



MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

CS689

PRODUCT: SPEC-AID 8Q302

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,

USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

NEOPRENE GLOVES

WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE IN COOL VENTILATED LOCATION. STORE AWAY FROM OXIDIZERS

HANDLING INSTRUCTIONS***

COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS

DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR

ABOVE THE PRODUCT FLASH POINT.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD

HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

3,548 GALLONS DUE TO (078); 12,774 GALLONS DUE TO (162)

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE

IDENTIFICATION NUMBER IS: D001=IGNITABLE

...DOT HAZARD/UN#/ER GUIDE# IS: COMBUSTIBLE LIQUID NA1993/#27

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO

CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: TRADE SECRET(078)--ALKYL AROMATIC, 2.0-5.0% ;

TRADE SECRET(162)--ALIPHATIC ALCOHOL, 2.0-5.0% ;

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE), DELAYED(CHRONIC) AND FIRE

...MICHIGAN CRITICAL MATERIALS: TRADE SECRET(078)--ALKYL AROMATIC ; TRADE

SECRET(162)--ALIPHATIC ALCOHOL ;

NFPA/HMIS : HEALTH - 2 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

**MATERIAL SAFETY
DATA SHEET**

PO BOX 1018, LAKE CHARLES, LA 70602
24 HOUR TELEPHONE (518) 625-7556



Since 1961

CS686

SECTION I - PRODUCT IDENTIFICATION MATERIAL SAFETY DATA SHEET

DATE: REVISED 12/20/89

CHEMICAL NAME AND SYNONYMS:

TRADE NAME AND SYNONYMS: ALPHACHEM 1386 DETERGENT

CHEMICAL FAMILY:

FORMULA: PROPRIETARY

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	X	TLV (Units)	OTHER INGREDIENTS	X	TLV (Units)
Solvents:					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES:	X	TLV (Units)
NONE		

SECTION III - PHYSICAL DATA

BOILING POINT (F.):	APPROX. 212 Degrees F	SPECIFIC GRAVITY (H2O=1):	Approx. 1.024
VAPOR PRESSURE (mm Hg.):	UNK.	PERCENT, VOLATILE:	NOT DETERMINED
VAPOR DENSITY (AIR=1):	UNK.	BY VOLUME (X)	
SOLUBILITY IN WATER:	100%	EVAPORATION RATE:	1
APPEARANCE AND ODOR:	CLEAR TO AMBER LIQUID WITH CLEAN, FRESH ODOR.	(____ Water ____=1)	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used):	NONE	FLAMMABLE LIMITS
		LeI: UeI:
EXTINGUISHING MEDIA:	NONE NECESSARY	

SPECIAL FIRE FIGHTING PROCEDURES: COOL FIRE EXPOSED DRUMS WITH WATER TO AVOID RUPTURING THAT CAN RESULT IN SLIPPERY AND DANGEROUS FOOTING.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

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MATERIAL SAFETY DATA SHEET

SECTION V - HEALTH HAZARD DATA

ALPHACHEN 1386 DETERGENT

THRESHOLD LIMIT VALUE: UNK.

EFFECTS OF OVEREXPOSURE: CAN CAUSE SKIN DRYNESS AND IRRITATION TO EYES ON DIRECT CONTACT.

EMERGENCY AND FIRST AID PROCEDURES: MAY CAUSE IRRITATION IF SPLASHED INTO EYES. WASH EYES WITH FRESH WATER AND IF IRRITATION PERSISTS, SEE PHYSICIAN. WASH WITH FRESH WATER WITH CONTACT OF SKIN AND CLOTHING.

INGESTION: IF SWALLOWED, GIVE LARGE AMOUNTS OF WATER IF VICTIM IS COMPLETELY CONSCIOUS AND ALERT. DO NOT INDUCE VOMITING. OBTAIN MEDICAL ATTENTION.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE	CONDITIONS TO AVOID:
	STABLE	XXX

INCOMPATIBILITY (Materials to avoid): AVOID CONTACT WITH CONCENTRATED ACIDS, ALKALIES OR OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE KNOWN

HAZARDOUS POLYMERIZATION	MAY OCCUR	CONDITIONS TO AVOID:
	WILL NOT OCCUR	XXX

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: WASH TO SEWER OR DRAINAGE WITH WATER IF ACCEPTABLE. MAY NEED TO ABSORB WITH INERT MATERIAL AND SHOVEL TO WASTE RECEPTACLE.

WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH STATE, FEDERAL, AND LOCAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): NONE NECESSARY

VENTILATION	LOCAL EXHAUST	SPECIAL:
	MECHANICAL (General)	OTHER: GENERAL DILUTION

PROTECTIVE GLOVES: RECOMMENDED | EYE PROTECTION: RECOMMENDED

OTHER PROTECTIVE EQUIPMENT: SAFETY EQUIPMENT ADEQUATE TO AVOID PROLONGED SKIN AND EYE CONTACT.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT TASTE OR SWALLOW. WASH HANDS THOROUGHLY AFTER HANDLING. AVOID PROLONGED CONTACT WITH SKIN. DO NOT GET IN EYES. PREVENT CONTACT WITH FOOD, CHEWING AND SMOKING MATERIALS.

OTHER PRECAUTIONS: SUGGEST THIS PRODUCT NOT BE MIXED WITH CONCENTRATED ACIDS, ALKALIES OR OXIDIZING AGENTS.

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COASTAL PRODUCTS & CHEMICALS, INC.
HOUSTON, TEXAS
U.S.A.

68026

PRODUCT SAFETY BULLETIN

ALUMINUM SULFATE IN AQUEOUS SOLUTION (LIQUID ALUM)
 $\text{Al}_2(\text{SO}_4)_3 \cdot 49 \text{H}_2\text{O}$

PHYSICAL DATA

CHEMICAL NAME: ALUMINUM SULFATE - LIQUID

COMMON NAME: LIQUID ALUM

FORMULA: $\text{Al}_2(\text{SO}_4)_3 \cdot 49 \text{H}_2\text{O}$

STATE: LIQUID (20°C/68°F - 14.7 psia)

FORMULA WEIGHT: 1224.86

SPECIFIC GRAVITY: 1.29-1.34
@ 15°C/59°F

CONCENTRATION: 8.0-8.6 % Al_2O_3

BOILING POINT: 102°C/215.6°F

MELTING POINT: -10°C/14°F

ODOR: None

COLOR: Clear, water white

pH VALUE: 1.8 to 2.5

REACTIVITY/CORROSIVITY: Similar to dilute sulfuric acid. Stainless steel and plastic are resistant to corrosion.

STABILITY: Begins to decompose at temperatures above 650°C/1200°F. Forms sulfur trioxide and aluminum oxide at temperatures above 650°C/1200°F.

SAFETY PRECAUTIONS

PERSONAL SAFETY EQUIPMENT

RESPIRATORY: None Required

HANDS-BODY: Plastic or Rubber Gloves

FACE-EYES: Clear Goggles or Face Shield

OTHER EQUIPMENT: Slicker Suit

HANDLING AND STORAGE

STORAGE: Stainless steel or specially lined tanks. Typical liners include fiber reinforced plastics and rubber.

TRANSPORTATION: Shipped in stainless steel or specially-lined tank cars and trucks.

DISPOSAL: Dispose unused material according to environmental regulations. Contact CP&C's Technical Services Department to develop Disposal plan. Containers must be thoroughly emptied prior to disposal. Incineration may produce sulfur trioxide fumes.

SPECIAL NOTE: Establish a spill prevention, control and countermeasure plan with the assistance of CP&C's Technical Services Department. Alum can be neutralized with Caustic Soda or Lime.

FIRE HAZARDS

Non Flammable

EXTINGUISHING MEDIA: Use water to keep the temperature below 650°C/1200°F to prevent decomposition.

UNUSUAL FIRE/EXPLOSION HAZARDS: Decomposition at 650°C/1200°F produces sulfur trioxide which may add to combustion.

SPECIAL PROCEDURES: Wear protective clothing to avoid potential irritation by mist to the skin, eyes and mucous membranes.

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HEALTH HAZARDS & MEDICAL PROCEDURES

GENERAL INFORMATION: The most common injury from exposure is local tissue irritation. If exposure occurs or if poisoning is suspected, inform physician immediately of type and extent of exposure, describe the victim's symptoms and follow medical advice.

INCIDENT	FIRST AID
INHALATION: Irritation of the respiratory system may be a warning of exposure to acidic mist.	Remove the victim from the contaminated atmosphere. If breathing has stopped, initiate CPR. CPR and weak breathing may be supplemented with a bag-mask respirator or a manually operated oxygen supply which delivers at least 1 liter/second. CALL PHYSICIAN IMMEDIATELY.
INGESTION: Oral and gastrointestinal irritation. Local tissue damages. Nausea, vomiting, diarrhea and gastrointestinal bleeding may occur. Large amounts may cause serious injury.	Immediately dilute swallowed material by orally administering large amounts of water or milk. Induce vomiting. Continue administering fluid until vomitus is clear. NEVER administer liquids orally to an unconscious person. Call physician or Poison Control Center immediately.
EYE CONTACT: Irritation. Sulfuric acid burns.	Immediately flush victim's eyes with running water for 15 minutes. Hold eyelids fully open to expose entire eye surface to water. Call physician immediately. Continue flushing eyes for another 15 minutes if medical help is not immediately available.
SKIN CONTACT: Irritation.	Immediately remove contaminated clothes under a safety shower. Flush skin with running water for at least 15 minutes. Call physician immediately.

