responsibility. While McCall Oil & Chemical Corporation believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state and local regulations.

22.) ETHANOL SDA

ASHLAND CHEMICAL -- ETHANOL SDA 3A 200 PROOF
MATERIAL SAFETY DATA SHEET
NSN: 681000D005104
Manufacturer's CAGE: 34897
Part No. Indicator: B
Part Number/Trade Name: ETHANOL SDA 3A 200 PROOF

General Information

Company's Name: ASHLAND CHEMICAL COMPANY
Company's P. O. Box: 2219
Company's City: COLUMBUS
Company's State: OH
Company's Country: US
Company's Zip Code: 43216-2219
Company's Emerg Ph #: 800-274-5236 OR 800-ASHLAND
Company's Info Ph #: 614-889-3333
Safety Data Action Code: A
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: FM
Date MSDS Prepared: 05JAN96
Safety Data Review Date: 02JUL98
Supply Item Manager: CX
MSDS Serial Number: CHLCL
Specification Number: UNKNOWN
Hazard Characteristic Code: F5
Unit Of Issue: NK
Unit Of Issue Container Qty: UNKNOWN
Type Of Container: UNKNOWN
Net Unit Weight: UNKNOWN

Ingredients/Identity Information

Proprietary: NO
Ingredient: ETHYL ALCOHOL (ETHANOL)
Ingredient Sequence Number: 01
Percent: 93-97
Ingredient Action Code: A
NIOSH (RTECS) Number: KQ6300000
CAS Number: 64-17-5
OSHA PEL: 1000 PPM
ACGIH TLV: 1000 PPM; 9596
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: METHYL ALCOHOL (METHANOL) (SARA 313) (CERCLA)
Ingredient Sequence Number: 02
Percent: 4.8
Ingredient Action Code: A
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: S, 200 PPM
ACGIH TLV: S,200PPM/250STEL; 96
Other Recommended Limit: NONE RECOMMENDED

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID, ALCOHOL ODOR
Boiling Point: 171F,77C
Melting Point: <148F,<64C
Vapor Pressure (MM Hg/70 F): 48.50
Vapor Density (Air=1): 1.56

Specific Gravity: 0.794
Decomposition Temperature: NOT GIVEN
Evaporation Rate And Ref: 2.67 (N-BUTYL ACETATE=1)
Solubility In Water: COMPLETE
Percent Volatiles By Volume: 100
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 60.0F,15.6C
Flash Point Method: TOC
Lower Explosive Limit: 3.3
Upper Explosive Limit: 19.0
Extinguishing Media: ALCOHOL FOAM OR WATER FOG OR CARBON DIOXIDE OR DRY CHEMICAL.
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS W/ FULL FACEPIECE OPERATED IN POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.
Unusual Fire And Expl Hazrds: VAPOR IS FLAMMABLE AND HEAVIER THAN AIR AND MAY TRAVEL TO SOURCE OF IGNITION AND FLASHBACK. USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL TO REDUCE PRESSURE.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): AVOID ALL SOURCES OF IGNITION.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: CARBON DIOXIDE, CARBON MONOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE. WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYE CONTACT CAUSES IRRITATION. SKIN CONTACT MAY CAUSE MILD IRRITATION. PROLONGED/REPEATED SKIN CONTACT MAY CAUSE DRYING/CRACKING/REDNESS/BURNING. SWALLOWING MAY BE HARMFUL. BREATHING SMALL AMOUNTS OF MATERIAL DURING NORMAL HANDLING NOT LIKELY TO CAUSE HARMFUL EFFECTS. BREATHING LARGE MAOUNTS MAY BE HARMFUL.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.
Signs/Symptoms Of Overexp: STOMACH OR INTESTINAL UPSET, NAUSEA, VOMITING, DIARRHEA, NOSE/THROAT/AIRWAYS IRRITATION, DIZZINESS, DROWSINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, UNCONSCIOUSNESS, VISUAL IMPAIRMENT, BLINDNESS, DEATH.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES. FLUSH UNDER LIDS BY LIFTING THEM OR ROLLING EYES. SEE DOCTOR ASAP. SKIN: FLUSH WITH WATER. REMOVE CLOTHING AND CONTINUE FLUSHING. INHALATION: REMOVE TO FRESH AIR AND RESTORE BREATHING. GET MEDICAL HELP. INGESTION: SEEK MEDICAL ATTENTION. IF VICTIM IS ALERT, INDUCE VOMITING. IF DROWSY OR UNCONSCIOUS, DO NOT GIVE ANYTHING BY MOUTH.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ABSORB LIQUID ON VERMICULITE, FLOOR ABSORBENT, OR OTHER MATERIA AND TRANSFER TO HOOD. ELIMINATE ALL IGNITION

SOURCES. TRANSFER CONTAMINATED ABSORBENT TO CONTAINERS FOR DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSAL CONTAINER OR LINER IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: CONTAINS METHANOL. CANNOT BE MADE NONPOISONOUS. ALL FIVE-GALLON PAILS & LARGER METAL CONTAINERS SHOULD BE GROUNDED/BONDED WHEN MATERIAL IS TRANSFERRED
Other Precautions: EMPTY CONTAINERS RETAIN RESIDUE AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE.

Control Measures

Respiratory Protection: IF WORKPLACE LIMITS OF PRODUCT OR ANY COMPONENT ARE EXCEEDED, A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROLS.
Ventilation: LOCAL EXHAUST AND MECHANICAL (GENERAL) VENTILATION AS REQUIRED TO MAINTAIN EXPOSURE LEVELS.
Protective Gloves: RESISTANT GLOVES SUCH AS NEOPRENE.
Eye Protection: CHEMICAL SPLASH GOGGLES
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING AS NECESSARY TO PREVENT SKIN CONTACT. AN EMERGENCY EYEWASH AND SHOWER SHOULD BE AVAILABLE.
Work Hygienic Practices: WASH HANDS THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES.
Suppl. Safety & Health Data: FORMAULATION CHANGE.

Transportation Data

Transportation Action Code: A
Trans Data Review Date: 98183
DOT PSN Code: FTN
DOT Proper Shipping Name: ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS
DOT Class: 3
DOT ID Number: UN1170
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: GOQ
IMO Proper Shipping Name: ETHANOL
IMO Regulations Page Number: 3219
IMO UN Number: 1170
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: KXQ
IATA UN ID Number: 1170
IATA Proper Shipping Name: ETHANOL
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: KXQ
AFI Prop. Shipping Name: ETHANOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL OR EHTYL ALCOHOL SOLUTIONS
AFI Class: 3
AFI ID Number: UN1170
AFI Pack Group: II
AFI Special Prov: P5
AFI Basic Pac Ref: A7.3

Disposal Data

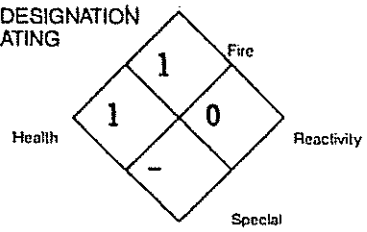
Label Data

Label Required: YES
Technical Review Date: 02JUL98
MFR Label Number: NONE
Label Status: F
Common Name: ETHANOL SDA 3A 200 PROOF
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: CONTAINS METHANOL. CANNOT BE MADE NONPOISONOUS. ALL FIVE-GALLON PAILS & LARGER METAL CONTAINERS SHOULD BE GROUNDED/BONDED WHEN MATERIAL IS TRANSFERRED FIRST AID: EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES. FLUSH UNDER LIDS BY LIFTING THEM OR ROLLING EYES. SEE DOCTOR ASAP. SKIN: FLUSH WITH WATER. REMOVE CLOTHING AND CONTINUE FLUSHING. INHALATION: REMOVE TO FRESH AIR AND RESTORE BREATHING. GET MEDICAL HELP. INGESTION: SEEK MEDICAL ATTENTION. IF VICTIM IS ALERT, INDUCE VOMITING. IF DROWSY OR UNCONSCIOUS, DO NOT GIVE ANYTHING BY MOUTH.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ASHLAND CHEMICAL COMPANY
Label P.O. Box: 2219
Label City: COLUMBUS
Label State: OH
Label Zip Code: 43216-2219
Label Country: US
Label Emergency Number: 800-274-5236 OR 800-ASHLAND

23.) ETHYLENE GLYCOL

MATERIAL SAFETY DATA SHEET

NFPA 704 DESIGNATION
HAZARD RATING



4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

GREAT WESTERN CHEMICAL CO.

sue Date: 07/17/91 Supersedes: 09/01/90

PRODUCT NAME: ETHYLENE GLYCOL

CHEMICAL NAME: 1,2-Ethanediol CHEMICAL FAMILY: Glycols

FORMULA: $C_2H_6O_2$ MOLECULAR WEIGHT: 62.08

D.O.T. SHIPPING CLASSIFICATION: Not Restricted

I. PHYSICAL DATA

BOILING POINT 760mm. Hg	387.5° F.	FREEZING POINT	8.6° F.
SPECIFIC GRAVITY (WATER = 1)	1.113 @ 25° C.	pH of 1% (w/v) SOLUTION	NDA
PERCENT VOLATILE ORGANICS BY VOLUME	NDA	SOLUBILITY IN WATER	Complete
APPEARANCE AND ODOR	Clear, colorless, hydroscopic liquid with no characteristic odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	% (wt.)	ACGIH TLV (Units)	OSHA PEL
- Ethylene Glycol CAS #107-21-1	Inhalation/Toxic	100	Air: CL 50 ppm (vapor)	Air: CL 50 ppm
	[Oral - Human LDLo: 398 mg./kg. CNS,		GIT, LIV]	

* Chemicals subject to SARA Title III, Section 313 reporting. This notification must not be detached from this MSDS, and any copies of this MSDS must include this notification. This notification applies only to material while it is within the boundaries of the United States of America or its territories.

All chemicals contained in this product are listed on the Toxic Substance Control Act (TSCA) Inventory.

N/A = Not Applicable
NDA = No Data Available

EMERGENCY PHONE NUMBERS

Great Western Chemical Company
808 S.W. 15th Avenue
Portland, Oregon 97205
Phone: (503) 228-2600

800/424-9300
CHEMTREC

CHRONIC EXPOSURE EFFECTS	Repeated exposure may lead to dermatitis with possible systemic effects including CNS, pulmonary, kidney, and liver effects.

V. REACTIVITY DATA

STABILITY				CONDITIONS TO AVOID	
'NSTABLE		STABLE	X		None

INCOMPATIBILITY (materials to avoid)	Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS	When heated to decomposition, it emits toxic oxides of carbon plus acrid smoke and irritating fumes.

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

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Contain spilled liquid. (For small spills, add dry material to contain.) Wearing recommended protective equipment, remove bulk of liquid. Add dry material to absorb remaining liquid; pick up and containerize for recovery or disposal. Flush area with water to remove residues.
'ASTE DISPOSAL ..ETHOD	This product, if disposed as shipped, is not a hazardous waste as specified in 40 CFR 261. Consult state or local officials for proper disposal method. When empty, thoroughly rinse container with water before disposal, return to manufacturer, or any other industrial use.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		If the OSHA-PEL is exceeded, a NIOSH-approved respirator with an organic vapor cartridge or supplied air is required.		
VENTILATION	LOCAL EXHAUST	Preferable	SPECIAL	None
	MECHANICAL (general)	OK	OTHER	N/A
PROTECTIVE GLOVES		Plastic or rubber		
EYE PROTECTION		Chemical goggles (recommended by ANSI Z87.1-1979)		
OTHER PROTECTIVE EQUIPMENT		Rubber apron and rubber boots, eyewash, safety shower		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.

Keep out of reach of children.

Protect eyes, skin, and clothing from contact with product.

Do not breathe vapor, mist, or spray.

Use with adequate ventilation.

Keep container tightly closed when not in use.

Wash thoroughly after handling.

This product is not manufactured to contain a known carcinogen or reproductive toxin.

OTHER HANDLING AND STORAGE CONDITIONS

Store in a cool, dry area away from heat, sparks, and open flame.

PREPARED BY	Mike Hoefler	DATE	July 17, 1991

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

24.) FLUX

MATERIAL SAFETY DATA SHEET

D/K ASPHALT FLUX

Revision NO. : VI
Revision Date : April 1997
Original Issue Date : July 1988

This Material Safety Data Sheet (MSDS) contains environmental, health and toxicological information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Please discard any previous edition of this MSDS.

SECTION I
PRODUCT IDENTIFICATION

PRODUCT TRADE NAME: D/K ASPHALT FLUX

SYNONYMS: Vacuum Tower Residual, High Flash Asphalt Flux

FAMILY/CHEMICAL NAME: Petroleum Hydrocarbon

MANUFACTURER/SUPPLIER: DeMenno/Kerdoon
2000 North Alameda Street
Compton, CA U.S.A. 90222
(310) 537-7100

EMERGENCY NUMBER: Chemtrec (800)-424-9300

FOR PRODUCT OR TECHNICAL INFORMATION CALL (310) 537-7100

Prepared according to the OSHA Hazard Communication Standard (29 CFR § 1910.1200) by:

DeMenno/Kerdoon
2000 North Alameda Street, Compton CA U.S.A. 90222

SECTION II
HAZARDOUS COMPONENTS

NAME	SYNONYM	CAS NO.	WT. %
#1 Used Oil Vacuum Residual	Lubricating oils, used,residues	129893-17-0	100
#2*Hydrogen Sulfide	Dihydrogen Monosulfide	7783-06-4	**

	OSHA PEL		ACGIH TLV		OTHER DATA	
	TWA	STEL	TWA	STEL	LD	LC
#1	N/A	N/A	5mg/m3 (a)	N/A	N/A	N/A
#2	10ppm	15ppm	10ppm	15ppm	N/A	800 b

a For asphalt (petroleum) fumes
b Inhalation-Human LCLo(ppm/5Mins)
N/A = Not available
*See Section X Other Regulatory Information
**the concentration of hydrogen sulfide dissolved in asphalt is less than 0.10 WT% but may give rise to vapor concentration in storage tanks in excess of the OSHA PEL or ACGIH TLV limits.

SECTION III
EMERGENCY AND FIRST AID

EYES:
For direct contact, flush eyes with water for 15 minuets lifting upper and lower lids occasionally then cover with sterile bandages. If irritation or redness from exposure to vapor or mist develops, move victim away from exposure into fresh air. Consult physician if irritation or pain persists.

For burns from contact with hot material, immediately cool affected area by flushing or immersing in water until material solidifies. DO NOT remove solidified material as this might cause skin tearing. Cover area with sterile. Seek immediate medical attention.

If contact is NOT with hot material, remove contaminated clothing and shoes. Wash skin twice with soap and water. Consult physician if irritation or pain persists.

INHALATION (Breathing):
Remove to fresh air immediately. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek medical attention if necessary.

INGESTION (Swallowing):
Seek immediate medical attention. DO NOT induce vomiting. If spontaneous vomiting occurs, keep head below hips to avoid aspiration (into lungs).

Note to Physician:
Treat symptomatically and sportively. Contact Poison Control Center for additional medical attention.

SECTION IV
HEALTH HAZARD AND TOXICOLOGY DATA

PRIMARY ROUTES OF EXPOSURE:
Eye and skin contact; inhalation, ingestion.
EXPOSURE LIMITS:
See Section II.

SIGNS AND SYMPTOMS OF EXPOSURE:

ACUTE

EYES: Contact with hot fumes may cause irritation. Direct contact with hot material may cause thermal burns. Prolonged or repeated eye exposure to hot vapors may cause conjunctivitis.

SKIN CONTACT: Contact tends to remove skin oils, possibly leading to irritation and dermatitis. No significant skin absorption

Prolonged or repeated contact may cause drying and cracking, acne-like lesions and mild keratoses. Prolonged or repeated skin exposure to hot vapors may cause photosensitization and melanosis. Pre- existing skin disorders may be more susceptible to the effects of this material.

INHALATION (BREATHING): This material may be irritating to the respiratory tract. Inhalation of hydrogen sulfide released from hot product in enclosed areas may produce unconsciousness, convulsions, respiratory paralysis, coma and death.

INGESTION (SWALLOWING): This material has a low order of acute oral toxicity. May cause gastrointestinal irritation and nausea.

CHRONIC

Prolonged or repeated eye exposure to hot vapors may cause conjunctivitis. Prolonged or repeated skin contact may cause drying and cracking or dermatitis, acne-like lesions and mild keratoses. Prolonged or repeated skin exposure to hot vapors may cause photosensitization and melanosis. Workers who have the habit of chewing asphalt (a similar substance) and sometimes swallowing it have been reported to pyloric obstruction because the undigestible mass accumulates in the stomach forming a stony concentration.

MEDICAL CONDITIONS AGGRAVATED EXPOSURE:

Individual with pre-existing lung, skin or central nervous system disorders may have increased susceptibility to the effects of exposure.

CARCINOGENICITY:
IARC classifies chemicals by their carcinogenic risk, including agents that are known, probable or possible carcinogens. NTP classifies chemicals as either known carcinogens or for which there is a limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals. ACGIH recognizes two categories of carcinogens, confirmed or suspected human carcinogens. Moderate irritant may contain carcinogenic components.

Also see section X.

SECTION V
FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TCC): Greater than 400 deg/f

FIRE AND EXPLOSION HAZARDS:
Decomposition and combustion products may be toxic. Heated containers may rupture, explode or be thrown into air. Not sensitive to mechanical impact or static charge.

FIRE FIGHTING PROCEDURE:
Keep storage containers cool with water spray. Positive pressure, self-contained breathing apparatus (SCBA) and structural firefightters' protective clothing will provide limited protection.

EXTINGUISHING MEDIA:
Carbon dioxide, regular foam, dry chemical, water spray.

CONDITION OF FLAMMABILITY:
Flame

AUTO-IGNITION TEMPERATURE: 905 deg/f

FLAMMABLE LIMITS IN AIR:
Lower: NDA
Upper: NDA

HAZARDOUS COMBUSTION PRODUCTS:
Burning may produce hydrogen sulfide and carbon monoxide.

NFPA CODES: HEALTH:2 FIRE:1 REACTIVITY:0

SECTION VI
REACTIVITY DATA

HAZARDOUS POLYMERIZATION: Not known to occur under normal temperatures and pressures.

STABILITY: Stable under normal temperatures and pressures, and not reactive with water.

INCOMPATIBILITY: Avoid flame. Do not allow hot product to contact water or other liquids as this can cause violent eruptions, splatter hot material or ignite flammable materials.

HAZARDOUS DECOMPOSITION PRODUCTS:
None under normal temperature and pressure. However, thermal decomposition may produce hydrogen sulfide and carbon monoxide.

SECTION VII
SPECIAL HANDLING INFORMATION

HANDLING PRECAUTIONS:
This material is normally handled at high temperatures. Keep away from flame. Avoid contact with eyes, skin, clothing or shoes.

VENELATION:
Store and handle in well venenated area and avoid breathing vapor or mist. Keep away from heat, sparks, and flames. Keep container tightly closed when not in use or transportation.

PROTECTIVE CLOTHING:
Use butyl rubber, polyvinyl alcohol or equivalent gloves to prevent contact with skin. For direct contact with hot material, use combination temperature resistant and chemical protective gloves.

EYE PROTECTION:
Approved eye protection to safeguard against potential eye contact, irritation or injury is recommended, such as safety glasses, splash goggles or full face shields.

RESPIRATORY PROTECTION:
Use NIOSH/OSHA approved respiratory protective equipment when concentration of vapors or mist exceed applicable exposure limit. A self-contained breathing apparatus (SCBA) and full protective equipment is required for large spills or fire emergencies.

SECTION VIII
SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with cleanup. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during cleanup.

SPILL PROCEDURES: Remove all ignition sources. Stop leak if you can do it without risk. Wear protective equipment specified in

avoid breathing vapor or mist. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. For large spills, dike far ahead of liquid spill for later disposal. Contain away from surface waters and sewers. Shovel into closable container for disposal.

WASTE DISPOSAL:
Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State, and Local regulations. Do not flush to surface water or sanitary sewer system. Recycle as much of the recoverable product as possible.

SECTION IX
PHYSICAL DATA

PROPERTIES	TYPICAL RANGE
Physical state, appearance and odor	Viscous semi-black, asphalt odor
Odor threshold	0.10 ppm (based on hydrogen sulfide)
Specific gravity	0.98 (water = 1)
Density	8.2 lbs/gal
Vapor density	Greater than 1 (air = 1)
Vapor pressure	Less than 0.2 mm Hg @ 175 deg/f
Boiling point	Greater than 500 deg/f
Freeze point	N/A
Pour point	30 deg/f
pH	6 - 8
Evaporation rate	0 (butyl acetate = 1)
Solubility in water	Insoluble
Coefficient of water/oil distribution	Less than 1

SECTION X
OTHER REGULATORY INFORMATION

TRANSPORTATION INFORMATION

BASED ON TEMPERATURE EQUAL OR GREATER THAN 212 DEG/F:

DOT PROPER SHIPPING NAME:
HIGH FLASH ASPHALT FLUX ELEVATED TEMPERATURE, LIQUID N.O.S.
DOT CLASS:
UN 3257, PG III

BASED ON TEMPERATURE LESS THAN 212 DEG/F:

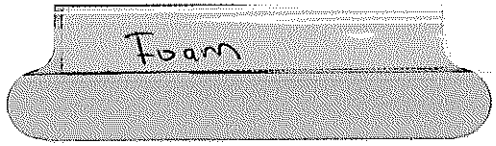
NON DOT REGULATED

SARA TITLE III:
Product contains a toxic chemical subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Toxic constituent is listed with an asterisk in section II of this Material Safety Data.

Product poses the following the following health hazards as defined in 40 CFR 370.3 (Sections 311, 312 of SARA Title III)

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard

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 investigation to determine the suitability of the information for their particular purposes.


Foam

CHEMAX

MATERIAL SAFETY DATA SHEET

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

2	– Health
2	– Fire
0	– Reactivity
–	– Special

Issued: 11/16/92 Supersedes: 08/31/92

PRODUCT NAME: FOAM 1846-50

CHEMICAL NAME: N/A CHEMICAL FAMILY: Foaming Lubrication Agent

FORMULA: Proprietary MOLECULAR WEIGHT: N/A

D.O.T. SHIPPING CLASSIFICATION: Not Restricted

I. PHYSICAL DATA

BOILING POINT 760 mm, Hg	about 212 deg. F.	FREEZING POINT	< 32 deg. F
SPECIFIC GRAVITY (WATER = 1)	1.010 @ 20 deg. C	pH of an (as is) SOLUTION	8.1 – 8.9
PERCENT VOLATILE ORGANICS BY VOLUME	6	SOLUBILITY IN WATER	Complete
APPEARANCE AND ODOR	Clear, pale yellow liquid with an alcohol/surfactant odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	%	ACGIH TLV (Units)	OSHA PEL
Isopropyl Alcohol; CAS #67630	Flamm./Irritant	3 +/– 1	AIR: 400 ppm STEL: 500 ppm	AIR: TWA 400 ppm STEL: 500 ppm
* Glycol Ether (Category)	Moderate Irritant	8 +/– 5	Not Established	Not Established

* Chemicals subject to SARA Title III, section 313 reporting. This notification must not be detached from this MSDS and any copies of this MSDS must include this notification.

All chemical contained in this product are listed on the Toxic Substance Control Act (TSCA) Inventory.

N/A – Not Applicable

EMERGENCY PHONE NUMBERS

503/227-1616
CHEMAX

800/424-9300
CHEMTREC

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT [test method(s)]	144 deg F.: Tag. Closed Cup	AUTOIGNITION TEMPERATURE	N/A
FLAMMABLE LIMITS IN AIR, % by volume	LOWER N/A	UPPER	N/A

EXTINGUISHING MEDIA	Water spray or "fog", foam, carbon dioxide and dry chemicals.
UNUSUAL FIRE AND EXPLOSION HAZARDS	May produce hazardous fumes or hazardous decomposition products. Water solutions are slippery.
SPECIAL FIRE FIGHTING PROCEDURES	When fire fighting, wear full protective equipment including self-contained breathing apparatus.

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Not established on this product.		
ROUTE OF EXPOSURE	EYE CONTACT "Caution" Moderate Irritant	SKIN CONTACT "Caution" Moderate Irritant	SKIN ABSORPTION No data published
	INHALATION May be harmful if inhaled	INGESTION May be harmful if swallowed	
EFFECTS OF OVEREXPOSURE	Can cause eye and skin irritation. May be harmful if swallowed.		
EMERGENCY AND FIRST AID PROCEDURES	EYES: Immediately flush eyes with plenty of clean running water. Get medical attention. EXTERNAL: In case of contact, flush skin with plenty of clean running water. Remove contaminated clothing and shoes. If irritation occurs and persists, get medical attention. INTERNAL: If swallowed, do NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician.		

CHRONIC EXPOSURE EFFECTS	Repeated exposure may lead to dermatitis; otherwise, same as for overexposure.

V. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID	Hot storage
UNSTABLE	STABLE X		
INCOMPATIBILITY (materials to avoid)		Strong oxidizers and cationic materials.	
HAZARDOUS DECOMPOSITION PRODUCTS		When heated to dryness and decomposition, it emits toxic oxides of carbon, sulfur and sodium.	
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID	None
MAY OCCUR	WILL NOT OCCUR X		

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Contain spilled liquid. (For small spills, add dry material to contain). Wearing recommended protective equipment, remove bulk of liquid. Add dry material to absorb remaining liquid; pick up and containerize for recovery or disposal. Flush area with water to remove residues.
WASTE DISPOSAL METHOD	This product, if disposed as shipped, is not a hazardous waste as specified in 40 CFR 261. Consult state or local officials for proper disposal method. When empty, thoroughly rinse container with water before disposal, return to manufacturer or any other industrial use.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		Not required when used as directed.		
VENTILATION	LOCAL EXHAUST	Preferable	SPECIAL	None
	MECHANICAL (general)	OK	OTHER	N/A
PROTECTIVE GLOVES		Plastic or rubber (when handling the concentrated product).		
EYE PROTECTION		Safety glasses with side shields. (when handling the concentrated product).		
OTHER PROTECTIVE EQUIPMENT		N/A		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.
Protect eyes, skin and clothing from contact with concentrated product.
Use with adequate ventilation.

Keep container tightly closed when not in use.
Wash thoroughly after handling.

Caution! FOAM 1846-50 is combustable.

This product is not formulated to contain a known carcinogen or reproductive toxin. Extremely small amounts of these materials may be present in this product from general environmental sources.

OTHER HANDLING AND STORAGE CONDITIONS

Store in a cool, ventilated area.

Empty container may be hazardous. It can contain organic residues and vapors that would be ignited. Do not cut, puncture or weld on or near this container.

PREPARED BY	Edward Doheny	DATE	11/16/92

While Chemax believes that the data contained herein are factual and the opinions expressed are those of qualified experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which Chemax assumes legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be determined by the user to be in accordance with applicale Federal, State, & local laws & regulations.

26.) GAS METER STANDARD

Gas mtr standard

Received 4/11/08
KY

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	1-713/668-0440
Fax on Demand:	1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIHTLV		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.

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

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.

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.

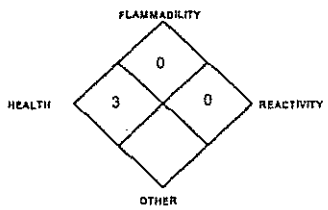
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture contains toxic gases, Hydrogen Sulfide and Carbon Monoxide, and presents an extreme health hazard to firefighters. This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

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)

BOILING POINT: -195.8°C (-320.4°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

pH: Not applicable.

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

MOLECULAR WEIGHT: 28.01

EVAPORATION RATE (nBuAc = 1): Not applicable.

EXPANSION RATIO: Not applicable.

ODOR THRESHOLD: Not applicable.

SPECIFIC VOLUME (ft^3/lb): 13.8

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

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 pph/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

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} = 2.38. 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 (Cranfgonyx 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.

27.) GLYCERIN

GLYCEROL

Material Safety Data Sheet

Mallinckrodt Inc.
Science Products Division
P.O. Box M
Paris, Kentucky 40361

Emergency Telephone Number
314-539-1600

Effective Date: 03-13-90 Supersedes 04-06-89

PRODUCT IDENTIFICATION:

Synonyms: 1,2,3-propanetriol; glycerin

Formula CAS No.: 56-81-5

Molecular Weight: 92.09

Hazardous Ingredients: Glycerol

Chemical Formula: C3H5(OH)3

PRECAUTIONARY MEASURES

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

EMERGENCY FIRST AID

SEE SECTION 5.

DOT Hazard Class: Not Regulated

Physical Data

Appearance: Colorless oily liquid.

Odor: Odorless.

Solubility: Miscible with water.

Boiling Point: 290 C (554 F).

Vapor Density (Air=1):3.17

Melting Point: 18 C (64.4 F).

Vapor Pressure (mm Hg):0.0025 @ 50 C (122 F).

Specific Gravity: 1.25

Evaporation Rate:No information found.

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0

Fire and Explosion Information — SECTION 2

Fire:	Slight fire hazard when exposed to heat or flame. Flashpoint: 160 C (320 F) (CC). Autoignition temperature: 400 C (752 F). Explosive limits: volume % in air: lel: 0.9; uel: unknown.
Explosion:	Above flash point, vapor-air mixtures are explosive within flammable limits noted above.
Fire Extinguishing Media:	Use any means suitable for extinguishing surrounding fire. Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.
Special Information:	In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Reactivity Data — SECTION 3

Stability:	Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:	Toxic gases and vapors may be released if involved in a fire. Glycerin decomposes upon heating above 290 C, forming corrosive gas (acrolein).
Hazardous Polymerization:	This substance does not polymerize.
Incompatibilities:	Strong oxidizers. Can react violently with acetic anhydride, calcium oxychloride, chromium oxides and alkali metal hydrides.

Leak/Spill Disposal Information — SECTION 4

Ventilate area of leak or spill. Clean-up personnel may require protective clothing. Absorb liquid spills with a dry absorbent. Containerize unusable material for disposal in an approved waste facility.

Ensure compliance with local, state and federal regulations.

Health Hazard Information — SECTION 5

A. Exposure/Health Effects

Inhalation:	Due to the low vapor pressure, inhalation of the vapors at room temperatures is unlikely. Inhalation of mist may cause irritation of respiratory tract.
Ingestion:	Low toxicity. May cause nausea, headache, diarrhea.
Skin Contact:	May cause irritation.
Eye Contact:	May cause irritation.
Chronic Exposure:	May cause kidney injury.
Aggravation of Pre-existing Conditions:	Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

B. FIRST AID

Inhalation:	Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:	Give water to rinse mouth and get medical attention immediately. Never give anything by mouth to an unconscious person.
Skin Exposure:	Remove any contaminated clothing. Wash skin with plenty of water for at least 15 minutes. If irritation develops, get medical attention.
Eye Exposure:	Wash thoroughly with running water. Get medical advice if irritation develops.

C. TOXICITY (RTECS, 1982)

Oral rat LD50: 12,600 mg/kg. Oral mouse LD50: 26,000 mg/kg. Aquatic toxicity rating, TLm96: over 1000 ppm.

Occupational Control Measures — SECTION 6

Airborne Exposure Limits:	-OSHA Permissible Exposure Limit (PEL): 10 mg/m3 total dust, 5 mg/m3 respirable fraction for glycerine (mists) -ACGIH Threshold Limit Value (TLV): 10 mg/m3 for glycerin mist containing no asbestos and < 1% free silica
Ventilation System:	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.
Personal Respirators (NIOSH Approved)	If the TLV is exceeded, a half mask chemical cartridge respirator may be worn up to ten times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less.
Skin Protection:	Wear protective gloves and clean body-covering clothing.
Eye Protection:	Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

Storage and Special Information — SECTION 7

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibilities.

****
The information contained herein is provided in good faith and is believed to be correct as of the date hereof. However, Mallinckrodt, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, Mallinckrodt, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. NO REPRESENTATIONS, OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR TO THE PRODUCT TO WHICH THE INFORMATION REFERS.
****

Addendum to Material Safety Data Sheet

REGULATORY STATUS

Hazard Categories for SARA
Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X				

Product or Components of Product:	SARA EHS Sec. 302 RQ	SARA EHS Sec. 302 TPQ	SARA Sec. 313 Chemicals Name List	SARA Sec. 313 Chemicals Chemical Category	CERCLA Sec.103 RQ lbs	RCRA Sec. 261.33
GLYCEROL (56-81-5)	No	No	No	No	No	No

SARA Section 302 EHS RQ:
Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA Section 302 EHS TPQ:
Threshold Planning Quantity of Extremely Hazardous substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA Section 313 Chemicals:
Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA Sec. 103:
Comprehensive Enviromental Response, Compensation and Liability Act (Superfund).

Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4

RCRA:
Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

GLCER . GLYCEROL

28.) Hg ABSORB

received 4/11/08 Kg 9

Hg Absorb®
MATERIAL SAFETY DATA SHEET

MSDS 1609

SECTION I: MANUFACTURER INFORMATION

Lab Safety Supply, Inc.
PO Box 1368
Janesville WI 53547
(608) 754-2345

Date Issued: 5/16/90
Date Reviewed: 5/18/2007
Phone Number: (800) 255-3924
Emergency Number: (800) 356-2501

Assembled for Lab Safety Supply per
Lab Safety Supply Specifications by:
Kandu Industries
Janesville, WI

SECTION II: MATERIAL IDENTIFICATION & INFORMATION

Components CAS Number	%	OSHA PEL	ACGIH TLV	Limits Recommended
Granular Zinc *(7440-66-6)*	94–96	N/A	N/A	5mg/m³ respirable dust 15mg/m³ total dust
Citric Acid *(77-92-9)*	4–6	N/A	N/A	5mg/m³ respirable dust 15mg/m³ total dust

SECTON III: PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: N/A
Vapor Pressure: N/A
Vapor Density (Air=1): N/A
Solubility in Water: Moderate
Appearance and Odor: Gray granular solid

Specific Gravity (H_2O=1): Bulk density 2.35gm/cc
Melting Point: N/A
Evaporation Rate: N/A
Water Reactive: Hydrogen may be released

SECTION IV: FIRE & EXPLOSION DATA

Flash Point: N/A
Auto Ignition Temperature: N/A
Flammability Limits in Air (% by volume): N/A

LEL: N/A
UEL: N/A

Extinguishing Media:
CO_2, or dry chemical (DO NOT use water. Water will react violently with molten material.)
Special Fire Fighting Procedures: N/A
Unusual Fire & Explosion Hazards: Zinc dust mixed with sulfur dust may explode.

SECTION V: REACTIVITY HAZARD DATA

Stability: Stable
Materials to Avoid: Oxidizing agents, acids, bases, halogens, reducing agents, amines, chlorinated solvents and sulfur.
Hazardous Decomposition Products: May release CO and/or CO_2.
Hazardous Polymerization: N/A
Conditions to Avoid: N/A

SECTION VI: HEALTH HAZARD DATA

Primary Routes of Entry: Inhalation

Carcinogen Listed in: N/A

Health Hazards:
Acute irritation to eyes, nose, throat, metallic taste in mouth, flu like symptoms. Chronic chromosomal anomalies in leukocytes reported, arthritic lameness and inflammation of gastro-intestinal tract reported in animal studies.

Signs and Symptoms of Exposure:
Irritation of nose, throat and eyes.

Medical Conditions Generally Aggravated by Exposure:
N/A

EMERGENCY FIRST AID PROCEDURES—Seek medical assistance for further treatment.
Eye contact: Flush eyes with plenty of water for at least 15 minutes.
Skin contact: Flush with plenty of water.
Inhalation: Remove to fresh air, seek medical attention immediately.
Ingestion: Dilute with plenty of water and seek medical attention immediately.

SECTION VII: CONTROL AND PROTECTIVE MEASURES

Respiratory Protection:
Use NIOSH approved particulate respirator at total dust levels over 15mg/m³.

Eye Protection:
Safety glasses recommended.

Ventilation to be Used:
Mechanical (general)

Protective Gloves:
Polyethylene, rubber or PVC

Other Protective Clothing and Equipment:
None required under normal use.

Hygienic Work Practices:
Wash hands after use.

SECTION VIII: PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken if Material is Spilled or Released:
Sweep up material and place in waste disposal container.

Waste Disposal Methods:
Mercury free material may be containerized and disposed of in a licensed landfill. Dispose of mercury containing material in accordance with local, state and federal regulations for hazardous waste.

Precautions to Take in Handling and Storage:
Store in cool dry place, away from incompatible materials.

Other Precautions and/or Special Hazards:
N/A

NFPA Rating:
Health 0 Flammability 1 Reactivity 1 Special N/A

20.) HYDROCHLORIC ACID

HYDROCHLORIC ACID, 37%

Material Safety Data Sheet

Mallinckrodt Inc.
Science Products Division
P.O. Box M
Paris, Kentucky 40361

Emergency Telephone Number
314-982-5000

Effective Date: 09-10-86 Supersedes 08-21-85

PRODUCT IDENTIFICATION:

Synonyms: Muriatic acid

Formula CAS No.: 7647-01-0 Molecular Weight: 36.46 (HCl)

Hazardous Ingredients: Hydrogen chloride Chemical Formula: HCl

PRECAUTIONARY MEASURES

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

Do not get in eyes, on skin, or on clothing.
Avoid breathing mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
This substance is classified as a POISON under the Federal Caustic Poison Act.

EMERGENCY FIRST AID

case of contact, immediately flush skin or eyes with plenty of water for at ıst 15 minutes. If swallowed, DO NOT INDUCE VOMITING! Give large quantities ɔf water or milk if available. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
SEE SECTION 5.

DOT Hazard Class: Corrosive Material

Physical Data

Appearance: Clear, colorless fuming liquid.

Odor: Pungent odor of hydrogen chloride.

Solubility: Infinite in water with slight evolution of heat.

Boiling Point: 53 C (127 F); Azeotrope (20.2%) boils at 109 C (228 F)

Vapor Density (Air=1): No information found.

Melting Point: -74 C (-101 F)

Vapor Pressure (mm Hg): 190 @ 25 C (77 F)

Specific Gravity: 1.18

Evaporation Rate: No information found.