ADDITIONAL INFORMATION

THRESHOLD LIMIT VALUE (TLV): No TLV has been established for aluminum sulfate by the American Conference of Governmental Industrial Hygienists.

TIME WEIGHED AVERAGE: N/A

NEUTRALIZING AGENT: None

TOPICAL TREATMENT: Water

INTERNAL TREATMENT: Water
or Milk

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FOR ADDITIONAL INFORMATION CONTACT:
COASTAL PRODUCTS & CHEMICALS, INC.
 TECHNICAL SERVICES DEPARTMENT
 3160 Interfirst Plaza
 Houston, Texas 77002-5217
 Telephone: (713) 739-7400
 Telex: 853169

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GS685

SECTION I - PRODUCT IDENTIFICATION MATERIAL SAFETY DATA SHEET

DATE: REVISED 1/4/90
CHEMICAL NAME AND SYNONYMS:

TRADE NAME AND SYNONYMS: ALPHACHEM 2084
DEGREASER

CHEMICAL FAMILY:

FORMULA: PROPRIETARY

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	X	TLV (Units)	OTHER INGREDIENTS	X	TLV (Units)
Solvents:					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES:

	X	TLV (Units)
HEAVY AROMATIC SOLVENT		25 ppm
ALIPHATIC NAPHTHA		100 ppm

SECTION III - PHYSICAL DATA

BOILING POINT (F.):	SPECIFIC GRAVITY (H ₂ O=1):	Approx. .895
VAPOR PRESSURE (mm Hg.):	PERCENT, VOLATILE:	UNK.
VAPOR DENSITY (AIR=1):	BY VOLUME (%)	
SOLUBILITY IN WATER:	EVAPORATION RATE:	UNK.
APPEARANCE AND ODOR: DARK LIQUID WITH HYDROCARBON ODOR.	(_____ = 1)	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used): TYPICALLY 180 Degrees F (FHCC) FLAMMABLE LIMITS
LeL: UeL:
EXTINGUISHING MEDIA: WATER SPRAY, DRY CHEMICALS, FOAM OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES: USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. IF A LEAK OR SPILL HAS NOT IGNITED USE WATER SPRAY TO DISPERSE THE VAPORS. USE AIR SUPPLIED RESCUE EQUIPMENT FOR ENCLOSED AREAS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: DO NOT STORE OR MIX WITH STRONG OXIDANTS.

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MATERIAL SAFETY DATA SHEET

SECTION V - HEALTH HAZARD DATA

ALPHACHEM 2084 DEGREASER

THRESHOLD LIMIT VALUE: UNDETERMINED (SEE SECTION II)

EFFECTS OF OVEREXPOSURE: CENTRAL NERVOUS SYSTEM DEPRESSION WITH DROWSINESS AND POSSIBLE UNCONSCIOUSNESS AT HIGH CONCENTRATION OF VAPOR.

EMERGENCY AND FIRST AID PROCEDURES: EYES: FLUSH WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH SOAP AND WATER. SHOULD SYMPTOMS OF OVEREXPOSURE TO VAPORS OCCUR REMOVE TO FRESH AIR. IF UNCONSCIOUS, APPLY ARTIFICIAL RESPIRATION. DO NOT INDUCE VOMITING IF SWALLOWED.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID:
	STABLE	XXX	

INCOMPATIBILITY (Materials to avoid): CONTACT WITH STRONG OXIDIZERS MAY CAUSE REACTIONS.

HAZARIOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE IN THE CASE OF INCOMPLETE COMBUSTION.

HAZARIOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID:
	WILL NOT OCCUR	XXX	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: CONTAIN SPILL IF POSSIBLE. VENTILATE AREA. AVOID BREATHING VAPOR. USE SELF CONTAINED BREATHING APPARATUS OR FRESH AIR MASK FOR LARGE SPILL IN CONFINED AREA. WIPE UP OR ABSORB AND SHOVEL UP. REMOVE ALL IGNITION SOURCES.

WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): FRESH AIR MASK OR APPARATUS IF PRODUCT USED IN CONFINED AREA.

VENTILATION	LOCAL EXHAUST	XXX	SPECIAL:
	MECHANICAL (General)		

PROTECTIVE GLOVES: SUGGESTED | EYE PROTECTION: SUGGESTED

OTHER PROTECTIVE EQUIPMENT:

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP CONTAINER CLOSED WHEN NOT IN USE. KEEP AWAY FROM HEAT AND FLAME.

OTHER PRECAUTIONS: AVOID PROLONGED OR REPEATED SKIN CONTACT. REPEATED CONTACT OF SIMILAR MATERIALS ON LABORATORY ANIMALS HAS RESULTED IN THE INDUCTION OF TUMORS.

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21259

MATERIAL SAFETY DATA SHEET

08684

MSDS DATE: 3/16/90
CHANGE NO.: 8276For Assistance, Contact:
Regulatory Affairs Dept.
PO Box 987 Ames, IA 50018
(800) 227-4224HACH COMPANY
PO BOX 987
AMES, IA 50018Emergency Telephone 8
Rocky Mountain Poison Ctr.
(303) 623-5716

I. PRODUCT IDENTIFICATION

CATALOG NO.: 21259
PRODUCT NAME: Digestion Solution for COD 0-1500 ppm Range
CAS NO.: NA CHEMICAL NAME: Not applicable
FORMULA: Not applicable CHEMICAL FAMILY: Not applicable

II. INGREDIENTS

Sulfuric Acid ACS Grade
PCT: <05 CAS NO.: 7664-93-9 SARA: LISTED
TLV: 1 mg/M3 PEL: 1 mg/M3
HAZARD: Very corrosiveMercuric Sulfate
PCT: <5 CAS NO.: 7783-35-9 SARA: LISTED
TLV: 0.05 mg/M3 as Hg PEL: C: 0.1 mg/M3 Hg
RCRA: D069
HAZARD: Causes burns; very toxicChromic Acid
PCT: <1 CAS NO.: 13530-68-2 SARA: NOT LISTED
TLV: 0.05 mg/M3 as Cr PEL: 0.5 mg/M3 as Cr
HAZARD: Corrosive; extremely toxic; cancer hazardSilver Sulfate
PCT: <2 CAS NO.: 10294-26-5 SARA: LISTED
TLV: 0.01 mg/M3 as Ag PEL: 0.01 mg/M3 as Ag
HAZARD: Toxicity unknown; may cause irritationDemineralized Water
PCT: to 100 CAS NO.: 7732-18-5 SARA: NOT LISTED
TLV: Not applicable PEL: Not applicable
HAZARD: None

III. PHYSICAL DATA

STATE: liquid APPEARANCE: Turbid, light orange ODOR: Not determined
SOLUBILITY IN: WATER: Miscible ACID: Not determined
OTHER: Sodium hydroxide solution BOTTLING POINT: >100°C MELTING PT.: NA
SPEC GRAVITY: >1.0 pH: <0.5 VAPOR PRESSURE: Not determined
VAPOR DENSITY (air=1): ND EVAPORATION RATE: None
METAL CORROSIVITY - ALUMINUM: Corrosive STEEL: Corrosive
STABILITY: See Conditions to Avoid
STORAGE PRECAUTIONS: Protect from light and from contamination by organic materials.

IV. FIRE, EXPLOSION HAZARD AND REACTIVITY DATA

FLASH PT.: Not applicable METHOD: NA
FLAMMABILITY LIMITS - LOWER: NA UPPER: NA
SUSCEPTIBILITY TO SPONTANEOUS HEATING: None
SHOCK SENSITIVITY: None AUTOIGNITION PT.: NA
EXTINGUISHING MEDIA: Not applicable
FIRE/EXPLOSION HAZARDS: May emit toxic fumes in fire
HAZARDOUS DECOMP. PRODUCTS: May emit toxic fumes of sulfur oxides in fire
OXIDIZER: mild NFPA Codes: Health: 3 Flammability: 0 Reactivity: 1
NFPA Symbol: W
CONDITIONS TO AVOID: Exposure to light or organic contamination (will affect product stability). Contact with strong caustics.

V. HEALTH HAZARD DATA

THIS PRODUCT MAY BE: corrosive to eyes, skin and respiratory tract.
ACUTE TOXICITY: Oral rat LD50 = 428 mg/Kg = Very toxic
ROUTES OF EXPOSURE: Ingestion, Inhalation
TARGET ORGANS: Not determined
CHRONIC TOXICITY: Erosion of the teeth, chronic irritation or inflammation
ROUTES OF EXPOSURE: Inhalation
TARGET ORGANS: teeth, lungs
CANCER INFORMATION: An ingredient of this mixture is a recognized carcinogen.
ROUTES OF EXPOSURE: Inhalation
TARGET ORGANS: Not determined
OVEREXPOSURE: Severely burns any tissue contacted. Breathing in the mist or vapor may cause teeth erosion or the mouth to become sore and also difficulty in breathing.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Respiratory conditions

VI. PRECAUTIONARY MEASURES

Caution. Protect from light.

Avoid contact with eyes, skin and clothing
Do not breathe mist or vapor.
Wash thoroughly after handling.
PROTECTIVE EQUIPMENT: fume hood, disposable gloves, lab grade goggles, lab coat

VII. FIRST AID

EYE AND SKIN CONTACT: Immediately flush eyes and skin with water for 15 minutes. Remove contaminated clothing. Call physician.
INGESTION: Do not induce vomiting. Give large quantities of water. Give at least 1 ounce of milk of magnesia in an equal amount of water, or the whites of 3 eggs. Never give anything by mouth to an unconscious person. Call physician.
INHALATION: Remove to fresh air. Give artificial respiration if necessary. Call physician.

VIII. SPILL AND DISPOSAL PROCEDURES

IN CASE OF SPILL OR RELEASE: The toxicity of mercury is such that the element and its compounds should not be allowed to contaminate air or water. Consult your EPA or similar agency to determine the recommended disposal method in your area. For large spills, contain the spill with inert material and evacuate the area.
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

IX. TRANSPORTATION DATA

D.O.T. PROPER SHIPPING NAME: Sulfuric acid solution
HAZARD CLASS: Corrosive Material ID: UN1830I.C.A.O. PROPER SHIPPING NAME: Sulphuric acid solution
HAZARD CLASS: 8 ID: UN1830 GROUP: III.M.O. PROPER SHIPPING NAME: Sulphuric Acid Solution
HAZARD CLASS: 8 ID: UN1830 GROUP: II

X. REFERENCES

- 1) TLV's Threshold Limit Values and Biological Exposure Indices for 1988-1989. American Conference of Governmental Industrial Hygienists, 1988.
- 2) Air Contaminants, Federal Register, Vol. 54, No. 12, Thursday, January 19, 1989, pp. 2352-2903.
- 3) In-house information
- 4) Technical judgment
- 5) NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Cincinnati: Department of Health and Human Services, 1981.
- 6) IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7, 1987, France.
- 7) Outside testing.

SARA: This product contains a chemical or chemicals subject to the report: requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

PER CALIFORNIA PROPOSITION 65: "WARNING - This product contains a chemical known to the State of California to cause cancer."

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SAL 000006910





MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

68683

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 5547 EMULSION BREAKER

DESCRIPTION: Blend of oxyalkylates in a hydrocarbon solvent

NFPA 704M/HMIS RATING: 2/2 HEALTH 2/2 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX.%
Heavy aromatic naphtha	68603-08-7	40-70
Naphthalene	91-20-3	1-5
Ethylbenzene	100-41-4	5-10
Xylene	1330-20-7	5-10

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: Causes irritation to skin and eyes. Combustible. Prolonged inhalation of vapor may be harmful. Do not get in eyes, on skin, or on clothing. Wear goggles and face shield when handling. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Wash thoroughly with soap and rinse with water. Call a physician.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions,

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Shea 014075



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS688

SECTION 4 FIRST AID INFORMATION

(CONTINUED)

do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation *

EYE CONTACT: Can cause moderate irritation. *

SKIN CONTACT: Can cause moderate irritation. *

INHALATION: Prolonged inhalation of vapor may be harmful. *

SYMPTOMS OF EXPOSURE:

ACUTE: Inhalation of high concentrations of product can cause nausea, dizziness, vomiting, stupor or unconsciousness. *

CHRONIC: Prolonged skin contact of product can cause dry skin and defatting resulting in irritation and dermatitis. *

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions not previously mentioned, or identified in Section 6 or 14. *

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: No toxicity studies have been conducted on this product.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear amber FORM: Liquid ODOR: Hydrocarbon *

SPECIFIC GRAVITY: 0.97 @ 60 Degrees F *

FLASH POINT: Minimum 120 Degrees F (PMCC) ASTM D-93 *

NOTE: These physical properties are typical values for this product. *

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: Minimum 120 Degrees F (PMCC) ASTM D-93 *

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material. *

UNUSUAL FIRE AND EXPLOSION HAZARD: Containers exposed in a fire should be *



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 8 FIRE AND EXPLOSION INFORMATION

(CONTINUED)

cooled with water to prevent vapor pressure buildup leading to a rupture. *

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes. *

FEEDING EQUIPMENT: Do not use this product with rubber, polyethylene, neoprene, Hypalon, Buna-N, vinyl, PE, ethylene propylene or polyurethane. *

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂ may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment. *

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed. If significant vapors, mists or aerosols are generated, wear a NIOSH approved or equivalent respirator, (ANSI Z 88.2, 1980 for requirements and selection). *

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended. *

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, mists or aerosols may be released. *

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment, doing maintenance or handling product. *

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. *

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510) *

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14. *



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS688

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

DISPOSAL: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under the Resources Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous Waste D001.

As a hazardous liquid waste, it must be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to a licensed industrial waste landfill (Hazardous Waste Treatment, Storage and Disposal facility). A hazardous liquid waste can also be incinerated in accordance with local, state, and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - COMBUSTIBLE LIQUID, N.O.S.
COMBUSTIBLE LIQUID NA 1993
CONTAINS - AROMATIC HYDROCARBONS,
NAPHTHALENE

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.

Heavy aromatic naphtha - Skin irritant, combustible
Naphthalene - Irritant
Ethylbenzene - Eye irritant
Xylene - Eye irritant



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

6 S 6 8 3

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

Naphthalene = TWA 10 ppm, STEL 15 ppm ACGIH/TLV
52 mg/m³ 79 mg/m³ ACGIH/TLV
Ethylbenzene = TWA 100 ppm, STEL 125 ppm ACGIH/TLV
434 mg/m³, 543 mg/m³ ACGIH/TLV
Xylene = TWA 100 ppm, STEL 150 ppm ACGIH/TLV
434 mg/m³, 651 mg/m³ ACGIH/TLV

Naphthalene = TWA 10 ppm, STEL 15 ppm OSHA/PEL
50 mg/m³, 75 mg/m³ OSHA/PEL
Ethylbenzene = TWA 100 ppm, STEL 125 ppm OSHA/PEL
435 mg/m³, 545 mg/m³ OSHA/PEL
Xylene = TWA 100 ppm, STEL 150 ppm OSHA/PEL
435 mg/m³, 651 mg/m³ OSHA/PEL

CERCLA/SUPERFUND, 40 CFR 117, 302:

This product contains naphthalene, a Reportable Quantity (RQ) substance and if 3,400 pounds of product are released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D. C. (1-800-424-8802).

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
-- Delayed (chronic) health hazard
XX Fire hazard
-- Sudden release of pressure hazard
-- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS688

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product contains the following ingredient(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals.

Naphthalene	91-20-3	1-5
Ethylbenzene	100-41-4	5-10
Xylene	1330-20-7	5-10

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
If this product becomes a waste, it does meet the criteria of a hazardous waste as defined under RCRA 40 CFR 261 (consult Section 11).

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15/
formerly Sec. 307, 40 CFR 116/formerly Sec. 311:

This product contains the following ingredients covered by the Clean Water Act:

Naphthalene - Section 307, 311
Ethylbenzene - Section 307, 311
Xylene - Section 311

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product contains the following ingredients covered by the Clean Air Act:

Ethylbenzene - Section 111
Xylene - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

Substances known to the State of California to cause cancer may be present as an impurity or residue.

MICHIGAN CRITICAL MATERIALS:

This product contains the following substance(s) identified on the Michigan Critical Materials Register:

Naphthalene, Xylene



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

68688

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

STATE RIGHT TO KNOW LAWS:

The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Ethylbenzene	100-41-4
Heavy aromatic naphtha	68603-08-7
Naphthalene	91-20-3
Oxyalkylated resin	Trade secret
Xylene	1330-20-7

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70. The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Heavy aromatic naphtha	68603-08-7	40-70
Naphthalene	91-20-3	1-5
Ethylbenzene	100-41-4	5-10
Xylene	1330-20-7	5-10

SECTION 15 ADDITIONAL INFORMATION

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SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5547 EMULSION BREAKER

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

65689

SECTION 17 BIBLIOGRAPHY

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PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G. D., Clayton, F. E., eds., John Wiley and Sons, N. Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

Information on this MSDS has changed. The changes are indicated by asterisks on the right side of only the changed sections. This is an updated MSDS as required by OSHA's Hazard Communication Rule 29 CFR 1910.1200.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 04/17/90

DATE PRINTED: 05/12/90



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

CS622

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 5151 CORROSION INHIBITOR *

DESCRIPTION: An aqueous solution of alkyl primary amine and alkanolamine compounds *

NFPA 704M/HMIS RATING: 3/3 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER*
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme *

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX.%
Methoxypropylamine	5332-73-0	10-20
Monoethanolamine	141-43-5	40+

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: Causes burns to skin and eyes. Do not get in eyes, on skin, or on clothing. Wear goggles and face shield when handling. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. *

Empty containers may contain residual product. Do not reuse container unless properly reconditioned. *

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.
SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

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Shea 003741



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS682

SECTION 4 FIRST AID INFORMATION

(CONTINUED)

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

SKIN CONTACT: Corrosive to skin with possible permanent damage depending on length of exposure. Can cause allergic contact dermatitis in susceptible individuals.

INGESTION: Can be harmful or fatal.