N. A Ratings: Health: 3 Flammability: 0 Reactivity: 0

Fire and Explosion nformation — SECTION 2

Fire:	Can react with metals to release flammable hydrogen gas.
Explosion:	Not considered to be an explosion hazard.
Fire Extinguishing Media:	If involved in a fire, use water spray.
Special Information:	In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Reactivity Data — SECTION 3

Stability:	Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:	When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes.
zardous Polymerization:	Will not occur.
Incompatibilities:	A strong mineral acid, concentrated hydrochloric acid is highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.

Leak/Spill Disposal Information — SECTION 4

Clean-up personnel should wear protective clothing and respiratory equipment suitable for toxic or corrosive fluids or vapors. Isolate or enclose the area of the leak or spill. Small Spills: Flush with water and neutralize with alkaline material (soda ash, lime, etc.). Sewer neutralized material with excess water. Larger spills and lot sizes: Neutralize with alkaline material, pick up with absorbent material (sand, earth, vermiculite). Provide forced ventilation to dissipate fumes. Dispose in a RCRA-approved waste facility or sewer the neutralized slurry with excess water if local ordinances allow.
Reportable Quantity (RQ)(CWA/CERCLA) : 5000 lbs.
Ensure compliance with local, state and federal regulations.

Health Hazard Information — SECTION 5

A. Exposure/Health Effects

Inhalation:	Corrosive! Inhalation of vapors can cause coughing, choking, inflamation of the nose, throat, and upper respiratory tract. Inhalation of higher concentrations may cause lung damage.
Ingestion:	Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea.
Skin Contact:	Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
Eye Contact:	Corrosive! Vapors are irritating and may cause damage to the eyes. Splashes may cause severe burns and permanent eye damage.
Chronic Exposure:	Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Pre-existing Conditions:	Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

B. FIRST AID

Inhalation:	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:	DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Exposure:	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 Exposure:	Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY (RTECS, 1982)

Oral rat LD50: 900 mg/kg (Hydrochloric acid concentrated) Mutation references

Occupational Control Measures — SECTION 6

Airborne Exposure Limits:	-OSHA Permissible Exposure Limit (PEL): 5 ppm Ceiling -ACGIH Threshold Limit Value (TLV): 5 ppm Ceiling
Ventilation System:	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.
Personal Respirators (NIOSH Approved)	If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.
Skin Protection:	Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
Eye Protection:	Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

Storage and Special Information — SECTION 7

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect from physical damage and direct sunlight. Isolate from incompatible substances. Protect from moisture.

****
The information contained herein is provided in good faith and is believed to be correct as of the date hereof. However, Mallinckrodt, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, Mallinckrodt, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. NO REPRESENTATIONS, OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR TO THE PRODUCT TO WHICH THE INFORMATION REFERS.
****

Addendum to Material Safety Data Sheet

REGULATORY STATUS

This Addendum Must Not Be
Detached from the MSDS
Identifies SARA 313 substance(s)

Any copying or redistribution of the MSDS
must include a copy of this addendum

Hazard Categories for SARA
Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			X

Product or Components of Product:	SARA EHS Sec. 302 RQ	SARA EHS Sec. 302 TPQ	SARA Sec. 313 Chemicals Name List	SARA Sec. 313 Chemicals Chemical Category	CERCLA Sec.103 RQ lbs	RCRA Sec. 261.33
HYDROCHLORIC ACID, 37% (7647-01-0)	1	500gas	Yes	No	5000acid	No

SARA Section 302 EHS RQ:
Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA Section 302 EHS TPQ:
Threshold Planning Quantity of Extremely Hazardous substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA Section 313 Chemicals:
Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA Sec. 103:
Comprehensive Enviromental Response, Compensation and Liability Act (Superfund).

Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4

RCRA:
Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

30.) INNOVALT

Rhodia

Material Safety Data Sheet

INNOVALT (TM) N400

Date Prepared: 2/27/03 **Supersedes Date: 0/00/00**

1. PRODUCT AND COMPANY DESCRIPTION

RHODIA INC.
RHODIA SPECIALTY PHOSPHATES
CN 7500
259 Prospect Plains Road
Cranbury NJ 08512-7500

Emergency Phone Numbers:
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC (800-424-9300 within the United States or 703-527-3887 for international collect calls) or Rhodia CAERS (Communication and Emergency Response System) at 800-916-3232.

For Product Information:
(800) 243-5052

Chemical Name or Synonym:
POLYPHOSPHORIC ACID, TETRAPHOSPHORIC ACID

Molecular Formula:
$H(PO_3H)_nOH$

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	OSHA Hazard	Percentage
POLYPHOSPHORIC ACIDS	8017-16-1	Y	~ 100

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW:

Physical Appearance and Odor:
colorless to dark grey viscous liquid, odorless.

Warning Statements:
DANGER! CAUSES BURNS. CORROSIVE TO METALS.

B. POTENTIAL HEALTH EFFECTS:

Acute Eye:
Corrosive. Can cause permanent damage to the cornea, blindness.

Acute Skin:
Causes irritation, burns.

Acute Inhalation:
May cause respiratory tract irritation, shortness of breath, fluid in lungs.

Acute Ingestion:
Causes corrosion, burns to mouth and esophagus, abdominal pain, chest pain, nausea, vomiting, diarrhea, seizures, Aspiration of the swallowed or vomited product can cause severe pulmonary complications.

Chronic Effects:
This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens. Prolonged contact may cause chronic dermatitis.

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:
Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist. If the physician is not immediately available, eye irrigation should be continued for an additional 15 minutes. If it is necessary to transport the patient to a physician and the eye needs to be bandaged, use a dry sterile cloth pad and cover both eyes.

Skin Exposure:
In case of contact, immediately wash with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned.

Inhalation:
Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek immediate medical attention.

Ingestion:
If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Material may enter lungs and cause severe damage. Do not give anything by mouth to an unconscious victim. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Persons attending the victim should avoid direct contact with heavily contaminated clothing and vomitus. Wear impervious gloves while decontaminating skin and hair.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.

Acute Eye:
Corrosive. Can cause permanent damage to the cornea, blindness.

Acute Skin:
Causes irritation, burns.

Acute Inhalation:
May cause respiratory tract irritation, shortness of breath, fluid in lungs.

Acute Ingestion:
Causes corrosion, burns to mouth and esophagus, abdominal pain, chest pain, nausea, vomiting, diarrhea, seizures, Aspiration of the swallowed or vomited product can cause severe pulmonary complications.

Chronic Effects:
This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens. Prolonged contact may cause chronic dermatitis.

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:
Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist. If the physician is not immediately available, eye irrigation should be continued for an additional 15 minutes. If it is necessary to transport the patient to a physician and the eye needs to be bandaged, use a dry sterile cloth pad and cover both eyes.

Skin Exposure:
In case of contact, immediately wash with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned.

Inhalation:
Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek immediate medical attention.

Ingestion:
If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Material may enter lungs and cause severe damage. Do not give anything by mouth to an unconscious victim. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Persons attending the victim should avoid direct contact with heavily contaminated clothing and vomitus. Wear impervious gloves while decontaminating skin and hair.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.

INHALATION: If cough or shortness of breath occurs, evaluate the possibility of bronchitis or pneumonitis. Chest x-ray and arterial blood gases can be used to determine the presence of pulmonary edema. In severe cases, use of humidified oxygen and assisted ventilation including positive end expiratory pressure (PEEP) may be needed. Parenteral steroids may be useful in limiting the extent of pulmonary damage.

SKIN: Wash exposed area thoroughly with soap and water. Chemical burns from strong acids are generally treated the same as thermal burns.

EYES: Irrigate eyes for 15 minutes with sterile saline. If irritation, pain, swelling, photophobia or lacrimation persist, examination by an ophthalmologist is recommended.

INGESTION: If not already performed by first aid personnel, irrigate mouth with large amounts of water and dilute the acid by having victim drink 4 to 8 ounces of water or milk. DO NOT induce vomiting. Use of gastric lavage is controversial. The advantage of removal of acid must be weighted against the risk of perforation or bleeding. If a large amount of acid (> 1 ml/kg body weight) has been recently ingested, cautious gastric lavage is generally advised if the patient is alert and there is little risk of convulsions. Consultation with a gastroenterologist and/or surgeon is advised. Serious complications such as perforation or stricture of the esophagus may occur requiring care by specialists. Laryngeal edema may develop requiring intubation or tracheostomy.

5. FIRE FIGHTING MEASURES

FIRE HAZARD DATA:

Flash Point:
Not Applicable

Extinguishing Media:
Not combustible. Use extinguishing method suitable for surrounding fire.

Special Fire Fighting Procedures:
Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Keep unnecessary people away, isolate hazard area and deny entry. Evacuate residents who are downwind of fire. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later. Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation.

Unusual Fire and Explosion Hazards:
Not combustible. Under fire conditions, toxic, corrosive fumes are emitted.

Hazardous Decomposition Materials (Under Fire Conditions):
oxides of phosphorus

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:
Wear appropriate protective gear for the situation. See Personal Protection information in Section 8. Evacuate and isolate spill area.

Containment of Spill:
Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike or retain dilution water or water from firefighting for later disposal. Follow procedure described below under Cleanup and Disposal of Spill.

Cleanup and Disposal of Spill:
Exercise caution during neutralization as considerable heat may be generated. Neutralize spill area with soda ash, sodium bicarbonate or lime. Flush neutralized spill with copious amounts of water.

Environmental and Regulatory Reporting:
Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures:
Not Available

Handling:
Do not get on skin or in eyes. Avoid breathing vapors and mists. Do not ingest.

Storage tanks, pipes and pumps should be equipped with external heating and insulation to maintain at or above minimum storage temperature. This material is corrosive to common metals such as mild steel, copper, brass and bronze and may generate flammable hydrogen gas as a result of this reaction. See Storage below for recommended material for storage tanks, pipes and pumps. When diluting an acid, ALWAYS add the acid slowly to water and stir well to avoid spattering. NEVER ADD WATER TO ACID.

Storage:
Store in tightly closed containers. Store in an area that is cool, dry, well-ventilated, away from ignition sources, Recommended container material: stainless steel (Type 316ELC).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:
These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:
No exposure limits were found for this product or any of its ingredients.

Engineering Controls:
Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Respiratory Protection:
When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate OSHA, WHMIS or ANSI standard(s):

organic vapors, acid gases. Under conditions immediately dangerous to life or health, or emergency conditions with unknown concentrations, use a full-face positive pressure air-supplied respirator equipped with an emergency escape air supply unit or use a self-contained breathing apparatus unit.

Eye/Face Protection:
Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area. Face contact should be prevented through use of a face shield.

Skin Protection:
Skin contact should be prevented through use of suitable protective clothing, gloves and footwear, selected with regard for use conditions and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:
Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

(1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
(2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
(3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance:
colorless to dark grey viscous liquid.

Odor:
odorless.

pH:
< 1 at 1 wt/wt%.

Specific Gravity:
2.02 at 15 C (59 F).

Water Solubility:
soluble w/ envolution of heat

Melting Point Range:
16 C (61 F)

Boiling Point Range:
~ 282 C (540 F) at 760 mmHg

Vapor Pressure:
~ 1 mmHg at 20 C (68 F)

Vapor Density:
Not Available

10. STABILITY AND REACTIVITY

Chemical Stability:
This material is stable under normal handling and storage conditions described in Section 7.

Conditions To Be Avoided:
extreme heat
moisture

Materials/Chemicals To Be Avoided:
water
strong bases
metals

The Following Hazardous Decomposition Products Might Be Expected:

Decomposition Type: thermal
oxides of phosphorus

Hazardous Polymerization Will Not Occur.

Avoid The Following To Inhibit Hazardous Polymerization:
not applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:
The following data are for similar or related products.
Toxicological Information and Interpretation:
eye - eye irritation, rabbit. Corrosive. Data for phosphoric acid.

Acute Skin Irritation:
Toxicological Information and Interpretation:
skin - skin irritation, rabbit. Corrosive.

Acute Dermal Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:
LD50 - lethal dose 50% of test species, 2740 mg/kg, rabbit. Data for phosphoric acid.

Acute Respiratory Irritation:
No test data found for product.

Acute Inhalation Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:

LC50 - lethal concentration 50% of test species, > 850 mg/cu m/1 hr, rat. Data for phosphoric acid.

Acute Oral Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:
LD50 - lethal dose 50% of test species, 1530 mg/kg, rat. Data for phosphoric acid.

Chronic Toxicity:
This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

No additional test data found for product.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:
No data found for product.

Chemical Fate Information:
No data found for product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

EPA Hazardous Waste - YES

EPA RCRA HAZARDOUS WASTE CODES:
"C" Corrosive.

14. TRANSPORTATION INFORMATION

Transportation Status: IMPORTANT! Statements below provide additional data on listed DOT classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

US Department of Transportation
Hazard Class..... 8
Shipping Name:
CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Shipping Name:
(POLYPHOSPHORIC ACID)
ID Number..... UN3264

Packing Group.... III
Labels..... CORROSIVE
Emergency Guide #.... 154

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	Y
CANADA (DSL)	Y
EUROPE (EINECS/ELINCS)	Y
AUSTRALIA (AICS)	Y
JAPAN (MITI)	Y
SOUTH KOREA (KECL)	Y

Y = All ingredients are on the inventory.
E = All ingredients are on the inventory or exempt from listing.
P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

FEDERAL REGULATIONS

Inventory Issues:
All functional components of this product are listed on the TSCA Inventory.

SARA Title III Hazard Classes:

Fire Hazard	- NO
Reactive Hazard	- NO
Release of Pressure	- NO
Acute Health Hazard	- YES
Chronic Health Hazard	- NO

SARA Extremely Hazardous Substances (EHS)/CERCLA Hazardous Substances

Ingredient	CERCLA/SARA RQ	SARA EHS TPQ
UNLISTED HAZARDOUS WASTES - CHARACTERISTIC OF CORROSIVITY	100 lbs	

STATE REGULATIONS:
This product does not contain any components that are regulated under California Proposition 65.

16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings--NFPA(R):

3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
1 Instability Rating--Slight

National Paint & Coating Hazardous Materials Identification System--HMIS(R):

3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
1 Reactivity Rating--Slight

Reason for Revisions:
New product MSDS.

Key Legend Information:
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value
PEL - Permissable Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
ND - Not determined
RPI - Rhodia Established Exposure Limits

Disclaimer:
The information herein is given in good faith but no warranty, expressed or implied, is made.

**** End of MSDS Document ****

Rhodia

Material Safety Data Sheet

INNOVALT (TM) N200

Date Prepared: 2/27/03 **Supersedes Date: 0/00/00**

1. PRODUCT AND COMPANY DESCRIPTION

RHODIA INC.
RHODIA SPECIALTY PHOSPHATES
CN 7500
259 Prospect Plains Road
Cranbury NJ 08512-7500

Emergency Phone Numbers:
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC (800-424-9300 within the United States or 703-527-3887 for international collect calls) or Rhodia CAERS (Communication and Emergency Response System) at 800-916-3232.

For Product Information:
(800) 243-5052

Chemical Name or Synonym:
POLYPHOSPHORIC ACID, TETRAPHOSPHORIC ACID

Molecular Formula:
$H(PO_3H)_nOH$

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	OSHA Hazard	Percentage
POLYPHOSPHORIC ACIDS	8017-16-1	Y	~ 100

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW:

Physical Appearance and Odor:
colorless to dark grey viscous liquid, odorless.

Warning Statements:
DANGER! CAUSES BURNS. CORROSIVE TO METALS.

B. POTENTIAL HEALTH EFFECTS:

Acute Eye:
Corrosive. Can cause permanent damage to the cornea, blindness.

Acute Skin:
Causes irritation, burns.

Acute Inhalation:
May cause respiratory tract irritation, shortness of breath, fluid in lungs.

Acute Ingestion:
Causes corrosion, burns to mouth and esophagus, abdominal pain, chest pain, nausea, vomiting, diarrhea, seizures, Aspiration of the swallowed or vomited product can cause severe pulmonary complications.

Chronic Effects:
This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens. Prolonged contact may cause chronic dermatitis.

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:
Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist. If the physician is not immediately available, eye irrigation should be continued for an additional 15 minutes. If it is necessary to transport the patient to a physician and the eye needs to be bandaged, use a dry sterile cloth pad and cover both eyes.

Skin Exposure:
In case of contact, immediately wash with plenty of soap and water for at least 15 minutes. Seek medical attention. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned.

Inhalation:
Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek immediate medical attention.

Ingestion:
If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Material may enter lungs and cause severe damage. Do not give anything by mouth to an unconscious victim. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Persons attending the victim should avoid direct contact with heavily contaminated clothing and vomitus. Wear impervious gloves while decontaminating skin and hair.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.

INHALATION: If cough or shortness of breath occurs, evaluate the possibility of bronchitis or pneumonitis. Chest x-ray and arterial blood gases can be used to determine the presence of pulmonary edema. In severe cases, use of humidified oxygen and assisted ventilation including positive end expiratory pressure (PEEP) may be needed. Parenteral steroids may be useful in limiting the extent of pulmonary damage.

SKIN: Wash exposed area thoroughly with soap and water. Chemical burns from strong acids are generally treated the same as thermal burns.

EYES: Irrigate eyes for 15 minutes with sterile saline. If irritation, pain, swelling, photophobia or lacrimation persist, examination by an ophthalmologist is recommended.

INGESTION: If not already performed by first aid personnel, irrigate mouth with large amounts of water and dilute the acid by having victim drink 4 to 8 ounces of water or milk. DO NOT induce vomiting. Use of gastric lavage is controversial. The advantage of removal of acid must be weighted against the risk of perforation or bleeding. If a large amount of acid (> 1 ml/kg body weight) has been recently ingested, cautious gastric lavage is generally advised if the patient is alert and there is little risk of convulsions. Consultation with a gastroenterologist and/or surgeon is advised. Serious complications such as perforation or stricture of the esophagus may occur requiring care by specialists. Laryngeal edema may develop requiring intubation or tracheostomy.

5. FIRE FIGHTING MEASURES

FIRE HAZARD DATA:

Flash Point:
Not Applicable

Extinguishing Media:
Not combustible. Use extinguishing method suitable for surrounding fire.

Special Fire Fighting Procedures:
Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Keep unnecessary people away, isolate hazard area and deny entry. Evacuate residents who are downwind of fire. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later. Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation.

Unusual Fire and Explosion Hazards:
Not combustible. Under fire conditions, toxic, corrosive fumes are emitted.

Hazardous Decomposition Materials (Under Fire Conditions):
oxides of phosphorus

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:
Wear appropriate protective gear for the situation. See Personal Protection information in Section 8. Evacuate and isolate spill area.

Containment of Spill:
Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike or retain dilution water or water from firefighting for later disposal. Follow procedure described below under Cleanup and Disposal of Spill.

Cleanup and Disposal of Spill:
Exercise caution during neutralization as considerable heat may be generated. Neutralize spill area with soda ash, sodium bicarbonate or lime. Flush neutralized spill with copious amounts of water.

Environmental and Regulatory Reporting:
Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures:
Not Available

Handling:
Do not get on skin or in eyes. Avoid breathing vapors and mists. Do not ingest.

Storage tanks, pipes and pumps should be equipped with external heating and insulation to maintain at or above minimum storage temperature. This material is corrosive to common metals such as mild steel, copper, brass and bronze and may generate flammable hydrogen gas as a result of this reaction. See Storage below for recommended material for storage tanks, pipes and pumps. When diluting an acid, ALWAYS add the acid slowly to water and stir well to avoid spattering. NEVER ADD WATER TO ACID.

Storage:
Store in tightly closed containers. Store in an area that is cool, dry, well-ventilated, away from ignition sources, Recommended container material: stainless steel (Type 316ELC).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:
These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:
No exposure limits were found for this product or any of its ingredients.

Engineering Controls:
Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Respiratory Protection:
When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate OSHA, WHMIS or ANSI standard(s):

organic vapors, acid gases. Under conditions immediately dangerous to life or health, or emergency conditions with unknown concentrations, use a full-face positive pressure air-supplied respirator equipped with an emergency escape air supply unit or use a self-contained breathing apparatus unit.

Eye/Face Protection:
Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area. Face contact should be prevented through use of a face shield.

Skin Protection:
Skin contact should be prevented through use of suitable protective clothing, gloves and footwear, selected with regard for use conditions and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:
Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

(1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
(2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
(3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance:
colorless to dark grey viscous liquid.

Odor:
odorless.

pH:
< 1 at 1 wt/wt%.

Specific Gravity:
2.02 at 15 C (59 F).

Water Solubility:
soluble w/ envolution of heat

Melting Point Range:
16 C (61 F)

Boiling Point Range:
~ 282 C (540 F) at 760 mmHg

Vapor Pressure:
~ 1 mmHg at 20 C (68 F)

Vapor Density:
Not Available

10. STABILITY AND REACTIVITY

Chemical Stability:
This material is stable under normal handling and storage conditions described in Section 7.

Conditions To Be Avoided:
extreme heat
moisture

Materials/Chemicals To Be Avoided:
water
strong bases
metals

The Following Hazardous Decomposition Products Might Be Expected:

Decomposition Type: thermal
oxides of phosphorus

Hazardous Polymerization Will Not Occur.

Avoid The Following To Inhibit Hazardous Polymerization:
not applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:
The following data are for similar or related products.
Toxicological Information and Interpretation:
eye - eye irritation, rabbit. Corrosive. Data for phosphoric acid.

Acute Skin Irritation:
Toxicological Information and Interpretation:
skin - skin irritation, rabbit. Corrosive.

Acute Dermal Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:
LD50 - lethal dose 50% of test species, 2740 mg/kg, rabbit. Data for phosphoric acid.

Acute Respiratory Irritation:
No test data found for product.

Acute Inhalation Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:

LC50 - lethal concentration 50% of test species, > 850 mg/cu m/1 hr, rat. Data for phosphoric acid.

Acute Oral Toxicity:
The following data is for similar or related products.
Toxicological Information and Interpretation:
LD50 - lethal dose 50% of test species, 1530 mg/kg, rat. Data for phosphoric acid.

Chronic Toxicity:
This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

No additional test data found for product.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:
No data found for product.

Chemical Fate Information:
No data found for product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

EPA Hazardous Waste - YES

EPA RCRA HAZARDOUS WASTE CODES:
"C" Corrosive.

14. TRANSPORTATION INFORMATION

Transportation Status: IMPORTANT! Statements below provide additional data on listed DOT classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

US Department of Transportation
Hazard Class..... 8
Shipping Name:
CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Shipping Name:
(POLYPHOSPHORIC ACID)
ID Number..... UN3264

Packing Group.... III
Labels..... CORROSIVE
Emergency Guide #.... 154

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	Y
CANADA (DSL)	Y
EUROPE (EINECS/ELINCS)	Y
AUSTRALIA (AICS)	Y
JAPAN (MITI)	Y
SOUTH KOREA (KECL)	Y

Y = All ingredients are on the inventory.
E = All ingredients are on the inventory or exempt from listing.
P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

FEDERAL REGULATIONS

Inventory Issues:
All functional components of this product are listed on the TSCA Inventory.

SARA Title III Hazard Classes:

Fire Hazard	- NO
Reactive Hazard	- NO
Release of Pressure	- NO
Acute Health Hazard	- YES
Chronic Health Hazard	- NO

SARA Extremely Hazardous Substances (EHS)/CERCLA Hazardous Substances

Ingredient	CERCLA/SARA RQ	SARA EHS TPQ
UNLISTED HAZARDOUS WASTES - CHARACTERISTIC OF CORROSIVITY	100 lbs	

STATE REGULATIONS:
This product does not contain any components that are regulated under California Proposition 65.

16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings--NFPA(R):

3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
1 Instability Rating--Slight

National Paint & Coating Hazardous Materials Identification System--HMIS(R):

3 Health Hazard Rating--Serious
0 Flammability Rating--Minimal
1 Reactivity Rating--Slight

Reason for Revisions:
New product MSDS.

Key Legend Information:
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value
PEL - Permissable Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
ND - Not determined
RPI - Rhodia Established Exposure Limits

Disclaimer:
The information herein is given in good faith but no warranty, expressed or implied, is made.

** End of MSDS Document **

31.) KLING BETA

AKZO NOBEL

MATERIAL SAFETY DATA SHEET
KLING® BETA NE
Proprietary Modified Polyamine Mixture

AKZO NOBEL ASPHALT APPLICATIONS, INC.
4914 Fort Avenue 76710
P.O. Box 7677
Waco, Texas 76714-7677
PHONE: INQUIRY (817) 772-7677
EMERGENCY (800) 424-9300

US D.O.T. *EMERGENCY RESPONSE GUIDEBOOK* REFERENCE — 60

IDENTITY: (As used on label and list)

TRADE NAME:	KLING® BETA NE
CHEMICAL NAME:	Proprietary Polyamine Mixture
DOT HAZARD CLASSIFICATION:	Non-regulated
DOT HAZARD LABEL:	None

****

SECTION I

****

MANUFACTURER'S NAME:	AKZO NOBEL ASPHALT APPLICATIONS, INC.
ADDRESS:	4914 Fort Avenue 76710 P.O. BOX 7677 WACO, TEXAS 76714-7677
EMERGENCY PHONE NUMBER:	(800) 424-9300
PHONE NUMBER FOR INFORMATION:	(817) 772-7677
DATE REVISED:	02/13/95
NAME OF PREPARER:	Sundaram Logaraj
SIGNATURE OF PREPARER:	S. Logaraj

****

SECTION II HAZARDOUS INGREDIENTS/INFORMATION

****

HAZARDOUS COMPONENTS:

CAS #	Chemical	Hazard
Proprietary TSCA Listed	Aliphatic Polyamines	Corrosive to eye

Note: SARA Title III Section 313 toxic chemicals above de minimis: *none. See Section IX for SARA reporting requirements.*

****

SECTION III — PHYSICAL/CHEMICAL CHARACTERISTICS

****

BOILING POINT: >150°C
SPECIFIC GRAVITY (H_2O=1): Typ., 0.93 @ 25°C
VAPOR PRESSURE (mm Hg @ 20°C): N/A
MELTING POINT: N/A
VAPOR DENSITY (Air=1): N/A
EVAPORATION RATE (Butyl Acetate=1): N/A
SOLUBILITY IN WATER (% by weight): Insoluble
APPEARANCE AND ODOR: Dark brown liquid with characteristic odor.
pH: N/A

ND – not determined

****

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

****

FLASH POINT (method used): >125°C Closed Cup **FLAMMABLE LIMITS:** LEL N/A UEL N/A
AUTO IGNITION TEMPERATURE: N/A
EXTINGUISHING MEDIA: Water fog, CO_2, alcohol foam or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Wear NIOSH/MSHA approved self-contained breathing apparatus and protective clothing. Cool containers exposed to flames with water spray. Solid stream of water may cause splattering and spread flames.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

****

SECTION V — REACTIVITY DATA

****

STABILITY: Stable.
CONDITIONS TO AVOID: Temperatures near or above flash point.
INCOMPATIBILITY (materials to avoid): Strong oxidizers and materials that react with amines.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Thermal decomposition results in CO, CO_2 and NO_x, and other gases.
HAZARDOUS POLYMERIZATION: Will not occur.

****

SECTION VI — HEALTH HAZARD DATA

****

ROUTE(S) OF ENTRY:

INHALATION?	Yes. May irritate upper respiratory tract. May cause allergic response.
SKIN?	Yes. Single exposure can cause moderate burns.
INGESTION?	Yes. Low oral toxicity. If ingested, can cause burns of mouth and digestive tract.
EYES?	Yes. Irritant. Exposure to liquid may cause irritation and damage to eyes.

HEALTH HAZARDS (acute and chronic): None established.
CARCINOGENICITY:

NTP?	Ingredients not on list.
IARC MONOGRAPHS?	Ingredients not on list.
OSHA REGULATED?	Ingredients not on list.

SIGNS AND SYMPTOMS OF EXPOSURE:
INHALATION — Repeated and prolonged exposure may result in respiratory irritation.
INGESTION — May cause irritation of the mouth and throat, abdominal pain, vomiting and diarrhea.
SKIN CONTACT — Contact can cause burns with allergenic reactions. Long term exposure may result in absorption of harmful amounts.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin contact may aggravate existing dermatitis. Vapor may aggravate existing asthma and other pulmonary diseases.
EMERGENCY AND FIRST AID PROCEDURES:
INGESTION — Administer large quantities of water or milk. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
INHALATION — Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
EYE CONTACT — Immediately flush with plenty of water for at least 30 minutes. Immediately call physician.
SKIN CONTACT — Immediately wash with soap and plenty of water while removing contaminated clothing and shoes. Continue to flush with water for at least 30 minutes. Call a physician. Wash clothing before reuse.

AKZO NOBEL

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SECTION VII — PRECAUTIONS FOR SAFE HANDLING AND USE

****

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Dike spill and absorb in sand, earth, or vermiculite. Collect into closed containers for disposal according to federal, state, and local regulations. Do not sewer.

WASTE DISPOSAL METHOD: Treatment, storage, transportation and disposal must be in accordance with EPA or state regulations under the authority of the Resource Conservation and Recovery Act (40 CFR, parts 260-271). Recover nonusable free liquid and dispose of in an approved and permitted incinerator. Recover contaminated water and dispose of in an approved and permitted biological treatment system or an approved and permitted deep well. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Do not flush to surface water or sanitary sewer system.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in cool, dry area away from acids, oxidizers, and halogenated compounds. Handle using good industrial hygiene and safety practices. Avoid contact with skin and eyes. Remove closures carefully to release possible internal pressure.

OTHER PRECAUTIONS: N/A

****

SECTION VIII — CONTROL MEASURES

****

RESPIRATORY PROTECTION (specify type): Use mask equipped with organic filters.

VENTILATION: local exhaust recommended.

PROTECTIVE GLOVES: Rubber.

EYE PROTECTION: Chemical splash-proof goggles or full face shield.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Boots, apron, clean body-covering clothing, eye wash station and safety shower accessible to workers.

WORK/HYGIENIC PRACTICES: Do not use unless eye bath and safety shower are available in the work area. Wash hands before eating, drinking, smoking or using toilet. Use good housekeeping practices.

****

SECTION IX — ADDITIONAL INFORMATION

****

ENVIRONMENTAL

BIODEGRADABILITY: Not known.

WASTE DISPOSAL METHODS: Treatment, storage, transportation and disposal must be in accordance with EPA or state regulations under the authority of the Resource Conservation and Recovery Act (40 CFR, parts 260-271). Recover nonusable free liquid and dispose of in an approved and permitted incinerator. Recover contaminated water and dispose of in an approved and permitted biological treatment system or an approved and permitted deep well. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Do not flush to surface water or sanitary sewer system.

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ADDITIONAL INFORMATION

EMPTY CONTAINER HANDLING: Dispose of as hazardous waste (40CFR 261.33) in authorized hazardous waste disposal facility in accordance with federal, state and local regulations. Emptied container retains product residue and vapors. Observe all precautions even after container is emptied. Do not cut, drill, grind, or weld on or near container.

SARA TITLE III REPORTING REQUIREMENTS

SECTION 302 — EXTREMELY HAZARDOUS SUBSTANCES	Reporting not required.
SECTION 304 — HAZARDOUS\RELEASES	Reporting not required.
SECTION 302 — COMMUNITY RIGHT TO KNOW (RTK)	Reporting required.
SECTION 302 — RTK INVENTORY DATA	Reporting required.
SECTION 302 — EMISSIONS AND RELEASE	Reporting not required.
CERCLA	Same as Section 304.

REFERENCES

PERMISSIBLE EXPOSURE REFERENCES: Registry of toxic effects of chemical substances Title 29 Code of Federal Regulations. International Agency for Research on Cancer (IARC) monographs.

REGULATORY STANDARDS:

Title 49 CFR Sections 173.240, 173.245.
Title 29 CFR Section 1910.1200
Title 40 CFR Section 261.33

SHIPPING DESCRIPTION: Non-hazardous liquid.

LABEL REQUIRED: None.

The information contained herein is believed to be accurate. However, it is provided solely for the customer's consideration, investigation and verification. The product described herein can, if not used properly, cause damage to property and injury or death to persons. Akzo Nobel Asphalt Applications, Inc. hereby specifically disclaims any and all warranties, expressed or implied, regarding the accuracy and completeness of such inform1ation, and makes no representations with respect thereto.

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME
Kling Beta 2912

CHEMICAL NAME
Proprietary Modified Polyamine Mixture

SYNONYM
Proprietary

CHEMICAL FORMULA
Proprietary

CAS #
ND

CHEMICAL FAMILY
Aliphatic polyamines

MANUFACTURER'S NAME
Akzo Nobel Asphalt Applications, Inc

PRODUCT/TECHNICAL INFORMATION
1-817-772-7677

ADDRESS
4914 Fort Avenue
Waco, TX 76710

MEDICAL/EMERGENCY
1-817-772-7677/1-817-745-4616

COUNTRY
U.S.A.

TRANSPORTATION EMERGENCY
CHEMTREC 1-800-424-9300

PRODUCT USE
Liquid anti-strip

REVISION DATE
01/30/97

REVISION NO.
003

SUPERSEDES
12/16/96

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE DESCRIPTION	PERCENT	CAS #
Aliphatic Polyamines	100	Proprietary

SECTION 3. HAZARDS/IDENTIFICATION

APPEARANCE AND ODOR
Dark brown liquid with ammoniacal odor

STATEMENT OF HAZARDS
CAUTION!
MAY CAUSE EYE AND SKIN IRRITATION.

HMIS HAZARD RATING

Health	2
Flammability	1
Reactivity	0
PPE Class	H

FIRE AND EXPLOSION HAZARDS
This product is not defined as flammable or combustible. However, under fire conditions it may support combustion and decompose to give off toxic materials such as carbon monoxide, carbon dioxide, and oxides of nitrogen. This product is not sensitive to static discharge.

PRIMARY ROUTE OF EXPOSURE
Skin and eye contact are the primary routes of exposure to this product.

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INHALATION ACUTE EXPOSURE EFFECTS
Repeated and prolonged inhalation may result in respiratory irritation, asthmatic symptoms, sensitization, pulmonary edema, nausea and vomiting.

SKIN CONTACT ACUTE EXPOSURE EFFECTS
Contact can cause irritation with allergenic reactions.

EYE CONTACT ACUTE EXPOSURE EFFECTS
Causes irritation or burns; may cause blindness.

INGESTION ACUTE EXPOSURE EFFECTS
May cause irritation of the mouth and throat, abdominal pain, vomiting and diarrhea.

MEDICAL CONDITIONS AGGRAVATED
Skin contact may aggravate existing dermatitis. Vapor may aggravate existing asthma and other pulmonary diseases.

CARCINOGENICITY

IARC ..... NO	OSHA ..... NO
NTP ..... NO	ACGIH ..... NO

SECTION 4. FIRST AID MEASURES

INHALATION
Remove to fresh air. Get immediate medical attention.

SKIN CONTACT
Flush with plenty of water while removing contaminated clothing and shoes. Wash with soap and rinse well with water. Thoroughly wash clothing before reuse. If skin irritation persists or is severe, get medical attention.

EYE CONTACT
Immediately flush eyes with plenty of water for at least 15 minutes. If victim is wearing contact lenses, remove them. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Get medical attention immediately.

INGESTION
Give several glasses of milk or water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

NOTE TO PHYSICIAN
Attending physician should treat exposed patients symptomatically.

SECTION 5. FIREFIGHTING MEASURES

FLASH POINT
>350°F >177°C

FLASH METHOD
Pensky-Martens Closed Cup

NFPA HAZARD RATING

Health	2
Flammability	1
Reactivity	0
Other	ND

AUTO IGNITION TEMPERATURE
ND

UPPER EXPLOSION LIMIT
ND

LOWER EXPLOSION LIMIT
ND

EXTINGUISHING MEDIA
Water spray, dry chemical, CO_2, or foam extinguishing agents.

FIREFIGHTING METHOD
Cool containers exposed to flames with water spray. Solid stream of water may cause splattering and spread flames.

FIREFIGHTING PROCEDURES
As in any fire, prevent human exposure to fire, smoke, fumes, or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear positive pressure/pressure demand, self-contained breathing apparatus and impervious protective clothing. If possible remove containers from the fire area. Keep containers exposed to fire cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers, increasing contamination or fire hazard. Dike fire water for later disposal. Do not allow contaminated water to enter waterways.

FIRE AND EXPLOSION HAZARDS
This product is not defined as flammable. Under fire conditions it will support combustion and burn to give off toxic materials such as carbon monoxide, carbon dioxide, and oxides of nitrogen. This product is not sensitive to static discharge.

OTHER FIRE AND EXPLOSION HAZARDS
No other fire or explosion hazards of this product are known.

HAZARDOUS PRODUCTS OF COMBUSTION
Oxides of carbon and nitrogen are produced by the combustion of this product.

SECTION 6. ACCIDENTAL RELEASE MEASURES

CLEANUP
Isolate spill and restrict non-essential personnel from area.

All personnel involved in spill cleanup should follow good industrial hygiene practices and wear appropriate protective clothing to prevent eye and skin contact. Use adequate ventilation and/or wear a NIOSH/MSHA approved organic vapor respirator with dust, mist, and fume filter to minimize inhalation exposure. Isolate spill. Stop source of spill if this is possible without being injured.

Small spills should be absorbed with suitable, non-combustible, inert material (e.g., sand, earth). Collect into closed containers for disposal according to federal, state, and local regulations. Avoid direct discharge of concentrated product to aquatic environment. Do not sewer.

Large spills should be diked to prevent spreading. Pump spilled material to salvage according to a predetermined plan. Collect unsalvageable material into closed containers for disposal according to federal, state, and local regulations. Remove residual material. Do not sewer. Avoid direct discharge of concentrated product to aquatic environment.

SECTION 7. HANDLING/STORAGE/TRANSPORTATION

HANDLING
Handle using good industrial hygiene and safety practices. Remove closures carefully to release possible internal pressure. Use only in well-ventilated areas. Use protective equipment when handling this product to prevent eye and skin contact.

Use approved equipment for transport of containers to avoid puncturing or rupturing containers. Do not use air pressure to empty containers.

Emptied container may contain product residues. Follow all warnings and precautions even after container is emptied.