INHALATION: Can be corrosive to the mucous membranes and the lungs.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but toxicity studies of the ingredient(s) in Section 2 have been reviewed. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS):

Methoxypropylamine LD₅₀ = 750 mg/kg

Monoethanolamine LD₅₀ = 2,100 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS):

Methoxypropylamine LD₅₀ = 2,600 mg/kg

Monoethanolamine LD₅₀ = 1,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING:

6.6/8.0 Corrosive - Methoxypropylamine

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING:

104/110.0 Extremely irritating - Methoxypropylamine

SKIN SENSITIZATION: Skin sensitization expected.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 6 TOXICOLOGY INFORMATION

(CONTINUED)

OTHER TOXICITY RESULTS: Methoxypropylamine. Bacterial mutagenicity bioassay (Ames) negative.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Colorless	FORM: Liquid	ODOR: Amine
DENSITY:	8.5 lbs/gal.	
SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	1.02 @ 60 Degrees F	ASTM D-1298
pH (NEAT) =	11.4	ASTM E-70
VISCOSITY:	42 SUS @ 100 Degrees F	ASTM D-2983
POUR POINT:	Less than -30 Degrees F	ASTM D-97
BOILING POINT:	Greater than 200 Degrees F @ 760 mm Hg	ASTM D-86
FLASH POINT:	None	

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: Ammonia, CO, CO₂ may be evolved under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: N-nitrosamines, many are cancer causing agents to laboratory animals, may be formed when certain amines are mixed with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations.

FEEDING EQUIPMENT: Do not use with copper, brass, aluminum or bronze, rubber, neoprene, polyurethane, Buna-N or ethylene propylene.

Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS682

SECTION 9 REACTIVITY INFORMATION

(CONTINUED)

Avoid contact with strong acids (eg. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) which can generate heat, splattering or boiling and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, NO_x may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent respirator is recommended.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, mists or aerosols may be released.

PROTECTIVE EQUIPMENT: Wear gloves, boots, apron and a face shield with chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.). A full slicker suit is recommended if gross exposure is possible.

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

Keep the spill away from heat, sparks, flames and welding operations. Ventilate area and evacuate employees from exposure if the airborne concentration exceeds the TLV. Refer to Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - CORROSIVE LIQUID, N.O.S.
CORROSIVE MATERIAL UN 1760
CONTAINS - ORGANIC AMINE COMPOUND

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.

Methoxypropylamine - Corrosive, sensitizer
Monoethanolamine - Corrosive

Monoethanolamine = TWA 3 ppm, STEL 6 ppm ACGIH/TLV



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

8 mg/m³, 15 mg/m³ ACGIH/TLV

Monoethanolamine = TWA 3 ppm, STEL 6 ppm OSHA/PEL
8 mg/m³, 15 mg/m³ OSHA/PEL

Methoxypropylamine = TWA 10 ppm, STEL 20 ppm
Workplace Environmental Exposure Limit (WEEL)

CERCLA/SUPERFUND, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an
Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found this product to be hazardous. The product
should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
-- Delayed (chronic) health hazard
-- Fire hazard
-- Sudden release of pressure hazard
-- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local
emergency planning commission, state emergency response commission and local
fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever
is less, of an extremely hazardous substance.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):
This product does not contain ingredients (at a level of 1% or greater) on the
List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):
The chemical ingredients in this product are on the 8(b) Inventory List
(40 CFR 710).



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
If this product becomes a waste, it does not meet the criteria of a
hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:
This product contains the following ingredients covered by the Clean Air Act:

Monoethanolamine - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be
present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical
Materials Register.

STATE RIGHT TO KNOW LAWS:

The following ingredient(s) are disclosed for compliance with State Right To
Know Laws:

Methoxypropylamine	5332-73-0
Monoethanolamine	141-43-5
Water	7732-18-5

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill
C-70. The product contains the following substance(s), from the Ingredient
Disclosure List or has been evaluated based on its toxicological properties,
to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Methoxypropylamine	5332-73-0	10-20
Monoethanolamine	141-43-5	40+



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

65682

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

65682

SECTION 17 BIBLIOGRAPHY

(CONTINUED)

WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

Information on this MSDS has changed. The changes are indicated by asterisks on the right side of only the changed sections. This is an updated MSDS as required by OSHA's Hazard Communication Rule 29 CFR 1910.1200.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 04/18/90

DATE PRINTED: 05/12/90



MATERIAL SAFETY DATA SHEET

PRODUCT

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SAL 000006928



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBI

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

CS621

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 89RB068 CORROSION INHIBI

DESCRIPTION: An imidazoline in heavy aromatic naphtha

NFPA 704M/HMIS RATING: 3/3 HEALTH 2/2 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous. One or more is being claimed as a trade secret under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Heavy aromatic naphtha	64742-94-5	40-70
Proprietary imidazoline	Proprietary	40-70

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: Causes burns to skin and eyes. Combustible. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield when handling. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.
SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

SAL 000006929

CAUTION: If unconscious, having trouble breathing or in convulsions,

Shea 021460



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBIT

Emergency Telephone Number

GS681

Medical (312) 920-1510 (24 hours)*

SECTION 4 FIRST AID INFORMATION

(CONTINUED)

do not induce vomiting or give water.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

SKIN CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

INGESTION: Can be harmful.

INHALATION: Prolonged inhalation of vapor may be harmful.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but acute studies have been conducted on a similar product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = 1,122 mg/kg

95% Confidence Limit = 887 - 1,420 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 3,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING: 8.0/8.0 Extremely irritating (Corrosive)

COMMENTS: Third degree burns were apparent on all application sites.

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING: 110/110.0 Extremely irritating (Corrosive)



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBITOR

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

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SECTION 6 TOXICOLOGY INFORMATION

(CONTINUED)

COMMENTS: Caused permanent damage to the cornea and iris.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Clear light amber	FORM:	Liquid	ODOR:	Hydrocarbon
SOLUBILITY IN WATER:	Completely				
SPECIFIC GRAVITY:	0.92 @ 60 Degrees F				
VISCOSITY:	39 cst @ 60 Degrees F			ASTM D-445	
POUR POINT:	Less than -30 Degrees F			ASTM D-97	
FLASH POINT:	152 Degrees F (PMOC)			ASTM D-93	

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: 152 Degrees F (PMOC) ASTM D-93

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions. Containers exposed in a fire should be cooled with water to prevent vapor pressure buildup leading to a rupture.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent respirator is recommended.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBITOR

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Medical (312) 920-1510 (24 hours)*

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SECTION 10 PERSONAL PROTECTION EQUIPMENT

(CONTINUED)

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors or mists may be released.

PROTECTIVE EQUIPMENT: Wear gloves, boots, apron and a face shield with chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.). A full slicker suit is recommended if gross exposure is possible.

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBITOR

Emergency Telephone Number

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SECTION 12 ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - CORROSIVE LIQUID, N.O.S.
CORROSIVE MATERIAL UN 1760
CONTAINS - ORGANIC AMINE COMPOUND

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.

Heavy aromatic naphtha - Combustible, skin irritant
Proprietary imidazoline - Corrosive to eyes/skin

Heavy aromatic naphtha = 100 ppm TLV
Manufacturer's recommendation

CERCLA/SUPERFUND, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS
(40 CFR 370):

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
— Delayed (chronic) health hazard
XX Fire hazard
— Sudden release of pressure hazard
— Reactive hazard



MATERIAL SAFETY DATA SHEET

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

After October 17, 1989, MSDS(s), or a list of product names for all hazardous substances between zero (0) and 10,000 pounds, not previously reported, must be submitted.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does not meet the criteria of a hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15/
formerly Sec. 307, 40 CFR 116/formerly Sec. 311:
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIB

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

This product does not contain ingredients listed by State Right To Know Laws.

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70. The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Heavy aromatic naphtha	64742-94-5	40-70
Proprietary imidazoline	Proprietary	40-70

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C. D., and Admur, M. O., eds., Macmillian Publishing Company, Inc., N. Y., 2nd edition, 1980.

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DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 89RB068 CORROSION INHIBITOR

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

CS681

SECTION 17 BIBLIOGRAPHY

(CONTINUED)

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G. D., Clayton, F. E., eds., John Wiley and Sons, N. Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 06/15/89

DATE PRINTED: 03/21/90

PRODUCT: SLIMICIDE C30A

PRINTED: 05-15-90

PRODUCT APPLICATION : BIOCIDES.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE AND CHRONIC HAZARDS OF THIS FORMULATION.

AROMATIC SOLVENTS,PREMIUM***CAS#64742-94-5;COMBUSTIBLE LIQUID;EYE IRRITANT;
MANUFACTURER'S RECOMMENDED EXPOSURE LIMIT:100PPM;PEL/TLV:NONE.

N-METHYLPYRROLIDONE***CAS#872-50-4;COMBUSTIBLE;POTENTIAL EYE AND SKIN
IRRITANT;PEL/TLV:NONE;MANUFACTURER'S RECOMMENDED EXPOSURE LIMIT:100PPM.

BIS(TRICHLOROMETHYL) SULFONE***CAS#3064-70-8;CORROSIVE(EYES);SEVERE
IRRITANT(SKIN);PEL:NONE;TLV:NONE.

HEAVY AROMATIC NAPHTHA;***CAS#64742-06-9;COMBUSTIBLE LIQUID;IRRITANT(EYE);
MANUFACTURERS SUGGESTED EXPOSURE LIMIT:100PPM;PEL:NONE;TLV:NONE.

METHYLENE BIS(THIOCYANATE)***CAS#6317-18-6;IRRITANT(SKIN);CORROSIVE (EYES);
TOXIC(ORAL INGESTION);PEL:NONE;TLV:NONE.

(NONYLPHENOXYPOLY(ETHYLENEOXY) ETHANOL***CAS#9016-45-9;EYE AND SKIN IRRITANT;
PEL:NONE;TLV:NONE.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 5% EMULSION (APPROX.)	3.3	ODOR: SLIGHT PUNGENT
FL.PT.(DEG.F): 154	P-M(CC)	SP.GR.(70F)OR DENSITY: 1.080
VAPOR PRESSURE(mmHG): <10		VAPOR DENSITY(AIR=1): >1
VISC cps70F: 15		%SOLUBILITY(WATER): 0
EVAP.RATE: ND	WATER=1	APPEARANCE: YELLOW TO AMBER
PHYSICAL STATE: LIQUID		FREEZE POINT(DEG.F): <-30

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000006937

PRODUCT: SLIMICIDE C30A

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

CORROSIVE TO SKIN.POTENTIAL SKIN SENSITIZER

ACUTE EYE EFFECTS ***

CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS,GASES,MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT. PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED EXPOSURES MAY CAUSE DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

DERMAL EXPOSURES WILL DEFAT AND DRY SKIN AND CAUSE SEVERE SKIN IRRITATION; INHALATION OF VAPORS/MISTS/AEROSOLS CAUSES EYE AND RESPIRATORY IRRITATION,DIZZINESS,HEADACHE,NAUSEA.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***

MAY BE HIGHLY TOXIC IF INHALED.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

(INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM DO NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBENT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.

FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT(AS IS) -

DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

BETZ MATERIAL SAFETY DATA SHEET

(PAGE 3 OF 3)

PRODUCT: SLIMICIDE C30A

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

NEOPRENE GLOVES

WASH OFF AFTER EACH USE.REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE IN COOL VENTILATED LOCATION.STORE AWAY FROM OXIDIZERS

HANDLING INSTRUCTIONS***

COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS
DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR
ABOVE THE PRODUCT FLASH POINT.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...FIFRA(40CFR):EPA REG.NO. 3876- 61

TREAT AS OIL SPILL

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: D002=CORROSIVE (SKIN)

...DOT HAZARD/UN#/ER GUIDE# IS: CORROSIVE TO SKIN.COMBUSTIBLE UN1760/#60

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE),DELAYED(CHRONIC) AND FIRE

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

NFPA/HMIS : HEALTH - 3 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - CORR ; PE - B

GS680

BETZ INDUSTRIAL DIV.
1 QUALITY WAY, TREVOSE, PA.19047
BETZ MATERIAL SAFETY DATA SHEET (PAGE 1 OF 3)
24 HOUR EMERGENCY TELEPHONE NO.(215)355-3300

REVISIONS TO SECTIONS: -;EDIT:2

PRINTED: 05-15-90

PRODUCT: SLIMICIDE C41A

PRODUCT APPLICATION : BIOCIDES.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE AND CHRONIC HAZARDS OF THIS FORMULATION.

AROMATIC SOLVENTS,PREMIUM***CAS#64742-94-5;COMBUSTIBLE LIQUID;EYE IRRITANT;
MANUFACTURER'S RECOMMENDED EXPOSURE LIMIT:100PPM;PEL/TLV:NONE.

N-METHYLPYRROLIDONE***CAS#872-50-4;COMBUSTIBLE;POTENTIAL EYE AND SKIN
IRRITANT;PEL/TLV:NONE;MANUFACTURER'S RECOMMENDED EXPOSURE LIMIT:100PPM.

STODDARD SOLVENT;CAS#8052-41-3;COMBUSTIBLE LIQUID;IRRITANT;PEL=NONE;
TLV=100PPM.

B-BROMO-B-NITROSTYRENE***CAS#7166-19-0;EYE,SKIN AND RESPIRATORY IRRITANT;
PEL:NONE;TLV:NONE.

METHYLENE BIS(THIOCYANATE)***CAS#6317-18-6;IRRITANT(SKIN);CORROSIVE (EYES);
TOXIC(ORAL INGESTION);PEL:NONE;TLV:NONE.

TRADE SECRET INGREDIENT(E019);EYE AND SKIN IRRITANT;PEL:NONE;TLV:NONE.THIS
CHEMICAL IS NOT ON ANY STATE RIGHT-TO-KNOW LIST. TSRN 125438 - 5008P

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 50% SOL.	(APPROX.)	4.1	ODOR: SLIGHT PUNGENT
FL.PT.(DEG.F):	156	P-M(CC)	SP.GR.(70F)OR DENSITY: 0.976
VAPOR PRESSURE(mmHG):	<10		VAPOR DENSITY(AIR=1): >1
VISC cps70F:	10		%SOLUBILITY(WATER): 0
EVAP.RATE: <1	BUTYL ACETATE=1		APPEARANCE: YELLOW TO BROWN
PHYSICAL STATE:	LIQUID		FREEZE POINT(DEG.F): <-30

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000006940

BETZ MATERIAL SAFETY DATA SHEET

(PAGE 2 OF 3)

PRODUCT: SLIMICIDE C41A

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

MODERATELY IRRITATING TO SKIN.ABSORBED BY SKIN.MAY CAUSE DERMATITIS

ACUTE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES, POSSIBLY CORROSIVE

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS,GASES,MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT. PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED OVEREXPOSURES MAY CAUSE REPRODUCTIVE SYSTEM TOXICITY;MAY CAUSE DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

EXCESSIVE DERMAL EXPOSURE CAUSES DEFATTING AND DRYING OF SKIN;EXCESSIVE INHALATION OF VAPORS CAUSES DIZZINESS,HEADACHE AND NAUSEA.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***

MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM DO NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBENT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.
REMOVE IGNITION SOURCES.FLUSH AREA WITH WATER.SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT(AS IS)-

DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

BETZ MATERIAL SAFETY DATA SHEET

(PAGE 3 OF 3)

PRODUCT: SLIMICIDE C41A

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

GAUNTLET-TYPE NEOPRENE GLOVES, CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES. FACE SHIELD

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE IN COOL VENTILATED LOCATION. STORE AWAY FROM OXIDIZERS

HANDLING INSTRUCTIONS***

COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS
DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR
ABOVE THE PRODUCT FLASH POINT.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...FIFRA(40CFR):EPA REG.NO. 3876- 127

TREAT AS OIL SPILL

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: NOT APPLICABLE

...DOT HAZARD/UN#/ER GUIDE# IS: COMBUSTIBLE LIQUID NA1993/#27

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE), DELAYED(CHRONIC) AND FIRE

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

NFPA/HMIS : HEALTH - 2 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - D

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PHONE NO. 713-928-5171

MANUFACTURER:
SPARTAN CHEMICAL CO.
110 N. WESTWOOD AVE.
TOLEDO, OH 43607
EMERGENCY PHONE NO. 419-531-5551

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 0111

PRODUCT NAME: AIRLIFT FRESH SCENT (BULK)

GS675

PRODUCT NO. 498-4048, 498-4056, 498-4056, 498-4081

DATE: JANUARY 2, 1987

SECTION 2- HAZARDOUS INGREDIENTS

CAS NO.	%WT:	CHEMICAL NAME:	PEL:	ACGIH:	STEL:	CARCINOGEN
67-63-0	1-5	ISOPROPANOL	980	980	1225	NO

SECTION 3- PHYSICAL DATA

BOILING POINT: 212F.

SPECIFIC GRAVITY: 1.0

VAPOR PRESSURE: 75 F.

PERCENT SOLID BY WEIGHT: 3-5

VAPOR DENSITY: UNKNOWN

EVAPORATION RATE: <1

SOLUBILITY IN WATER: COMPLETE

APPEARANCE AND ODOR: PALE BLUE LIQUID,
PLEASANT FRAGRANCE.

PH: 5.0 - 7.0

MATERIAL IS LIQUID.

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE

METHOD USED - ASTM - D92

FLAMMABLE LIMITS: N/A

EXTINGUISHING MEDIA: N/A

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION 5- HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE - CONDITIONS TO AVOID: THRESHOLD LIMIT VALUE: N/E

MAY CAUSE SKIN AND EYE IRRITATION. AVOID CONTAMINATION OF FOOD. DO NOT
GET IN EYES; AVOID CONTACT WITH SKIN AND CLOTHING.

CONDITIONS AGGRAVATED BY USE: UNKNOWN

PRIMARY ROUTES OF ENTRY: SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES:

IF SWALLOWED, DRINK LARGE QUANTITIES OF WATER. IN CASE OF CONTACT,
IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15
MINUTES. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

SECTION 6- REACTIVITY DATA

STABILITY: STABLE

INCOMPATIBILITY (CONDITIONS TO AVOID): STRONG OXIDIZERS.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE KNOWN

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SAL 000006943

Shea 021451

MATERIAL SAFETY DATA SHEET

PAGE 2 **GS675**

PRODUCT NAME: AIRLIFT FRESH SCENT

PRODUCT NO. 498-4048, 498-4056, 498-4072, 498-4081

SECTION 7- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
FLUSH WITH WATER THROUGH SANITARY SEWER SYSTEM.

WASTE DISPOSAL METHOD: SAME AS ABOVE.