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STORAGE
Store away from foodstuffs or animal feed. Containers should be stored in a cool, dry, well-ventilated area away from acids, strong oxidizers, and halogenated compounds. Containers which have been opened should be tightly closed when returned to storage. If outdoor storage is unavoidable, containers should be placed in an area shielded from the sun and other elements. Use caution to prevent damage to, or leakage from, containers.

MAXIMUM STORAGE TEMPERATURE
180°F (82°C)

GENERAL COMMENTS
Keep containers tightly closed until ready for use.
Wash thoroughly after handling.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION
Respiratory protection generally is not required. Use a NIOSH-MSHA approved organic vapor respirator with organic vapor filters to reduce potential for inhalation exposure if use conditions generate vapor and adequate ventilation (i.e.., outdoor or well-ventilated area) is not available. Where exposure potential necessitates a higher level of protection, use NIOSH\MSHA approved, positive-pressure/pressure-demand, air-supplied respirator.

When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the work shift) to assure breakthrough exposure does not occur.

SKIN PROTECTION
Protective equipment made of neoprene or nitrile rubber is recommended. Suitable protective clothing, gloves, and footwear should be selected with regard for use condition exposure potential.

EYE PROTECTION
Splash-proof goggles or full face shield during handling to avoid eye contact.

VENTILATION PROTECTION
Local exhaust ventilation.

OTHER PROTECTION
Do not use unless eye bath with a gentle flow of cool to tepid water and safety shower with quick opening valves which stay open are available in the work area. Water should be supplied through insulated and heat-traced lines to prevent freezing in cold weather. Wash hands before eating, drinking, smoking or using toilet. Use good housekeeping practices.

APPLICABLE EXPOSURE LIMITS

SUBSTANCE DESCRIPTION	REG. AGENCY	PEL	TLV	TWA	STEL	CEIL
Aliphatic polyamines	OSHA	None	None	None	None	None
	ACGIH	None	None	None	None	None
	NIOSH	None	None	None	None	None
	SUPPLIER	N/D	N/D	N/D	N/D	N/D

WHMIS HAZARD CLASS
Not controlled

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE (mm Hg)
ND

VAPOR DENSITY (Air = 1.0)
>1.0

EVAPORATION RATE (Butylacetate = 1)
<1.0

VOLATILE %
ND

BOILING POINT
ND

ODOR THRESHOLD (ppm)
ND

SPECIFIC GRAVITY (Water = 1)
1.00

BULK DENSITY (lb/gal)
8.36

SOLUBILITY IN WATER
Miscible

SOLUBILITY IN OTHER SOLVENTS
ND

COEFFICIENT OF OIL/WATER
ND

POUR POINT
5°F (-15°C)

MELTING POINT
ND

pH FACTOR
11.5

CLOUD POINT
ND

FLASH POINT
>350°F >177°C PMCC

UPPER EXPLOSION LIMIT
ND

LOWER EXPLOSION LIMIT
ND

AUTO IGNITION TEMPERATURE
ND

OTHER
ND

APPEARANCE AND ODOR
Dark brown liquid with ammoniacal odor

SECTION 10. STABILITY AND REACTIVITY

STABILITY
Stable at ambient temperatures and atmospheric pressures. This product is not self-reactive and has a shelf life of greater than one year under sealed conditions. It is not sensitive to physical impact or static discharge.

INCOMPATIBILITIES
Strong oxidizers, acids, chlorinated hydrocarbons, halogenated compounds, copper, copper alloys, nickel cobalt and other materials that react with amines.

POLYMERIZATION
Hazardous polymerization is not expected to occur.

DECOMPOSITION
Under fire conditions the product supports combustion and decomposes to give off toxic materials such as carbon dioxide and carbon monoxide.

CONDITIONS TO AVOID
Contact with strong acids and strong oxidizers and prolonged storage at elevated temperatures.

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SECTION 11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL - INHALATION
Inhalation toxicity data are not available for this product.

INHALATION CHRONIC EXPOSURE EFFECTS
Chronic inhalation exposure effects of this product are not known.

TOXICOLOGICAL - DERMAL
Dermal toxicity data is not available for this product. The product is not considered irritating to skin based on animal tests with related products.

SKIN CONTACT - CHRONIC EXPOSURE
Chronic dermal exposure effects for this product are not known.

TOXICOLOGICAL - EYE
Acute eye toxicity has not been determined for this product. However, based on animal tests with related products, it is considered a severe eye irritant.

TOXICOLOGICAL - INGESTION
Acute oral toxicity data are not available for this product. However, closely related products have low oral toxicity but can be irritating to the digestive tract.

INGESTION - CHRONIC EXPOSURE
Chronic ingestion effects of this product are not known.

CARCINOGENICITY/MUTAGENICITY/TERATOGENICITY
Carcinogenic/mutagenic/teratogenic properties of this product are not known.

Neither this material nor any of its components is classified as a carcinogen or suspected carcinogen by IARC, NTP, OSHA, or ACGIH.

NEUROTOXICITY
Neurotoxic effects of this product are not known.

OTHER TOXICOLOGICAL EFFECTS
No other toxic effects of this product are known.

TARGET ORGANS
Target organ effects of this material are not available.

SECTION 12. ECOLOGICAL INFORMATION

ECOLOGICAL TOXICITY
ND

OTHER ECOLOGICAL INFORMATION
ND

CHEMICAL FATE INFORMATION
ND

SECTION 13. DISPOSAL INFORMATION

WASTE DISPOSAL METHOD: Treatment, storage, transportation and disposal must be in accordance with federal, state, and local regulations. State and local regulations may be more stringent than federal regulations. Do not sewer.

EMPTY CONTAINER HANDLING: Dispose of in authorized waste disposal facility in accordance with federal, state and local regulations. Emptied container retains product residue and vapors. Observe all precautions even after container is emptied. Do not cut, drill, grind, or weld on or near container. Containers that are "Empty" (per 40 CFR 261.7 or 40 CFR 261.33(e), whichever is applicable) may be reclaimed by an authorized container reconditioner.

SECTION 14. TRANSPORT INFORMATION

SHIPPING DESCRIPTION
Not US DOT regulated for shipping.

U.S. DOT 1993 *EMERGENCY RESPONSE GUIDEBOOK* REFERENCE
31

NORTH AMERICAN 1996 *EMERGENCY RESPONSE GUIDEBOOK* REFERENCE
171

REQUIRED LABEL(S)
No hazard labels required.

ENVIRONMENTAL - HAZARDOUS SUBSTANCE
This product does not contain an environmentally hazardous substance per 49 cfr 172.101.

OTHER REGULATORY INFORMATION

Domestic Substance List - Canada	All components listed
Toxic Substances Control Act - U.S.	All components listed
California Proposition 65	This product does not contain materials which the State of California has found to cause cancer, birth defects, or other reproductive harm.

SECTION 15. OTHER INFORMATION

REVISION NO.	003
EFFECTIVE DATE:	01/30/97
SUPERSEDES DATE:	12/16/96
PREPARED BY:	M. J. Morris
APPROVAL:	WH SI

Acronyms

AP or ~	Approximately
CAA	Clean Air Act
CEIL	Ceiling Exposure Limit
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act of 1980
DSL	Domestic Substance List - Canada
EQ or =	Equal
GT or >	Greater Than
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
LT or <	Less Than
MA List	Massachusetts Substance List
MSHA	Mine Safety and Health Administration
N/A	Not applicable
ND	No Data available
NDSL	Non-Domestic Substance List - Canada
NFPA	National Fire Protection Agency
NIOSH	National Institute for Occupational Safety & Health
NJ R-T-K	New Jersey Right to Know Hazardous Substance
NTP	National Toxicology Program
PA List	Pennsylvania Hazardous Substance List
PEL	Permissible Exposure Limit
PMCC	Pensky-Martens Closed Cup test for flash point
PPE	Personal Protective Equipment
PPM	Parts per million parts of contaminated air
PROP 65	California Proposition 65
RQ	Reportable Quantity under CERCLA
SARA	Superfund Amendments and Reauthorization Act of 1986 (aka Emergency Planning and Community Right-to-Know
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity under SARA Title III
TR	Trace
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System - Canada

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32.) KRAYTON POLYMER

Leading by Listening

Material Safety Data Sheet

USA:
24 Hour Emergency Assistance: CHEMTREC - Domestic: +1 800 424 9300
24 Hour Emergency Assistance: CHEMTREC - International: +1 703 527 3887
General Assistance Number: +1 800 4 KRATON
24 Hour Health and Safety Assistance: +1 800 305 1438

EUROPE:
24 Hour Emergency Assistance: SGS ECLN: +32 35 75 03 30

Visit our Website at www.kraton.com

SECTION 1 MATERIAL/COMPANY IDENTIFICATION

PRODUCT NAME: **KRATON Polymers Styrene-Butadiene-Styrene D Series Products:**
(Note: This MSDS covers all alphanumeric suffixes for the following products. Suffixes designate location of manufacture, lube type, product form and/or new commercial grade):
D1101, D1102, D1116, D1118, D1122, D1133, D1134, D1144, D1151, D1152, D1153, D1155, D1184, D1186, D1190, D1192, DX1000.

CHEMICAL NAME: Styrene-Butadiene-Styrene Block Copolymer
PRODUCT FAMILY: Thermoplastic Elastomer

CORPORATE OFFICE:
KRATON Polymers U.S. LLC
700 Milam, North Tower, 13th Floor
Houston, Texas 77002, USA
General Assistance: +1 832 204 5400
Fax: +1 832 204 5461

UNITED KINGDOM SALES OFFICE:
KRATON Polymers UK Ltd
Stellar House, Barbour Square, Tattenhall
CH3 9RF Chester, UK
General Assistance: +44 (0) 1829 771 224
Fax: +44 (0) 1829 770 961

SECTION 2 COMPOSITION

COMPONENTS	CAS #
1. Styrene-Butadiene-Styrene Block Copolymer	9003-55-8
2. Antioxidant/Stabilizer/Dusting Agent	

Refer to the KRATON Polymers Data Document for more information on a specific product.

SECTION 3 HAZARDS IDENTIFICATION

Human Health Hazards:
Molten product adheres to the skin and causes burns.

Safety Hazards:
Electrostatic charges may be generated during handling. Risk of self-ignition of bulk product above certain temperature (Refer to Section 10). Specifically for powder grades and accumulated polymer dust: dust explosion could occur.

Environmental Hazards:
No specific Hazards.

Other Hazards:
Not classified as dangerous for supply or conveyance.

Special Notes:
These materials are rubber compounds, which are essentially non-toxic. Material is not irritating. If polymer dusts are generated, they could scratch the eyes and cause minor irritation to the respiratory tract.

SECTION 4 FIRST AID MEASURES

Symptoms and Effects:
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation:
Remove to fresh air. If rapid recovery does not occur, obtain medical attention.

Skin:
If contact with hot material, cool the burn area by flushing with large amounts of water. DO NOT attempt to remove anything from the burn area or apply burn creams or ointments. Cover the burn area loosely with a sterile dressing, if available and seek medical attention.

Eye:
Flush eye with water. Seek medical attention if necessary.

Ingestion:
No specific measures.

Advice to physicians:
Treat Symptomatically.

SECTION 5 FIRE FIGHTING MEASURES

Specific Hazards:
Not classified as flammable but will burn. Hazardous combustion products may include carbon monoxide, carbon dioxide.

Extinguishing Media:
Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media:
Water in a jet may disperse fire.

Protective Equipment:
Full protective clothing and self contained breathing apparatus.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Avoid raising a dust cloud.

Environmental Precautions:
No Specific Measures.

Clean-up Methods - Small Spillage:
Shovel up and place in a labeled, sealable container for subsequent safe disposal as required by local, state, federal, international or country specific regulations.

Clean-Up Methods - Large Spillage:
Transfer to a labeled, sealable container for product recovery or safe disposal as required by local, state, federal, international or country specific regulations.

Protective Measures:
Wear appropriate personal protective equipment (refer to Section 8) when responding to spills.

Spill Management:
Shovel and sweep up or use industrial vacuum cleaner. Proper disposal should be evaluated based on regulatory status of this material (refer to Section 13), potential contamination from subsequent use and spillage, and regulations governing disposal in the local area. Prevent entry into waterways, sewer, or confined areas.

SECTION 7 HANDLING AND STORAGE

Handling:
Avoid generation or accumulation of dusts. Take precautionary measures against static discharges, earth/ground all equipment. Avoid contact with heated or molten product. Do not breathe dust. Do not breathe fumes or vapors from heated product. Use local exhaust extraction over processing area.

When processing KRATON Polymers products, maintain a fire watch if the material reaches 225 deg. C (437 deg. F) for KRATON IR and KRATON D (polymers and compounds), and 280 deg. C (536 deg. F) for KRATON G (polymers and compounds).

The temperatures listed above are indicated only for safety reasons (risk of fire and product degradation) and are not necessarily recommended for processing.

Degradation of the polymer (polymer breakdown) will start at lower temperatures depending on the specific processing conditions. Therefore, operating below these temperatures does not guarantee the absence of product degradation.

For more information about processing precautions, consult the KRATON Polymers technical literature available from your sales representative.

Static charge buildup can be a potential fire hazard when used in the presence of volatile or flammable vapors or in high airborne dust concentrations. For more information, consult the KRATON Polymers Static Electricity Safety Bulletin available from your sales representative.

Storage:
Keep container dry. Keep in a cool, well-ventilated place. Keep away from direct sunlight and other sources of heat or ignition. Avoid storage of bulk product at temperatures above ambient to minimize risk of exothermic degradation, self-heating and possible self-ignition (Refer to Section 10). Avoid storage under pressure or at elevated temperatures to minimize particulate clustering. Do not stack intermediate bulk containers.

Storage Temperatures:
Ambient.

Product Transfer:
Take precautionary measures against static discharge. Earth/Ground all equipment.

Other Information:
KRATON Polymer has a tendency to accumulate static charge during transport, handling and processing. Reducing the velocity of material transfer will reduce the likeliness that charge will be created. Static charge buildup can be a potential fire hazard when used in the presence of volatile or flammable vapors or in high airborne dust concentrations. For more information, consult the KRATON Polymers Static Electricity Safety Bulletin available from your sales representative.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure:
None established. In the absence of occupational exposure standards for this product, it is recommended that the following be adopted:

DUST, RESPIRABLE DUST
TLV (EH40)
Total Inhalable Dust: TWA (8 h) 10 mg/m3
Respirable Dust: TWA (8 h) = 4 mg/m3

RUBBER FUME
TLV (EH40)
RUBBER MANUFACTURING AND PROCESSING GIVING RISE TO RUBBER DUST AND RUBBER FUME
Rubber Fume: MEL/TWA (8 h) = 0.6 mg/m3
Rubber Process Dust: MEL/TWA (8 h) = 6 mg/m3
MEL = Maximum Exposure Limit

Engineering Control Measures:
Use local exhaust ventilation.

Respiratory Protection:
Where local exhaust ventilation is not practicable and odors are detected use a negative pressure half face respirator equipped with a cartridge designed to protect against organic vapors and if dust is also present a particulate pre-filter should also be used. For high airborne dust concentrations use a cartridge designed to be used against nuisance dust.

Hand Protection:
Cloth gloves if desired.

Eye Protection:
Dust-tight mono goggles.

Body Protection:
Standard issue work clothes which may include: apron, safety shoes or boots as necessary.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid
Color: White
Odor: Essentially odorless
Flash Point: Not applicable
Density: Typical between 880-95 kg/m3 at 20C
Specific Gravity: <1
Bulk density (for solids): Typical 300-400 kg/m3 at 20 Deg. C (ASTM D-1895)
Solubility (In Water): Insoluble
N-octanol/water partition coefficient (log Pow): Not applicable

SECTION 10 REACTIVITY AND STABILITY

Stability:
Stable under ambient conditions. Oxidizes exothermically above ambient temperature.

Conditions to Avoid:
Avoid contact with strong oxidizing agents. Accumulation of product in areas exposed to elevated temperatures for extended periods in air may result in self-heating and auto ignition. Avoid elevated temperatures in storage for prolonged periods of time (example: 5 days at 200 Degrees F or 93 Degrees C).

Hazardous Decomposition Products:
Hazardous vapors from heated products are not expected to be generated under normal processing temperatures and conditions.

Although highly dependent on temperature and environmental conditions, a variety of thermal decomposition products may be present if the product is over heated, is smoldering or catches fire. These range from simply hydrocarbons (such as methane and propane) to toxic/irritating vapors (such as carbon monoxide and dioxide, acrolein, aldehydes and ketones). (Refer to Handling in Section 7).

SECTION 11 TOXICOLOGICAL INFORMATION

Basis for Assessment:
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the toxicology of similar products.

Acute Toxicity Oral:
Expected to be of low toxicity, LD50 > 2000 mg/kg

Acute Toxicity Dermal:
Expected to be of low toxicity, LD50 > 2000 mg/kg

Acute Toxicity Inhalation:
Data not available.

Skin Irritation:
Not expected to be irritating.

Eye Irritation:
Not expected to be irritating.

Skin Sensitization:
Not expected to be a skin sensitizer.

Repeated Dose Toxicity:
Repeated exposure does not cause significant toxic effects.

Mutagenicity:
Not considered to be a mutagenic hazard.

SECTION 12 ECOLOGICAL INFORMATION

Basis for assessment:
Ecotoxicological data have not been determined specifically for this product. The information given below is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility:
Floats on water. Remains on surface of soil.

Persistence/Degradability:
Expected to be not inherently biodegradable. Persists under anaerobic conditions.

Bioaccumulation:
Not expected to bioaccumulate.

Acute Toxicity - Fish:
Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l

Acute Toxicity - Invertebrates:
Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l

Acute Toxicity - Algae:
Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l

Acute Toxicity - Bacteria:
Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l

Sewage Treatment:
Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l

Other Information:
KRATON Polymers products (the neat resin or the base product) are high molecular weight polymers which by all accounts are non-toxic and biologically inactive.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal:
Recover or Recycle if possible, otherwise Incineration, otherwise Licensed Landfill.

Product Disposal:
Same as for waste disposal.

Container Disposal:
Remove all packaging for recover or waste disposal.

Local Legislation:
The recommendations given are considered appropriate for safe disposal. However, local state, federal, international, or country specific regulations take precedents. They may vary, and they may be more stringent but they must be strictly enforced and complied with.

If this material becomes a waste and has not been chemically altered, it is not considered a hazardous waste as defined by RCRA (40CFR 261).

SECTION 14 TRANSPORT INFORMATION

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

International Air Transportation Association Classification:
This material is not classified as hazardous under IATA regulations.

International Maritime Organization - IMDG:
This material is not classified as hazardous under IMDG regulations.

UN, IMO, ADR/RID, ICAO Code:
This material is not dangerous for conveyance under these codes.

SECTION 15 REGULATORY INFORMATION

The regulatory information provided is not intended to be comprehensive. Other local, state, federal, international or country specific regulations may apply to this material.

EUROPE - EC Classification:
Not classified as dangerous under EC criteria.

US Federal - Superfund Amendment & Reauthorization Act (SARA) Title III:
This material is not regulated under SARA Title III.

US Federal - Toxic Substances Control Act (TSCA) Inventory Status:
Component(s) of this material is (are) listed on the EPA TSCA Inventory of Chemical Substances.

US State - California Safe Drinking Water
This material is not regulated by the California Safe Drinking Water Act.

US State -Toxic Enforcement Act (Proposition 65):
This material is not regulated by the Toxic Enforcement Act (Proposition 65).

US State - New Jersey Right-To-Know List:
This material is not regulated by the New Jersey Right-To-Know Act.

US State - Pennsylvania Right-To-Know List:
This material is not regulated by Pennsylvania Right-To-Know Act.

SECTION 16 OTHER INFORMATION

Revision #: **04**
Revision Date: **August 19, 2003**
Revisions since last change (discussion): **Changes made to Sections 1 and 16.**

This Material Safety Data Sheet replaces an accumulation of various product specific Material Safety Data Sheets.

Uses and Restrictions:
KRATON® Polymers are high performance thermoplastic elastomers engineered for a wide spectrum of end uses. Each customer or user of KRATON Polymers products is solely responsible for determining the suitability of the materials they select for the intended purpose.

Material Safety Data Sheet Distribution:
The information in this document should be made available to all who may handle the product.

Other Information:
KRATON is a registered KRATON ® trademark.

Disclaimer:
This information is based on our current knowledge and is intended to describe the product for the purposes of Health, Safety and Environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. Advice in this document relates only to the product as originally supplied. Where other ingredients are added in the processing of this product, advice should be sought on their handling and use.

33.) MERCURY

QUICK IDENTIFIER (In Plant Common Name)

UN2809

Material Safety Data Sheet

Manufacturer's Name	Cannon Instrument Company	Emergency Telephone No.	800-424-9300 Chemtrec #
Address	PO Box 16 State College, PA 16804-0016	Other Information Calls	814-353-8000
Signature of Person Responsible for Preparation		Date Prepared	July 22, 1998

SECTION 1 - IDENTITY

Common Name: (used on label)
(Trade Name & Synonyms) Mercury or Quicksilver

Chemical Name	Metallic Mercury	Cas No.	7439-97-6
Formula	Hg	Chemical Family	Mercury

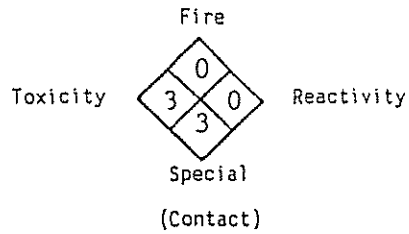
SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)(chemical & common name(s))	%	Threshold Limit Value (units)
Mercury or Quicksilver	100%	0.05 mg/m³

THIS ITEM IS CONTAINED IN THE TSCA INVENTORY

HAZARD RATING

N	4 - Extreme
F	3 - High
P	2 - Moderate
A	1 - Slight
	0 - Insignificant



SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

Boiling Point	356.9°C	Specific Gravity(H_2O=1)	13.59
Vapor Pressure (mm Hg)	0.0019	Percent Volatile by Volume (%)	100
Vapor Density (Air = 1)	1.015	Evaporation Rate (_____ = 1)	Less than one
Solubility in Water	0	Reactivity in Water	0
Appearance and Odor	Silver Metallic Liquid - No Odor		

Flash Point	N/A	Flammable Limits in Air % by Volume	Lower N/A	Upper N/A
Extinguisher Media	N/A	Auto-Ignition Temperature	N/A	
Special Fire Fighting Procedures	N/A			
Unusual Fire and Explosion Hazards	N/A			

SECTION 4 - PHYSICAL HAZARDS

Stability Unstable ☐ Stable ■ Conditions to avoid: Avoid long exposure to air, heat, non-ferrous metals.

Incompatability (Materials to Avoid) Non-ferrous metals

Hazardous Decomposition Products N/A

Hazardous Polymerization May Occur ☐ Will Not Occur ■ Conditions to Avoid N/A

SECTION 5 - HEALTH HAZARDS

Threshold Limit Value 0.05 mg/m³

Signs and Symptoms of Exposure 1. Acute Overexposure: Nervous irritability, weakness, tremors, gingivitis, erethism, greying of lens of eyes.

2. Chronic Overexposure: Same as above.

Medical Conditions Generally Aggravated by Exposure Known allergy to mercury.

Chemical Listed as Carcinogen or Potential Carcinogen N/A

National Toxicology Program Yes ☐ No ☐

I.A.R.C. Monographs Yes ☐ No ☐

OSHA Yes ☐ No ☐

OSHA Permissible Exposure Limit 0.10 mg/m³

ACGIH Threshold Limit Value 0.05 mg/m³

Other Exposure Limit Used N/A

Emergency and First Aid Procedures

1. Inhalation
   Contact qualified physician - Do NOT induce vomiting.
2. Eyes
   Wash with water
3. Skin
   Wash with standard soap and water.
4. Ingestion
   Contact qualified physician - Do NOT induce vomiting.

SECTION 6 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) Should be NIOSH-MESA certified.

Ventilation Yes - Point of Origin

Local Exhaust Yes

Mechanical (General) Yes

Special

Other

Protective Gloves Yes

Eye Protection Yes - glasses

Other Protective Clothing or Equipment Wear protective clothing - Avoid contact.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage Always keep mercury stored in a sealed container away from heat.

Other Precautions Store in sealed containers.

Steps to be Taken in Case Material is Released or Spilled Clean up spills immediately.

Waste Disposal Methods Do not incinerate. Return to reclamation government regulations.

IMPORTANT

Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.

34.) METHANE IN AIR

1H099

ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

Material Safety Data Sheet

(These data are prepared for product supplied in DOT 39 nonreusable cylinders.)

	PRODUCT NAME 10 PPM-2.5% Methane in Air TELEPHONE (510) 977-6500 EMERGENCY RESPONSE INFORMATION ON PAGE 2	
LIQUID AIR CORPORATION ALPHAGAZ DIVISION California Plaza, Suite 350 2121 N. California Blvd. Walnut Creek, California 94596	TRADE NAME AND SYNONYMS 10 PPM-2.5% Methane in Air	CAS NUMBER CH_4 = 74-82-8 Air = N/A
	CHEMICAL NAME AND SYNONYMS See Page 4	NFPA 704 NUMBER (HFR) 0 0 0
ISSUE DATE AND REVISIONS JANUARY 1, 1992 CORPORATE SAFETY DEPT.	FORMULA See Page 4 / MOLECULAR WEIGHT See Page 4	CHEMICAL FAMILY Gas Mixture

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

The components in these mixtures are nontoxic and no TWA is listed for them by ACGIH (1991-1992) or OSHA (1989).

SYMPTOMS OF EXPOSURE

These mixtures should be considered similar to air and would therefore cause no symptoms of exposure.

TOXICOLOGICAL PROPERTIES

See Symptoms of Exposure, above.

Neither methane or air are listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Listed as Carcinogen or Potential Carcinogen	National Toxicology Program	Yes ☐ No ☒	I.A.R.C. Monographs	Yes ☐ No ☒	OSHA	Yes ☐ No ☒

RECOMMENDED FIRST AID TREATMENT

See Symptoms of Exposure, above.

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Liquid Air Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or consequences of its use. Since Liquid Air Corporation has no control over the use of this product, it assumes no liability for damage or loss of product resulting from proper (or improper) use or application of the product. Data Sheets may be changed from time to time. Be sure to consult the latest edition.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES
None

PHYSICAL DATA

BOILING POINT CH_4 = -258.6°F (-161.4°C) Air = -317.9°F (-194.2°C)	LIQUID DENSITY AT BOILING POINT See Page 4
VAPOR PRESSURE See Page 4	GAS DENSITY AT 70°F 1 atm .0741-.0749 lb/ft^3 (1.187-1.200 kg/m^3)
SOLUBILITY IN WATER Very slightly	FREEZING POINT CH_4 = -296.5°F (-182.5°C) Air is a mixture
APPEARANCE AND ODOR Colorless, odorless gas. Specific Gravity (Air=1) @ 70°F (21.1°C) = 0.99-1.0	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS % BY VOLUME
N/A	N/A	N/A

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION
Nonflammable gas mixtures	Nonhazardous

SPECIAL FIRE FIGHTING PROCEDURES

If cylinders are involved in a fire, safely relocate or keep cool with water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS

These mixtures at high pressures will accelerate the burning of materials to a greater rate than they burn at atmospheric pressure.

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
Unstable		
Stable	X	N/A
INCOMPATIBILITY (Materials to avoid)		None
HAZARDOUS DECOMPOSITION PRODUCTS		None
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		
Will Not Occur	X	N/A

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
N/A
WASTE DISPOSAL METHOD
N/A

EMERGENCY RESPONSE INFORMATION
IN CASE OF EMERGENCY INVOLVING THIS MATERIAL, CALL DAY OR NIGHT (800) 231-1366
OR CALL CHEMTREC AT (800) 424-9300

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)	N/A	
VENTILATION	LOCAL EXHAUST	SPECIAL
N/A	N/A	N/A
	MECHANICAL (Gen.)	OTHER
	N/A	N/A
PROTECTIVE GLOVES	Any material	
EYE PROTECTION	Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT	Safety shoes	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name:	Compressed Gases, N.O.S.	DOT Hazard Class:	Division 2.2
DOT Shipping Label:	Nonflammable Gas	DOT I.D. No.:	UN 1956

SPECIAL HANDLING RECOMMENDATIONS

Use a pressure reducing regulator when connecting cylinder to lower pressure (<500 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Close valve after each use and when empty.

For additional handling recommendations consult L'Air Liquide's Encyclopedia de Gaz or Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well ventialted area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations consult L'Air Liquide's Encyclopedia de Gaz or Compressed Gas Association Pamphlet P-1.

SPECIAL PACKAGING RECOMMENDATIONS

These mixtures are noncorrosive and may be used with all materials of construction. Moisture causes metal oxides which are formed with air to be hydrated so that they increase in volume and lose their protective role (rust formation). Concentrations of SO_2, Cl_2, salt, etc. in the moisture enhances the rusting of metals in air.

OTHER RECOMMENDATIONS OR PRECAUTIONS

DOT 39 cylinders may not be reused or refilled (49CFR).

NEVER transport these cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport them "contained" in open flatbed or open pick-up type vehicles.

Reporting under SARA, Title III, Section 313 not required.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which may not be contained herein. The customer or user of this product should be familiar with these regulations.

ALPHAGAZ
DIVISION OF LIQUID AIR CORPORATION

ADDITIONAL DATA

CHEMICAL NAME AND SYNONYMS: 10 Molar PPM-2.5 Molar % Methane in Air

FORMULA: 10 Molar PPM-2.5 Molar % CH_4 in Air

MOLECULAR WEIGHT: CH_4 = 16.04
Air = 28.96

PHYSICAL DATA

LIQUID DENSITY AT BOILING POINT: CH_4 = 26.38 lb/ft^3 (422.6 kg/m^3)
Air = 54.6 lb/ft^3) (874 kg/m^3)

VAPOR PRESSURE: @ 70°F (21.1°C) = Above the critical temperature of methane.
Air is a mixture.

35.) METHONOL

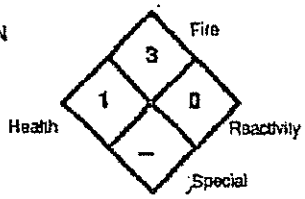
MATERIAL SAFETY DATA SHEET

GREAT WESTERN CHEMICAL COMPANY

ISSUE DATE: 08/10/94	SUPERSEDES: 03/03/94
GREAT WESTERN MSDS NUMBER: 56745	

NFPA 704 DESIGNATION
HAZARD RATING -

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER:	**METHANOL**
GENERAL USE:	Used as an industrial solvent; as an antifreeze for automotive radiators; octane booster in gasoline; and to denature ethanol.
PRODUCT DESCRIPTION:	An organic alcohol. Synonyms include: carbinol, colonial spirit, methyl alcohol, methyl hydroxide, monohydroxymethane, pyroxylic spirit, wood alcohol, wood naphtha, wood spirit.

INFORMATION PROVIDED BY:

GREAT WESTERN CHEMICAL COMPANY
Corporate Office
808 S.W. 15th Avenue
Portland, OR 97205
PHONE: 503-228-2600 FAX: 503-221-5767

EMERGENCY PHONE NUMBERS

GREAT WESTERN:	800-GW-SPILL
CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

COMPONENT	CAS #	OSHA HAZARD	Wt.%	ACGIH TLV (TWA)	ACGIH STEL	OSHA PEL (TWA)	OSHA STEL
Methanol	000067-56-1	*Flammable* Liquid, Eye and Skin Irritant, Lung, Kidney, and Central Nervous System toxin	99+	200 ppm (skin)	250 ppm	200 ppm (skin)	250 ppm

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

A clear, colorless liquid with a slight alcoholic odor. Flammable liquid and vapors. Irritating to eyes and skin. Inhalation of high concentrations may result in permanent lung damage. *Toxic by ingestion and skin* absorption. Ingestion can produce blindness. **The IDLH for methanol is 25,000 ppm.**

POTENTIAL HEALTH EFFECTS:

INHALATION: Exposure may cause irritation to the respiratory tract. High concentrations can result in lung edema, resulting in shortness of breath, coughing, wheezing, choking, chest pain, impairment of lung function, liver and kidney damage. A central nervous system depressant which can damage the optic nerve resulting in visual impairment or blindness. Symptoms may also include dizziness, narcosis and incoordination.

EYE CONTACT: Exposure to vapor and mists can cause irritation with symptoms of tearing, redness and blurred vision. Contact with liquid may cause impairment of vision and corneal damage.

SKIN CONTACT: Exposure to vapors, mists or liquid can cause irritation, defatting and mild dermatitis. Methanol is readily absorbed through the skin producing toxic effects similar to those described for inhalation exposure.

INGESTION: Ingestion may cause irritation to the gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea and abdominal pain. Ingestion can produce blindness. Fatal doses of 100 to 250 ml have been reported.

CHRONIC: Chronic inhalation exposure may cause impairment of lung function and permanent lung damage, liver, kidney and CNS damage, and visual impairment by damage to the optic nerve. Prolonged skin exposure can produce eczema, redness and scaling.

CONTINUED ON PAGE 2

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, using the Holger Nielsen method (back pressure-armlift). Do not use mouth-to-mouth method if victim has ingested or inhaled the substance. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. Get medical attention.

INGESTION: If swallowed, get medical attention immediately. Induce vomiting immediately, as directed by medical personnel. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Suggested treatment for ingestion: Gastric lavage with 3 to 5% sodium bicarbonate, leaving some solution in the stomach after the lavage. Treat exposures other than ingestion symptomatically.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: 12° C. (54° F.) Tagliabue Closed Tester (ASTM D 56-79)

Flammable Limits (in air, % by volume): **Lower:** 6% **Upper:** 36%

Autoignition Temperature: 385° C. (725° F.)

GENERAL HAZARD: Flammable liquid and vapors. Vapors from this product may concentrate in confined spaces and form an explosive mixture. Product may produce hazardous fumes or hazardous decomposition products. Heated containers may rupture violently from excessive heat.

FIRE FIGHTING INSTRUCTIONS: EXTINGUISING MEDIA: CO_2, dry chemical, alcohol foam or water fog.

Use water to cool containers exposed to fire. Water spray may be ineffective on fire, but should be used to dilute spills to a non-flammable mixture.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition will produce carbon monoxide, carbon dioxide, and formaldehyde. Reaction with alkali metals will yield hydrogen gas.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Remove all ignition sources. Vapors are heavier than air and will be concentrated near ground level. Vapors may be depressed by the use of a water fog. Dike spill and pick up bulk of liquid using non-sparking tools or absorb liquid in sand or a non-flammable absorbent. Place in approved containers for disposal. Methanol will percolate into soil and may result in spread of contamination. Flush spill area with water; collect rinsates and containerize for disposal.

WATER SPILL: This material is lighter than and completely soluble in water. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

CONTINUED ON PAGE 3

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Store below 25° C. (80° F.) **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated place, away from all sources of ignition. Outside or detached storage is preferable. Inside storage should be in a standard flammable liquids storage room or cabinet and must conform to all OSHA regulations and local fire codes. Do not store in plastic containers. Do not store near strong oxidizing agents.

Empty containers may contain flammable residues and flammable and/or explosive vapors. Do not cut, puncture, or weld on or near empty containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: Use local mechanical exhaust ventilation capable of maintaining emissions in the work area below the OSHA-PEL or ACGIH-TLV.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: For exposure above the OSHA-PEL or ACGIH-TLV, wear a NIOSH-approved full facepiece or half mask air-purifying cartridge respirator equipped with an organic vapor cartridge. For exposures from 2,000 ppm to 10,000 ppm a supplied air respirator with a full facepiece or SCBA is required. For exposures above 10,000 ppm a full facepiece supplied air respirator operated in the pressure-demand or continuous flow mode or SCBA is required.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979), unless a full facepiece respirator is worn.

GLOVES: Butyl rubber, neoprene, PVA or vitron gloves.

CLOTHING & EQUIPMENT: Wear a butyl rubber or neoprene apron or full protective suit when handling product. A eye wash station and safety shower should be available in the work area.

FOOTWEAR: Butyl rubber or neoprene boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colorless	Bulk Density (pounds/ft^3):	Not applicable
Physical State:	Liquid	Vapor Pressure:	92 mm Hg @ 20° C.
Odor:	Slight alcoholic	Vapor Density (air=1):	1.11
Odor Threshold:	10 ppm in air	Evaporation Rate (n-Butyl Acetate=1):	5
Molecular Formula:	CH_3OH	VOC Content:	790 grams/liter
Molecular Weight:	32.04	% Volatile:	100
Boiling Point:	65° C. (149° F.)	Solubility in H_2O:	Complete
Freezing/Melting Point:	-97.7° C. (-207.9° F.)	Octanol/Water Partition Coefficient:	P_{oct}: -0.82
Specific Gravity:	0.796 @ 20° C.	pH (as is):	Not applicable
Density (pounds/gallon):	6.64	pH (1% solution):	Not applicable

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: Avoid storage above 25° C. (80° F.). Avoid contact with a mixture of chloroform and sodium hydroxide.

INCOMPATIBLE MATERIAL: Strong oxidizing agents (e.g. oxygen, hydrogen peroxide, chromium trioxide), chromic anhydride, cyanuric chloride.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition will produce carbon monoxide, carbon dioxide, formaldehyde. Reaction with alkali metals will yield hydrogen gas.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is sensitive to static discharge.