SECTION 8- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE

VENTILATION: LOCAL EXHAUST: X
MECHANICAL (GENERAL):

PROTECTIVE GLOVES: RUBBER GLOVES

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE EQUIPMENT: NONE

SECTION 9- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NOTHING SPECIAL

OTHER PRECAUTIONS: NONE

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110 N. WESTWOOD AVE.
TOLEDO, OH 43607
EMERGENCY PHONE NO. 419-531-5551

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 0113

PRODUCT NAME: AIRLIFT FRESH, FLORAL, & LEMON

68676

PRODUCT NO. 498-4064, 498-4013, 498-4102

DATE: OCTOBER 4, 1985

SECTION 2- HAZARDOUS INGREDIENTS

CAS NO. %WT. CHEMICAL NAME: TLV: LISTED AS A CARCINOGEN
IN NTP, IARC OR OSHA:

CAS NO.	%WT.	CHEMICAL NAME	TLV	LISTED AS A CARCINOGEN IN NTP, IARC OR OSHA
142-82-5	1-5	HEPTANE	1600	NO
74-98-6	10	PROPANE	1800	NO

SECTION 3- PHYSICAL DATA

BOILING POINT: N/A
VAPOR PRESSURE: 75 F.
VAPOR DENSITY: UNKNOWN
SOLUBILITY IN WATER: 75 %
PH: 7.0 - 7.5
SPECIFIC GRAVITY: 0.99
PERCENT SOLID BY WEIGHT: 3-5
EVAPORATION RATE: <1 (CONCENTRATE)
APPEARANCE AND ODOR: MIST, PERFUME
FRAGRANCE, NO RESIDUE
MATERIAL IS LIQUID.

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLAME EXTENSION: 0" METHOD USED - ASTM - D3065

FLAMMABLE LIMITS: N/A

EXTINGUISHING MEDIA: WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES:
USE SOME EQUIPMENT OR SHIELDING TO PROTECT PERSONNEL AGAINST BURSTING,
RUPTURING OR VENTING CONTAINERS.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
AT ELEVATED TEMPERATURES (OVER 54 C. / 130 F.) CONTAINERS MAY VENT,
RUPTURE OR BURST.

SECTION 5- HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE CONDITIONS TO AVOID: THRESHOLD LIMIT VALUE:
N/E

MAY CAUSE EYE IRRITATION.

PRIMARY ROUTES OF ENTRY:

CONDITIONS AGGRAVATED BY USE: UNKNOWN

EMERGENCY AND FIRST AID PROCEDURES:
IN CASE OF EYE CONTACT, IRRIGATE WELL WITH WATER. IF IRRITATED,
CALL A PHYSICIAN.

SECTION 6- REACTIVITY DATA

STABILITY: STABLE

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE KNOWN

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SAL 000006945

Shea 21452

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: AIRLIFT FRESH, FLORAL, & LEMON (AEROSOL)
PRODUCT NO. 498-4064, 498-4013, 498-4102

GS678

SECTION 7- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
CLEAN UP SPILLS WITH ABSORBENT MATERIAL. SURFACES CAN BE CLEANED
WITH DETERGENT AND WATER. LARGEST CONTAINER IS ONE (1) POUND.

WASTE DISPOSAL METHOD:

DO NOT INCINERATE OR PUNCTURE AEROSOL CONTAINER. DISPOSE OF IN
ACCORDANCE WITH STATE OR LOCAL REGULATIONS.

SECTION 8- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE REQUIRED

VENTILATION: LOCAL EXHAUST (SPECIFY RATE): X
MECHANICAL (GENERAL):

PROTECTIVE GLOVES (SPECIFY TYPE): NOT NECESSARY

EYE PROTECTION (SPECIFY TYPE): NOT NECESSARY

OTHER PROTECTIVE EQUIPMENT: NONE

SECTION 9- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
CONTENTS UNDER PRESSURE. DO NOT USE NEAR FIRE, SPARKS OR FLAME.
DO NOT STORE WHERE TEMPERATURES COULD EXCEED 54C/130F.

OTHER PRECAUTIONS: NONE

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CS677

CENTURY PAPERS INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
PHONE NO. 713/928-5171

MANUFACTURER:
FOODSERVICE & LODGING PRODUCTS DIVISION
WINTON HILL TECHNICAL CENTER
6071 CENTER HILL ROAD
CINCINNATI, OHIO 45244
EMERGENCY PHONE NO. 1-800-562-1100

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 0801

PRODUCT NAME: FOODSERVICE JOY BRAND CODES: , 08163, 08514.
ITEM NO: 412-0914, 412-0973, 412-0922, 412-0931.
INGREDIENTS/CHEMICAL NAME: CLEANING AND SUDSING AGENTS (ANIONIC AND
NONIONIC SURFACTANTS), DISPENSING AID (ETHYL ALCOHOL), WATER, STABILIZING
AGENTS, AND PERFUME.

SECTION 2- HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS INGREDIENTS AS DEFINED BY OSHA, 29 CFR 1910.1200.

CHEMICAL NAME	COMMON NAME	CAS NO.	ACGIH TLV,	OSHA PEL,	OTHER
ETHANOL	ETHYL ALCOHOL	64-17-5	1000PPM	1000PPM	N.K.

DOT CLASSIFICATION: COMBUSTIBLE LIQUID NOT REGULATED IN PACKAGING OF LESS
THAN 110 GALLONS. (NA 1993)

SECTION 3- PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT (F.): N.A. SPECIFIC GRAVITY (H2O=1): 1.02
VAPOR PRESSURE (MM HG.): N.A. PERCENT VOLATILE BY VOLUME(%): 63%
VAPOR DENSITY (AIR=1): N.A. EVAPORATION RATE (NBUOAC=1): N.A.
APPEARANCE AND ODOR: YELLOW LIQUID, LEMON ODOR
SOLUBILITY IN WATER: APPRECIABLE

SECTION 4- FLAMMABILITY AND REACTIVITY

FLASH POINT (METHOD USED): 132 F. CLOSED CUP. ALTHOUGH THIS PRODUCT HAS
A FLASH POINT BELOW 200F. (CLOSED CUP), IT IS
AN AQUEOUS SOLUTION CONTAINING ETHYL ALCOHOL
WHICH DOES NOT SUSTAIN COMBUSTION.

EXPLOSIVE LIMITS: LEL: N.A. UEL: N.A.

EXTINGUISHING MEDIA: USE CO2, WATER OR DRY CHEMICAL.

SPECIAL FIRE FIGHTING PROCEDURES: NONE KNOWN

UNUSUAL FIRE HAZARDS: NONE KNOWN

STABILITY: STABLE CONDITIONS TO AVOID: NONE KNOWN

INCOMPATIBILITY (MATERIALS TO AVOID): PRODUCTS CONTAINING CHLORINE.

HAZARDOUS DECOMPOSITION/BY PRODUCTS: CHLORAMINES IN SMALL QUANTITIES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE KNOWN

SECTION 5- HEALTH AND SAFETY DATA

ROUTES OF ENTRY: ORAL, SKIN CONTACT, EYE CONTACT.

HEALTH HAZARDS (ACUTE AND CHRONIC): NONE KNOWN

SIGNS AND SYMPTOMS OF EXPOSURE:

EXPECTED TO BE EMETIC IF INGESTED. MAY CAUSE NAUSEA AND/OR DIARRHEA.
MAY CAUSE MILD TRANSIENT IRRITATION IF ACCIDENTAL EYE CONTACT OCCURS.
PROLONGED CONTACT WITH CONCENTRATED MATERIAL MAY BE TRANSIENTLY
IRRITATING OR DRYING TO SKIN.

SAL 000006947

Shea 021456

MATERIAL SAFETY DATA SHEETS

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PRODUCT NAME: FOODSERVICE JOY

PRODUCT NO. 412-0914, 412-0973, 412-0922, 412-0931

SECTION 5- HEALTH AND SAFETY DATA

CONTINUED.....

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

PRE-EXISTING DERMATITIS MAY BE AGGRAVATED BY PROLONGED CONTACT WITH CONCENTRATED MATERIAL.

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: FLUSH THOROUGHLY WITH WATER FOR 15 MINUTES.

INGESTION: DRINK A GLASSFUL OF WATER.

SKIN: IF PROLONGED CONTACT OCCURS, RINSE THOROUGHLY WITH WATER. IF SPILLED ON CLOTHING, CHANGE CLOTHES.

SECTION 6- PRECAUTIONS FOR SAFE HANDLING AND USE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NONE REQUIRED

OTHER PRECAUTIONS: DO NOT MIX WITH CHLORINE BLEACH AS TRANSIENT, IRRITATING FUMES MAY RESULT.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

FLUSH SMALL QUANTITIES DOWN ACCEPTABLE SEWER. (CONTAINS BIODEGRADABLE - SURFACTANTS.) PREVENT SPILLS FROM REACHING WATERWAY. SORBENTS MAY BE USED

WASTE DISPOSAL METHOD:

SMALL TO HOUSEHOLD QUANTITIES MAY BE DISPOSED OF IN SEWER. FOR LARGER QUANTITIES INCINERATION IS PREFERRED. DO NOT LANDFILL. DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL REGULATIONS.

SECTION 7- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE REQUIRED WITH NORMAL USE.

VENTILATION: LOCAL EXHAUST NOT REQUIRED WITH NORMAL USE

EYE PROTECTION: NONE REQUIRED WITH NORMAL USE. IF A SPLASH IS LIKELY, CHEMICAL GOGGLES MAY BE NEEDED.

PROTECTIVE GLOVES: NONE REQUIRED WITH NORMAL USE. PROTECTIVE GLOVES (RUBBER, NEOPRENE) SHOULD BE USED FOR PROLONGED DIRECT CONTACT.

OTHER PROTECTIVE EQUIPMENT: NONE REQUIRED WITH NORMAL USE.

THE SUBMISSION OF THIS MSDS MAY BE REQUIRED BY LAW, BUT THIS IS NOT AN ASSERTION THAT THE SUBSTANCE IS HAZARDOUS WHEN USED IN ACCORDANCE WITH PROPER SAFETY PRACTICES AND NORMAL HANDLING PROCEDURES. DATA SUPPLIED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH.

SAL 000006948

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A	TRADE NAME & SYNONYMS SUPER-SCENT	
CHEMICAL FAMILY PETROLEUM DISTILLATE	FORMULA X<--MIXTURE	
MANUFACTURERS NAME: NATIONAL CHEMSEARCH DIV. OF NCH CORP.		
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 152170 IRVING, TEXAS 75015		
PREPARED BY: KELLY SEALS/T.S.CHEMIST	PRODUCT CODE NUMBER 4039	EMERGENCY TELEPHONE NUMBER 214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
ALIPHATIC PETROLEUM DISTILLATE	COMBUST.	100PPM 1	500MG/M3 1	8008-20-6

SECTION IIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE SECRET REGISTRY # 409363-5211P

SECTION III - PHYSICAL DATA

SUPER-SCENT

(CONTINUED) SECTION III - PHYSICAL DATA PAGE : 02

BOILING PT. (FAHRENHEIT)	350	SPEC GRAVITY (H2D=1)	0.80
VAPOR PRESSURE (MM HG)	0.4	COLOR	RED
VAPOR DENSITY (AIR=1)	N/A	ODOR	CHERRY
PH @ 100%	N/A	CLARITY	CLEAR
PERCENT VOLATILE BY VOLUME (%)	75	EVAPORATION RATE (BU AC = 1)	0.08
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	NON-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	160 T.C.C.	FLAMMABLE LIMITS	1.0 LEL	N/A UEL
EXTINGUISHING MEDIA	"ALCOHOL" X<--FOAM	X<--CD2	DRY X<--CHEMICAL	WATER SPRAY X<--OTHER
SPECIAL FIRE FIGHTING PROCEDURES				
ESTINGUISH ALL SOURCES OF IGNITION AS WITH ALL PETROLEUM FIRES. WEAR SELF-CONTAINED BREATHING APPARATUS.				
UNUSUAL FIRE & EXPLOSION HAZARDS				
N/A				

NFPA HAZARD RATING (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE; 3=HIGH; 4=EXTREME):
1 <--HEALTH 2 <--FLAMMABILITY 0 <--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :
NOT ESTABLISHED FOR MIXTURE. SEEK SECTION II.
EFFECTS OF OVEREXPOSURE
IRRITANT TO EYES. INGESTION CAN CAUSE NAUSEA, AND DIARRHEA.

(CONTINUED)

SECTION V - HEALTH HAZARD DATA

PAGE : 03

ASPIRATION OF INGESTED MATERIAL INTO LUNGS CAN CAUSE CHEMICAL
PNEUMONITIS AND CAN BE FATAL.

- CHRONIC - (LONG TERM EXPOSURE)

MARKED IRRITATION TO EYES.

PRIMARY ROUTE OF ENTRY: X-- INHALATION <-- INGESTION <-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION :

NOT A HAZARD.

EYE CONTACT:

FLUSH WITH LARGE AMOUNTS OF WATER FOR 10 MINUTES. LIFTING UPPER AND
LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
TREATMENT IS MOST EFFECTIVE WITHIN ONE MINUTE.

SKIN CONTACT:

TYPICALLY NOT A HAZARD. WASH WITH SOAP AND WATER.

INGESTION

DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL
ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN
CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

NOTES TO PHYSICIAN :

GASTRIC LAVAGE IS INDICATED. DO NOT INDUCE VOMITING.

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC <--YES NTP <--YES DSHA <--YES ACGIH <--YES OTHER <--YES
X<--NO X<--NO X<--NO X<--NO X<--NO

ALIPHATIC PETROLEUM DISTILLATE

UNK-MAN LD50: 1176MG/KG 1.

ORL-RAT LD50: 28G/KG 1.

ORL-RBT LD50: 28G/KG 1.

SECTION VII - REACTIVITY DATA

STABILITY

X<--STABLE <--UNSTABLE CONDITIONS TO AVOID

N/A

INCOMPATIBILITY (MATERIALS TO AVOID)

STRONG OXIDIZERS

SUPER-SCENT

(CONTINUED)

SECTION VII - REACTIVITY DATA

PAGE : 04

HAZARDOUS DECOMPOSITION PRODUCTS

CARBON DIOXIDE

HAZARDOUS X WILL NOT MAY CONDITIONS TO AVOID
X <--OCCUR <--OCCUR

POLYMERIZATION

N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
ELIMINATE ALL IGNITION SOURCES. USE ABSORBANT SUCH AS PAPER, VERMICULITE,
ETC TO CONTAIN SPILL. DO NOT FLUSH TO SEWER. PLACE INTO LABELED
CONTAINERS.

WASTE DISPOSAL METHOD

SMALL AMOUNT: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. DISPOSE OF
REMAINING AMOUNT IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
LARGE AMOUNT: DESTROY BY LIQUID INCINERATION. CONTAMINATED ABSORBANT
MAY BE DISPOSED OF IN A LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND
LOCAL REGULATIONS.

NEUTRALIZING AGENT

N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION

USE OF PRODUCT AS AN ODORIZER REQUIRES NO SPECIAL VENTILATION.

RESPIRATORY PROTECTION

N/A

PROTECTIVE GLOVES

N/A

EYE PROTECTION

N/A

OTHER PROTECTION

N/A

SAL 000006950

STORAGE TEMPERATURE
120 F. <--MAX 30 F. <--MIN X INDOOR HEATED REFRIGERATED OUTDOOR

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
KEEP AWAY FROM IGNITION SOURCES. STORE ON SIDE TO
PREVENT CONDENSATION AND SUBSEQUENT CONTAMINATION
OF PRODUCT. KEEP CONTAINER TIGHTLY CLOSED.

OTHER PRECAUTIONS
KEEP AWAY FROM CHILDREN.
READ ENTIRE LABEL BEFORE USING PRODUCT.

ES678

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME C.A.S. NUMBER UPPER % LIMIT

N/A

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.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)

SHIPPING NAME

HAZARD CLASS ID NUMBER REPORT QTY

LABELS LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER NET EXPLOSIVE WT.

SUPER-SCENT

(CONTINUED) SECTION XII - TRANSPORTATION * (FOR FUTURE USE) PAGE : 06

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. VENDOR'S MSDS.

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 THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL 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.

APR 02 1988

MATERIAL SAFETY DATA SHEET :

M/M INSTANT ADHESIVE

PAGE : 01

(037927-0429 -E0016293-4910)

DATE OF ISSUE
05/20/88SUPERSEDES
11/11/87

SECTION I - GENERAL INFORMATION

CS674

CHEMICAL NAME & SYNONYMS

N/A

TRADE NAME & SYNONYMS

M/M INSTANT ADHESIVE

CHEMICAL FAMILY

METHACRYLATE

FORMULA

X<--MIXTURE

MANUFACTURERS NAME:

NATIONAL CHEMSEARCH DIV. OF NCH CORP.

ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)

BOX 152170

IRVING, TEXAS 75015

PREPARED BY:

RICHARD STOLLEY/T.S.CHEM.

PRODUCT CODE NUMBER

4910

EMERGENCY TELEPHONE NUMBER

214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
POLY METHYL METHACRYLATE	IRRITANT	N/A	N/A	9011-14-7
ETHYL CYANACRYLATE	SKIN IRR.	2 PPM 1.	N/A	7085-85-0

SECTION III - PHYSICAL DATA

BOILING PT. (FAHRENHEIT)	>300 F.	SPEC GRAVITY (H2O=1)	1.050
VAPOR PRESSURE (MM HG)	<0.2	COLOR	CLEAR LIQUID

M/M INSTANT ADHESIVE

(CONTINUED)

SECTION III - PHYSICAL DATA

PAGE : 02

VAPOR DENSITY (AIR=1)	3	ODOR	SHARP IRRITATING
PH @ 100%	N/A	CLARITY	TRANSPARENT
PERCENT VOLATILE BY VOLUME (%)	N/A	EVAPORATION RATE (BU AC = 1)	0.10
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	SEMI-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	>200 F. T.C.C.	FLAMMABLE LIMITS	N/A	LEL	UEL
EXTINGUISHING MEDIA	"ALCOHOL" X<--FOAM	X<--CO2	DRY X<--CHEMICAL	WATER X<--SPRAY	<--OTHER

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE & EXPLOSION HAZARDS

N/A

NFPA HAZARD RATING (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE; 3=HIGH; 4=EXTREME):
3 <--HEALTH 1 <--FLAMMABILITY 0 <--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

2PPM ESTIMATED 1.