CONTINUED ON PAGE 4

11. TOXICOLOGICAL INFORMATION

Components:	Methanol
Eye Contact:	Rabbit: 40 mg MODERATE
Skin Contact:	Rabbit: 500 mg MODERATE
Oral Rat LD_{50}:	5,628 mg/kg
Dermal Rabbit LD_{50}:	No data available
Inhalation Rat LC_{50}:	64,000 ppm/4 hours
Human Data:	Oral Human LDLo: 428 mg/kg; CNS, Pulmonary
Other Toxicological Data:	Dermal Monkey LDLo: 393 mg/kg
Carcinogenicity:	No data available
Teratogenicity:	Inhalation-Rat TCLo:10,000 ppm/7 hours (7-15 days pregnant)
Mutagenicity:	No data available
Synergistic Products:	None reported
Target Organs:	Eyes, Skin, Central Nervous System, Liver & Kidneys
Medical Conditions Aggravated by Exposure:	Chronic respiratory, skin, liver or kidney disorders.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
This material is lighter than water and completely soluble in water. No specific environmental fate information is available.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity rating 0 (TLM96: >1000 ppm). TLM96: Brown shrimp 1,700 ppm; cockle 3,300 - 12,000 ppm; armed bullhead 10,000 - 33,000 ppm. Critical range, 24 hours: Creek Chub 8,000-17,000 ppm. 11-15 hours: carassius auratus 250 ppm. Threshold concentration, 32 hours: daphnia magna 32,000 ppm.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Ignitable Waste

U.S. EPA WASTE NUMBER/DESCRIPTION: U154

If this product is disposed of as shipped, it meets the criteria of a hazardous waste as defined under 40 CFR 261 due to its ignitability. If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	U.S. Domestic Shipments Only: Methanol
DOT HAZARD CLASS:	3
UN NUMBER:	UN1230
PACKING GROUP:	II
DOT LABELS:	Primary: Flammable Liquid Subsidiary: None Required
DOT PLACARDS:	Flammable Liquid
CERCLA Reportable Quantity:	5,000 pounds (CH_3OH). For product: 5,000 pounds (753 gallons)
MARINE POLLUTANT:	No
DOT Emergency Response Guidebook Number:	28
TDG PROPER SHIPPING NAME:	Methanol
TDG HAZARD CLASS:	3 (6.1) Regulated Limit (RL): Not applicable
UN NUMBER:	UN1230
PACKING GROUP:	II
TDG LABELS:	Primary: Flammable Liquid Subsidiary: Poison
TDG PLACARDS:	Flammable Liquid/Poison
CANUTEC Initial Emergency Response Guide Number:	16
Other Shipping Information:	None.

CONTINUED ON PAGE 5

15. REGULATORY INFORMATION

Components: Methanol

OSHA

Target Organs: Eyes, Skin, Central Nervous System, Liver & Kidneys

Carcinogenic Potential:
Regulated by OSHA: No
Listed on NTP Report: *No*
IARC Listing: No

U.S. EPA Requirements

Release Reporting
CERCLA (40 CFR 302):
Listed Substance: Yes
Reportable Quantity: 5,000 pounds
Category: D
RCRA Waste No.: U154
Unlisted Substance: No
Reportable Quantity: Not applicable
Characteristic: Not applicable
RCRA Waste No.: Not applicable

SARA TITLE III

Section 302 & 303 (40 CFR 355)
Listed Substance: No
Reportable Quantity: *Not applicable*
Planning Threshold: Not applicable

Section 311 & 312 (40 CFR 370)
Hazard Categories (product): **Fire: Y** **Sudden Release of Pressure: N** **Reactive: N** **Acute Health: Y** **Chronic Health: Y**
Planning Threshold: 10,000 pounds

Section 313 (40 CFR 372)
Listed Toxic Chemical: Yes
Reporting Threshold: 10,000 pounds

U.S. TSCA STATUS

Listed (40 CFR 710): Yes

CANADIAN REGULATIONS

Controlled Product: Yes
WHMIS Hazard Symbols: Flammable Material, Material Causing Immediate and Serious Toxic Effects, Material Causing Other Toxic Effects.
WHMIS Class & Division: B.2, D.1A, D.2B
Product Identification Number: UN1230
IDL Substance: Yes
Domestic Substance List: Yes
CEPA Priority List: Not listed
Carcinogenicity:
ACGIH Appendix A: No
A1 Confirmed Human: No
A1 Suspected Human: No
IARC Group: Not listed

STATE REGULATIONS:

State of California
Safe Drinking Water and Toxins Enforcement Act, 1986
(Proposition 65)
Carcinogen: No
Reproductive Toxin: No

OTHER REGULATIONS:

State Right To Know Laws: MA, NJ, PA

CONTINUED ON PAGE 6

16. OTHER INFORMATION

EPA Registration number: Not Applicable

Approved Product Uses: Not Applicable

Special Notes:

WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in process operating under vacuum if subjected to sudden ingress of air, or outside process equipment operating under elevated pressure if sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

NFPA 704		
	Health:	1
	Fire:	3
	Reactivity:	0
	Special:	–

MSDS Revision Information: Form Revision made 02/09/94

Information Revised This Issue Date: ***Domestic shipping information updated.***

MSDS distributed by **Great Western Chemical Company**
Environmental Department
Phone: 800-547-1400 FAX: 503-221-5767

Prepared By:	David L. Bishop	Date Prepared:	August 10, 1994

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

[illegible] PHOTHORIC ACID

ICL Performance Products LP

Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: PHOSPHORIC ACID (105% - 117%)
Reference Number: AST10086
Date: April 28, 2006

Use of the substance or preparation

Phosphates, phosphate esters and phosphorylation of polyols, electrolyte for fuel cells, refractory bonding, catalyst in organic reactions, and may be used to treat drinking water.

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
622 Emerson Road - Suite 500
St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1 800 424 9300
In Canada call CANUTEC: 1 613 996 6666

General Information: +1 800 244 6169 (Worldwide)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

Substance	CAS No.	%w/w	EINECS No.	Risk Phrase
Phosphoric Acid	8017-16-1	100	232-417-0	R34

3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

EC Classification Corrosive
Safety Phrase S25, S36, S37, S39

Human health effects

WARNING STATEMENTS: DANGER!
CAUSES EYE AND SKIN BURNS
CAUSES RESPIRATORY TRACT IRRITATION
MAY BE HARMFUL IF SWALLOWED, CORROSIVE TO MILD STEEL

This product causes eye burns. Injury may be permanent. This product causes skin burns based on physical properties. It may not produce an immediate burning sensation upon skin contact, delaying the awareness of the worker that contact has occurred.

Breathing of vapor or mist may be irritating to the respiratory tract. This product may be harmful if swallowed. May cause nausea, vomiting, abdominal discomfort, burns, and a burning sensation (burning behind the breast bone) based on physical properties.

Environmental effects

When released into the soil, this material may leach into groundwater. When released to water, natural waters hardness minerals may readily reduce acidity. Phosphate may persist indefinitely.

4. FIRST AID MEASURES

General

This material is an acid; treatment is symptomatic and supportive. Phosphoric acid has irritating effects to mucous membranes.

Eye contact

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. If irritation persists, contact an ophthalmologist.

Skin contact

May cause skin irritation. Wash effected area with plenty of soap and water. Get medical attention.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

IF SWALLOWED, do NOT induce vomiting. Give victim 2-4 glasses of water to drink. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

5. FIRE FIGHTING MEASURES

Extinguishing media

Not combustible. No special requirements.

Unsuitable extinguishing media

Non-combustible. No special requirement.

Exposure hazard

Not combustible.
May gives off toxic fumes (oxides of phosphorus) in a fire.
May react with metals to liberate hydrogen, a flammable gas.

Protective equipment

Firefighters should wear self -contained breathing apparatus & personal protective clothing (PPE).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid unnecessary exposure and remove all material from eyes, skin and clothing. Do not ingest or inhale mists of phosphoric acid.

Environmental precautions

Small quantities: Avoid discharge into the environment
Large quantities: May cause pollution. Avoid discharge into the environment. Note methods for cleaning up in the next section.

Methods for cleaning up

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Neutralize washings with a base such as soda ash or lime. Flush residual spill area with large amounts of water.

Approach release from upwind. Stop or control leak using special protective clothing and positive pressure self-contained breathing apparatus. Control run off and isolate discharged material for proper disposal. Polyphosphoric acid reacts with water to product phosphoric acid.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

Handling

Do not get in eyes, on skin, or on clothing.
Avoid breathing mist or vapor.
Do not taste or swallow.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drums as thoroughly as possible to facilitate disposal.

For bulk transfer, purge lines with nitrogen to remove residual liquid before disconnect. When unloading bulk vehicles, personnel should wear chemical goggles and rubber or neoprene gloves.

All fittings should be properly secured prior to energizing unloading system. Care should be taken to avoid acid contact when disconnecting lines/hoses after unloading.

For bulk storage type 316L stainless is recommended. Glass, polyethylene and FRP (depending on resin used) are satisfactory, Steel, aluminum and type 304 stainless are not recommended because of rapid or potential corrosion. Vessels should be vented and operated at ambient conditions. Maintenance heat (hot water preferred) may be used to prevent freezing. Dike area around storage tank with sufficient volume to hold entire tank contents.

Storage

Store in plastic, rubber-lined, or 316L stainless steel tanks designed for Phosphoric Acid. Store drums away from heat and out of direct sunlight. Store in a well-ventilated dry area away from alkalis and most metals. Store above freezing point. Contact with reactive metals, i.e. mild steel and aluminum may generate hydrogen that may form and explosive mixture in storage vessels.

For tank inspection, follow manufacturer's recommended safety guidelines (ex. temperature, etc.). In addition, corrosion data for polyphosphoric acid must be followed to match the storage container of choice (ex. stainless, rubber lined, etc.).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

No OSHA vacated Permissible Exposure Limits are listed for Polyphosphoric Acid

For Phosphoric acid

State	Standard	Limit
Australia	Occupation Exposure Limit	1 mg/m^3 8-hr. TWA, 3 mg/m^3 STEL
Austria	Occupation Exposure Limit	MAK 1 mg/m^3 8-hr
Belgium	Occupation Exposure Limit	1 mg/m^3 8-hr. TWA, 3 mg/m^3 STEL
Denmark	Occupation Exposure Limit	1 mg/m^3 8-hr. TWA
Finland	Occupation Exposure Limit	1 mg/m^3 8-hr. TWA, 3 mg/m^3 STEL
France	Occupation Exposure Limit	VME 1 mg/m^3 VLE 3 mg/m^3
Japan	Occupation Exposure Limit	1 mg/m^3 8-hr.
United Kingdom	Occupation Exposure Limit	2 mg/m^3 STEL
United States	Occupation Exposure Limit	1 mg/m^3 8-hr. TWA, 3 mg/m^3 STEL

Respiratory protection

Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment (full face piece recommended) when airborne exposure limits are exceeded (see below). If used, full-face piece replaces the need for face shield and/or chemical goggles. Refer to U.S. OSHA regulations 29 CFR 1910.134 or European Standard EN 149.

Hand/Skin protection

Wear impervious protective gloves and clothing to prevent contact to skin. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean personal protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection

Wear chemical goggles, a face shield, and if necessary, a full face respirator when conditions warrant or exceed the Occupation Exposure Limit. Refer to U.S. OSHA regulations 29 CFR 1910.133 or European Standard EN 166.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Chemical Formula:	H_3PO_4
Appearance:	Clear, colorless, syrupy liquid
Odor:	None
Vapor Pressure (100% acid):	0.0285 mm Hg @ 20 °C
Solubility in Water:	Complete

Important health, safety and environmental information

pH	1.7 (as a 1% solution) @ 25°C
% Equivalent H_3PO_4:	105 - 117
Boiling Point °C :	300 to 550

Freezing point °C	29 - 38
Specific Gravity @ 25 °C /15.5 °C:	1.9 to 2.1

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

Incompatible materials.

Materials to avoid

Avoid contact with metals (such as mild steel and aluminum), which may liberate flammable hydrogen gas that can produce an explosion in confined vessels. Avoid contact with materials such as sulfides and sulfites, which could release toxic gases. Be cautious in mixing with strong bases because high heat of reaction can generate steam.

Hazardous decomposition

Phosphorus oxides may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Laboratory data

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

Oral – rat LD_{50}	1530 mg/kg, slightly toxic
Dermal – rabbit LD_{50}	2740 mg/kg, slightly toxic

Phosphoric Acid has produced no genetic changes in standard tests using bacterial cells.

Additional Information

This material is severely corrosive to steel based on DOT, 49 CFR criteria.

Phosphoric Acid has a low vapor pressure at room temperature and is not expected to present a significant inhalation hazard under ambient conditions. Phosphoric Acid can, however, be irritating to the respiratory tract if inhaled as a mist or if the material is vaporized. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) for Phosphoric Acid. For further information on this material, please refer to the current edition of the Documentation of The Threshold Limit Values and Biological Exposure Indices.

12. ECOLOGICAL INFORMATION

Environmental toxicity

Phosphoric acid is practically nontoxic to one species of freshwater fish. No toxicity data was located for other freshwater species, algae, or Daphnia magna in a search of the available scientific literature.

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

96-hr. LC50 Mosquitofish: 138 mg/L, practically nontoxic

Environmental Fate

No specific biodegradation test data was located in a search of the available scientific literature. It was reported in the literature that while acidity of this material may be reduced readily in natural waters, the phosphate may persist indefinitely.

13. DISPOSAL CONSIDERATIONS

European waste catalog number

The data provided in this section is for information only. Please apply the appropriate classification for your waste.

06 01 04 Waste from inorganic chemical processes; phosphoric and phosphorous acid

Disposal considerations

This material when discarded is a hazardous waste as defined by the U.S. Resource Conservation and Recovery Act (RCRA), 40 CFR 261.22, due to its characteristic of corrosivity, EPA hazardous waste number D002. Best Demonstrated Available Treatment (BDAT) as defined by RCRA for D002 characteristic wastes is DEACTIVATION plus meet 40 CFR 268.48 (Universal Treatment Standards) for non-CWA/non-CWA equivalent/non-Class I SDWA systems. Dispose of in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

IMDG/UN	Phosphoric acid, solution, 8, UN 1805, III
ICOA/IATA	UN 1805, Phosphoric acid, solution, 8, III
RID/ADR	Phosphoric acid, solution, 8, UN 1805, III
Canadian TDG	Phosphoric acid, solution, 8, 9.2 UN 1805, III*
US DOT	Phosphoric acid, solution, 8, UN 1805, III*

*Reportable Quantity/ Reportable Limit (RQ/RL):
Canadian: Reportable limit (RL) for packages greater than or equal to 230 kg
U.S. DOT: Reportable quantity (RQ) for packages greater than or equal to 5,000 lb

15. REGULATORY INFORMATION

EC label

Hazard symbol:	corrosive
R34	Causes burns
S25	Avoid contact with eyes
S36	Wear suitable protective clothing
S37	Wear suitable protective gloves
S39	Wear eye/face protection

Chemical Inventory

USA TSCA	Listed	Japan	not listed
Canada DSL	Listed	Australia	Listed
EC	Listed		

Additional Information

WHMIS Classification: D2 (B) - Materials Causing Other Toxic Effects

E - Corrosive Material

SARA Hazard Notification
Hazard Categories Under Title III Rules (40 CFR 370): Immediate
Section 302 Extremely Hazardous Substances: Not Applicable
Section 313 Toxic Chemical(s): Not applicable

CERCLA Reportable Quantity: 5,000 lbs. of phosphoric acid (CAS 7664-38-2)*

*Release of 5,000 lbs. or more of this product into the environment in a 24-hour period requires notification to the U.S. National Response Center (800-424-8802 or 202-426-2675). Since local, state, and federal laws vary; consult your attorney or appropriate regulatory officials for information relating to spill reporting.

FDA: Food grades of phosphoric acid are sanctioned as Generally Recognized as Safe (GRAS) by the U.S. Food and Drug Administration and is codified in 21 CFR 182.1073.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	3	0	1	
Suggested HMIS Rating	3	0	1	K K = Airline hood or mask, gloves, full suit, boots

Reason for revision: Revised section 7. Supersedes MSDS dated: April 21, 2006
Drafted in accordance with ECC Dir 2001/58/EC

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

PITCH

MSDS Material Safety Data Sheet
Holly Refining & Marketing Co - Woods Cross

Asphalt

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

Holly Refining & Marketing Company - Woods Cross
393 South 800 West

Woods Cross, Utah 84087

Contact: Health, Environmental & Safety Representative
Telephone Number: (801) 299-6600
FAX Number: (801) 299-6609
E-Mail:
Web

Product Name:	Asphalt
Revision Date:	10/04/2007
MSDS Number:	901790
CAS Number:	8054-42-4
Chemical Family:	Mixture
Chemical Formula:	Hydrocarbon Mixture
Synonyms:	SDA Bottoms; Bitumen, Asphalt Cement; Zero Pen Asphalt

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident
CHEMTREC: (800)424-9300
California Poison Control System: (800) 356-3129

		Least	0
Health:	1	Slight:	1
Flammability:	1	Moderate:	2
Reactivity:	0	High:	3
Special Haz:	-	Extreme:	4

2 COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Component	% By Wt.
8054-42-4	Asphalt	100

3 HAZARDS IDENTIFICATION

Route of Entry:
Target Organs:

Inhalation: May cause moderate irritation to the mucous membranes of the nose, throat and upper respiratory tract. Prolonged vomiting and muscle weakness.

Skin Contact: Fumes may be moderately irritating. Fumes may cause dermatitis, acne-like eruptions, hyperpigmentation and photosensitization.

Eye Contact: Fumes may be moderately irritating. Prolonged or repeated contact may cause hyperpigmentation ofthe eye tisue. Direct contact with hot asphalt can cuse thermal burns.

Ingestion: May cause gastrointestinal irritation or blockage.

HAZARD CLASSIFICATION

_X_ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

_X_ Combustible Liquid	___ Flammable Aerosol	___ Oxidizer
___ Compressed Gas	___ Explosive	___ Pyrophoric
___ Flammable Gas	_X_ Health Hazard (Section 11)	___ Unstable
___ Flammable Liquid	___ Organic Peroxide	___ Water Reactive
___ Flammable Solid		

4 FIRST AID MEASURES

Inhalation: Immediately remove from exposure. If breathing is difficult, give oxygen. If breathing ceases, administer artificial respiration followed by oxygen. Seek immediate medical attention.

Skin Contact: Immediately wash skin with soap and water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Eye Contact: Immediately flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Ingestion: Give two glasses of water and induce vomiting, only if subject is conscious. Seek medical attention.

Note: For thermal burns, cool quickly with water and seek immediate medical attention.

5 FIRE FIGHTING MEASURES

Flash Point: >425F (>218C)
Flash Point Method: COC, ASTM D92
LEL: Not Established
UEL: Not Established

Fire Extinguishing Media: Dry chemical, foam or carbon dioxide (CO_2)

Special Fire Fighting Procedures: Evacuate area of all unnecessary personnel. Water fog or spray may be used to cool exposed equipment and containers. When entry into or exit from concentrations of unknown exposure, use NISOH/MSHA approved self-contained breathing apparatus (SCBA).

Fire and Explosion Hazards: Carbon oxides, hydrogen sulfide and various hydrocarbons may be formed/released when burned.

6 ACCIDENTAL RELEASE MEASURES

Precautions Required if Material is Released or Spilled:
Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section 8 if exposure conditions warrant. Shut off source, if possible and contain spill. Protect from ignition. Keep out of water sources and sewers. Absorb in a dry, inert material (sand, clay, etc). Transfer to disposal drums using non-sparking equipment.

7 HANDLING AND STORAGE

Handling Precautions: Do not get in eyes, on skin or on clothing. Do not breathe vapors, mist, fume or dust. Wear protective equipment and/or garments described in Section 8 if exposure conditions warrant. Immediately remove and launder contaminated clothing before reuse. Wash thoroughly after handling. Use only with adequate ventilation.

Storage Requirements: Store in a well-ventilated area. Store in a closed container.

MSDS Material Safety Data Sheet
Holly Refining & Marketing Co - Woods Cross

Asphalt

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Ventilation: Use adequate ventilation to control below recommended exposure levels.

Protective Equipment: Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator. In case of spill or leak resulting in unknown concentration, use NIOSH/MSHA approved supplied air respirator.

Eye Protection: Wear safety glasses with side shields. For splash protection, use chemical goggles and face shield.

Skin Protection: Use impervious gloves (eg, neoprene). Use disposal long-sleeved garments or decontaminate before reuse.

NOTE: 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.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black semi-solid		
Physical State:		**Boiling Point:**	>650F (343C)
Odor:	Mild	**Freezing/Melting Pt.:**	
pH:		**Solubility:**	Negligible
Vapor Pressure:	Not Established	**Spec Grav./Density:**	1.01 - 1.02
Vapor Density:	Not Applicable		

Evap. Rate: Negligable
Viscosity: NE

10 STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Not Established

Materials to avoid (incompatability): Not Established

Hazardous Decomposition products: Carbon oxides, hydrogen sulfide and various hydrocarbons formed when heated or burned.

Hazardous Polymerization: Will Not Occur

11 TOXICOLOGICAL INFORMATION

ACUTE EFFECTS OF OVEREXPOSURE:

Eye: Fumes may be moderately irritating. Prolonged or repeated contact may cause hyperpigmenttion of the eye tissue. Direct contact with hot asphalt can cause thermal burns.

Skin:Fumes may be moderately irritating. Fumes may cause dermatitis, acne-like eruptions, hyperpigmetation, and photosensitization.

Inhalation: May cause moderate irritation to the mucous membranes of the nose, throat, and upper respiratory tract. Prolonged exposure may cause headache, dizziness, drowssiness, nausea, vomiting and muscle weakness.

Ingestion: May cause gastrointestinal irritation or blockage.

SUBCHRONIC AND CHRONIC EFFECTS OF OVEREXPOSURE:

In laboratory experiments, both whole and asphalts and condensed asphalt fume diluted with hydrocarbon solvents, produced equivocal results concerning their potential carcinogenicity when repeatedly applied to the skin of mice.

OTHER HEALTH EFFECTS:

The small quantities of polynuclear aromatic (PNA's) hydrocarbons found in asphalt have not been shown to be a human health risk. Health surveys and human experience indicate no cases of lung or skin cancer resulting from asphalt exposure.

Certain Isoparaffins may be prsent which have been reported to cause kidney injury in male rats only. No comparable health hazard for kidney disease is known to occur in humans.

HEALTH HAZARD CATEGORIES:

	Animal	Human		Animal	Human
Known Carcinogen	___	___	Toxic	___	___
Suspect Carcinogen	___	___	Corrosive	___	___
Mutagen	___	___	Irritant	___	___
Teratogen	___	___	Target Organ Toxin	_X_	_X_
Allergic Sensitizer	___	___	Specify - Skin Hazard - Photosensitizer;		
Highly Toxic	___	___	Liver, Lung/KidneyToxin; ReproductiveToxin .		
Embryo/Fetotoxin.					

12 ECOLOGICAL INFORMATION

None Established.

13 DISPOSAL CONSIDERATIONS

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations): Incinerate or place in permitted waste management facility.

14 TRANSPORT INFORMATION

HOT Shipments (eg, bulk by truck or rail)
Shipping name: Asphalt
Hazard Class: 3
ID#: NA 1999
Packing Group: III
Marking: NA 1999, Hot
Label: 3
Hazardous Substance RQ: N/A
Packaging references: 49 CFR 173.150, 203, 247
Forbidden to ship by passenger air/rail and cargo air

COLD Shipments (eg, cans)
Shipping name: Tars, Liquid (including road asphalt and oils, bitumen and cut backs)
Hazard Class: 3
ID#: UN 1999
Packing Group: II, III
Label: 3
Special Provisions: B13, T7, T3 - packing group II
B1, B13, T7, T30 - packing group III
Packaging references: 49 CFR 173.150, 202, 242
Quantity Limitations: Packing Group II - 5L by passenger air/rail, 60L by cargo air
Packing Group III - 60L by passenger air/rail, 220L by cargo air

15 REGULATORY INFORMATION

Product and/or Components Entered on EPA's TSCA Inventory: YES
This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

SARA 313
As of the preparation date, this product did not contain a 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.

16 OTHER INFORMATION

Issue Date: April 1, 2005
Previous Issue Date: None
Revised Sections: all
MSDS Number: 901790
Status: Final

Disclaimer of Expressed and Implied Warranties:

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MATERIAL SAFETY DATA SHEET

PETROLEUM ASPHALT PITCH

MSDS PAGE NUMBERS

"SAFETY FIRST"

CENEX REFINERY, P.O. Box 909, Laurel, MT, 59044, (406) 628-5200

SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

CHEMICAL NAME:
Petroleum Asphalt Pitch

CAS NUMBER:
8052-42-4 (Reference Petroleum Asphalts)

COMMON NAMES:
125 SP, 135 SP, 145 SP, 150 SP, 160 SP, 165 SP, 170 SP, 180 SP, 185 SP, 200 SP, 210 SP, 220 SP, AND 240 SP.

PRODUCT APPEARANCE AND ODOR:

Semi-solid thermoplastic material; viscous, hot liquid when heated above 125°F-240°F, depending on product; black color characteristic petroleum or asphaltic odor. It can also be shipped as a solid in pellet form.

EMERGENCY TELEPHONE NUMBERS:	CHEMTREC	1-800-424-9300
	CENEX REFINERY	1-406-628-5200

SECTION II COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Petroleum Asphalt Pitch	8052-42-4	99%
Hydrogen Sulfide (H_2S)	7783-06-4	<0.1%

(If this material is heated at high temperatures, H_2S may exist in the head space of storage vessels and containers.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by National Fire Protection Association (NFPA) and CENEX. Least-0 Slight-1 Moderate-2 High-3 Extreme-4

EXPOSURE LIMIT FOR TOTAL PRODUCT BASIS

5 mg/m^3 For Oil Mist In Air	OSHA 1910.1000, TABLE Z-1
5 mg/m^3 For Respirable Dust In Air	
15 mg/m^3 For Total Dust In Air	
10 ppm TWA for H_2S	OSHA 1910.1000, TABLE Z-1
15 ppm STEL For H_2S	

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUES:

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA SECTIONS 311-313)
(1) This product does not contain any listed chemicals, by weight, above the deminimis reporting levels.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CRF 355 (SARA SECTIONS 301-304)
(2) Not applicable.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA SECTION 102)
(3) Not applicable

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY ITSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR ITS OWN PARTICULAR USE. WE NEITHER ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION, NOR DO WE OFFER WARRANTY AGAINST PATIENT INFRINGEMENT.

SECTION III PRIMARY ROUTES OF ENTRY, EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT:

If hot product is splashed into eyes, flush with cool, clear water and contact physician immediately. If pitch dust product enters into the eyes, flush with cool, clear water. Contact physician if irritation persists.

SKIN:

If skin is contacted with hot liquefied pitch, thermal burns will result. In this case, the contaminated area should be treated similar to other thermal burns by cooling the affected area immediately with coolest available water. It is not usually advisable to immediately remove the pitch material. Natural separation will occur in 48-72 hours or sooner. Removal should be attempted only under the direction of a physician. If removal is attempted mineral oil (not mineral spirits), mineral oil ointment, or commercial products specific for asphalt removal, such as, DESOLV-IT may be applied to soften the asphalt to facilitate removal.

If skin is contaminated with cool, solid asphalt, the contaminate area should be cleaned with waterless skin cleanser followed by soap and water. "DeSolvit" may be used to remove product dust from skin, but avoid its use on the face and around the eyes. Mineral oil may also be used for removal.

INHALATION:

If overcome by H_2S, immediately remove to fresh air and call a physician. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION:

If ingested, DO NOT induct vomiting; call a physician immediately

SECTION IV FIRE & EXPLOSION HAZARD INFORMATION

FLASHPOINT (MINIMUM) TEMPERATURE

500°F COC
ASTM D 92
COMBUSTIBLE IIIB LIQUID (NFPA)

AUTOIGNITION

Approximately 1050°F

HANDLING PRECAUTIONS

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

% LEL and % UEL not listed by NFPA. Flammable at temperatures above 500°F. Flammability may depend on H_2S concentration and residual solvents.

HOT ASPHALT FLASH WARNING

Studies have shown that relatively low flash point substances, such as hydrogen sulfide $H_2S$and low-boiling hydrocarbons, may accumulate in the vapor space of hot asphalt tanks and bulk transport compartments. Such vapors may exhibit flammability characteristics of a significantly lower flash product than would be indicated by the open cup flash test. As a precaution, keep ignition sources away from vents and openings, including prevention of accumulation of pyrophoric iron sulfide. Asphalt Institute Publication IS-180 and American Petroleum Institute Publication 852-20230 contain further information and guidance on the safe storage and handling of hot asphalt.

STEAM EXPLOSION HAZARD

Avoid contamination with water. Water in contact with hot pitch may result in a violent reaction causing an increase in tank pressure and substantial foaming and frothing of the product, which could violently expel product from tank or container.

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation.

Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialist. Avoid contamination with water. Water in contact with hot asphalt may result in a violent reaction causing an increase in tank pressure and substantial foaming and frothing of the product.

FIRE FIGHTING PHASES

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide On Hazardous Materials", Ninth Edition (1986):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause "frothing". Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, hydrogen sulfide, sulfur oxides, aldehydes and other decomposition's products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. Do not cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition: they may explode and cause injury or death. All containers to be disposed of should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks, refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

"HOT WORK" PROCEDURES

A written "hot work" permit is required for any repair or maintenance operations on equipment, piping, container, or tank containing or contaminated with this chemical material, when any open flame, burning, acetylene cutting, arc welding, brazing, grinding, sand blasting, use of electrical power tools, or any spark producing operations are required for said repair or maintenance. The equipment, piping, container, or tank to be worked on shall be drained, steamed, water washed, isolated and/or blinded, ventilated, or any combination of these, as determined necessary, to provide a safe "hot work" environment. The equipment, piping, container, tank and the surrounding area shall be inspected and tested for the percent of the "lower explosive limit" and for toxic gas concentrations using appropriate testing equipment (i.e.., Gascope). Combustible material in the area shall be protected or removed. Proper "lockout/tagout" and "confined space entry" procedures shall be observed at all times. Each situation shall be evaluated on an individual basis by competent Safety personnel, who shall make all final determinations as to safety, proper PPE, and issuance of "hot work permits".

SECTION V HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (SIGNS AND SYMPTOMS OF EXPOSURE)

The Internal Agency for Research on Cancer, IRAC, conducted a thorough literature search in 1985 and determined that there is inadequate evidence for the carcinogens of undiluted asphalt in animals or humans. IARC also concluded that mouse skin painting studies showed that extracts of asphalt caused skin tumors. However, these extracts were derived by using benzene as the solvent and the resulting extract does not realistically characterize asphalt to which humans are exposed. The same criticism applies to a recent study where roofing asphalt fumes condensate, dissolved in cyclohexane/acetone, cause skin cancer in a similar mouse painting study. These animal data should be interpreted cautiously since the health effects may be dependent on variables such as solvent-extraction procedure, source of crude oil, manufacturing process, and that these studies involved repeated exposure of shaved skin which was never washed free of test material.

Inhalation of high vapor concentrations may cause eye and respiratory irritation, headaches, dizziness or nausea, unconsciousness and possibly death. Prolonged or repeated contact with product at warm or near ambient

unconsciousness, respiratory paralysis and could be fatal. To avoid possible inhalation toxicity, the American Conference of Governmental Industrial Hygienists (ACGIH) has adopted a threshold limit value for H_2S of 10 ppm in air as time-weighted average for an 8-hour workday. OSHA regulation 29 CFR 1910.1000 further lists a ceiling concentration of 20 ppm, and a maximum peak of 50 ppm for 10 minutes once per day if no other measurable exposure occurs. NIOSH-approved respiratory equipment should be used when permissible concentrations are exceeded.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mile to severe pulmonary injury and possible death.

This product is judged to have an acute oral LD_{50} (rat) greater than 5 g/kg of body weight, and an acute dermal LD_{50} (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE:
None recognized.

CARCINOGEN/POTENTIAL CARCINOGEN **NTP: No** **IARC: CAT.2B** **OSHA: No**

SECTION VI PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILER RANGE (or IBP)
Above 1050°F

SPECIFIC GRAVITY (15.6°C/15.6°C)
1.070 to 1.100

WEIGHT/GALLON
8.911 TO 9.161

GALLONS/TON
218.32 TO 224.44

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
125°F TO 240°F
Melting point by ASTM D 87

VISCOSITY
Not determined. Solid/semi solid at room temperature.

VAPOR PRESSURE
Less than 0.1 mm hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 1

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM, AND 25°C(77°F) (N-BUTYL ACETATE=1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM, AND 25°C (77°F)
Negligible: less than 0.1%

SECTION VII REACTIVITY INFORMATION

This product is stable. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite. Hot product in contact with water can cause foaming or sudden evolution of steam which could cause pressure build-up and possibly rupture a tank or vessel.

Hydrogen Sulfide (H_2S) from the product can react with the iron in an asphalt storage tank to form ferrous sulfide which is pyrophoric.

SECTION VIII ENVIRONMENTAL & REGULATORY INFORMATION

LAND SPILL
Shut off and eliminate all ignition sources Keep people away. Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Hot product will solidify when cooled. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers or watercourses. Assure conformity with applicable governmental regulations.

WATER SPILL
Contact authorities immediately. Keep people away. Shut off source of leak, if possible. Dike or divert spill into natural containment area. Immediately contact specialist in the field of watercourse spill containment and

cleanup. Material should congeal and solidify upon contact with water. Assure conformity with applicable governmental regulations.

EPA HAZARD CLASSIFICATION CODE:

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

SECTION IX PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes when handling hot product, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed, or when H_2S exceeds permissible limits. Use negative pressure respirator when working with palletized product in order to avoid breathing dust.

PROTECTIVE GLOVES
Protect against hot liquid. Use chemical-resistant gloves to avoid skin contact.

EYE PROTECTION
Safety glasses. Splash proof goggles or face shield if material may be readily splashed into eyes. Ventless safety goggles are recommended when working with palletized product to avoid dust entering eyes.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to protect against hot liquid and to avoid skin contact. Full head coverage using Tyvek hood is recommended when working with palletized product to avoid contact with dust.

WORK PRACTICES/ENGINEERING CONTROLS
Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE
Minimize breathing vapor, mist, fumes, and dusts. Avoid prolonged or repeated contact with skin. Remove contaminated clothing and launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard is unable to clean. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water. Commercial products such as "DeSolvit" may also be used, but avoid contact with face and eyes. Mineral oil (not mineral spirits) may also be used.

SECTION X TRANSPORTATION & OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest department of transportation emergency response guidebook for hazardous materials incidents, DOT p. 5800.4.

U.S. DOT INFORMATION AND CLASSIFICATION/UN NUMBER:
Elevated Temperature Liquid, n.o.s., (Asphalt-Pitch), 9, UN 3257, III
Placarded: None
Labels: "HOT, 3257"

DOT, EMERGENCY RESPONSE GUIDEBOOK, 1993:
Guide #27

STORAGE TEMPERATURE, °F:
500°F (max.)

LOADING/UNLOADING TEMPERATURE, °F:
500°F (max.)

STORAGE/TRANSPORT PRESSURE, MMHG:
Atmospheric

VISC. AT LOADING/UNLOADING TEMP., CST:
Varies

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.

CAUTION!

EXTREMELY HOT PRODUCT MAY CAUSE SEVERE THERMAL BURNS
VAPORS MAY BE FLAMMABLE
MAY FORM HYDROGEN SULFIDE (H_2S) WHEN HEATED
INHALATION OF H_2S MAY BE FATAL.

NOTE: PRODUCT LABEL WILL CONTAIN ADDITIONAL NON-OSHA RELATED INFORMATION.

The information and recommendations contained herein are, to the best of CENEX, Inc.'s knowledge and belief, accurate and reliable as of the date issued. CENEX, Inc. does not warrant or guarantee their accuracy or reliability, and CENEX, Inc. shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure that proper health, safety and other necessary information is included on the he container.

The Environmental Information included under Section VIII hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with CENEX, Inc.'s interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
Environmental Health & Safety Department
(EH&S Department)
Cenex Refinery
P.O. Box 909
Laurel, Montana 59044
(406) 628-5200

FOR OTHER PRODUCT INFORMATION CONTACT:
Marketing Department
Cenex
P.O. Box 909
Laurel, Montana 59044
(406) 628-5200

PREPARED BY:	DATE PREPARED:	SUPERSEDES ISSUE DATED:
H. Russell Lowe, EH&S Dept.	September 27, 1997	January 13, 1996

FILE: MSDS-PITCH

PRODUCT LABEL

PETROLEUM ASPHALT PITCH

MSDS PAGE NUMBERS

"SAFETY FIRST"

CENEX REFINERY, P.O. Box 909, Laurel, MT, 59044, (406) 628-5200

LABEL INFORMATION ON PRODUCT

CHEMICAL NAME: Petroleum Asphalt Pitch **CAS NUMBER:** 8052-42-4 (Reference Petroleum Asphalts)

COMMON NAMES: *125 SP, 135 SP, 145 SP, 150 SP, 160 SP, 165 SP, 170 SP, 180 SP, 185 SP, 200 SP, 210 SP, 220 SP, AND 240 SP*

CAUTION!
EXTREMELY HOT PRODUCT MAY CAUSE SEVERE THERMAL BURNS
DANGER! DO NOT INTRODUCE WATER.
VAPORS MAY BE FLAMMABLE
MAY FORM HYDROGEN SULFIDE (H_2S) WHEN HEATED
INHALATION OF CONCENTRATED H_2S MAY BE FATAL
AVOID BREATHING DUST FROM PELLITIZE PRODUCT

- **Keep away from flames and other sources of ignition.**
- **Stable unless moisture is introduced.**
- DANGER! Addition of water to hot product may cause steam explosion and material to froth.
- Avoid breathing vapors. May contain low concentrations of hydrogen sulfide.
- May cause dermatitis and acne lesions due to prolonged and repeated exposures to liquid or dust from pellitized product.
- Can cause severe burns when hot material contacts unprotected skin.
- Wear chemical resistant gloves, goggles, face shield or safety glasses, long sleeve shirt and pants.
- Use NIOSH approved respirator if TLV's are exceeded.
- Extinguishing media-CO_2 or Class "B" extinguisher, water spray to cool container.

EMERGENCY TELEPHONE NUMBERS:	CHEMTREC	1-800-424-9300
	CENEX REFINERY	1-406-628-5200

FIRST AID

EYE CONTACT:
Flush eyes with water for at lease 15 minutes. Call a physician.

SKIN:
If hot material contacts skin, place affected part in cold water. Have a physician remove material or for small amounts use mineral oil, or commercial product (such as "DeSolvit") for removal. For SEVERE burns over large area of body contact nearest burn center.

INHALATION:
Remove victim to fresh air. Start artificial resuscitation if necessary. Call a physician.

INGESTION:
If ingested call a physician.

PLACARDING INFORMATION

U.S. DOT INFORMATION AND CLASSIFICATION/UN NUMBER:
Elevated Temperature Liquid, n.o.s., (Asphalt-Pitch), 9, UN 3257, III
Placarded: None
Labels: "HOT, 3257"

DOT, EMERGENCY RESPONSE GUIDEBOOK, 1993: Guide #27

FOR FURTHER INFORMATION REFER TO THE MSDS FOR "*PETROLEUM ASPHALT PITCH*".

FILE:	PREPARED BY:	DATE PREPARED:	SUPERSEDES ISSUE DATED:
LABEL-PITCH	H. Russell Lowe, EH&S Dept.	September 27, 1997	January 13, 1996

38.) POLYBUTENE

Material Safety Data Sheet

S2000. Etc.
QUICK IDENTIFIER (In Plant Common Name)
Viscosity Standard

Manufacturer's Name	Cannon Instrument Company	**Emergency Telephone No.**	800-255-3924 Domestic CHEM-TEL INC. #
Idress	P.O. Box 16 State College, PA 16804-0016	**Other Information Calls**	814-353-8000
		Date Prepared	June 16, 2003

SECTION 1 – IDENTITY

Common Name: (used on label) (Trade Name & Synonym) S2000. N2000. N4000. S8000. N8000. N15000. S30000. N30000. N62000. N150000. N190000. N450000. N2700000. N2700000SP. VP1600. VP2400. VP3000. VP3700. VP5800. VP8400.

Chemical Name	Polybutene	**Cas No.**	9003-29-6
Formula	$(C_4H_8)n$ n = 5-60	**Chemical Family**	Hydrocarbon

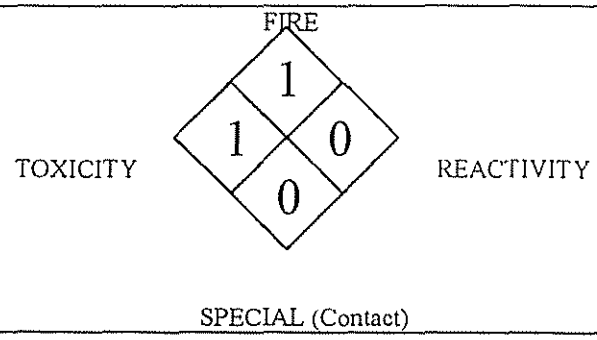
SECTION 2 – HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical & common name(s))	%	Threshold Limit Value (units)
To the best of our knowledge, none of the components is hazardous to OSHA (1910.1200) or one or more state Right-to-Know lists.		500 ppm

THIS ITEM IS CONTAINED IN THE TSCA INVENTORY

HAZARD RATING

N	4 – Extreme
F	3 – High
P	2 – Moderate
A	1 – Slight
	0 – Insignificant



SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

Boiling Point	Range from 480°F to decomp.	**Specific Gravity (H_20 = 1)**	0.85-0.91	
Vapor Pressure (mm Hg)	1 @ 250°F	**Percent Volatile By Volume (%)**	N/A	
Vapor Density (Air = 1)	N/A	**Evaporation Rate (= 1)**	N/A	
Solubility In Water	Insoluble	**Reactivity In Water**	N/A	
Appearance And Odor	Clear liquid; hydrocarbon odor.			
Flash Point	270°F – 510°F	**Flammable Limits in Air (% by Volume)**	**Lower** N/A	**Upper** N/A
Extinguisher Media	Water spray, dry chemical, CO_2	**Auto-Ignition Temperature**	N/A	
Special Fire Fighting Procedures	Firefighters should wear self-contained breathing apparatus to prevent inhalation of combustion products.			
Unusual Fire and Explosion Hazards	None.			

SECTION 4 – PHYSICAL HAZARDS

Stability	Unstable ☐ Stable ■	**Conditions To Avoid**	Not available
Incompatibility (Materials to Avoid)	Strong oxidizers.		
Hazardous Decomposition Products	CO, CO_2, aldehydes, ketones, combustion products of nitrogen.		
Hazardous Polymerization	May Occur ☐ Will Not Occur ■	**Conditions To Avoid**	Depolymerizes when subjected to high temperature or combustion.

SECTION 5 – HEALTH HAZARDS

Threshold Limit Value	None established. Suggest TLV of 500 ppm.						
Signs and Symptoms of Exposure	No health hazards have been identified.						
2) Chronic Overexposure	Unknown						
Medical Conditions Generally Aggravated by Exposure	Unknown						
Chemical Listed as Carcinogen Or Potential Carcinogen	N/A	**National Toxicology Program**	Yes ☐ No ■	**I.A.R.C. Monographs**	Yes ☐ No ■	**OSHA**	Yes ☐ No ■
OSHA Permissible Exposure Limit	N/A	**ACGIH Threshold Limit Value**	N/A	**Other Exposure Limit Data**	N/A		
Emergency and First Aid Procedures							
1. Inhalation	Remove to fresh air. Aid or restore breathing if necessary. Get medical attention if necessary.						
2. Eyes	Flush eyes with running water for at least fifteen minutes. If irritation develops, seek medical attention.						
3. Skin	Wash thoroughly with soap and water. Remove contaminated clothing and wash before re-use.						
4. Ingestion	Due to low acute oral toxicity, it should not be necessary to induce vomiting. Seek medical attention.						

SECTION 6 – SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	NIOSH approval required on any respiratory equipment used..				
Ventilation	N/A	**Local Exhaust**	As required if mist is generated.	**Mechanical (General)**	N/A
Protective Gloves	Impervious gloves	**Eye Protection**	Local policy		
Other Protective Clothing or Equipment	Emergency eye wash and shower.				

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken In Handling and Storage	Store in a cool, dry location. Handle in a well-ventilated area. Use personal protective equipment to prevent contact with skin and eyes. Keep containers closed when not in use.
Other Precautions	None
Steps to be taken in Case Material is Released or Spilled	Absorb in dry inert material (sand, clay, sawdust, etc.). Transfer to disposal container(s).
Waste Disposal Methods	Incinerate. Local regulations govern disposal of oil waste.

39.) ROUSE RUBBER

MATERIAL SAFETY DATA SHEET

Date Issued: 9/1/99

Rouse Rubber Industries, Inc.
P.O. Box 820369 Rubberway Dr. Hwy 61 South
Vicksburg, MS 39182-0369
Phone: (601) 636-7141

SECTION I PRODUCT IDENTIFICATION

PRODUCT CODE: XP-254
PRODUCT NAME: Reprocessed Ground Rubber

CHEMICAL FAMILY: Not Applicable
HAZARD LABEL: No Data
MOLECULAR FORMULA: Not applicable
MOLECULAR WEIGHT: No Data

NFPA RATINGS: (0-4)
Health: 1
Flammability: 1
Reactivity: 0

NFPA SPECIFIC HAZARDS

SYNONYMS: Crumb Rubber, Fine Ground Rubber

SECTION II HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Composition: Mixture of natural and synthetic rubbers, plastic, asphalt, carbon black, fillers and oils.

Components	CAS Number	%, Wt	OSHA PEL-TWA	ACGIH TLV-TWA
Reprocessed Rubber	SBR: 9003-55-8	20-47	15 mg/m^3*	10 mg/m^3**
	NR: 9003-31-0			
	EPDM: 25038-36-2	0-45	15 mg/m^3	10 mg/m^3
Polypropylene	09003-07-0	0-30	NA	NA
Asphalt	08052-42-4	0-15	5 mg/m^3	5 mg/m^3
Carbon Black	01333-86-4	18-28	3.5 mg/m^3	3.5 mg/m^3
Process Oil	64742-04-7	5-18	5 mg/m^3**	NA
Zinc Oxide	01314-13-2	1-5	5 mg/m^3**	10 mg/m^3
Sulfur	07704-34-9	1-5	NA	10 mg/m^3***
Stearic Acid	00057-11-4	1-5	NA	NA

* = Particulates Not Otherwise Classified (PNOC), 5 mg/m^3 respirable fraction
** = Total dust, 5mg/m^3 respirable fraction
*** = ACGIH TLV for Nuisance Dust
NA = Not Available/Not Applicable

SECTION III PHYSICAL / CHEMICAL CHARACTERISTICS

APPEARANCE: Gray or Black Granules
SOLUBILITY IN WATER: Insoluble
SPECIFIC GRAVITY: 1.03 – 1.15
MELTING POINT: NA
% VOLATILE BY VOLUME: <1% primarily water

ODOR: Rubber odor
VISCOSITY: NA
pH: NA
VAPOR PRESSURE: NA
VAPOR DENSITY: NA

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (COC): NA
AUTO-IGNITION TEMPERATURE: > 600 °F
FLAMMABLE LIMITS IN AIR % BY VOLUME: Upper: NA Lower: NA

MATERIAL SAFETY DATA SHEET

Date Issued: 9/1/99

EXTINGUISHING MEDIA: Water, Dry Chemical, Foam, or Carbon Dioxide.

SPECIAL FIRE FIGHTING PROCEDURES: All extinguishing media permitted - water recommended. Full emergency equipment with self contained breathing apparatus should be worn. During combustion, irritating and/or toxic gases and aerosols from decomposition products may be present.

UNUSUAL FIRE OR EXPLOSION HAZARD: This product will ignite when exposed to heat or flame. Rubber burns with intense heat and produces dense smoke. During an uncontrolled fire, incomplete combustion occurs which releases oil, soot(carbon black) and a wide range of hydrocarbon pyrolysis products.

DEFLAGRATION HAZARD: A dust explosion hazard exists with hard rubber in the powder form. Extreme precautions should be taken to prevent accumulations of rubber dust in the air surrounding work environments.

SECTION V REACTIVITY DATA

STABILITY: Material is stable.
CONDITIONS TO AVOID: Combustion.

INCOMPATIBILITY (MATERIALS TO AVOID): None known or expected.

HAZARDOUS POLYMERIZATION: Will not occur.

DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, hydrogen, hydrogen sulfide, pentadiene, benzene, xylene, carbon, ash: (zinc oxide, titanium dioxide, silicon dioxide, calcium oxide, and magnesium), oxides of sulfur and nitrogen, sulfides, styrene, toluene, 4-vinyl-1-cyclohexene, 1,5-cyclooctadiene, 1,5,9-cyclododecatriene, various hydrocarbons, and various oxidized hydrocarbons.

SECTION VI HEALTH HAZARD DATA

Note: This product has not been tested by Rouse Rubber Industries, Inc. to determine its specific health hazards. The information provided in this section includes health hazard information for the product components.

CARCINOGENICITY: NTP? No IARC Monographs? Yes OSHA Regulated? No
CARCINOGENICITY/OTHER INFORMATION: This product contains petroleum oils similar to ones categorized by the International Agency for Research on Cancer (ISRC) as causing skin cancer in mice after prolonged and repeated contact. Any potential hazard can be minimized by using recommended protective equipment to avoid skin contact and by washing thoroughly after handling.

OCCUPATIONAL EXPOSURE LIMITS: See Section II.

EFFECTS OF OVEREXPOSURE:

Acute:

Eyes: Slight to moderate eye irritation.
Skin: Moderately irritating.
Inhalation: Irritating to mucous membranes and respiratory tract.
Ingestion: Acute effects of rubber ingestion not determined.

Chronic: There is sufficient evidence for the carcinogenicity of solvent extract from heavy parafinnic distillates in experimental animals.

ADDITIONAL MEDICAL AND TOXICOLOGICAL INFORMATION: May aggravate pre-existing dermatitis. Certain rubber formulations contain trace nitrosamines, some of which are carcinogenic in animal experiments.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Persons with pre-existing skin disorders may be more susceptible may be more susceptible to irritating effects.

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush thoroughly with water, see physician if eye irritation persists.

MATERIAL SAFETY DATA SHEET

Date Issued: 9/1/99

Skin Contact: Wash skin with soap and water.
Inhalation: Remove to fresh air.
Ingestion: Seek medical attention if large quantities are consumed.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Collect in a manner appropriate for its physical condition

WASTE DISPOSAL METHOD: Dispose of in accordance with Federal, State, and Local regulations.

HAZARD LABEL INFORMATION: Store in a cool dry place.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool dry well ventilated area, away from direct sunlight.

OTHER PRECAUTIONS: Follow all applicable state, local, and federal regulations.

SECTION VIII CONTROL MEASURES

EYE PROTECTION: Use of safety glasses recommended as general safety practice at all times.

PROTECTIVE GLOVES: Wear gloves, minimize skin contact with product, and wash skin after handling.

VENTILATION: Ventilation should be provided at processing machinery to control fumes and odors. Fumes generated during processing or when overheated may by irritating. Respiratory protection is considered necessary where ventilation is not sufficient.

INGESTION: Not applicable.

G.R.	
Fire Hazard	1
Health Hazard	1
Reactivity	0
Personal Protection	B
wear dust mask to prevent lung irritation	

MATERIAL SAFETY DATA SHEET

Date Issued: 1/5/01

Rouse Polymerics International, Inc.
P.O. Box 820369 1000 Rubberway Hwy 61 South
Vicksburg, MS 39182-0369
Phone: (601) 636-7141

SECTION I PRODUCT IDENTIFICATION

PRODUCT CODE: XP492, XP496, and XP497
PRODUCT NAME: Reprocessed Ground Rubber

CHEMICAL FAMILY: Not Applicable
HAZARD LABEL: No Data
MOLECULAR FORMULA: Not applicable
MOLECULAR WEIGHT: No Data

NFPA RATINGS: (0-4)
Health: 1
Flammability: 1
Reactivity: 0

NFPA SPECIFIC HAZARDS

SYNONYMS: Crumb Rubber, Fine Ground Rubber

SECTION II HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Cured rubber dust. All ingredients are bound up in a cured rubber matrix and the product is not a hazardous material.

SECTION 313 SUPPLIER NOTIFICATION – This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the emergency planning and community right-to-know act of 1986 and of 40CFR 372:

CAS#	Chemical Name	Percent by Weight
01314-13-2	Zinc Oxide	3% (maximum)

SECTION III PHYSICAL / CHEMICAL CHARACTERISTICS

APPEARANCE: Black Granules
SOLUBILITY IN WATER: Insoluble
SPECIFIC GRAVITY: 1.14±0.03
MELTING POINT: NA
% VOLATILE BY VOLUME: <1% primarily water

ODOR: Rubber tire odor
VISCOSITY: NA
pH: NA
VAPOR PRESSURE: NA
VAPOR DENSITY: NA

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (COC): 475°F
AUTO-IGNITION TEMPERATURE: 700°F
FLAMMABLE LIMITS IN AIR % BY VOLUME: Upper: NA Lower: NA
EXTINGUISHING MEDIA: Water, Dry Chemical, Foam, or Carbon Dioxide.

SPECIAL FIRE FIGHTING PROCEDURES: All extinguishing media permitted - water recommended. Full emergency equipment with self contained breathing apparatus should be worn. During combustion, irritating and/or toxic gases and aerosols from decomposition products may be present.

UNUSUAL FIRE OR EXPLOSION HAZARD: This product will ignite when exposed to heat or flame. Rubber burns with intense heat and produces dense smoke. During an uncontrolled fire, incomplete combustion occurs which releases oil, soot(carbon black) and a wide range of hydrocarbon pyrolysis products.

DEFLAGRATION HAZARD: A dust explosion hazard exists with hard rubber in the powder form. Extreme precautions should be taken to prevent accumulations of rubber dust in the air surrounding work environments.

MATERIAL SAFETY DATA SHEET

Date Issued: 1/5/01

SECTION V REACTIVITY DATA

STABILITY: Material is stable.
CONDITIONS TO AVOID: Combustion.

INCOMPATIBILITY (MATERIALS TO AVOID): None known or expected.

HAZARDOUS POLYMERIZATION: Will not occur.

DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, hydrogen, hydrogen sulfide, pentadiene, benzene, xylene, carbon, ash: (zinc oxide, titanium dioxide, silicon dioxide, calcium oxide, and magnesium), oxides of sulfur and nitrogen, sulfides, styrene, toluene, 4-vinyl-1-cyclohexene, 1,5-cyclooctadiene, 1,5,9-cyclododecatriene, various hydrocarbons, and various oxidized hydrocarbons.

SECTION VI HEALTH HAZARD DATA

Note: This product has not been tested by Rouse Rubber Industries, Inc. to determine its specific health hazards. The information provided in this section includes health hazard information for the product components.

CARCINOGENICITY: NTP? No IARC Monographs? Yes OSHA Regulated? No
CARCINOGENICITY/OTHER INFORMATION: This product contains petroleum oils similar to ones categorized by the International Agency for Research on Cancer (ISRC) as causing skin cancer in mice after prolonged and repeated contact. Any potential hazard can be minimized by using recommended protective equipment to avoid skin contact and by washing thoroughly after handling.

OCCUPATIONAL EXPOSURE LIMITS: See Section II.

EFFECTS OF OVEREXPOSURE:

Acute:

Eyes: Slight to moderate eye irritation.
Skin: Moderately irritating.
Inhalation: Irritating to mucous membranes and respiratory tract.
Ingestion: Acute effects of rubber ingestion not determined.

Chronic: There is sufficient evidence for the carcinogenicity of solvent extract from heavy parafinnic distillates in experimental animals.

ADDITIONAL MEDICAL AND TOXICOLOGICAL INFORMATION: May aggravate pre-existing dermatitis. Certain rubber formulations contain trace nitrosamines, some of which are carcinogenic in animal experiments.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Persons with pre-existing skin disorders may be more susceptible may be more susceptible to irritating effects.

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush thoroughly with water, see physician if eye irritation persists.
Skin Contact: Wash skin with soap and water.
Inhalation: Remove to fresh air.
Ingestion: Seek medical attention if large quantities are consumed.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Collect in a manner appropriate for its physical condition

WASTE DISPOSAL METHOD: Dispose of in accordance with Federal, State, and Local regulations.

HAZARD LABEL INFORMATION: Store in a cool dry place.

MATERIAL SAFETY DATA SHEET

Date Issued: 1/5/01

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool dry well ventilated area, away from direct sunlight.

OTHER PRECAUTIONS: Follow all applicable state, local, and federal regulations.

SECTION VIII CONTROL MEASURES

EYE PROTECTION: Use of safety glasses recommended as general safety practice at all times.

PROTECTIVE GLOVES: Wear gloves, minimize skin contact with product, and wash skin after handling.

VENTILATION: Ventilation should be provided at processing machinery to control fumes and odors. Fumes generated during processing or when overheated may by irritating. Respiratory protection is considered necessary where ventilation is not sufficient.

INGESTION: Not applicable.

G.R.	
Fire Hazard	1
Health Hazard	1
Reactivity	0
Personal Protection	B
wear dust mask to prevent lung irritation	

MATERIAL SAFETY DATA SHEET

Date Issued: 3/1/00

Rouse Polymerics International
P.O. Box 820369 Hwy 61 South
Vicksburg, MS 39182-0369
Phone: (601) 636-7141

SECTION I PRODUCT IDENTIFICATION

PRODUCT CODE: XP-379
PRODUCT NAME: Ground Rubber

CHEMICAL FAMILY: Not Applicable
HAZARD LABEL: No Data
MOLECULAR FORMULA: Not applicable
MOLECULAR WEIGHT: No Data

NFPA RATINGS: (0-4)		NFPA SPECIFIC HAZARDS
Health:	1	
Flammability:	1	
Reactivity:	0	

SYNONYMS: Crumb Rubber, Fine Ground Rubber

SECTION II HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Cured rubber dust. All ingredients are bound up in a cured rubber matrix and the product is not a hazardous material.

SECTION 313 SUPPLIER NOTIFICATION – This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the emergency planning and community right-to-know act of 1986 and of 40CFR 372:

CAS#	Chemical Name	Percent by Weight
01314-13-2	Zinc Oxide	3% (maximum)

SECTION III PHYSICAL / CHEMICAL CHARACTERISTICS

APPEARANCE: Gray to Black Granules
SOLUBILITY IN WATER: Insoluble
SPECIFIC GRAVITY: NA
MELTING POINT: NA
% VOLATILE BY VOLUME: <1% primarily water

ODOR: Rubber odor
VISCOSITY: NA
pH: NA
VAPOR PRESSURE: NA
VAPOR DENSITY: NA

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (COC): NA
AUTO-IGNITION TEMPERATURE: > 660 °F
FLAMMABLE LIMITS IN AIR % BY VOLUME: Upper: NA Lower: NA
EXTINGUISHING MEDIA: Water, Dry Chemical, Foam, or Carbon Dioxide.

SPECIAL FIRE FIGHTING PROCEDURES: All extinguishing media permitted - water recommended. Full emergency equipment with self-contained breathing apparatus should be worn. During combustion, irritating and/or toxic gases and aerosols from decomposition products may be present.

UNUSUAL FIRE OR EXPLOSION HAZARD: This product will ignite when exposed to heat or flame. Rubber burns with intense heat and produces dense smoke. During an uncontrolled fire, incomplete combustion occurs which releases oil, soot (carbon black) and a wide range of hydrocarbon pyrolysis products.

DEFLAGRATION HAZARD: A dust explosion hazard exists with hard rubber in the powder form. Extreme precautions should be taken to prevent accumulations of rubber dust in the air surrounding work environments.

MATERIAL SAFETY DATA SHEET

Date Issued: 3/1/00

SECTION V REACTIVITY DATA

STABILITY: Material is stable.
CONDITIONS TO AVOID: Combustion.

INCOMPATIBILITY (MATERIALS TO AVOID): None known or expected.

HAZARDOUS POLYMERIZATION: Will not occur.

DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, hydrogen, hydrogen sulfide, pentadiene, benzene, xylene, carbon, ash: (zinc oxide, titanium dioxide, silicon dioxide, calcium oxide, and magnesium), oxides of sulfur and nitrogen, sulfides, styrene, toluene, 4-vinyl-1-cyclohexene, 1,5-cyclooctadiene, 1,5,9-cyclododecatriene, various hydrocarbons, and various oxidized hydrocarbons.

SECTION VI HEALTH HAZARD DATA

Note: This product has not been tested by Rouse Rubber Industries, Inc. to determine its specific health hazards. The information provided in this section includes health hazard information for the product components.

CARCINOGENICITY: NTP? No IARC Monographs? Yes OSHA Regulated? No
CARCINOGENICITY/OTHER INFORMATION: This product contains petroleum oils similar to ones categorized by the International Agency for Research on Cancer (ISRC) as causing skin cancer in mice after prolonged and repeated contact. Any potential hazard can be minimized by using recommended protective equipment to avoid skin contact and by washing thoroughly after handling.

OCCUPATIONAL EXPOSURE LIMITS: See Section II.

EFFECTS OF OVEREXPOSURE:

Acute:

Eyes: Slight to moderate eye irritation.
Skin: Moderately irritating.
Inhalation: Irritating to mucous membranes and respiratory tract.
Ingestion: Acute effects of rubber ingestion not determined.

Chronic: There is sufficient evidence for the carcinogenicity of solvent extract from heavy parafinnic distillates in experimental animals.

ADDITIONAL MEDICAL AND TOXICOLOGICAL INFORMATION: May aggravate pre-existing dermatitis. Certain rubber formulations contain trace nitrosamines, some of which are carcinogenic in animal experiments.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Persons with pre-existing skin disorders may be more susceptible may be more susceptible to irritating effects.

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush thoroughly with water, see physician if eye irritation persists.
Skin Contact: Wash skin with soap and water.
Inhalation: Remove to fresh air.
Ingestion: Seek medical attention if large quantities are consumed.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Collect in a manner appropriate for its physical condition

WASTE DISPOSAL METHOD: Dispose of in accordance with Federal, State, and Local regulations.

HAZARD LABEL INFORMATION: Store in a cool dry place.

MATERIAL SAFETY DATA SHEET

Date Issued: 3/1/00

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool dry well ventilated area, away from direct sunlight.

OTHER PRECAUTIONS: Follow all applicable state, local, and federal regulations.

SECTION VIII CONTROL MEASURES

EYE PROTECTION: Use of safety glasses recommended as general safety practice at all times.

PROTECTIVE GLOVES: Wear gloves, minimize skin contact with product, and wash skin after handling.

VENTILATION: Ventilation should be provided at processing machinery to control fumes and odors. Fumes generated during processing or when overheated may by irritating. Respiratory protection is considered necessary where ventilation is not sufficient.

INGESTION: Not applicable.

G.R.	
Fire Hazard	1
Health Hazard	1
Reactivity	0
Personal Protection	B
	wear dust mask to prevent lung irritation

40.) SAFETY KLEEN

safety-kleen®

Material Safety Data Sheet

ASPHALT EXTENDER

Product Code: Prefix 06B

Revision 12/94; Form No. 82409

ASPHALT EXTENDER

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 1 -- PRODUCT AND PREPARATION INFORMATION

PRODUCT INFORMATION:

IDENTITY (TRADE NAME): ASPHALT EXTENDER

SYNONYMS: Vacuum Tower Bottoms; LUWA Bottoms

PRODUCT CODE: Prefix 06B

FAMILY/CHEMICAL NAME: Petroleum hydrocarbon

PRODUCT USE: Blend with asphalt or fuel.
If this product is used in combination with other chemicals, refer to the Material Safety Data Sheets for those chemicals.

24-HOUR EMERGENCY TELEPHONE	*MEDICAL:*	*TRANSPORTATION:*
These numbers are for emergency use only. If you desire non-emergency information about this product, please call a telephone number listed below.	1-800-752-7869 (USA) 1-312-942-5969 (CANADA)	1-708-888-4660 (USA) 1-613-996-6666 (CANADA)

MANUFACTURER/SUPPLIER: Safety-Kleen Corp. - 1000 North Randall Road - Elgin, IL, 60123-7857 USA
Telephone number: 1-800-669-5740
Oil Recovery Division of Safety-Kleen Canada Inc. - 300 Woolwich Street South - Breslau, ON, Canada N0B 1M0 Telephone: 1-800-265-2792
Safety-Kleen Oil Recovery Co. - 601 Riley Road - East Chicago, IN, 46312-1638 USA
Telephone: 1-219-397-1131

PREPARATION INFORMATION

MSDS FORM NO.: 82409 *REVISION DATE:* December 1, 1994

ORIGINAL ISSUE DATE: October 31, 1988 *SUPERSEDES:* March 19, 1993

PREPARED BY: Product MSDS Coordinator *APPROVED BY:* MSDS Task Force

TELEPHONE NUMBER: **For Product Technical Information Call 1-800-265-2792 or 1-519-648-2291**

SECTION 2 -- HAZARDOUS COMPONENTS

				OSHA PEL		ACGIH TLV		OTHER DATA	
NAME	SYNONYM	CAS NO.	WT%	TWA	STEL	TWA	STEL	LD[a]	LC[g]
Used oil vacuum residual	Lubricating oils, used, residues	129893-17-0	100	N.Av.	N.Av.	5[c] mg/m^3	N.Av.	N.Av.	N.Av.
Hydrogen sulfide[d]	Dihydrogen monosulfide	7783-06-4	**	20[e] ppm (ceiling)	50[e,f] ppm	10 ppm	15 ppm	N.Av.	800[b]

N.Av. = Not Available

**The concentration of hydrogen sulfide dissolved in this material is less than 0.1 WT% but may give rise to vapor concentrations in the vapor portions of the storage tanks in excess of the OSHA PEL or ACGIH TLV limits.

[a]Oral LD
[b]Inhalation-Human LCLo (ppm/5 minutes)
[c]For Asphalt (petroleum) fumes
[d]Immediately Dangerous To Life or Health (IDLH) = 300ppm
[e]Reference source 29 CFR 1910.1000 Ch. XVII (7-1-92 edition): 10ppm TWA and 15ppm STEL
[f]Maximum duration: 10 minutes, once, only if no other measurable exposure occurs
[g]Inhalation LC

SECTION 3 -- EMERGENCY AND FIRST AID PROCEDURES

EYES: For direct contact, flush eyes with water for 15 minutes lifting upper and lower lids occasionally. Then, cover eyes with sterile bandages. If irritation or redness from exposure to vapor or mist develops, move victim away from exposure into fresh air. Consult physician if irritation or pain persists.

SKIN: For burns from contact with hot material, immediately cool affected area by drenching or immersing in water until material solidifies. Do NOT remove solidified material as this might cause skin tearing. Cover area with sterile, dry dressing. Seek immediate medical attention.

If contact is NOT with hot material, remove contaminated clothing and shoes. Wash skin twice with soap and water. Consult physician if irritation or pain persists.

INHALATION: (Breathing) Remove to fresh air immediately. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

INGESTION: (Swallowing) Seek immediate medical attention. Do NOT induce vomiting. If spontaneous vomiting occurs, keep head below hips to avoid aspiration (breathing) into the lungs.

SPECIAL NOTE TO PHYSICIAN: No specific antidote available. Treat symptomatically and supportively. Call medical emergency telephone number (see Section 1) for additional information.

SECTION 4 -- HEALTH HAZARD DATA AND TOXICOLOGICAL PROPERTIES

PRIMARY ROUTES OF EXPOSURE: Eye and skin contact; inhalation, ingestion.

EXPOSURE LIMITS: See Section 2.

SIGNS AND SYMPTOMS OF EXPOSURE

ACUTE: *Eyes:* Direct contact with hot material may cause thermal burns. Contact with hot vapors may cause irritation.

Skin: Direct contact with hot material may cause thermal burns. Contact with hot vapors may cause irritation. No significant skin absorption hazard.

Inhalation (Breathing): Inhalation of hot vapors may be irritating to the respiratory tract. Inhalation of hydrogen sulfide released from hot product in enclosed areas may produce unconsciousness, convulsions, respiratory paralysis, coma, and death.

Ingestion (Swallowing): Low order of acute oral toxicity. May cause gastrointestinal irritation and nausea.

CHRONIC: Prolonged or repeated eye exposure to hot vapors may cause conjunctivitis. Prolonged or repeated skin contact with hot vapors may cause drying, cracking, or dermatitis. Prolonged or repeated skin contact with hot vapors may also cause acne-like lesions, mild keratoses (horny growth), photosensitization (sensitivity to light), or melanosis (patchy skin darkening). Workers who were in the habit of chewing asphalt (a similar substance) and sometimes swallowing it have been reported to have stomach valve obstruction because the indigestible mass accumulates in the stomach forming a stony mass.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing lung, skin, or central nervous system disorders may have increased susceptibility to the effects of exposure.

CARCINOGENICITY: IARC classifies chemicals by their carcinogenic risk, including agents that are known, probable, or possible carcinogens. NTP classifies chemicals as either known carcinogens, or for which there is a limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals. ACGIH recognizes several categories of carcinogens, including confirmed human carcinogens, suspected human carcinogens, and animal carcinogens.

No animal skin carcinogenicity tests of this product have been conducted. Neither IARC, NTP, ACGIH, nor OSHA have classified this chemical as to its carcinogenic risk.

Also see Section 9.

OTHER POTENTIAL HEALTH HAZARDS: The following information is required by Canadian WHMIS regulations. Irritancy is covered in *SIGNS AND SYMPTOMS OF EXPOSURE* in Section 4. There is no known human sensitization, toxicologically synergistic product, reproductive toxicity, or teratogenicity associated with this product as a whole. There are no universally recognized test procedures or standards in the scientific community for this product correlating mutagenicity in single-cell micro-organisms with mutagenicity in humans. There is limited evidence which suggests that this product probably does not cause mutagenesis in single-cell micro-organisms.

SECTION 5 -- FIRE AND EXPLOSION HAZARD DATA

EMERGENCY RESPONSE GUIDE NUMBERS: 27
Reference *DOT Emergency Response Guidebook*
49
Reference *Dangerous Goods Initial Emergency Response Guide*

FIRE AND EXPLOSION HAZARDS: Decomposition and combustion products may be toxic. Heated containers may rupture, explode, or be thrown into the air. Not sensitive to mechanical impact or static discharge.

FIRE FIGHTING PROCEDURES: Keep storage containers cool with water spray. Positive-pressure, self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing may provide limited protection.

EXTINGUISHING MEDIA: Carbon dioxide, regular foam, dry chemical, water spray.

CONDITIONS OF FLAMMABILITY: Slight fire hazard when exposed to heat, sparks, or flame.

FLASH POINT: greater than 500°F (260°C) Cleveland Open Cup

AUTOIGNITION TEMPERATURE: 905°F (485°C) (based on a similar material)

FLAMMABLE LIMITS IN AIR: *LOWER:* Not available.
UPPER: Not available.

HAZARDOUS COMBUSTION PRODUCTS: Burning may produce hydrogen sulfide and carbon monoxide.

SECTION 6 -- REACTIVITY DATA

STABILITY: Stable under normal temperatures and pressures, and not reactive with water.

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID): Vapors from hot material may be explosive; avoid heat, sparks, or flame. Do not allow hot product to contact volatile solvents; vapors will ignite readily. Do not allow hot product to contact water or other liquids as this can cause violent eruptions, splatter hot material, or ignite flammable materials.

HAZARDOUS POLYMERIZATION: Not known to occur under normal temperatures and pressures.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal temperatures and pressures. However, thermal decomposition may produce hydrogen sulfide and carbon monoxide.

SECTION 7 -- PREVENTIVE MEASURES

PRECAUTIONS FOR SAFE USE AND HANDLING

HANDLING PRECAUTIONS: This material is normally handled at high temperatures. Vapors from hot material may be explosive; avoid heat, sparks, or flame. Avoid contact with eyes, skin, clothing, or shoes. Use in well ventilated area and avoid breathing vapor or mist.

PERSONAL 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. Discard contaminated clothing, shoes, or protective equipment if they cannot be thoroughly cleaned.

SHIPPING AND STORING PRECAUTIONS: Use dry container to avoid violent eruptions and splattering of hot material. Keep container tightly closed when not in use and during transport. Store in a cool, dry place. Do not pressurize, cut, heat, weld, grind, or expose containers to flame or other sources of ignition. Empty product containers may contain product residue. See Section 9 for Packing Group information.

SPILL PROCEDURES: Remove all ignition sources. Stop leak if you can do it without risk. Wear protective equipment specified in Section 7, CONTROL MEASURES. Ventilate area and avoid breathing vapor or mist. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. For large spills, dike far ahead of liquid spill for later disposal. Contain away from surface waters and sewers. Shovel into closable container for disposal. See *Dot Emergency Response Guidebook* guide number 27 or *Dangerous Goods Initial Emergency Response Guide* guide number 49 for more information.

WASTE DISPOSAL METHODS: Dispose in accordance with federal, state, provincial, and local regulations. Contact Safety-Kleen regarding recycling or proper disposal.

CONTROL MEASURES

EYE PROTECTION: Where there is likelihood of eye contact, wear chemical goggles: use of contact lenses is not recommended.

PROTECTIVE GLOVES: For direct contact with hot material, use combination temperature resistant and chemical protective gloves to prevent contact with skin. For direct contact with cooled material, use Butyl rubber, polyvinyl alcohol, or equivalent gloves to prevent contact with skin.

RESPIRATORY PROTECTION: Use NIOSH/MSHA-approved respiratory protective equipment when concentration of vapor or mist exceeds applicable exposure limit. A self-contained breathing apparatus (SCBA) and full protective equipment are required for large spills or fire emergencies. 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-M1982.

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 recommended exposure limits.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear appropriate chemical and temperature-resistant faceshield, boots, apron, or other protective clothing. Clean water should be available in work areas for flushing the eyes and skin.

SECTION 8 – PHYSICAL DATA

PHYSICAL STATE, APPEARANCE, AND ODOR: Viscous semi-solid, black, asphalt odor.

ODOR THRESHOLD: 0.1 ppm (based on hydrogen sulfide)

SPECIFIC GRAVITY: 0.96 (water = 1)

DENSITY: 8 lb/US gal (960 g/l)

VAPOR DENSITY: greater than 1 (air = 1)

VAPOR PRESSURE: 0.2 mm Hg at 175°F (79°C)

BOILING POINT: greater than 800°F (426°C)

FREEZING POINT: Not available.

pH:	7
VOLATILE ORGANIC COMPOUNDS: (PHOTOCHEMICALLY REACTIVE) AS PER 40 CFR PART 51.100(S)	100 WT%; 8 lb/US gal; 960 g/l
EVAPORATION RATE:	0 (butyl acetate = 1)
SOLUBILITY IN WATER:	Insoluble.
COEFFICIENT OF WATER/OIL DISTRIBUTION:	less than 1
MOLECULAR WEIGHT:	greater than 400

SECTION 9 -- OTHER REGULATORY INFORMATION

TRANSPORTATION INFORMATION:	DOT information is only applicable when transportation temperature is greater than 212°F (100°C). Otherwise, not regulated.
DOT PROPER SHIPPING NAME:	ELEVATED TEMPERATURE MATERIAL, LIQUID, N.O.S. (FLUX)
DOT CLASS:	9
DOT ID NUMBER:	NA9259, Packing Group III
TDG CLASSIFICATION:	Not regulated.
SARA TITLE III:	Components listed in Section 2 are not 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. 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: Immediate (Acute) Health Hazard Delayed (Chronic) Health Hazard
WHMIS CLASSIFICATION:	Not regulated.
TSCA:	All the components of this product are listed on the TSCA Inventory.
CALIFORNIA:	This product may contain detectable amounts of chromium CAS 7440-47-3, lead CAS 7439-92-1, and nickel CAS 7440-02-0. These materials are listed by the State of California as known carcinogens. This product may contain a detectable amount of lead CAS 7439-92-1. This material is listed by the State of California as known to cause reproductive toxicity.

User assumes all risks incident to the use of this product. 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 expressed 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 material as supplied to the user.

41.) SASOBIT

Date Issued : 06/28/00
Revision : 0

MATERIAL SAFETY DATA SHEET

MOORE & MUNGER MARKETING, INC.
Two Corporate Drive, Suite 434 Shelton, CT 06484
Emergency Phone: 203/925-4300 Other Calls: 203/925-4300

SECTION I - IDENTITY

Product Name: SASOBIT

Synonyms: Synthetic Paraffin, Fischer-Tropsch Wax

CAS No.: 8002-74-2
TSCA Status: All components of this product are listed on the U.S. TSCA inventory
WHMIS Classification: Not WHMIS Regulated
CEPA Status: All the ingredients of this product are listed on the Domestic Substances List (DSL)
Chemical Family: Paraffinic Hydrocarbons
Purity: 100% **Molecular Weight:** 1300

SECTION II - HAZARDOUS INGREDIENTS

Ingredient: None known
Threshold Limit: 2 mg/m^3 for wax fumes in air for an 8-hour workday

SECTION III - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point:	Not Determined	**Melting Point:**	216°F/102°C
Specific Gravity:	0.95	**Vapor Pressure mm/Hg:**	<1
Percent Volatile by Vol:	0.00	**Vapor Density Air = 1:**	1+
Flammable Limit:	Not Determined	**Solubility in Water:**	Negligible
Reactivity with Water:	No	**Flash Point:**	554°F/290°C
Evaporation Rate:	<1 as compared to BUAC	**Auto-Ignite Temp:**	Unknown
Appearance:	White	**Odor:**	Essentially Odorless

Fire Extinguisher Media: Foam, water spray (fog), dry chemical, CO_2 and vaporizing liquid types.
Special Fire Fighting Procedures: Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.
Unusual Fire and Explosion Hazards: Pressure will increase when over-heated in closed containers. Cool containers with water spray.

SECTION IV - PHYSICAL HAZARDS

ability: Stable
Polymerization: No
Incompatible Substances: Strong oxidants
Hazardous Decomposition Products: Partial burning produces fumes, smoke and carbon monoxide

SECTION V - HEALTH HAZARDS

Threshold Limit Value: 2 mg/m^3 for wax fumes
Signs and Symptoms of Over Exposure: Dizziness, headache, respiratory irritation or unconsciousness
Medical Conditions Generally Aggravated by Exposure: Unknown
Carcinogen: No
Oral LD50: >3000 mg/Kg (Rabbit) **Dermal LD50:** >5,000 mg/Kg (Rat) **Inhalation LC50:** Not Determined
Skin and Eye Irritative Effects (Rabbit): None

National Toxicology Program:	No	**O.S.H.A.:**	Unknown
O.S.H.A. Exposure Limit:	N/A	**A.C.G.I.H. Threshold Limit:**	N/A
I.A.R.C. Monograms:	No	**Other Exposure Limit:**	N/A

Emergency First Aid Procedures: If burned by molten product, quench immediately with cold tap water. Dry burn area and loosely cover to protect against infection. DO NOT apply ointments or salves. Consult a Physician if the burn is severe or covers a large area. If overcome by fumes, remove from exposure area immediately; call a Physician.

SECTION VI - SPECIAL PROTECTION INFORMATION

spiratory Protection: Normally not required. Use respirator for mist if handling molten product.
Ventilation Required: Provide sufficient ventilation
Local Exhaust Required: Face velocity greater than 60 CFM
Mechanical Protection: No special requirement
Other Protection: Splash goggles or face shield
Protective Clothing: Gloves and apron or lab coat

SECTION VII - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage: Use product with caution around heat, sparks, static electricity and open flame.
Precautions to be taken in case of a Spill or Leak: Remove ignitions sources. Keep people away. Recover liquid and scrape up any solidified material. Add absorbent (sand, sawdust, etc.) to liquid spill area. Minimize breathing of fumes. Ventilate confined spaces. Open all windows and doors. Advise authorities if product enters sewers.
Waste Disposal Procedures: Assure conformity with applicable disposal regulations. Dispose of absorbed material at approved waste site.

Reportable Quant.(RQ), EPA Reg. 40, CFR 302:	N/A
Threshold Planning Quant.(TPQ), EPA Reg.40, CFR 355:	N/A
Toxic Chem. Release Reporting, EPA Reg.40, CFR 372:	N/A
EPA Hazard Classification Code:	N/A

The information in this form is accurate to the best of our knowledge.

State of California DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

MATERIAL SAFETY DATA SHEET

(This voluntary form is provided by Cal/OSHA to assist MSDS preparers and users. Any format may be used as long as it contains all the required information.)

I. PRODUCT IDENTIFICATION

Trade name (as labeled) ULTRAPAVE 70

Chemical names, common names STYRENE/BUTADIENE - ANIONIC

Manufacturer's name TEXTILE RUBBER & CHEMICAL CO.
Address 14241 E. ALONDRA BLVD. LA MIRADA, CA 90638
Emergency phone (213)944-6291 Name of preparer*
Business phone (213)944-6291 Date prepared Revised April 5, 1988

II. HAZARDOUS INGREDIENTS

Chemical Names	CAS Numbers	Percent*	Exposure Limits in Air ACGIH(TLV)	OSHA(PEL)	Other
RESIDUAL STYRENE	100-42-5	<0.08	50 PPM	100 PPM	
RESIDUAL BUTADIENE	106-99-0	<0.005	10 PPM	1000 PPM	

(SEE SECTION IX)

III. PHYSICAL PROPERTIES

Vapor density (air=1) +N/A
Melting point or range, F +N/A
Specific gravity 1.0
Boiling point or range, F 212
Solubility in water miscible
Vapor pressure, mmHg at 20 C +N/A
Evaporation rate (butyl acetate = 1) ++N/E
Appearance and odor Liquid-white, Ammonia odor

HOW TO DETECT THIS SUBSTANCE* (warning properties of substance as a gas, vapor, dust, or mist)

*Not required. Space has been provided on this form for optional use.

+N/A = Not applicable
++N/E = Not established

IV. FIRE AND EXPLOSION

Flash Point, F (give method) +N/A

Autoignition temperature, F N/A

Flammable limits in air, volume %: lower 1.1 (residual monomers) upper 11.5 (residual monomers)

Fire extinguishing materials:

_X water spray __ carbon dioxide __ other:

__ foam __ dry chemical

Special firefighting procedures: During emergency conditions, thermal decomposition products may present a health hazard. NIOSH approved, self-contained breathing apparatus should be worn.

Unusual fire and explosion hazards: Although this material is non-flammable, vapors can collect above the liquid in closed containers and storage vessels which may flash if exposed to an ignition source.

V. HEALTH HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: N/E

Contact with skin or eyes: N/E

Absorbed through skin: N/E

Swallowed: N/E

HEALTH EFFECTS OR RISKS FROM EXPOSURE. Explain in lay terms. Attach extra page if more space is needed.

Acute: See attached

Chronic: See attached

FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Flush thoroughly with water. Seek medical assistance. Acute effects from residual monomers could be delayed for several hours.

Skin Contact:

Remove contaminated clothing and wash skin with soap and water.

Inhaled:

Remove to fresh air.

Swallowed:

Seek immediate medical attention.

SUSPECTED CANCER AGENT?

_X_ NO: This product's ingredients are not found in the lists below.

YES: __Federal OSHA __NTP __IARC __Cal/OSHA(see note)*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE N/E

RECOMMENDATIONS TO PHYSICIAN NONE

VI. REACTIVITY DATA

Stability: _X_Stable __Unstable

Conditions to avoid: None known

Incompatibility (materials to avoid): None known

Hazardous decomposition products (including combustion products):

Solids by combustion; oxides of carbon and nitrogen

Hazardous polymerization: __May occur X__Will not occur

Conditions to avoid: None known

VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):

Absorb with sawdust or other absorbent material; shovel into container for disposal. Flush away small spills with water.

Preparing wastes for disposal (container types, neutralization, etc.): Coagulate the latex with alcohol or alum. Filter the solids off. Dispose by industrial landfill. The remaining water can be flushed down a sanitary drain.

NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls There should be enough fresh air flowing past the user to keep the residual monomer vapors below the TLV's listed in section II.

Respiratory protection If the workplace residual monomer vapor concentration should exceed the TLV, use a NIOSH approved air purifying chemical cartridge respirator or an air supply respirator.

Eye protection (type) Chemical goggles

Gloves (specify material) Rubber or PVC

Other clothing and equipment Eye wash

Work practices, hygienic practices Practice good personal hygiene

Other handling and storage requirements Do not allow to freeze

Protective measures during maintenance of contaminated equipment

As for ventilation and respiratory protection above.

IX. LABELING

Labeling (precautionary statements)* Since the residual monomers are significantly below 1%(styrene) and 0.1% butadiene, this product is not considered a hazardous chemical by the OSHA Hazard Communication Standard, CFR Title 29 1910.1200

D.O.T. Label*

HEALTH EFFECTS OR RISKS FROM EXPOSURE:

ACUTE: This material is a high molecular weight synthetic polymer emulsified in water and does not have any known effects. However, residual butadiene and styrene are present in the latex (see sec.II) Overexposure to the residual monomer vapors could result in eye and upper respiratory irritation and central nervous system depression.

CHRONIC: Butadiene is an animal carcinogen. 1,3 butadiene has been determined to cause cancer in laboratory animals. However, a study of 13,920 employees in eight plants did not indicate any statistically significant increases in cancer incidence. 1,3 butadiene is classified as carcinogenic by NTP and IARC. Other studies on laboratory animals indicated that at very high concentrations, butadiene effected the developing fetus. IARC has classified 1,3 butadiene as "Class 2B: possibly carcinogenic to humans."

42.) SILICA GEL

EM SCIENCE

REVISED

111 Woodcrest Road, Cherry Hill, New Jersey 08034-0395, Phone (609) 354-9200

MATERIAL SAFETY DATA SHEET

Essentially Similar to U.S. Department of Labor Form OSHA-20

SECTION 1 NAME & PRODUCT

Chemical Name: Silica Gel	Catalog Number: SX0139, SX0143, SX0143B, SX0143E, SX0143F, SX0143G, SX0143H, SX0143J, SX0143K, SX0143L
Trade Name & Synonyms: Amorphous Silica, Precipitated Silicic Acid	Chemical Family: Inorganic Oxide
Formula: SiO_2	CAS #1343-98-2
Formula Weight: 60.09	

SECTION 2 PHYSICAL DATA

Boiling Point, 760 mm Hg (°C)	unavailable	Specific Gravity (H_2O = 1)	2.2
Melting Point (°C)	1710°	Solubility in H_2O, % by wt. at 20°C	insoluble
Vapor Pressure at 20°C	unavailable	Appearance and Odor	white (except indicating grades)
Vapor Density (air = 1)	unavailable	odorless crystals, powder, or granules	
Percent Volatiles by Volume	unavailable	Evaporation Rate (Butyl Acetate = 1)	unavail

SECTION 3 FIRE AND EXPLOSION HAZARD DATA

Flash Point (test method)	Noncombustible	Flammable Limits	Lel unavail	Uel	unavail

Extinguishing Media: Any suitable for surrounding materials

Special Hazards and Procedures: None indicated

Unusual Fire and Explosion Hazards: None indicated

SECTION 4 REACTIVITY DATA

Stable X	Conditions to Avoid: Moisture; Heating above 600°F (will destroy desiccant properties)
Unstable	

Materials to Avoid

( ) Water (X) HF Acids ( ) Bases ( ) Corrosives ( ) Oxidizers

(X) Other (specify) Strong alkalies

Hazardous Decomposition Products: None indicated

SECTION 5 SPILL OR LEAK PROCEDURES AND DISPOSAL

Steps to be Taken in Case Material is Released or Spilled: Take up & containerize for proper disposal

Waste Disposal Method: To be performed in compliance with all current local, state and federal regulations

The statements contained herein are offered for informational purposes only and are intended to be followed only by persons having related technical skills and at their own discretion and risk. Since conditions and manner 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.

SECTION 6 HEALTH HAZARD DATA

Threshold Limit Value

Effects of Overexposure

May irritate eyes on contact
Prolonged or repeated inhalation of dust may cause lung damage (pulmonary fibrosis)

First Aid Procedures

GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE

Skin:	wash with soap and water
Eyes:	flush thoroughly with water for 15 minutes
Inhalation:	remove to fresh air
Ingestion:	get medical attention

SECTION 7 SPECIAL PROTECTION INFORMATION

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection

Provide adequate general mechanical and local exhaust ventilation
Wear dust respirator, apron, long sleeves
protect eyes and skin with safety goggles and gloves
use only in hood
Use utmost caution to prevent inhalation of dust

SECTION 8 SPECIAL HANDLING AND STORING PRECAUTIONS

Keep container tightly closed

Wash thoroughly after handling

SECTION 9 HAZARDOUS INGREDIENTS

(refer to section 3 through 8)

N/A

SECTION 10 OTHER INFORMATION

Note: Indicating grades contain a small amount (approx. 0.1%) of an indicating compound which does not affect the hazard or protection requirement data contained herein.

EMERGENCY PHONE NUMBER (609) 354-9200

AUTHORIZED SIGNATURE

DATE ISSUED: 9/83

DATE REVISED: 6/85

MATERIAL SAFETY DATA SHEET
COPYRIGHT GENERAL ELECTRIC CO.

MANUFACTURED BY:

GENERAL ELECTRIC CO.
SILICONE PRODUCTS DIV
WATERFORD, NY 12188

EMERGENCY TELEPHONE:

(518) 237-3330 (24 HRS)

SUPPLIED BY:

GENERAL ELECTRIC CO.
SILICONE PRODUCTS DIV
WATERFORD, NY 12188

(518) 237-3330 (24 HRS)

REVISED: 07/31/89
PREPARER: DA POLSINELLI

*** I PRODUCT IDENTIFICATION ***

PRODUCT IDENTIFICATION: SF1188
CHEMICAL FAMILY
SILICONE SILOXANE FLUID
CHEMICAL NAME: SILICONE POLYETHER COPOLYMER FORMULA: MIXTURE

*** II PRODUCT COMPONENTS ***

PRODUCT COMPOSITION	APPROX. WGT. %	ACGIH TLV	OSHA PEL	UNITS	CAS REG NO.
A. HAZARDOUS					
NONE KNOWN	NA	NA	NA	NA	NA
B. NON-HAZARDOUS					

FORMULATION INFORMATION:
THIS SPACE RESERVED FOR SPECIAL USE.

*** III PHYSICAL DATA ***

**PRODUCT INFORMATION

BOILING POINT	: NA (F) NA (C)	% VOLATILE BY VOLUME	:<1.0
VAPOR PRESSURE(20 C)	: NEGL. MM HG	EVAPORATION RATE	:NA
VAPOR DENSITY(AIR=1)	: NEGL.	(BUTYL ACETATE=1)	
FREEZING POINT	: NA (F) NA (C)	SPECIFIC GRAVITY	:1.06
MELTING POINT	: NA (F) NA (C)	(WATER=1)	
PHYSICAL STATE	: LIQUID	DENSITY	:1059 KG/M3
ODOR	: MILD	ACID/ALKALINITY	:ESS.NEUT MEG/G
COLOR	: YELLOW	PH	:NA
ODOR THRESHOLD	: UNK (PPM)		

SOLUBILITY IN WATER(20C): SOLUBLE
SOLUBILITY IN ORGANIC SOLVENT: UNKNOWN
(STATE SOLVENT)

*** IV FIRE AND EXPLOSION DATA ***

FLASH PT: >200 (F) >93 (C) BY PMCC. IGNITION TEMP: UNKN(F) UNKN (C)
FLAMMABLE LIMITS IN AIR(%): LOWER NA UPPER NA
SENSITIVITY TO MECHANICAL IMPACT (Y/N): N
SENSITIVITY TO STATIC DISCHARGE:
SENSITIVITY TO STATIC DISCHARGE IS NOT EXPECTED.
EXTINGUISHING MEDIA:
ALL STANDARD FIREFIGHTING MEDIA
SF IAL FIREFIGHTING PROCEDURES:
VAPORS MAY FORM EXPLOSIVE MIXTURE WITH AIR.

*** V REACTIVITY DATA ***

STABILITY:
X STABLE UNSTABLE
HAZARDOUS:
POLYMERIZATION WILL NOT OCCUR
HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS:
CARBON MONOXIDE.
CARBON DIOXIDE.
SILICON DIOXIDE.
ALDEHYDES.
INCOMPATIBILITY (MATERIALS TO AVOID):
NONE KNOWN.
CONDITIONS TO AVOID:
PRODUCT GENERATES FLAMABLE GAS ON CONTACT WITH ACIDS, BASES OR OXIDIZING MATERIALS.

*** VI HEALTH HAZARD DATA ***

ACUTE SIGNS/EFFECTS OF OVEREXPOSURE:
INGESTION:
NONE KNOWN
SKIN CONTACT:
SKIN IRRITATION IS NOT EXPECTED, BUT MAY OCCUR IN CERTAIN

SENSITIVE INDIVIDUALS.
INHALATION:
NONE KNOWN.
EYE CONTACT:
MAY CAUSE MILD EYE IRRITATION.
MEDICAL CONDITIONS AGGRAVATED:
NONE KNOWN.
OTHER:
NONE KNOWN.
CHRONIC EFFECTS OF OVEREXPOSURE:
NONE KNOWN.

EMERGENCY AND FIRST AID PROCEDURES:
INGESTION:
RINSE MOUTH WITH WATER SEVERAL TIMES.
SKIN:
WASH WITH SOAP AND WATER.
INHALATION:
NONE KNOWN.
EYES:
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
NC TO PHYSICIAN:
NONE KNOWN.

TOXICITY: **PRODUCT INFORMATION
ACUTE ORAL LD50: NONE FOUND MG/KG
ACUTE DERMAL LD50: NONE FOUND MG/KG
ACUTE INHALATION LC50: NONE FOUND
OTHER: NONE.

AMES TEST: UNKNOWN
PRINCIPALS ROUTES OF EXPOSURE:
NONE KNOWN.
THIS PRODUCT OR ONE OF ITS INGREDIENTS PRESENT 0.1% OR MORE IS NOT LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN BY NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS
THIS SPACE RESERVED FOR SPECIAL USE.

PREVENTIVE MEASURES (SECTIONS VII, VIII, IX)

*** VII SPECIAL PROTECTIVE EQUIPMENT ***
RESPIRATORY PROTECTION:
NONE KNOWN.
PROTECTIVE GLOVES:

NONE KNOWN.
EYE AND FACE PROTECTION:
SAFETY GLASSES.
OTHER PROTECTIVE EQUIPMENT:
NONE KNOWN.
VENTILATION:
NONE KNOWN.

*** VIII SPILL, LEAK AND DISPOSAL PROCEDURES ***

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
WIPE, SCRAPE OR SOAK UP IN AN INERT MATERIAL AND PUT IN A CONTAINER FOR DISPOSAL.
WASH WALKING SURFACES WITH DETERGENT AND WATER TO REDUCE SLIPPING HAZARD.
DISPOSAL METHOD:
DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
INCINERATION RECOMMENDED IN APPROVED INCINERATOR ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.

*** IX SPECIAL PRECAUTIONS ***

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
AVOID CONTACT WITH SKIN AND EYES.
ENGINEERING CONTROLS:
EYEWASH STATIONS.

*** X SHIPPING AND REGULATORY CLASSIFICATION DATA ***

DOT SHIPPING NAME: NA
DOT HAZARD CLASS: NA
DOT LABELS(S): NA
UN/NA NUMBER: NA
PLACARDS:
NONE
EXPORT:
NA

EPA HAZARD WASTE: NA
SARA HAZARD CLASS:
TO BE DETERMINED
WHMIS HAZARD CLASS:
NO KNOWN WHMIS CLASS

CPSC CLASSIFICATION: NA
TRANSPORTATION CLASS: NA
RID (OCTI) NA
ADR (ECE) NA
RAR (IATA) NA
NFPA/HMIS CLASSIFICATION FLAMMABILITY 0 , REACTIVITY 0 , HEALTH 0

SCHEDULE B:
3910.00.20009
ECCN:
6799G

ADDITIONAL INFORMATION:
THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTENT OF THE INTENDED USE.....
.....
THIS PRODUCT OR ITS COMPONENTS ARE ON THE AUSTRALIAN INVENTORY (ACOIN).....
.....

C =	CEILING LIMIT	NEGL =	NEGLIGIBLE
EST=	ESTIMATED	NF =	NONE FOUND
NA =	NOT APPLICABLE	UNKN =	UNKNOWN
NE =	NONE ESTABLISHED	REC =	RECOMMENDED
ND =	NONE DETERMINED	V =	RECOMM. BY VENDOR
BY-PRODUCT =	REACTION BY-PRODUCT, TSCA INVENTORY STATUS NOT REQUIRED UNDER 40 CFR PART 720.30(H-2)	SKN =	SKIN
		TS =	TRADE SECRET
		R =	RECOMMENDED
		MST =	MIST
STEL =	SHORT TERM EXPOSURE LIMIT		

.....
THIS PRODUCT CONTAINS A MATERIAL THAT IS ON THE CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS.
WARNING! THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.....
.....

44.) SLIP LB

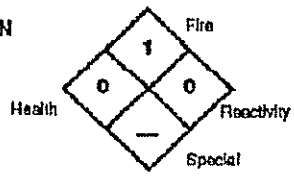
MATERIAL SAFETY DATA SHEET

GREAT WESTERN CHEMICAL COMPANY

ISSUE DATE: 07/26/94	SUPERSEDES: NEW
GREAT WESTERN MSDS NUMBER: 89554	

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: SLIP LB

GENERAL USE: This product is used as a release coating for metals.

PRODUCT DESCRIPTION: An organic mixture, non-hazardous per 29 CFR 1910.1200.

INFORMATION PROVIDED BY:
GREAT WESTERN CHEMICAL COMPANY
Corporate Office
808 S.W. 15th Avenue
Portland, OR 97205
PHONE: 503-228-2600 FAX: 503-221-5767

EMERGENCY PHONE NUMBERS

GREAT WESTERN:	800-GW-SPILL
CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

COMPONENT	CAS #	OSHA HAZARD	Wt%	ACGIH TLV (TWA)	ACGIH STEL	OSHA PEL (TWA)	OSHA STEL
Component #1	Trade Secret	Non-hazardous per 29 CFR 1910.1200	70 ± 10	10 mg/m³ (Vegetable oil mists)	None	5 mg/m³ (Vegetable oil mists)	None
Component #2	Trade Secret	Non-hazardous per 29 CFR 1910.1200	30 ± 10	None	None	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
A clear, amber liquid with no characteristic odor. Product is not a combustible liquid per 29 CFR 1910.1200, but can be ignited at elevated temperatures and will burn. Liquid and mist are not expected to be irritating to eyes, skin or respiratory tract. Product is practically non-toxic by ingestion.

POTENTIAL HEALTH EFFECTS:

INHALATION: Inhalation of mists is not expected to be irritating to the respiratory tract.

EYE CONTACT: Exposure to mist or liquid is not expected to cause eye irritation.

SKIN CONTACT: Exposure to mist or liquid is not expected to cause skin irritation. Published data on components does not indicate the product poses a hazard due to absorption through the skin.

INGESTION: Ingestion is not expected to cause gastrointestinal irritation.

CHRONIC: Prolonged or repeated exposure to this product is not expected to present a chronic health risk.

CONTINUED ON PAGE 2

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, flush eyes with plenty of clean running water. Remove contact lenses, if worn. Get medical attention if symptoms occur.

SKIN CONTACT: In case of contact, flush skin with plenty of clean running water. Remove contaminated clothing and shoes.

INGESTION: If large quantities of this material are swallowed, call a physician immediately. **DO NOT** induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Treat symptomatically. Product is practically non-toxic by ingestion.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: 328° C (622° F) Tagliabue Open Cup

Flammable Limits (in air, % by volume): **Lower:** Not determined **Upper:** Not determined

Autoignition Temperature: Not determined

GENERAL HAZARD: Product is a non-flammable organic mixture. The Uniform Fire Code rating for this product would be a Class IIIB Combustible Liquid. Product will ignite at elevated temperatures and will burn. Product may produce hazardous fumes or hazardous thermal decomposition products.

FIRE FIGHTING INSTRUCTIONS: **EXTINGUISING MEDIA:** Water fog, CO_2, foam or dry chemical.

Use a water spray to cool containers exposed to fire. Use extinguising media appropriate to surrounding fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition of this material will produce carbon monoxide and carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Wearing recommended protective clothing, dike spill and pick up bulk of liquid or absorb liquid in sand or a commercial absorbent. Place in approved containers for recovery or disposal. Flush spill area with water, collect rinsates and containerize for disposal. Prevent run-off from contaminating sewers, streams or other bodies of water.

WATER SPILL: This material is lighter than water and the solubility in water is negligible. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. Notify all downstream users of possible contamination.

CONTINUED ON PAGE 3

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated place. Do not take internally. Avoid contact with skin, eyes and clothing. Avoid breathing mists. Use only with adequate ventilation. Keep container tightly closed when not in use. Wash hands thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL MEASURES: A local mechanical exhaust ventilation is recommended if mists are generated and the ACGIH TLV or the OSHA PEL is exceeded.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATOR: Respiratory protection is not normally required. If use creates mists, and the ACGIH TLV or the OSHA PEL is exceeded, then a NIOSH approved respiratory with a dust and mist cartridge is recommended.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979).

GLOVES: Neoprene or natural rubber gloves.

CLOTHING & EQUIPMENT: Wear a neoprene or natural rubber apron when handling product. A eye wash station should be available in the work area.

FOOTWEAR: Neoprene or natural rubber boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, amber	Bulk Density (pounds/ft³):	Not applicable
Physical State:	Liquid	Vapor Pressure:	No data available
Odor:	None	Vapor Density (air=1):	No data available
Odor Threshold:	No data available	Evaporation Rate (n-Butyl Acetate=1):	No data available
Molecular Formula:	Not applicable - Mixture	VOC Content:	920 g/l
Molecular Weight:	Not applicable - Mixture	% Volatile:	100
Boiling Point:	No data available	Solubility in H_2O:	Negligible
Freezing/Melting Point:	No data available	Octanol/Water Partition Coefficient:	No data available
Specific Gravity:	0.92 @ 20° C.	pH (as is):	Not applicable - non-aqueous
Density (pounds/gallon):	7.67	pH (1% solution):	6.0 to 8.0

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIAL: Strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition of this material will produce carbon monoxide and carbon dioxide.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

CONTINUED ON PAGE 4

11. TOXICOLOGICAL INFORMATION

Components:	Component #1	Component #2
Eye Contact:	No data available	No data available
Skin Contact:	No data available	No data available
Oral Rat LD_{50}:	No data available	No data available
Dermal Rabbit LD_{50}:	No data available	No data available
Inhalation Rat LC_{50}:	No data available	No data available
Human Data:	No data available	No data available
Other Toxicological Data:	No data available	No data available
Carcinogenicity:	No data available	No data available
Teratogenicity:	No data available	No data available
Mutagenicity:	No data available	No data available
Synergistic Products:	None reported	None reported
Target Organs:	None reported.	None reported
Medical Conditions Aggravated by Exposure:	None reported	None reported

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
The solubility of this mixture in water is negligible. No specific environmental fate data available.

ENVIRONMENTAL EFFECTS:
Aquatic toxicity information for this product is not available.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATION: Not classified

U.S. EPA WASTE NUMBER/DESCRIPTION: None

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D. As a non-hazardous liquid waste, it should be disposed of in accordance with all local, state and federal regulations. Consult state or local officials for proper disposal method.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not Regulated

DOT HAZARD CLASS: None

UN NUMBER: None

PACKING GROUP: None

DOT LABELS: Primary: None Required Subsidiary: None Required

DOT PLACARDS: None Required

CERCLA Reportable Quantity: None

MARINE POLLUTANT: No

DOT Emergency Response Guidebook Number: None

TDG PROPER SHIPPING NAME: Not Regulated

TDG HAZARD CLASS: None Regulated Limit (RL): None

UN NUMBER: None

PACKING GROUP: None

TDG LABELS: Primary: None Required Subsidiary: None Required

TDG PLACARDS: None Required

CANUTEC Initial Emergency Response Guide Number: None

Other Shipping Information:
None

CONTINUED ON PAGE 5

12. REGULATORY INFORMATION

Components:	Component #1	Component #2
OSHA		
Target Organs:	None reported	None reported
Carcinogenic Potential:		
Regulated by OSHA:	No	No
Listed on NTP Report:	No	No
IARC Listing:	No	No
U.S. EPA Requirements		
Release Reporting		
CERCLA (40 CFR 302):		
Listed Substance:	Not listed	Not listed
Reportable Quantity:	Not applicable	Not applicable
Category:	Not applicable	Not applicable
RCRA Waste No.:	Not applicable	Not applicable
Unlisted Substance:	Not applicable	Not applicable
Reportable Quantity:	Not applicable	Not applicable
Characteristic:	Not applicable	Not applicable
RCRA Waste No.:	Not applicable	Not applicable
SARA TITLE III		
Section 302 & 303 (40 CFR 355)		
Listed Substance:	Not listed	Not listed
Reportable Quantity:	Not applicable	Not applicable
Planning Threshold:	Not applicable	Not applicable
Section 311 & 312 (40 CFR 370)		
Hazard Categories (product):	Fire: N Sudden Release of Pressure: N Reactive: N Acute Health: N Chronic Health: N	
Planning Threshold:	10,000 pounds	10,000 pounds
Section 313 (40 CFR 372)		
Listed Toxic Chemical:	Not listed	Not listed
Reporting Threshold:	Not applicable	Not applicable
U.S. TSCA STATUS		
Listed (40 CFR 710):	Yes	Yes
CANADIAN REGULATIONS		
Controlled Product:	Not a Controlled Product	
WHMIS Hazard Symbols:	None required	
WHMIS Class & Division:	None	
Product Identification Number:	None	
IDL Substance:	Not listed	Not listed
Domestic Substance List:	Yes	Yes
CEPA Priority List:	Not listed	Not listed
Carcinogenicity:		
ACGIH Appendix A:	No	No
A1 Confirmed Human:	No	No
A1 Suspected Human:	No	No
IARC Group:	Not listed	Not listed
STATE REGULATIONS:		
State of California		
Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65)		
Carcinogen:	No	No
Reproductive Toxin:	No	No
OTHER REGULATIONS:		
State Right To Know Laws:	Not listed	Not listed

CONTINUED ON PAGE 6

16. OTHER INFORMATION

EPA Registration number: Not Applicable

Approved Product Uses: Not Applicable

NFPA 704		
	Health:	0
	Fire:	1
	Reactivity:	0
	Special:	—

MSDS Revision Information:

Form Revision made 02/09/94

Information Revised This Issue Date: NEW MSDS.

MSDS distributed by Great Western Chemical Company

Environmental Department

Phone: 800-547-1403 FAX: 503-221-5767

Prepared by:	David L. Bishop	Date Prepared:	July 26, 1994

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

45.) SODIUM BICARBONATE

MATERIAL SAFETY DATA SHEET

Sodium Bicarbonate

MSDS Ref. No: 144-55-8
Version: US/Canada
Date Approved: 06/05/2002
Revision No: 2

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Bicarbonate
SYNONYM(s): Baking Soda, Bicarbonate of Soda
GENERAL USE: Leavening agent, cleaner ingredient, bath salt ingredient, water softener, diaper rinse ingredient, feed additive.

This chemical is certified to ANSI/NSF Standard 60, Drinking Water Chemicals-Health Effects. The maximum dosage level for this chemical is 100 mg/L.

MANUFACTURER

FMC Wyoming Corporation
Alkali Chemicals Division
1735 Market Street
Philadelphia, PA 19103
General Information: 215-299-6000

Emergency Telephone Numbers:

CHEMTREC (U.S.): (800) 424-9300
Emergency Phone (303)595-9048
(Medical - call collect)
Emergency Phone (307) 875-2580 (Green River, WY-call collect)

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%
Sodium Bicarbonate	144-55-8	100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: White, granular solid. Product is non-combustible. Reacts with acids to release carbon dioxide gas and heat.

POTENTIAL HEALTH EFFECTS: No significant health effects anticipated.

4. FIRST AID MEASURES

EYES: Flush with plenty of water. Get medical attention if irritation occurs and persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Drink plenty of water. Never give anything by mouth to an unconscious person. If any discomfort persists, obtain medical attention.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: Internal toxicity is low. Treatment is symptomatic and supportive.

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: Non-combustible

FLAMMABLE LIMITS: Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

EXTINGUISHING MEDIA: Water, water fog, carbon dixoide (CO_2), dry chemical

HAZARDOUS COMBUSTION PRODUCTS: None

FIRE / EXPLOSION HAZARDS: None

FIRE FIGHTING PROCEDURES: None

SENSITIVITY TO STATIC DISCHARGE: None

SENSITIVITY TO IMPACT: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

6. ACCIDENTAL RELEASE MEASURES

GENERAL PROCEDURES: Sweep up as much as possible for salvage or disposal. Wash away residue with water.

---

7. HANDLING AND STORAGE

HANDLING: Use air conveying/mechanical systems for bulk transfer to storage. For manual handling of bulk transfer use mechanical ventilation to remove airborne dust from railcar, ship or truck. Use approved respiratory protection when ventilation systems are not available. Selection of respirators is based on the dust cloud generated.

STORAGE: Store in a cool dry area, away from acids.

COMMENTS: Use general room dilution or local exhaust ventilation when excessive dust is expected in the work environment.

---

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Minimize eye and skin contact by using appropriate protective equipement. Use local or general room ventilation to control airborne dust that may be generated into the work environment.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Chemical goggles

RESPIRATORY: Wear MSHA-NIOSH approved dust respirator or dust mask if visible dust levels are experienced or anticipated.

PROTECTIVE CLOTHING: General purpose gloves. Full cover clothing.

---

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Odorless

APPEARANCE: White, granular solid.

pH: (1% solution): 8.3

PERCENT VOLATILE: Not available

VAPOR PRESSURE: Not available

VAPOR DENSITY: (Air = 1): Not applicable

BOILING POINT: Not applicable

MELTING POINT: Decomposes

SOLUBILITY IN WATER: % by wt. @ 20°C (68°F): 9.0

EVAPORATION RATE: (Butyl Acetate = 1) Not applicable

DENSITY: 0.88 g/mL

SPECIFIC GRAVITY: (H2O = 1) 2.20

COEFF. OIL/WATER: Not available

ODOR THRESHOLD: Not applicable

OXIDIZING PROPERTIES: Not applicable

---

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Contact with acids except under controlled conditions.

STABILITY: Stable

POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: None

INCOMPATIBLE MATERIALS: Reacts with acids to release carbon dioxide gas and heat.

---

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Non-irritating (rabbit) J. Amer. Coll. Toxicol. 1987

SKIN EFFECTS: Non-irritating (rabbit) J. Amer. Coll. Toxicol. 1987

DERMAL LD_{50}: No data available for the product.

ORAL LD_{50}: 4300 mg/kg (rat) (20% slurry)
6000 mg/kg (rat) (50% slurry)
Gosselin, Smith & Hodge, Clinical Tox. of Comm. Products, 1984

INHALATION LC_{50}: No data available for the product.

TARGET ORGANS: None

ACUTE EFFECTS FROM OVEREXPOSURE: Sodium bicarbonate is a GRAS (Generally Recognized As Safe) food ingredient. No significant toxicity is expected.

CHRONIC EFFECTS FROM OVEREXPOSURE: Administration of large doses of sodium bicarbonate to patients with renal insufficiency can produce systemic alkalosis.

CARCINOGENICITY:

IARC: Not listed

NTP: Not listed

OSHA: Not listed

OTHER: (ACGIH) Not listed

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12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: 48 hr LC50 = 2000 mg/L (Culex sp. larvae or mosquito)

CHEMICAL FATE INFORMATION: No data available for the product.

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13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: If material cannot be salvaged, an acceptable method is to dispose of uncontaminated product into a secured landfill in accordance with all local, state and federal environmental regulations. Empty containers may be incinerated or discarded as general trash.

---

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME: Not regulated

PRIMARY HAZARD CLASS/DIVISION: Not applicable

UN/NA NUMBER: None

PLACARDS: Not applicable

LABEL: Not applicable

OTHER SHIPPING INFORMATION:
DOT Marking: Not applicable
Hazardous Substance/RQ: Not applicable
49 STCC Number: Not applicable

SPECIAL SHIPPING NOTES: IMDG: Not regulated
IATA: Not regulated

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): Not listed

SECTION 311 HAZARD CATEGORY (40 CFR 370): Not applicable

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA REGULATORY (40 CFR 302.4): Not applicable

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS (40 CFR 710): Listed

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM): Product Identification No.: None
Hazard Classification: None
Ingredient Disclosure List: Not listed

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16. OTHER INFORMATION

REVISION SUMMARY

This MSDS replaces Revision #1 dated August 18, 2000. Changes in information are as follows:

Section 16 (Other Information): HMIS Headings

HMIS RATING

HEALTH:	0
FLAMMABILITY	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION (PPE):	E

NFPA RATING

HEALTH:	0
FLAMMABILITY	0
REACTIVITY:	0
SPECIAL:	None

Key
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

HMIS RATINGS NOTES:

Protection = E (Safety glasses, gloves, dust respirator)

The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard and Canada's Workplace Hazardous Information System (WHMIS).

National Fire Protection Association (NFPA)

Hazardous Materials Identification System (HMIS)

46.) SODIUM DICHROMATE

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response In Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM DICHROMATE

MSDS Number: S3506 --- *Effective Date: 12/01/00*

1. Product Identification

Synonyms: Sodium bichromate; sodium bichromate dihydrate; chromic acid, disodium salt, dihydrate; Sodium Dichromate, Dihydrate
CAS No.: 10588-01-9 (7789-12-0 dihydrate)
Molecular Weight: 298.0
Chemical Formula: Na2Cr2O7 2H2O
Product Codes:
J.T. Baker: 3672, 3674
Mallinckrodt: 7420, 7424

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Dichromate	10588-01-9	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA (tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. May cause ulceration and perforation of the nasal septum. Symptoms may include sore throat, coughing, shortness of breath, and labored breathing. May produce pulmonary sensitization or allergic asthma. Higher exposures may cause pulmonary edema.
Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. May cause violent gastroenteritis, peripheral vascular collapse, dizziness, intense thirst, muscle cramps, shock, coma, abnormal bleeding, fever, liver damage and acute renal failure.
Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Dusts and strong solutions may cause severe irritation. Contact with broken skin may cause ulcers (chrome sores) and absorption, which may cause systemic poisoning, affecting kidney and liver functions. May cause skin sensitization.
Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. May cause corneal injury or blindness.
Chronic Exposure:
Repeated or prolonged exposure can cause ulceration and perforation of the nasal septum, respiratory irritation, liver and kidney damage and ulceration of the skin. Ulcerations at first may be painless, but may penetrate to the bone producing "chrome holes." Known to be a human carcinogen.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, asthma, allergies or known sensitization to chromic acid or chromates may be more susceptible to the effects of this material.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not combustible, but substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Explosion:
Strong oxidants may explode when shocked, or if exposed to heat, flame, or friction. Also may act as initiation source for dust or vapor explosions.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Protect against physical damage. Store in a dry location separate from combustible, organic or other readily oxidizable materials. Avoid storage on wood floors. Remove and dispose of any spilled dichromates; do not return to original containers. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
For chromic acid and chromates, as CrO_3 = 0.1 mg/m3 (ceiling)
- ACGIH Threshold Limit Value (TLV):
For water-soluble Cr(VI) compounds, as Cr = 0.05 mg/m3 (TWA), A1 - confirmed human carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices* , most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Orange-red crystals or granules.
Odor:
Odorless.
Solubility:
Soluble in water (73%)
Specific Gravity:
2.35 @25C (77F)
pH:
3.5 (1% solution) 4.0 (10% solution)
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
400C (752F)
Melting Point:
357C (675F)
Vapor Density (Air=1):
10
Vapor Pressure (mm Hg):
0 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Burning may produce chrome oxides.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Hydrazine, acetic anhydride, ethanol, trinitrotoluene, hydroxylamine, strong acids, oxidizable materials especially in the presence of strong acid solutions. Any combustible, organic or other readily oxidizable material (paper, wood, sulfur, aluminum or plastics).
Conditions to Avoid:
Heat, incompatibles.

11. Toxicological Information

Oral rat LD50: 50 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sodium Dichromate (10588-01-9)	Yes	No	1

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into water, this material is not expected to evaporate significantly. This material may bioaccumulate to some extent. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.
Environmental Toxicity:
This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S. (SODIUM DICHROMATE)
Hazard Class: 6.1, 8
UN/NA: UN3290
Packing Group: II
Information reported for product/size: 100LB

International (Water, I.M.O.)

Proper Shipping Name: TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S. (SODIUM DICHROMATE)
Hazard Class: 6.1, 8
UN/NA: UN3290

Packing Group: II
Information reported for product/size: 100LB

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Sodium Dichromate (10588-01-9)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sodium Dichromate (10588-01-9)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313----- List	Chemical Catg
Sodium Dichromate (10588-01-9)	No	No	No	Chromium com

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sodium Dichromate (10588-01-9)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 1WE
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 1 Reactivity: 1
Label Hazard Warning:
DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.
Label Precautions:
Keep from contact with clothing and other combustible materials.
Do not get in eyes, on skin, or on clothing.
Do not breathe dust or mist from solutions.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Do not store near combustible materials.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 1, 3, 5, 14, 16.
Disclaimer:

****

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

47.) SODIUM SILICATE

MATERIAL SAFETY DATA SHEET

EM SCIENCE

|1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer.....:

EM SCIENCE
A Division of EM Industries
P.O. Box 70
480 Democrat Rd.
Gibbstown, N.J. 08027

Preparation Date.: 07/01/93
Date MSDS Printed.: Jul 06, 1995

Information Phone Number.: 609-354-9200
Hours: Mon. to Fri. 8:30-5
Chemtrec Emergency Number: 800-424-9300
Hours: 24 hrs a day

Catalog Number(s):
SX0749 SX0750

Trade Name.....:
Water Glass
Chemical Name....:
Sodium Silicate, Meta
Chemical Family..: Inorganic Salt
Formula.....:
$Na_2SiO_3 \cdot xH_2O$

Molecular Weight.: 122.08 (anhydrous)

|2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS #	Appr %
Sodium Silicate, Meta	6834-92-0	100%

CAS# is for anhydrous form.
SX0749 is 9-hydrated. SX0750 is 5-hydrated.

|3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
CAUSES EYE BURNS.
MAY BE HARMFUL IF SWALLOWED.
CAUSES SKIN IRRITATION.

Appearance.....:
Colorless to white
odorless crystals or granules

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

Symptoms of Exposure:
Causes eye burns on contact.
Inhalation of dust or fumes causes irritation of upper respiratory passages.
Skin contact causes irritation which may be severe.
Ingestion causes severe irritation of gastrointestinal tract, nausea, vomiting, and diarrhea.

Medical Cond. Aggravated by Exposure:
Data not available.

Routes of Entry.....:
Inhalation, ingestion or skin contact.

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

4. FIRST AID MEASURES

Emergency First Aid:
GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.
Eyes: Immediately flush thoroughly with water for at least 15 minutes.
Skin: Wash thoroughly with soap and water.
Inhalation: Remove to fresh air; give artificial respiration if breathing has stopped.
Ingestion: Do not induce vomiting; if conscious, give water freely and get medical attention.
Remove contaminated clothing and wash before reuse.

5. FIRE FIGHTING MEASURES

Flash Point (F).....: Noncombustible
Flammable Limits LEL (%).: N/A
Flammable Limits UEL (%).: N/A
Extinguishing Media.....:
Use any suitable for adjacent material.

Fire Fighting Procedures.:

None

Fire & Explosion Hazards.:
None

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.

7. HANDLING AND STORAGE

Handling & Storage:
Keep container tightly closed.
Store at controlled room temperature.
Do not breathe dust.
Do not get in eyes, on skin, or on clothing.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection
Material should be handled or transferred in an approved fume hood or with adequate ventilation.
Protective gloves (Neoprene, PVC or equivalent) should be worn to prevent skin contact.
Safety glasses with side shields must 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.

EXPOSURE GUIDELINES

OSHA - PEL:

Component	TWA PPM	TWA MG/M^3	STEL PPM	STEL MG/M^3	CL PPM	CL MG/M^3	Skin
Sodium Silicate, Meta							

ACGIH - TLV:

Component	TWA PPM	TWA MG/M^3	STEL PPM	STEL MG/M^3	CL PPM	CL MG/M^3	Skin
Sodium Silicate, Meta							

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (C 760 mmHg).: N/A
Melting Point (C).....: 1089C
Specific Gravity (H20 = 1).: 1.750
Vapor Pressure (mm Hg).....: N/A
Percent Volatile by Vol (%): N/A
Vapor Density (Air = 1)....: N/A
Evaporation Rate (BuAc = 1): N/A
Solubility in Water (%)....: Soluble
Appearance.....:
Colorless to white

10. STABILITY AND REACTIVITY

Stability.....: Yes
Hazardous Polymerization:
Does not occur
Hazardous Decomposition.:

SiO_2

Conditions To Avoid.....:

Contact with strong acid generates heat.

Materials To Avoid.....:

( )Water
(X)Acids
( )Bases
( )Corrosives
( )Oxidizers
(X)Other :

Fluorine

|11. TOXICOLOGICAL INFORMATION

Toxicity Data:
(for anhydrous)
orl-rat LD50: 1153 mg/kg
orl-mus LD50: 770 mg/kg

Toxicological Findings:
(for anhydrous)
Tests on laboratory animals indicate material may produce adverse reproductive effects.
Cited in Registry of Toxic Effects of Chemical Substances (RTECS)

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.

|13. TRANSPORT INFORMATION

DOT Proper Shipping Name...:
non-regulated

14. REGULATORY INFORMATION

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

Component	SARA EHS (302)	SARA EHS TPQ (lbs)	CERCLA RQ (lbs)
Sodium Silicate, Meta			

Component	OSHA Floor List	SARA 313	DeMinimis for SARA 313 (%)
Sodium Silicate, Meta			

15. OTHER INFORMATION

Comments:
None

NFPA Hazard Ratings:
Health : 2
Flammability : 0
Reactivity : 0
Special Hazards:

Revision History:
08/24/81 01/20/87 10/27/87 03/01/91

N/A = Not Available
N/E = None Established

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technical skill and at their own descretion and risk. Since conditions and manner of use are outside our control, we make NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

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48.) SOLVO KLEEN

CUST OMER: F0396807
BATCH #: 022050002
ZONE #: 02
BARCODE #: 96110190951502108188 77
PRODUCT NAME: SOLVO-KLEEN

ORDER #: 0218@
STICKER #: 022050013

MATERIAL SAFETY DATA SHEET: SOLVO-KLEEN

(00 0-000000- -0137)

DATE OF ISSUE	SUPERSEDES
10/05/2000	5/06/1999

SECTION I - GENERAL INFORMATION

Chemical Name & Synonyms
MEDIUM ALIPHATIC SOLVENT NAPHTHA

Trade Name & Synonyms
SOLVO-KLEEN

Chemical Family:
PETROLEUM HYDROCARBON

Formula Mixture -->

Manufacturer's Name:
CHEMSEARCH DIV. OF NCH CORP.

Address:
BOX 152170
IRVING, TX 75015

Prepared By:
L Boynton/Chemist

Product Code Number
0137

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 #
MEDIUM ALIPHATIC SOLVENT NAPHTHA	IRR/COMB	5 MG/M3$ 1	5 MG/M3$ 2	NOT EST.	64742-88-7
$ OIL MIST					

SECTION III - PHYSICAL DATA

Boiling Point (F):	363-414	Specific Gravity (H20=1):	0.79
Vapor Pressure (MM HG):	1.0	Color:	WATER-WHITE TO AMBER
Vapor Density (Air=1):	6.6	Odor:	PETROLEUM
PH [illegible]:	N/A	Clarity:	TRANSPARENT
% V[illegible]ile by Volume:	100	Evaporation Rate (BU A/C=1):	<1
H20 Solubility:	NEGLIGIBLE	Viscosity:	NON-VISCOUS

SECTION IV - FIRE AND EXPLOSION HAZARD

Flash Point	Flammable Limits	LEL	UEL
142°F / T.C.C.	MEDIUM ALIPHATIC NAPHTHA	0.7%	6%

Extinguishing Media
X <--Foam <--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. COOL FIRE-EXPOSED CONTAINERS WITH WATER SPRAY TO PREVENT BURSTING.

Unusual Fire and Explosion Hazards:
IF LEAK OR SPILL HAS NOT IGNITED, USE WATER TO DISPERSE VAPORS. VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL TO DISTANT SOURCES OF IGNITION AND FLASHBACK. PRODUCT MAY PRODUCE A FLOATING FIRE HAZARD AS LIQUID FLOATS ON WATER. USE CARE AS SPILLS 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 2 <--Flammability 0 <--Instability <--Special

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value:
5 MG/M3 AS OIL MIST 1.

Effects of Overexposure:

-Acute (Short Term Exposure)

EYE CONTACT: MAY CAUSE IRRITATION SEEN AS TEARING AND REDNESS.
SKIN CONTACT: MAY CAUSE IRRITATION SEEN AS ITCHING AND REDNESS. PROLONGED OR REPEATED CONTACT MAY CAUSE DERMATITIS.
INGESTION: MAY CAUSE HEADACHE, NAUSEA, DROWSINESS, FATIGUE, CENTRAL NERVOUS SYSTEM DEPRESSION, CONVULSIONS AND LOSS OF CONSCIOUSNESS. 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.
INHALATION: INHALATION OF VAPORS MAY CAUSE HEADACHE, DROWSINESS, NASAL AND RESPIRATORY IRRITATION AND NAUSEA. HIGH VAPOR CONCENTRATIONS MAY RESULT IN CENTRAL NERVOUS SYSTEM DEPRESSION.

-Chronic (Long Term Exposure)

ON R[illegible]CCASIONS, PROLONGED AND REPEATED EXPOSURE TO OIL MIST POSES A RISK OF CHRONIC LUNG INFLAMMATION. THIS CONDITION IS USUALLY ASYMPTOMATIC AS A RES[illegible]F REPEATED SMALL ASPIRATIONS. SHORTNESS OF BREATH AND COUGHING ARE THE MOST COMMON SYMPTOMS. ASPIRATION MAY LEAD TO PULMONARY EDEMA AND HEM[illegible]GE AND MAY BE FATAL. SIGNS OF LUNG INVOLVEMENT INCLUDE INCREASED RESPIRATION AND HEART RATES AS WELL AS A BLUISH DISCOLORATION OF THE SKIN. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE ARE PRE-EXISTING RESPIRATORY AND SKIN CONDITIONS SUCH AS ASTHMA, EMPHYSEMA, AND DERMATITIS.
TARGET ORGANS: NONE KNOWN.

Primary Routes of Entry: X <--Inhalation <--Ingestion <--Absorption

SECTION V - HEALTH HAZARD DATA (Continued)

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 FOR SEVERAL MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS.

-Skin Contact:
WA"" 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. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-Notes to Physician:
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.

SECTION VI - TOXICITY INFORMATION

Product Contains Chemicals Listed as Carcinogen or Potential Carcinogen By:
IARC--> No NTP--> No OSHA--> No ACGIH--> No OTHER--> No

MEDIUM ALIPHATIC SOLVENT NAPHTHA

EYE-HMN:	470 PPM/15 M	3.
SKN-RBT LD50:	>4 ML/KG	4.
ORL-RAT LD50:	>25 ML/KG	4.
IHL-RAT LC50:	>700 PPM/4H	4.

VOC INFORMATION: VOC CONTENT, 780 GRAMS PER LITER. VAPOR PRESSURE OF THE VOC COMPONENT <0.1 MM HG @ 20° CELCIUS. THE VOC COMPONENT IS NOT PHOTOCHEMICALLY REACTIVE.

SECTION VII - REACTIVITY DATA

Stability: X <--Stable <--Unstable
Conditions to Avoid:
AVOID HEAT, HOT SURFACES, SPARKS AND OPEN FLAMES.

Incompatibility (Materials to Avoid):
STRONG OXIDIZING AGENTS SUCH AS CHLORINE BLEACH AND CONCENTRATED HYDROGEN PEROXIDE.

Hazardous Decomposition Products:
OXIDES OF CARBON.

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:
ELIMINATE ALL SOURCES OF IGNITION. DIKE AND CONTAIN SPILL IF SAFE TO DO SO. USE ONLY NON-SPARKING EQUIPMENT. ABSORB WITH AN INERT MATERIAL AND TRANSFER INTO A PROPERLY LABELED CONTAINER FOR DISPOSAL. WEAR APPROPRIATE PROTECTIVE CLOTHING. PREVENT PRODUCT FROM CONTAMINATING SOIL OR FROM ENTERING SEWAGE AND DRAINAGE SYSTEMS AND BODIES OF WATER. 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:
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 IF REPEATED OR PROLONGED SKIN CONTACT IS LIKELY.

Eye Protection:
SAFETY GLASSES IF THE METHOD OF USE PRESENTS THE LIKELIHOOD OF EYE CONTACT.

Other Protection:
NONE UNDER NORMAL CONDITIONS OF USE.

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. USE WITH CAUTION AROUND HEAT, SPARKS, PILOT LIGHTS, STATIC ELECTRICITY AND OPEN FLAME. 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.

Othr -ecautions:
KEE 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

SECTION XI - REGULATORY INFORMATION (Continued)

None

Those ingredients listed above are subject to the reporting requirements of 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Please call 1-800-527-9919 for additional information if you are a California customer.
This MSDS is not intended for users in the state of California.

SECTION XII - REFERENCES

1. THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS AND BIOLOGICAL EXPOSURE INDICES, ACGIH, 1999.
2. OSHA PEL.
3. SAX'S DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, EIGHTH EDITION, RICHARD J. LEWIS, SR.
4. VENDOR'S MSDS

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, PNOC:PARTICULATES NOT OTHERWISE CLASSIFIED, SDT:STANDARD DRAIZE TEST, ORL:ORAL, HMN:HUMAN, IHL: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.

CHEMSEARCH DIV. OF NCH CORP. 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

RHONE-POULENC BASIC CHEMICALS CO.
1 Corporate Drive Box 881 Shelton, CT. 06484 (203)925-3300
24-HOUR EMERGENCY TELEPHONE CHEMTREC 1-800-424-9300

PRODUCT NAME(S):

SULFUR

Effective Date: APRIL 21, 1992
Supercedes: MARCH 8, 1991

I. IDENTIFICATION

CHEMICAL NAME OF PRIMARY COMPONENT(S): Sulfur

FORMULA: S_x ATOMIC WEIGHT: 32.06
SYNONYMS: Brimstone; flowers of sulfur; industrial sulfur; ground sulfur
TRADENAMES: ANCHOR®, YELLOTONE®, DIAMOND-S®, TRIANGLE®, ARROW® Roll, TIRE®, RUBBERMAKERS®, CRUDE LUMP, SCREENED CRUDE, SPIDER®, LACCO®
CAS # AND NAME: 7704-34-9 Sulfur

II. INGREDIENTS / SUMMARY OF HAZARDS

INGREDIENT(S)	CAS NUMBER	OSHA HAZARDOUS (H)/ NON-HAZARDOUS (NH)	PERCENT
Sulfur	7704-34-9	H	97 - 100

WARNING STATEMENTS:

WARNING: BURNING SULFUR EMITS HIGHLY TOXIC FUMES.
SULFUR DUST SUSPENDED IN AIR IGNITES EASILY.
SULFUR DUST CAUSES EYE IRRITATION.
Avoid contact with eyes. Keep away from heat, sparks and flame. Avoid creating dust in handling. Wash thoroughly after handling. Keep container tightly closed. Use with adequate ventilation. Keep from contact with oxidizing materials.

(See Section VI for complete Health Hazard Data)

NATIONAL FIRE PROTECTION ASSOCIATION RATING

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

	NFPA	HMIS
HEALTH	2	1
FIRE	1	1
REACTIVITY	0	0

(4=Extreme/Severe 3=High/Serious 2=Moderate 1=Slight 0=Minimum

SARA TITLE III HAZARD CLASSIFICATION

IMMEDIATE (ACUTE) HEALTH	YES
DELAYED (CHRONIC) HEALTH	NO
FIRE	NO
SUDDEN RELEASE OF PRESSURE	NO
REACTIVE	NO

MATERIAL SAFETY DATA SHEET

RHONE-POULENC BASIC CHEMICALS CO.

III. PHYSICAL DATA

SPECIFIC GRAVITY:		2.07 @ 68°F (20°C) (Rhombic)
BULK DENSITY:	Lump:	75 - 115 lbs /cu ft
	Powder:	33-80 lbs /cu ft
BOILING POINT, 760 mm Hg:		444°C (831°F)
MELTING POINT:		110-119°C (230-246°F)
VAPOR PRESSURE, @ 300°C:		<0.0001 mm Hg
SOLUBILITY IN WATER:		Insoluble
APPEARANCE AND ODOR:		yellow powder, lumps or crystals; faint odor of rotten eggs

(For additional technical information call 1-800-642-4200)

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (degrees C (F)): 207.2°C (405°F)

FLAMMABLE LIMITS IN AIR: Not known

AUTOIGNITION TEMPERATURE (degrees C (F)): 248-266°C (478-511°F)

EXTINGUISHING MEDIA: Use water fog. Do not use solid streams of water. Cool surrounding area with water fog to prevent reignition. Fires will rekindle until mass is cooled below 154°C (310°F).

SPECIAL FIRE FIGHTING PROCEDURES:

Provide for the protection of employees and residents:

Evacuate non-essential personnel from the fire area. Prevent unauthorized entry to the fire area. Persons who may have been exposed to contaminated smoke should be examined by a physician and treated appropriately. Stay upwind from fire and keep out of low areas. Dike area to prevent runoff and contamination of water sources.

Firefighters should wear a NIOSH/MSHA approved full-face positive-pressure self-contained breathing apparatus. Firefighters who are exposed to contaminated smoke should be immediately relieved from duty and checked for symptoms of overexposure. These should not be mistaken for heat exhaustion or smoke inhalation. See Section VI, Health Hazard Data for symptoms of overexposure, first aid procedures and Notes to Physician.

IV. FIRE AND EXPLOSION HAZARD DATA (continued)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Under fire conditions, decomposes to liberate sulfur dioxide which is irritating, and toxic.

Sulfur dust ignites easily and results in an explosion in confined areas. Ignitions can be caused by heat sources, friction and static electricity.

V. REACTIVITY DATA

STABILITY: Product is stable at ambient temperatures and atmospheric pressure.

CONDITIONS TO AVOID: Keep away from heat, sparks, open flame and other ignition sources.

MATERIALS TO AVOID: May react violently with strong oxidizing agents.
Corrosive to copper and copper alloys.
In presence of water, sulfur will corrode steel.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide is produced in a fire.

HAZARDOUS POLYMERIZATION: Will not occur.

VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES

EXPOSURE LIMITS:
No exposure limits have been established for sulfur. The following limits may apply:

Chemical Name(s)	ACGIH (TLV)	OSHA (PEL)
Particulates Not Otherwise Classified	10 mg/m³ (TWA)	15 mg/m³ (TWA) (total dust) 5 mg/m³ (TWA) (Respirable fraction)

TOXICOLOGY DATA:

ORAL LD_{50} (RATS):	>5000 mg/kg body weight	(2)
DERMAL LD_{50} (RATS):	>2000 mg/kg body weight	(2)
INHALATION LC_{50}:	No information available	
SKIN EFFECTS (RABBITS):	No information available	
EYE EFFECTS (RABBITS):	No information available	

CARCINOGENICITY, TERATOGENICITY, MUTAGENICITY:
This product does not contain any ingredient designated by NTP, IARC or OSHA as a probable human carcinogen.

VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES (continued)

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing:	Ingested sulfur is converted to sulfides in the gastrointestinal tract and ingestion of 10 - 20 grams has caused irritation of the GI tract and renal injury. (1)
Skin Absorption:	No evidence of adverse effects from available information.
Inhalation:	Dusts may be irritating to the respiratory tract.
Skin Contact:	No significant adverse effects are anticipated based on available information.
Eye Contact:	Dusts may cause eye irritation.

EFFECTS OF REPEATED OVEREXPOSURE:
No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE:
No evidence of adverse effects from available information.

EXISTING MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Skin irritation may be aggravated in persons with existing skin lesions. Breathing of dusts may aggravate acute or chronic asthma and other chronic pulmonary disease.

EMERGENCY AND FIRST AID PROCEDURES:

Swallowing:	If victim is conscious and alert, give two or more glasses of water to drink. If available, give one tablespoon of Syrup of Ipecac to induce vomiting. If vomiting does occur, give fluids again. If vomiting has not occurred in 20 minutes, the same dose of Syrup of Ipecac may be repeated one additional time. Alternatively, vomiting may be induced by touching the back of the throat with a finger. Do not give anything by mouth to an unconscious or convulsing person. GET MEDICAL ATTENTION.
Skin:	Wash skin with plenty of soap and water. Seek medical attention if irritation develops.
Inhalation:	Remove patient to fresh air. If not breathing, clear airway and start mouth-to-mouth resuscitation. If heart has stopped beating, start cardiopulmonary resuscitation (CPR). GET MEDICAL ATTENTION
Eyes:	In case of contact, immediately flush eyes with plenty of water for a minimum of 15 minutes using an eyewash fountain, if available. Hold upper and lower lids apart to ensure rinsing of the entire surface of the eye and lids. GET MEDICAL ATTENTION, PREFERABLY AN OPHTHALMOLOGIST.

NOTES TO PHYSICIAN:
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Wear appropriate protective clothing and equipment (see below) during cleanup activities.
To the extent possible, clean up spillage using non-sparking aluminum shovels. Carefully scoop up loose material and place it in appropriate containers so as to avoid dust generation. Stand upwind if possible. Residual spillage that cannot be removed by shovelling should be cleaned from hard surfaces as appropriate. If spilled on the ground, the affected area should be scraped clean and the material placed in an appropriate container for disposal.
Do not flush material to public sewer systems or any waterways.
Ensure adequate decontamination of tools and equipment after cleanup.

Large spills should be handled according to a predetermined plan. For assistance in developing a plan, contact the Technical Service Department, 1-800-642-4200.

WASTE DISPOSAL METHOD:
Dispose of in accordance with Local, State and Federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep away from heat, sparks, open flame and other ignition sources.
Store in a cool, dry, well-ventilated place in tightly closed containers away from all sources of ignition.

VIII. SPECIAL PROTECTION INFORMATION

PROTECTIVE EQUIPMENT SHOULD BE USED DURING THE FOLLOWING PROCEDURES:
- Manufacture or formulation of this product
- Repair and maintenance of contaminated equipment
- Clean up of leaks and spills
- Any situation which may result in hazardous overexposure.

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved dust respirator if airborne concentrations exceed exposure limits.

VENTILATION: Use local exhaust to maintain airborne exposure below exposure limits.

PROTECTIVE CLOTHING: No special requirements.

EYE PROTECTION: Safety glasses with side shields.

OTHER PROTECTIVE EQUIPMENT:
Maintain a sink, safety shower and eyewash fountain in the work area.

IX. REGULATORY STATUS

TSCA Inventory Status: This product is listed on the TSCA inventory.

Transportation Status: DOT
Land, Air: Not regulated

Water:

PROPER SHIPPING NAME:	Sulfur, solid
HAZARD CLASS:	ORM-C
ID # :	UN 1350
LABEL:	None (ORM-C marking)

Reportable quantity under 49 CFR 172.101 Appendix: Not listed

SARA Title III
Section 302 Extremely Hazardous Substance List: Not listed
Section 313 Toxic Chemicals: Not listed

Reportable Quantity (RQ) under US EPA CERCLA: Not listed
RCRA Hazardous Waste: Not listed

State/International Right-to-Know Regulations:

	Sulfur
California:	Not listed
Connecticut:	Survey
Florida:	Toxic
Illinois:	Not listed
Louisiana:	Not listed
Massachusetts:	Not listed
New Jersey:	RTK, ID 1757
New York:	Not listed
Pennsylvania:	RTK
Rhode Island:	Hazard, Note F
Canada:	Not listed

X. REFERENCES

(1) Dreisbach, Handbook of Poisoning, 12th edition
(2) Unpublished Rhone-Poulenc sponsored toxicity study.

The information herein is given in good faith
but no warranty, expressed or implied, is made.

50.1 STYRENE COPOLYMER

MATERIAL SAFETY DATA SHEET

DEXCO VECTOR 2518P

DATE PREPARED: MAY 25, 2C
MSDS NO.: 25251801

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: STYRENIC BLOCK COPOLYMER
CHEMICAL NAME:
Styrene-Butadiene Block Copolymer
CHEMICAL FAMILY:
Styrene-Butadiene Block Copolymer
PRODUCT DESCRIPTION:
Elastomer; pour granule, solid pellet or powder
natural color; little to no odor

CONTACT ADDRESS:
DEXCO POLYMERS
12012 WICKCHESTER HOUSTON, TX 77079

** EMERGENCY TELEPHONE NUMBERS: (24 Hours) **
** CHEMTREC (800) 424-9300 **
** THE DOW CHEMICAL COMPANY (517) 636-4400 **

NON EMERGENCY TELEPHONE NUMBERS : (8am-5pm M-F)
FOR HEALTH AND SAFETY INFORMATION CALL : (225) 353-1805

FOR GENERAL PRODUCT INFORMATION CALL : (281) 754-5800

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

The composition of this mixture may be proprietary information. In the event of a medical emergency, compositional information will be provided to a physician or nurse. This product is not hazardous as defined in 29 CFR1910.1200

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYE CONTACT:
Particulates may scratch eye surfaces/cause mechanical irritation.

SKIN CONTACT:
No hazard in normal industrial use.
Exposure to hot material may cause thermal burns.

INHALATION:
Dust may be irritating to eyes and respiratory tract.

INGESTION:
No hazard in normal industrial use.
Minimal toxicity.

CHRONIC EFFECTS
This product contains talc. In rats exposed to high concentrations of fine particles (mass median diameter around 3 um) of talc (6 and 18 mg/m3) for a lifetime, lung inflammation and fibrosis (male and female) and lung tumors (female) were observed. Male and female mice exposed to similar concentrations produced only inflammation. However, no lung tumors were observed in either male or female mice. These effects were likely due to overloading of the normal respiratory clearance mechanisms. Due to physiological differences, rats may be more susceptible to particle clearance overload than mice. An increase in adrenal tumors was observed in both male and female rats. However, due to high spontaneous incidence of these tumors in control animals, the human health relevance of these tumors is questionable.

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MATERIAL SAFETY DATA SHEET

SECTION 4 FIRST AID MEASURES

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Flush with large amounts of water; use soap if available.
For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze and get prompt medical attention. No attempt should be made to remove material from skin or to remove contaminated clothing, as the damaged flesh can be easily torn.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:
First aid is normally not required.

SECTION 5 FIRE-FIGHTING MEASURES

FLASH POINT:	Not available
FLAMMABLE LIMITS:	LEL: 1.3 UEL: 8.0
AUTOIGNITION TEMPERATURE:	NOTE: Not Available

GENERAL HAZARD

Low hazard.
If thermally decomposed, flammable/toxic gases may be released.
Product can accumulate electrostatic charges when rubbed, chafed, or abraded. Static discharge in the presence of volatile or flammable mixtures presents a potential fire or explosion hazard.
Under fire conditions, polymers decompose. Fire is accompanied by the evolution of a dense black smoke with an acrid odor. It may cause watery eyes (lachrimation). The smoke may contain polymer fragments of varying compositions in addition to unidentified toxic and/or irritating compounds.
Compounding of product in high shear equipment can cause the temperature to rise.
Avoid temperatures above 250 C (482 F).
Product contains residual unsaturation which can undergo exothermic oxidative degradation. Accumulation of product in areas exposed to elevated temperatures for extended periods in air may result in self-heating and autoignition.
Cool material before storing or disposing. Storage or disposal without proper cooling may result in autoignition.
The following conditions may cause heat build up, possibly resulting in ignition: an insulated situation (that prevents heat loss), extended time, air exposure and high surface to weight ratios, accumulation of hot polymer patties.
Flammable vapors can be released at elevated temperatures.
This polymer contains low levels of residual solvent which, when stored in closed containers or heated, can form flammable mixtures above the material. Vessels which are used to heat the

Continues on page 3

MATERIAL SAFETY DATA SHEET

Styrene-Butadiene Block Copolymer	9003-55-8	>88%
Talc (nonfibrous)	14807-96-6	0-10%
Additives	Proprietary	<2%
Calcium Carbonate	471-34-1	0-10%

The Dow Chemical Company recommends the following Industrial Hygiene Limit (IHG):
A TWA of 0.5 mg/m3 (respirable dust) for talc

HAZARD RATING SYSTEMS:

This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704
HEALTH	0	0
FLAMMABILITY	2	2
REACTIVITY	0	0

KEY
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

REVISION SUMMARY:
Since April 1, 2000 this MSDS has been revised in Section(s):
1, 5, 7, 9, 10, 16

REFERENCE NUMBER:
HDHA-X-00001

SUPERSEDES ISSUE DATE:
April 1, 2000

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR HIS OWN PARTICULAR USE. WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

HAZARDOUS POLYMERIZATION:
Will not occur
CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION:
Not Applicable
MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Avoid contact with strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS:
Flammable Hydrocarbons
Hazardous decomposition product depend upon temperature, air supply and the presence of other materials. Processing may release fumes which may include polymer fragments and other decomposition products. Fumes can be irritating. At temperatures exceeding melt temperatures, polymer fragments can occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Please refer to Section 3 for available information on potential health effects.

SECTION 12 ECOLOGICAL INFORMATION

No specific ecological data are available for this product. Please refer to Section 6 for information regarding accidental releases and Section 15 for regulatory reporting information.

SECTION 13 DISPOSAL CONSIDERATIONS

Please refer to Sections 5, 6, and 15 for disposal and regulatory information.

SECTION 14 TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):

Information not available. Please contact ExxonMobil Chemical Company for more inform

SECTION 15 REGULATORY INFORMATION

TSCA:
Components of this product are listed on the TSCA Inventory.
CERCLA:
If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We recommend you contact local authorities to determine if there may be other local reporting requirements.
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:
Not Hazardous.
This product does not contain Section 313 Reportable Ingredients.

SECTION 16 OTHER INFORMATION

NOTES:
The composition of this product is listed below:

Component	CAS#	Amount

Continues on page 6

accumulate.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS

- Local exhaust ventilation of process equipment may be needed to control exposures to below the recommended threshold exposure limit. See personal protection recommendations.

PERSONAL PROTECTION

For open systems where contact is likely, wear safety glasses with side shields.
Where contact may occur with hot materials, wear thermal resistant gloves, arm protection and a face shield.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

WORKPLACE EXPOSURE GUIDELINES

OSHA REGULATION 29CFR1910.1000 REQUIRES THE FOLLOWING PERMISSIBLE EXPOSURE LIMITS:

A TWA of 20 mppcf (million particles per cubic foot) for Talc (non asbestos form).
A TWA of 15 mg/m3 (total dust) and 5 mg/m3 (respirable fraction) for Calcium Carbonate.
The recommended permissible exposure levels indicated above reflect the levels revised by OSHA in 1989 or in subsequent regulatory activity. Although the 1989 levels have since been vacated by the 11th Circuit Court of Appeals, ExxonMobil Chemical Company recommends that the lower exposure levels be observed as reasonable worker protection.

THE ACGIH RECOMMENDS THE FOLLOWING THRESHOLD LIMIT VALUES:

A TWA of 2 mg/m3 (respirable dust) for talc that does not contain asbestos fibers, with an A4 designation.
A TWA of 10 mg/m3 for Calcium Carbonate.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

SPECIFIC GRAVITY, at °F:
< 1
DENSITY at °F: lbs/gal Not Applicable

SOLUBILITY IN WATER, wt. % at °F:
Insoluble

SP. GRAV. OF VAPOR, at 1 atm (Air=1):
Not Applicable

EVAPORATION RATE, n-Bu Acetate=1:
Not Applicable

VAPOR PRESSURE, mmHg at °F:
Not available

VISCOSITY OF LIQUID, cSt at °F:
Not Applicable

FREEZING/MELTING POINT, °F:
Not Applicable

BOILING POINT, °F:
Not Applicable

SECTION 10 STABILITY AND REACTIVITY

STABILITY:
Stable

CONDITIONS TO AVOID INSTABILITY:
Do not store above 200 deg F/93 deg C

Continues on page 5

material should be purged or blanketed with an inert gas to maintain the volatiles level outside the residual solvent flammability range of 1.3 - 8.0 %.
Mechanical handling can cause formation of dusts. To reduce the potential for dust explosion, do not permit dust to accumulate.

FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply to fire.
Use water, carbon dioxide or dry chemical to extinguish fire.
Cool surrounding area with water to localize fire zone. Soak thoroughly with water to cool and prevent reignition.
Respiratory and eye protection required for fire fighting personnel.
A self-contained breathing apparatus (SCBA) is recommended for indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of a SCBA is optional. If protective equipment is not available or not used, fight fires from a protected location of safe distance.
Keep people away. Isolate fire area and deny unnecessary entry.
See Section 3 HAZARDS IDENTIFICATION, Section 8 EXPOSURE CONTROLS AND PERSONAL PROTECTION and Section 10 STABILITY AND REACTIVITY.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

SECTION 6 ACCIDENTAL RELEASE MEASURES

LAND SPILL

Spilled pellets present a slipping hazard on hard surfaces.
Recover spilled material and place in suitable containers for recycle or disposal.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL

Recover the spilled material and place in suitable containers for recycle or disposal.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 7 STORAGE AND HANDLING

ELECTROSTATIC ACCUMULATION HAZARD:

Yes, use proper bonding and/or grounding procedure.

STORAGE TEMPERATURE, °F:

Below 200 F/ 93 C

LOADING/UNLOADING TEMPERATURE, °F:

Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:

Atmospheric

LOADING/UNLOADING VISCOSITY, cSt:

Not Applicable

STORAGE AND HANDLING:

Keep containers closed. Handle containers with care. Store in a cool, well-ventilated place away from incompatible materials.
Do NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight.
Material will accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.
Mechanical handling equipment can cause formation of dusts. Maintain good housekeeping. Layers of flammable dusts should not be permitted to

Continues on page 4

MATERIAL SAFETY DATA SHEET

Dexco Polymers* Houston, TX 77079 Emergency Phone: 517-636-4400
Grade Code: 25241101 Product Code: 31730 Page: 1

Product Name: VECTOR® 2411P STYRENIC BLOCK COPOLYMER

Effective Date: 10/22/93 MSDS: 004378

1. INGREDIENTS: (% w/w, unless otherwise noted)

Styrene-Butadiene block copolymer	CAS# 009003-55-8	95-97%
Talc	CAS# 014807-96-6	3-5%
Additives		<1%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT:	Not applicable
VAP. PRESS.:	Negligible
VAP. DENSITY:	Not applicable
SOL. IN WATER:	Negligible
SP. GRAVITY:	0.92
APPEARANCE:	Natural color powder
ODOR:	None

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT:	Not applicable (See Section 9)
METHOD USED:	Not applicable (See Section 9)

FLAMMABLE LIMITS

LFL: 1.3% (for residual solvent)
UFL: 8.0% (for residual solvent)

EXTINGUISHING MEDIA: Water fog, foam, carbon dioxide, and dry chemical.

FIRE AND EXPLOSION HAZARDS: Keep unnecessary people away; isolate hazard area and deny unnecessary entry. Dense smoke emitted when burned without sufficient oxygen. See also "Storage and

(Continued on Page 2)

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3. FIRE AND EXPLOSION HAZARD DATA: (Continued)

FIRE AND EXPLOSION HAZARDS: (Continued)

Handling* section of this MSDS.

FIRE-FIGHTING EQUIPMENT: Wear positive pressure, self-contained breathing apparatus and full protective equipment.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Do not store above 200° F.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion may produce carbon dioxide and toxic carbon monoxide. Unidentified organic compounds may be formed during combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS: Sweep up or pick up with an industrial vacuum cleaner. Put into container for disposal.

DISPOSAL METHOD: Reclaim, burn in a chemical incinerator, or bury in an approved landfill in accordance with federal, state, and local regulations.

6. HEALTH HAZARD DATA:

EYE: Solid or dust may cause irritation or corneal injury due to mechanical action.

SKIN CONTACT: Essentially nonirritating to skin.

(Continued on Page 3)

6. HEALTH HAZARD DATA: (Continued)

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The dermal LD50 has not been determined.

INGESTION: Single dose LD50 has not been determined. Single dose oral toxicity is believed to be low. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: Dust may cause irritation to upper respiratory tract.

SYSTEMIC AND OTHER EFFECTS: Repeated inhalation exposure to talc may cause respirator irritation and lung effects/injury.

CANCER INFORMATION: Both asbestiform and nonasbestiform talc have caused cancer in laboratory animals but only that containing asbestiform fibers (fibrous talc) is listed by IARC. Increased mortality rates from lung and pleural cancer have been seen in workers repeatedly exposed to fibrous talc.

7. FIRST AID

EYES: Flush eyes with plenty of water, mechanical effects only.

SKIN: Wash off in flowing water or shower.

INGESTION: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

(Continued on page 4)

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE (S): Talc: for non-asbestos form, ACGIH TLV and OSHA PEL are 2 mg/m3, respirable dust. For fibrous form use the ACGIH TLV and OSHA PEL for asbestos. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs. Major components of this material do not have exposure guidelines.

VENTILATION: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

RESPIRATORY PROTECTION: In dusty atmospheres, use an approved dust respirator.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

EYE PROTECTION: Use safety glasses. If there is a potential for exposure to particles which could cause mechanical injury to the eye, wear chemical goggles.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Product can accumulate electrostatic charges when rubbed, chafed or abraded. Static discharge in the presence of volatile or flammable mixtures presents a potential fire or explosion hazard. Equipment should provide a means for dissipating any charges that may develop.

Mechanical handling equipment can cause formation of dusts. Maintain good housekeeping. Layers of flammable dusts should not be permitted to accumulate.

(Continued on page 5)

9. ADDITIONAL INFORMATION: (Continued)

This polymer does not have a flash point as measured by standard methods. It does contain levels of residual solvent. When heated, flammable mixtures can form above the material especially in closed vessels. Purge or vent vessels which are used to heat the material to avoid flammable mixtures.

Compounding of product in high shear equipment can cause the temperature to rise. DO NOT ALLOW THE TEMPERATURE TO EXCEED 450° F. MAINTAIN A FIRE WATCH IF 450° F IS REACHED.

MSDS STATUS: Revised sections 1, 3, 6, 7, 8, 9 and regulatory.

For information regarding state/provincial and federal regulations, see the Regulatory Information Section.

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REGULATION INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to insure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U. S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

(Continued on Page R-2)

REGULATION INFORMATION: (Continued)

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in Section 1 of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
Talc	014807-97-6	NJ3 PA1

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dexco Polymers For Further Information.

L.C.Y.C.I.C. LCY ELASTOMERS LP

MSDS N° : BT120
Issue : 02/02/2004
Revision : 0

Material Safety Data Sheet

1. DESCRIPTION AND COMPANY IDENTIFICATION

1.1 - Description

Chemical name : Styrene-Butadiene-Styrene Block Copolymers
Designation or trade name : **GLOBALPRENE T** **GLOBALPRENE TE**

Grades : T161B, T161BE, T161BP, T161C, T161CP, T166, T6302E, T6302P, T6306, T6306P, TE6320, T6414, TE6437, TE6437P

1.2 – Use of preparation

Production of various rubber containing products.

1.3 - Company Identification

Corporate Office : LCY Elastomers LP
Address : 2000 West Loop South, Suite 2010A, Houston, Texas (USA)
Telephone N° : (713) 940-0740
Manufacturing Facility : 4803 Decker Drive, Baytown, Texas, (U.S.A.)
Telephone N° : (281) 424-6100
Emergency Telephone N°
-(North America) : **Baytown, Safety Manager** (281) 424-6105
(business hours, 8am to 4:30pm CST)

: **Chemtrec** (800) 424-9300 (emergency service 24 hours/day)

2. COMPOSITION / INFORMATION ON INGREDIENTS

The preparation is essentially made of :
Styrene-Butadiene-Styrene, partial or total Block Copolymers (Thermoplastic Elastomers).
CAS Registry number : 9003-55-8 (referred to the polymer)

3. HAZARDS IDENTIFICATION

- Critical hazards to man:
The preparation is not hazardous in the form in which it is placed on the market and under the normal and recommended conditions of storage and use. See also chapters 4 and 11.

- Critical hazards to the environment
The preparation is not considered to be dangerous to the environment.

Decoding :
(#) = The symbol means information has been updated at the revision date.
N.Av. = Not available.
N.Ap. = Not applicable (or T.I. = Technically impossible).
[..] = Bibliographic reference.

4. FIRST-AID MEASURES

- Symptoms, effects, indication for on the spot actions:

. Inhalation

Symptoms:	(dust or gas/vapors released by heat) irritation of the respiratory organs
Expected delayed effects:	N. Ap.
First aid action:	move the affected person into the open air and seek medical assistance.

. Contact with skin

Symptoms:	dust can irritate skin. No effect expected by contact with the Elastomer at room temperature. Melted product causes burns.
Expected delayed effects:	N. Ap.
First aid action:	Wash with plenty water. In case of contact with melted material, cool down with cold water and seek medical assistance. Do not remove the product that solidified on the skin. Treat as a burn.

. Contact with Eyes

Symptoms:	(dust or gas/vapors released by heat) dust can redden eyes.
Expected delayed results:	N. Ap.
First aid action:	Flush eyes with plenty water. for at least 5 minutes. If irritation continues seek medical assistance.

. Ingestion

Symptoms:	abdominal pain
Expected delayed effects:	N. Ap.
First aid action:	no specific measures requested in case of ingestion. If needed seek medical assistance.

-Specific and immediate treatment means to be available at the workplace: eye wash fountain.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media:
Water, water spray, foam, dry chemicals, carbon dioxide.
Cool down the containers using water spray.

- Extinguishing media which must not be used for safety reasons: N.Ap.

- Special exposure hazards arising from preparation itself, combustion products, resulting gases:
The preparation, when involved in a fire, burns with a sooty flame and release fumes made up of water, carbon dioxide, carbon monoxide (when starved of oxygen). Overheating/pyrolysis evolves vapors made up of monomers, low molecular weight polymers and their oxidation products.

- Special protective equipment for fire fighters:
Use suitable personal protective equipment (self contained breathing apparatus, helmet, goggles, fire resistant gloves, boots).

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions: See section 8.

- Environmental precautions: Keep away from drains. Do not release into the environment.

- Methods for cleaning: Collect mechanically. Reuse if possible or dispose of as required by national and local regulations (see chapter 13). Avoid generating dust clouds.

7. HANDLING AND STORAGE

7.1 Handling
- Safety precautions
During processing, ventilation should be ensured and suitable exhaust systems should be in place. Use gloves and safety glasses. Avoid contact with sources of ignition. Elevated processing temperatures may result in some degree of thermal degradation: as a guideline 200°C (392°F) is the maximum allowed temperature for very short time.

The preparation is a poor conductor and it is likely to accumulate electrostatic charges. Precautions normally used for materials not conductive and against the accumulation of electrostatic charges should be used during processes that employ powdered materials or produce dust (e.g.: reduce speed to the minimum, install grounding systems, the absolute prohibition to smoke and use free flames, use inert gases in mills and in the closed systems).

Comply with personal hygiene measures and use the personal protective equipment (see chapter 8). Do not smoke, eat or drink in the workplace. Re-seal opened containers.

7.2 Storage
- Safety conditions
Store the preparation in a covered place in sealed packaging, away from sunlight and heat sources. Store at ambient temperatures.

Ensure the proper ventilation in all storage areas. If the preparation undergoes to a prolonged exposure to sunlight and/or heat, it may degrade and cause self-combustion phenomena.

7.3 – Specific uses
Recommendations: N.Ap.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure limit values
A) Occupational:

Threshold limit values ACGIH (Tab. 2002)*

	TWA (ppm; mg/m^3)	STEL / C (ppm; mg/m^3)
residual monomer:		
Styrene	20 ppm, A4	40 ppm, A4
Butadiene	2 ppm, A2	---
other substances:		
Particulate not otherwise classified (inhalable)	10 mg/m^3	--

*Or statutory limit values in the country concerned.

B) Medical:
- Recommended monitoring procedures: As required by the rules and regulations of each country.

8.2 Exposure control
- Occupational exposure control:
Traces of monomers and others volatile substances may be given off during processing, particularly at unusually high processing temperatures.

Workrooms must be provided with adequate ventilation and exhaust equipment to collect dusts and gas/vapors that may be emitted during the conversion.

- Equipment to provide adequate and personal protection:
Respiratory protection: In normal conditions masks with anti-dust filters should be available to be used when requested.
Hand protection: chemical substances resistant gloves. Breakthrough time of the glove material: see producer's data.

Eye protection: not necessary when no powders or vapors are present. Where present, use safety goggles.
Skin protection: standard work clothes.

- Specific hygiene measures: No smoking, eating or drinking in the workplace.
Wash hands thoroughly before eating, drinking or smoking.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance	
Physical state at 23°C	: solid
Color	: white
Form	: granules or powder
- Odor	: odorless
- Density	: 0.94 – 0.96
- Bulk density	: 0.20 ÷ 0.45 (g/cm3)
- Softening temperature	: N.Ap.
- Autoflammability	: > 280 °C
- Decomposition temperature	:>200°C
- Solubility in water	:insoluble
- Solubility with other solvents	:aromatics, cyclohexane, tetrahydrofuran.
- Heath of combustion	: ca. 8000 Kcal/Kg

10. STABILITY AND REACTIVITY

The preparation is stable and inert in the recommended storage and handling conditions (see chapter 7).

- Conditions/Materials to avoid:
Exposure to sunlight and/or heat. Accumulation of electrostatic charges. Oxidizing substances.

- Hazardous decomposition products: (see sect. 5).
Comply with the advised processing temperatures to avoid the formation of noxious gas and vapors.

11 . TOXICOLOGICAL INFORMATION

Specific information on the preparation is not available in the literature. Residual monomers are present in the product at trace level, hindered in the elastomer matrix and therefore not available in normal conditions.

- Dangerous effects from exposure to the preparation:
The possible dusts may cause irritation to the eyes and/or respiratory organs.
The elastomer does not present any intrinsic health hazard when processed according to correct working procedures.

- Delayed and immediate effects from short and long term exposure:
Carcinogenicity, mutagenicity, reproductive toxicity: no evidence of these effects has been reported for the preparation.

12 . ECOLOGICAL INFORMATION

- Ecotoxicity
The preparation is essentially an high molecular weight polymer, not regarded as ecotoxic.

- Mobility
Use according to good working practice, and avoid releasing the product into the environment.

- Persistence and degradability
The preparation is not a biodegradable polymer.

13 . DISPOSAL CONSIDERATIONS

- Description and handling of residues: For the handling of the residues the same safety advices given for the preparation are to be applied.

- Appropriate methods of disposal of preparation:

Residues should be disposed of as required by national and local regulations.

- **Incineration**
  Must be done under approved conditions, possibly with energy recovery and only at suitable facilities equipped with a scrubber for the treatment of fumes before their release into the atmosphere.

- **Recycling**
  After suitable treatment (cleaning, grinding, etc.), the preparation can be safely re-used, as is or mixed with fresh material, when this is compatible with the intended final application.

- **Landfilling**
  Should be avoided as far as possible. If unavoidable, use approved landfill sites.

-National and community provisions relating to waste:
The recommendations above are considered appropriate. However, local, federal and international regulations take precedents and must be complied with.

14. TRANSPORT INFORMATION

The products are not classified as dangerous for transport according to the following regulations;
ADR/RID, IMO, IATA, U.S. Department of Transportation.
Label not required.

15. REGULATORY INFORMATION

-Information on classification and labeling:

TOXIC SUBSTANCES CONTROL ACT (TSCA): All of the ingredients in these products are on the TCSA inventory.

SARA TITLE III, SECTION 313: The products are not subjected to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

CLEAN AIR ACT (CCA): The products do not appear on the list of hazardous Air Pollutants (HAP-42 USC 7414, Title 1, Part A, Sec 112).

CLEAN WATER ACT (CWA): The products do not appear of the list of Hazardous Substances (40 CFR 1164).

CALIFORNIA PROPOSITION 65: The products do not appear of the Proposition 65 list(s).

CANADIAN DOMESTIC SUBSTANCES LIST (DSL): The products are listed on the Canadian DSL as Non-Confidential.

EUROPE: The products are not considered dangerous under EC criteria.

16. OTHER INFORMATION

- Sources used for main data:

Bibliography

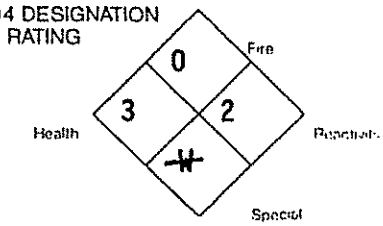
1 - A.C.G.I.H. - Documentation of the Threshold Limit Values - 1999
2 - PATTY - Industrial Hygiene and Toxicology (40 Ed.) - 1985/86
3 - NIOSH - Registry of Toxic Effects of Chemical Substances - 1985/86
4 - Stazione Sperimentale Combustibili - Relazione NO B40 487
5 - Manufacturer's data
6 - Sax -Dangerous Properties of Industrial Materials - 1992

Data and information contained in this Material Safety Data Sheet are based on our available knowledge at the last revision date. No guarantee can be given as to the sufficiency of any safety measures contained in this Information Data Sheet, nor can it be assumed that other or additional measures may not be required under particular or exceptional circumstances. The user must make sure of the fitness and completeness of the information, according to the specific use he wants to do.

51.) SULFURIC ACID

MATERIAL SAFETY DATA SHEET

NFPA 704 DESIGNATION
HAZARD RATING



4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

GREAT WESTERN CHEMICAL CO.

Issue Date: 07/23/91 Supersedes: 02/28/89

PRODUCT NAME: SULFURIC ACID, 66° BE

CHEMICAL NAME: Sulfuric Acid CHEMICAL FAMILY: Inorganic Acid

FORMULA: H_2SO_4 93% (in water) MOLECULAR WEIGHT 98.08

D.O.T. SHIPPING CLASSIFICATION: Sulfuric Acid Corrosive Material UN1830

I. PHYSICAL DATA

BOILING POINT 760mm, Hg	279° C.	FREEZING POINT	NDA
SPECIFIC GRAVITY (WATER = 1)	1.835 @ 20° C.	pH of 1% (w/v) SOLUTION	< 1.0
PERCENT VOLATILE ORGANICS BY VOLUME	NDA	SOLUBILITY IN WATER	Complete
APPEARANCE AND ODOR	Clear, colorless to pale yellow liquid with a slight acidic odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	%(wt.)	ACGIH TLV (Units)	OSHA PEL
*Sulfuric Acid CAS# 7664-93-9	Corrosive	93 min.	Air: 1 mg/cu.m.	Air: TWA 1 mg/cu.m.

* Chemicals subject to SARA Title III, Section 313 reporting. This notification must not be detached from this MSDS, and any copies of this MSDS must include this notification. This notification applies only to material while it is within the boundaries of the United States of America or its territories.

All chemicals contained in this product are listed on the Toxic Substance Control Act (TSCA) Inventory.

N/A = Not Applicable
NDA = No Data Available

EMERGENCY PHONE NUMBERS

Great Western Chemical Company
808 S.W. 15th Avenue
Portland, Oregon 97205
Phone: (503) 228-2600

800/424-9300
CHEMTREC

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT [test method(s)]	N/A	AUTOIGNITION TEMPERATURE	N/A
FLAMMABLE LIMITS IN AIR, % by volume		LOWER	N/A
		UPPER	N/A

EXTINGUISHING MEDIA	Water, foam, carbon dioxide and dry chemicals.
UNUSUAL FIRE AND EXPLOSION HAZARDS	May produce hazardous fumes or hazardous decomposition products. Water solutions are corrosive. Readily attacks some metals (i.e. aluminum, magnesium and zinc) to liberate flammable/explosive hydrogen gas. Dilution with water liberates large amounts of heat and may cause violent boiling and spattering.
SPECIAL FIRE FIGHTING PROCEDURES	When fire fighting, wear full protective equipment, including self-contained breathing apparatus.

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Air: 1 mg/cu.m.		
ROUTE OF EXPOSURE	EYE CONTACT	SKIN CONTACT	SKIN ABSORPTION
	"Danger" Corrosive	"Danger" Corrosive	No data published
	INHALATION	INGESTION	
	Harmful if inhaled	Harmful if swallowed	
EFFECTS OF OVEREXPOSURE	Causes severe eye and skin irritation or burns. Harmful if swallowed.		
EMERGENCY AND FIRST AID PROCEDURES	EYES: Immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately. EXTERNAL: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If burn or irritation occurs, call a physician. INTERNAL: If swallowed, DO NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician. Never give anything by mouth to an unconscious person.		

NIC EXPOSURE ECTS	Repeated exposure causes destruction of tissue.

V. REACTIVITY DATA

STABILITY				CONDITIONS TO AVOID	
UNSTABLE		STABLE	X		None

INCOMPATIBILITY (materials to avoid)	Caustic, alkali, organic materials, aluminum, magnesium and zinc.
HAZARDOUS DECOMPOSITION PRODUCTS	When heated to decomposition, it emits toxic oxides of sulfur and sulfuric acid fumes.

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

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Contain spill (unless small spill). Wearing recommended protective equipment, carefully add lime or sodium carbonate to neutralize acid. Pick up and containerize residues for disposal. Flush spill area with water; collect rinsates for disposal or sewer, as appropriate. Dispose of neutralized acid in an approved landfill in accordance with state and local regulations.
WASTE DISPOSAL METHOD	This product, if disposed as shipped, meets EPA criteria of a hazardous waste as specified in 40 CFR 261 on the basis of its corrosivity. Dispose of product in a licensed hazardous waste disposal facility in accordance with all applicable laws. When empty, thoroughly rinse container with water before disposal, return to manufacturer or any other industrial use.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		If an OSHA-PEL is exceeded, then a NIOSH-approved respirator with an acid gas cartridge or supplied air is required.		
VENTILATION	LOCAL EXHAUST	Preferable	SPECIAL	None
	MECHANICAL (general)	OK	OTHER	N/A
PROTECTIVE GLOVES		Rubber or synthetic rubber		
EYE PROTECTION		Chemical goggles and full face shield		
OTHER PROTECTIVE EQUIPMENT		Rubber apron, rubber boots, eyewash, safety shower		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.

Keep out of reach of children.

Do not get product in eyes, on skin, or on clothing.

Keep container tightly closed when not in use.

Wash thoroughly after handling.

This product is not manufactured to contain a known carcinogen or reproductive toxin. Extremely small amounts of these materials may be present in this product from general environmental sources.

OTHER HANDLING AND STORAGE CONDITIONS

Store in a cool, dry, well-ventilated area.

Do not add (Sulfuric Acid, 66^{0} Be) to hypochlorite bleaches, chlorine sanitizers or chlorinated cleaners as this liberates toxic, corrosive chlorine gas.

Add Sulfuric Acid slowly to cool water with adequate agitation to prevent boiling and violent spattering.

PREPARED BY	Mike Hoefler	DATE	July 23, 1991

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

TALC

Mallinckrodt
Material Safety Data

Emergency Phone Number: 314-982-5000

Mallinckrodt provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 43061.

TALC U.S.P.

PRODUCT IDENTIFICATION:

Synonyms: Agalite; snowgoose; talcum

Formula CAS No.: 14807-96-6

Molecular Weight: 96.33

Chemical Formula: $H_2O_3Si \cdot 3/4\ Mg$

Hazardous Ingredients: Talc ACGIH Listed

PRECAUTIONARY MEASURES

CAUTION! CHRONIC INHALATION MAY CREATE A RESPIRATORY HAZARD

Maintain adequate ventilation.
Avoid prolonged or repeated inhalation of dust.

EMERGENCY/FIRST AID

SEE SECTION 5.

DOT Hazard Class: Not Regulated

SECTION 1 Physical Data

Appearance: White to grayish-white fine powder.

Odor: Odorless.

Solubility: Insoluble in water.

Boiling Point: No information found.

Melting Point: No information found.

Relative Density: 2.8

Vapor Density (Air=1): No information found.

Vapor Pressure (mm Hg): No information found.

Evaporation Rate: No information found.

SECTION 2 Fire and Explosion Information

Fire:
Not considered to be a fire hazard.

Explosion:
Not considered to be an explosion hazard.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 3 Reactivity Data

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
No information found.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Manganese trifluoride, Fluorine monoxide, Chlorine trifluoride.

SECTION 4 Leak/Spill Disposal Information

Clean-up personnel may require protection from inhalation of dust. Spills: Clean up spills in a manner that does not disperse dust into the air. Pick up spill for recovery or disposal and place in a closed container. Disposal: Whatever cannot be saved for recovery may be disposed in an approved waste facility.

Ensure compliance with local, state and federal regulations.

SECTION 5 Health Hazard Information

A. EXPOSURE / HEALTH EFFECTS

Inhalation:
May cause irritation to the upper respiratory tract. Tickling cough is a common symptom.

Ingestion:
Large doses may cause gastric irritation, nausea, and diarrhea.

Skin Contact:
May cause irritation.

Eye Contact:
May cause redness or irritation of eyes.

Chronic Exposure:
Prolonged inhalation of dust is associated with respiratory effects.

Aggrevation of Pre-existing Conditions:
No information found.

B. FIRST AID

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:
If large amounts were swallowed, give water to drink and get medical advice.

Skin Exposure:
Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Exposure:
Wash thoroughly with running water. Get medical advice if irritation develops.

C. TOXICITY DATA (RTECS, 1982)

Irritation skin human: 300 g/3D-I mild

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL): 20 mppcf
-ACGIH Threshold Limit Value (TLV):
2 mg/m^3 of respirable dust

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)
If the TLV is exceeded, a dust/mist respirator may be worn up to ten times the TLV. Consult respirator supplier for details.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage.

53.) TITINT BLACK #15

Technical Industries, Inc.

Material Safety Data Sheet 1-Dec-93

Section 1- Material Identification

Product Name: TiTint Black #15

Description: *Carbon Black
*Water based dispersion of carbon black.

Manufacturer Name:
Technical Industries, Inc.
217 Church Street
Peace Dale, RI 02883
Fax No. (401) 789-2270

Section 2 - Composition / Information on Ingredients

If used improperly is this material toxic by:

Ingestion?	NO	Respiratory system?	NO	Skin?	NO
Inhalation?	NO	Skin absorption?	NO	Eye?	NO

Hazardous Materials/ OSHA:	None	Carcinogenic Materials/ OSHA:	None
Hazard:	None	Sara Title III Section 313 Material:	None

Regulated Components	CAS. No.	%

Section 3 - Warning Statement

Section 4 - Physical And Chemical Data

Specific gravity (Water=1)	N/A	pH	9.0 +
Total Solids	34% +/- 1%	Odor	None
Melting point	N/A	Appearance	Black Liquid
Freeze Point	32*F		

Section 5 - Fire, Explosive and Reactivity Data

Is this material flammable, explosive or combustible? NO
Product non-flammable as supplied.

Flash Point:
Flammable Explosive Limits: Lower _____ Upper _____

What decomposition products may form upon exposure to fire and/or high temperature?

Product Stability: Stable

Does this material polymerize, decompose, explode or react violently when exposed to:

Acid	NO	Alkalines	NO	Air	NO	Heat	NO
Organics	NO	Oxiders	NO	Water	NO		

Comments:

Extinguishing Media: Product is non-flammable as supplied.
Use water, foam, carbon dioxide or dry chemical or foam.

Fire Fighting Procedures: Wear self-contained breathing apparatus while extinguishing fire.

Technical Industries, Inc.

Material Safety Data Sheet (Continued)

Product Name: TITint Black #15

1-Dec-93

Section 6 - Exposure / Handling Measures

Precautions for normal use:
Observe proper industrial hygienic regulation practices.
Use of recommended protective equipment.

Protective equipment:
Rubber gloves / safety goggles to avoid unnecessary contact.

First Aid: Eye Contact - Flush immediately with water / continue for 15 minutes, seek medical attention for irritation.
Skin Contact - Wash with soap and water as soon as possible.

Action in case of spill or breakage: Cover with absorbent material, sweep, shovel or vacuum into closed container.

Disposal Procedures: In accordance with Local, State and federal regulations.

Section 7 - Transportation Requirements

Temperature: Keep from Freezing.

D.O.T. Shipping Information:

Shipping name:	N/A
Hazard Class:	N/A
Transport Label Required:	N/A
Hazardous Substances (Product reportable quantity):	N/A

Section 8 - Other Information

HMIS RATING	
Health	1
Fire	0
Reactivity	0
Personal	0

HMIS INDEX	
0 - Minimal	3 - Serious
1 - Slight	4 - Severe
2 - Moderate	

Effects of Exposure: Inhalation
Acute: None expected. Temporary discomfort to upper respiratory for inhalation above TLV.
Chronic: Contains less than 0.1% of absorbed PNA compounds. In non-absorbed form, some PNA's were found to be a carcinogens, however no carcinogenic effect has been found in humans due to exposure. Carbon Black is not considered a carcinogen by IARC, OSHA or NTP.

Section 9 - Information Reported By:

Name: Elizabeth Hathaway, B.S.N.
Title: Lab Technician
Date: 15-Oct-93 Date Revised: Jan-93

This information is given is based on information Technical Industries, Inc. believes to be. accurate. No warranty, expressed or implied. Information provided is for your information and consideration. Technical Industries, Inc. assumes no legal responsibility for the use or reliance thereon.

54.) TOLUENE

TEDIA *Material Safety Data Sheet*

Tedia Company, Inc.
2880 Symmes Road
Fairfield, OH 45014 USA

24 Hour Emergency Number (CHEMTREC)
USA: 800-424-9300 • International: 703-527-3887
All non-emergency questions should be directed to Customer Service: 800-PURITY-1 for assistance

Toluene

MSDS No. M0192

Date Revised: 12/15/99

1. CHEMICAL PRODUCT IDENTIFICATION

Product Name: Toluene
Product Catalog Number(s): TA-2131, TR-1850, TH-3930, TS-2132, TP-2133
Synonyms: Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol
Molecular Formula: $C_6H_5CH_3$
Molecular Weight: 92.14

2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry Number)
100% Toluene (108-88-3)

3. HAZARDS IDENTIFICATION

MAY BE HARMFUL IF SWALLOWED. THIS SUBSTANCE HAS CAUSED ADVERSE REPRODUCTIVE AND FETAL EFFECTS IN ANIMALS. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. ASPIRATION HAZARD. MAY CAUSE CARDIAC DISTURBANCES. MAY CAUSE LIVER AND KIDNEY DAMAGE. CAUSES DIGESTIVE AND RESPIRATORY TRACT IRRITATION. CAUSES EYE IRRITATION AND POSSIBLE INJURY. MAY CAUSE SKIN IRRITATION.

NFPA Hazard Ratings: Health - 2, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings involve data and interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury. Vapors may cause eye irritation.

Skin: May cause skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis.
Ingestion: Aspiration hazard. May cause irritation of the digestive tract. May cause effects similar to those for inhalation exposure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

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. May cause liver and kidney damage. May cause heart disturbances, possibly leading to cardiac arrest and death.

Chronic: Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage. Prolonged or repeated skin contact may cause dermatitis. May cause cardiac sensitization and severe heart abnormalities. May cause liver and kidney damage.

Target Organs: Kidneys, heart, central nervous system, liver.

4. FIRST-AID MEASURES

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

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: 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. Possible aspiration hazard. Get medical aid immediately.

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

Notes to Physician: Causes cardiac sensitization to endogenous catelcholamines which may lead to cardiac arrhythmias. Do NOT use adrenergic agents such as epinephrine or pseudoepinephrine.

5. FIRE FIGHTING MEASURES

Autoignition Temperature: 535 deg C (995.00 deg F)
Flash Point: 4 deg C (39.20 deg F)
Explosion Limits, Lower: 1.20 vol % Upper: 7.00 vol %

Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May be ignited by heat, sparks, and flame. Containers may explode when heated.

Extinguishing Media: Use water spray to cool fire-exposed containers. 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. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. A vapor suppressing foam may be used to reduce vapors. Use water spray to reduce vapors, do

not put water directly on leak, spill area or inside container.

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. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. 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.

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

ACGIH: 50 ppm ; 188 mg/m3; skin - potential for cutaneous absorption
NIOSH: 100 ppm TWA; 375 mg/m3 TWA 500 ppm IDLH
OSHA - Final PELs: 200 ppm TWA; C 300 ppm; C 300 ppm
OSHA Vacated PELs: Toluene: 100 ppm TWA; 375 mg/m3 TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

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 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Appearance: Clear colourless liquid
Odor: Aromatic, sweet.
pH: Not available.
Vapor Pressure: 10 mm Hg
Vapor Density: 3.1 (Air=1)
Evaporation Rate:
Viscosity: 0.59 cP 20 deg
Boiling Point: 110.6760.00 deg C
Freezing/Melting Point: -95 deg C
Decomposition Temperature:Not available.
Solubility: 0.05 G/100ML WATER (200C)

Specific Gravity/Density: 0.8650g/cm3

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat, electrical sparks, exposure to flame.

Incompatibilities with Other Materials: Acids (mineral, oxidizing, e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), oxidizing agents (strong, e.g. bromine, hydrogen peroxide, nitrogen dioxide, potassium nitrate), water reactive substances (e.g. acetic anyhdride, alkyl aluminum chloride, calcium carbide, ethyl dichlorosilane).

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

11. TOXICOLOGICAL INFORMATION

RTECS#: CAS# 108-88-3: XS5250000
LD50/LC50: CAS# 108-88-3:
Inhalation, mouse: LC50 =400 ppm/24H;
Inhalation, rat: LC50 =49 gm/m3/4H;
Oral, rat: LD50 = 636 mg/kg;
Skin, rabbit: LD50 = 12124 mg/kg;<BR.

Carcinogenicity: CAS# 108-88-3:
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Group 3 carcinogen
Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Neurotoxicity: No data available.
Mutagenicity: No data available.
Other Studies: None.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Bluegill LC50=17 mg/L/24H Shrimp LC50=4.3 ppm/96H Fathead minnow LC50=36.2 mg/L/96H Sunfish (fresh water) TLm=1180 mg/L/96H
Environmental Fate: From soil, substance evaporates and is microbially biodegraded. In water, substance volatilizes and biodegrades.
Physical/Chemical: Photochemically produced hydroxyl radicals degrade substance.
Other: None.

13. DISPOSAL CONSIDERATIONS

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration ofContaminants: None listed.
RCRA D-Series Chronic Toxicity ReferenceLevels: None listed.

RCRA F-Series: None listed.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 108-88-3: waste numberU220.

14. TRANSPORT INFORMATION

DOT (USA) Status: regulated
Shipping name: Toluene
Class 3, UN 1294, packing group II
DOT Reportable Quantity: 5000 lb (2270 kg)

15. REGULATORY INFORMATION

US FEDERAL

TSCA
CAS# 108-88-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 108-88-3: Effective Date: October 4, 1982; Sunset Date: October 4 , 1992
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.
SARA

Section 302 (RQ)
CAS# 108-88-3: final RQ = 1000 pounds (454 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 108-88-3: acute, flammable.
Section 313
This material contains Toluene (CAS# 108-88-3, 99 8%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 108-88-3 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 108-88-3 is listed as a Hazardous Substance under the CWA. CAS# 108-88-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 108-88-3 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 108-88-3 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
WARNING: This product contains Toluene, a chemical known to the state of California to cause birth defects or other reproductive harm. 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:

XN F
Risk Phrases:
R 11 Highly flammable. R 20 Harmful by inhalation.
Safety Phrases:
S 16 Keep away from sources of ignition - No smoking. S 25 Avoid contact with eyes. S 29 Do not empty into drains. S 33 Take precautionary measures against static discharges.
WGK (Water Danger/Protection)
CAS# 108-88-3: 2
Canada
CAS# 108-88-3 is listed on Canada's DSL/NDSL List.
WHMIS: Not available.
CAS# 108-88-3 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits
CAS# 108-88-3: OEL-AUSTRALIA:TWA 100 ppm (375 mg/m3);STEL 150 ppm (5
60 mg/m3) OEL-BELGIUM:TWA 100 ppm (377 mg/m3);STEL 150 ppm (565 mg/m3
) OEL-CZECHOSLOVAKIA:TWA 200 mg/m3;STEL 1000 mg/m3 OEL-DENMARK:TWA 5
0 ppm (190 mg/m3);Skin OEL-FINLAND:TWA 100 ppm (375 mg/m3);STEL 150 p
pm;Skin OEL-FRANCE:TWA 100 ppm (375 mg/m3);STEL 150 ppm (560 mg/m3)
OEL-GERMANY:TWA 100 ppm (380 mg/m3) OEL-HUNGARY:TWA 100 mg/m3;STEL 30
0 mg/m3;Skin OEL-JAPAN:TWA 100 ppm (380 mg/m3) OEL-THE NETHERLANDS:T
WA 100 ppm (375 mg/m3);Skin OEL-THE PHILIPPINES:TWA 100 ppm (375 mg/m
3) OEL-POLAND:TWA 100 mg/m3 OEL-RUSSIA:TWA 100 ppm;STEL 50 mg/m3 OE
L-SWEDEN:TWA 50 ppm (200 mg/m3);STEL 100 ppm (400 mg/m3);Skin OEL-SWI
TZERLAND:TWA 100 ppm (380 mg/m3);STEL 500 ppm OEL-THAILAND:TWA 200 pp
m;STEL 300 ppm OEL-TURKEY:TWA 200 ppm (750 mg/m3) OEL-UNITED KINGDOM
:TWA 100 ppm (375 mg/m3);STEL 150 ppm;Skin OEL IN BULGARIA, COLOMBIA,
JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM
check ACGI TLV

16. OTHER INFORMATION

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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55.) VISCOSITY STANDARD

Material Safety Data Sheet

CL10. Etc.
QUICK IDENTIFIER (In Plant Common Name)
Viscosity Standard

Manufacturer's Name	Cannon Instrument Company	**Emergency Telephone No.**	800-255-3924 Domestic CHEM-TEL INC. #
Address	P.O. Box 16 State College, PA 16804-0016	**Other Information Calls**	814-353-8000
Signature of Person Responsible for Preparation		**Date Prepared**	June 8, 2000

SECTION 1 – IDENTITY

Common Name: (used on label) (Trade Name & Synonym)	CL10. CL12. CL14. CL16. CL19. CL22. CL25. CL28. CL32. CL38. CL48. CL60. CL74. N27B. N105B. N17L. N69L. N74B. N38B. N25B. N14B. N26L. N38L. N56L. N81L.		
Chemical Name	Refined mineral oil.	**Cas No.**	8012-95-1
Formula	Mixed hydrocarbons.	**Chemical Family**	Hydrocarbon

SECTION 2 – HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical & comon name(s))	%	Threshold Limit Value (units)
Refined mineral oil.	100%	5 mg/m^3

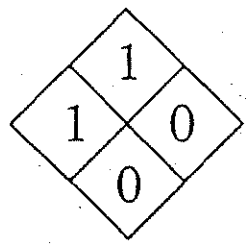
THIS ITEM IS CONTAINED IN THE TSCA INVENTORY

HAZARD RATING

N	4 – Extreme
F	3 – High
P	2 – Moderate
A	1 – Slight
	0 – Insignificant

FIRE

TOXICITY



REACTIVITY

SPECIAL (Contact)

SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

Boiling Point	>260°C	**Specific Gravity (H_20 = 1)**	0.91 @ 15.6°C	
Vapor Pressure (mm Hg)	<0.0001	**Percent Volatile By Volume (%)**	Negligible.	
Vapor Density (Air = 1)	10	**Evaporation Rate (_____ = 1)**	Negligible.	
Solubility In Water	Insoluble	**Reactivity In Water**	None.	
Appearance And Odor	Amber liquid, petroleum odor.			
Flash Point	ASTM D-92 >150°C	**Flammable Limits in Air (% by Volume)**	**Lower** N/A	**Upper** N/A
Extinguisher Media	Sand/earth, water fog, dry chemical, CO_2	**Auto-Ignition Temperature**	N/A	
Special Fire Fighting Procedures	Firefighters should wear self-contained breathing apparatus to prevent inhalation of combustion products. Water spray is an unsuitable extinguishing agent.			
Unusual Fire and Explosion Hazards	None.			

SECTION 4 – PHYSICAL HAZARDS

Stability	Unstable ☐ Stable ■	Conditions To Avoid	N/A
Incompatibility (Materials to Avoid)	Strong oxidizers, such as chromic acid, hydrogen peroxide and bromine.		
Hazardous Decomposition Products	Upon combustion: CO, CO_2.		
Hazardous Polymerization	May Occur ☐ Will Not Occur ■	Conditions To Avoid	N/A

SECTION 5 – HEALTH HAZARDS

Threshold Limit Value	5 milligrams mineral oil mist per cubic meter of air (OSHA).						
Signs and Symptoms of Exposure 1) Acute Overexposure	Prolonged contact may cause minor skin irritation.						
2) Chronic Overexposure	Unknown						
Medical Conditions Generally Aggravated by Exposure	Unknown						
Chemical Listed as Carcinogen Or Potential Carcinogen N/A	National Toxicology Program	Yes ☐ No ■	I.A.R.C. Monographs	Yes ☐ No ■	OSHA	Yes ☐ No ■	
OSHA Permissible Exposure Limit	5 mg/m^3	ACGIH Threshold Limit Value	5 mg/m^3	Other Exposure Limit Data	N/A		
Emergency and First Aid Procedures							
1. Inhalation	If adverse effects occur, remove to uncontaminated area. Get medical attention.						
2. Eyes	Flush eyes with running water for at least fifteen minutes. If irritation develops, seek medical attention.						
3. Skin	Wash thoroughly with soap and water. Remove contaminated clothing and wash before re-use.						
4. Ingestion	Due to low acute oral toxicity, it should not be necessary to induce vomiting. Seek medical attention.						

SECTION 6 – SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	NIOSH approval required on any respiratory equipment used..				
Ventilation	Normal	Local Exhaust	As required if mist is generated.	Mechanical (General)	N/A
Protective Gloves	Oil-resistant rubber.	Eye Protection	Chemical splash goggles.		
Other Protective Clothing or Equipment	Rubber apron.				

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken In Handling and Storage	Store in a cool, dry location. Handle in a well-ventilated area. Use personal protective equipment to prevent contact with skin and eyes. Keep containers closed when not in use. Avoid exposure to heat/flame.
Other Precautions	None
Steps to be taken in Case Material is Released or Spilled	Stop leak. Absorb in dry inert material (sand, clay, vermiculite, etc.). Transfer to disposal container(s). Dike up large spills.
Waste Disposal Methods	Dispose of in accordance with local, state and federal government regulations.