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)

SKIN IRRITATION, DERMATITIS AND ADHESION.
IF INTRODUCED INTO THE EYES, WEeping WILL OCCUR AND POSSIBLE DOUBLE VISION.
A LARGE DROP MAY CAUSE THERMAL BURNS.

- CHRONIC - (LONG TERM EXPOSURE)

SKIN IRRITATION DERMATITIS AND ADHESION LEADING ITSELF TO LOSS OF SKIN TISSUE.

SAL 000006952

Shea 021400

G S 6 7 4

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
110 F. <--MAX 40 F. <--MIN	X			

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
STORE BELOW 75 F. FOR MAXIMUM SHELF LIFE.

OTHER PRECAUTIONS
KEEP OUT OF REACH OF CHILDREN.
READ ENTIRE LABEL BEFORE USING PRODUCT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
N/A		

N/A

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.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION • (FOR FUTURE USE)

APPLICABLE REGULATIONS	<--49 CFR	<--IMCO	<--TARIFF 6 D	<--IATA	<--MILITARY AIR (AFR 71-4)
SHIPPING NAME					

HAZARD CLASS

ID NUMBER | REPORT QTY

LABELS

LIMITED QTY

UNIT CONTAINER

ODT SPS CONTAINER

| NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

1. VENDOR'S MSDS.

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 THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL 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.



Conoco Inc.

Purchase Requisition

Page
ofShaded Areas
for Purchasing
Dept. Use OnlyRQ Loc
316Requisition No.
257943

A

CD

For Information	Priority	RLOC REB	Department Refining	Ship Via none	Date Req'd at Dest.	Order Type	Previous P.O.
NATIONAL CHEMSEARCH			Ship To Conoco Inc. Refinery Warehouse Old Spanish Trail P.O. Box 37 Westlake, LA 70669		Tagging Instructions		
					F.O.B. Point		Freight Terms
					Carrier		
					Project ID		Clauses
Attn:					Payment Terms		AFE Reporting
JOE HARTNER Requisitioner			Date		Distribution Charge		
#318-491-5558 S ANDERSON 03-13-90			7411-3-0-55-03-30				
Tax Status		Special Instructions					
Charge	Exempt						
to							

Date	Control W.O.	Equip. No.	Init.	Stat.	Time Ordered	Time Req'd	Unit Code	Date Required
257943	03-13-90	S055	FV	**	1515	none	none	7411-3-0-55-03-30

Item No.	Quantity Ordered	Unit of Issue	Price	Qty. Issued
1	9	EACH		
2	3	EACH		
3	12	EACH		
NATIONLIZER				
DEL FLOYD OFFICE				
FLOYD VINCENT				
OFFICE ORDER ANDERSON TO CHEMSEARCH (JOE) DO NOT DUPLICATE				

Approval - Operating Dept.

Approval - Purchasing Dept.

SAL 000006954

<i>Robert M...</i>	
--------------------	--

100 x 11-88

NATIONAL CHEMSEARCH

Shipper, Per

Agent, Per

L302 23-03

71H

10/019

MAIL FREIGHT BILLS TO P.O. BOX 152120, IRVING, TEXAS 75015

ALLOY ROBE CORPORATION
MATERIAL SAFETY DATA SHEET (MSDS)
 For Welding Consumables and Related Products
 Complies with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION I - IDENTIFICATION

Identify: WELD STEEL COVERED ELECTRODES	
Manufacturer's Name: ALLOY ROBE CORPORATION	Emergency Telephone No.: 717/837-8911
Address: P.O. Box 517, Wilson Avenue, Hanover, PA 17331	Telephone No. for Information: 717/837-8911
Product Trade Name(s): SW14, SW15, SW15P, 7024, SW16, AP100, SW612, SW-17F, 70LA-2, XP-60, AND SW75	Product Classification(s): AWS A5.1, E6011, E6012, E7014, E7024, E6010, E6010, E6012, E6012, E7016, E6010, AND E6013 AWS A5.5, E7010-S, E6010-S, E6010-S, AND E7016A1

SECTION II - HAZARDOUS INGREDIENTS

IMPORTANT: THIS SECTION COVERS THE MATERIALS FROM WHICH THE PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING WELDING WITH NORMAL USE OF THIS PRODUCT ARE COVERED IN SECTION V.
THE TERM "HAZARDOUS" OR "HAZARDOUS MATERIALS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN OSHA HAZARD COMMUNICATION STANDARD (29 C.F.R. 1910.1200) AND IT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF ANY HAZARD.

Ingredient	CAS No.	Exposure Limit mg/M3	Source	Ingredient	CAS No.	Exposure Limit mg/M3	Source
Iron (A)	(7439-89-6)	10-5	(1) (2)	Cellulose (B)	(8004-34-6)	10	(2)
Potassium Thiocyanate (C)	(12839-87-6)	(N/A)	(3)	Calcium Carbonate (D)	(1317-65-3)	10	(2)
Magnesium Carbonate (E)	(546-93-6)	10	(2)	Titanium Dioxide (A)	(13458-67-7)	10	(2)
Manganese (A)	(7439-96-9)	5 or	(1) (2)	Sodium Silicate (F)	(6834-92-8)	(N/A)	(3)
Potassium Silicate (B)	(1312-79-1)	(N/A)	(3)	Potassium Aluminum Silicate (H)	(68476-25-5)	(N/A)	(3)
Aluminum Oxide (I)	(1344-26-1)	10	(2)	Bauxite (J)	(1302-78-9)	(N/A)	(3)
Magnesium Sulfate (H)	(1200-68-4)	15-10	(1) (2)	Calcium Phosphate (L)	(7798-78-5)	2.5 or P	(1) (2)
Silica (K)	(7440-21-3)	10	(2)	Zirconium Dioxide (L)	(1314-29-4)	5	(1) (2)
Nickel (M)	(7440-02-0)	1	(1) (2)	Molybdenum (P)	(7439-98-7)	5	(1) (2)
Chromium (Cr) (N)	(7440-47-3)	1-0.5	(1) (2)	Mn (B)	(12001-21-2)	5	(2)
Zirconium Silicate (O)	(1314-23-4)	5	(1) (2)				

- Occupational Safety and Health Administration, 29 C.F.R. 1910.1000 Permissible Exposure Limit (PEL).
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV).
- Not known, reference particulate concentration per OSHA 1910.1000, Table Z-3, is 5 mg/M³ respirable dust, and per ACGIH is 10 mg/M³.

(A) in all electrodes; (B) in SW14, SW15, SW15P, 7024, SW75, SW610, AP100, XP-60, XP-70, XP-90, XP-90 and SW13; (C) in SW14 only; (D) in SW14, 7024, SW12 and 70LA-2; (E) in SW14, SW75 and SW612; (F) in all electrodes except 70LA-2 and SW13; (G) in SW15, SW612, 70LA-2 and SW13; (H) in SW75 and 7024; (I) in SW15P and 7024; (J) in SW15P and 7024; (K) in SW15P and AP100; (L) in 70LA-2; (M) in XP-60, XP-70, XP-90 and XP-90; (N) in XP-60, XP-90 and SW75; (O) in SW13 only; (P) in SW75 only.

MSDS-2.1-2

Date Revised: 4/26/88

SECTION III - PHYSICAL AND CHEMICAL DATA

These products as shipped are nonhazardous, nonflammable, nonexplosive, and nonreactive.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Nonflammable. Welding arc and sparks are highly combustible. See Z-40.1 referenced in Section VII.

SECTION V - REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS:

Welding fumes cannot be classified simply. Their composition and quantity are dependent upon the metal being welded, the process, procedures and electrode used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing); number of welds and volume of work area; quality and amount of ventilation; position of welder's head with respect to the fume plume; as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). The primary route of entry of welding fumes and gases is by inhalation.

If the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section II. Specific products include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from base metal, i.e., as noted above. These components are virtually always present as complex compounds and not as metals [Characterization of Arc Welding Fumes from Welding Society].

Commonly expected fume constituents from these products would include: Oxides (70LA-2 only) and oxides which containing iron, manganese, silicon, nickel (XP-60, XP-70, XP-90 and XP-90), aluminum (XP-60 and XP-90) and beryllium (XP-60 and XP-90). Various reaction products may include carbon monoxide and carbon dioxide. Some and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet, if worn, or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 551048, Miami, FL 33155.

SECTION VI - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume HOC (Not Otherwise Classified) is 5 mg/M³. The ACGIH 1984-85 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section V for specific fume constituents which may modify this TLV.

Effects of Overexposure: FUMES AND GASES can be dangerous to your health. Aggravation of preexisting respiratory or allergic conditions may occur in some workers. SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. LONG TERM (CHRONIC) OVEREXPOSURE may lead to silicosis (lung disease) and is believed by some investigators to affect pulmonary function. ARC RAYS can injure eyes and burn skin. ELECTRIC SHOCK can kill. See Section VII.

Emergency & First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

HAZARDOUSITY	BYPP	1 AHC Monograph?	OSHA Regulated?
When present	Cr. M	Cr. No	Cr.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the preliminary label on this product. See American National Standard Z-49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 361040, Miami, FL 33135 and OSHA Publication 2288 (29 C.F.R. 1910), U.S. Government Printing Office, Washington, D.C. 20540 for more detail on many of the following.

Ventilation: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined spaces or where local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is two tints to see the weld zone. Then go to the next lighter shade which gives sufficient view of the work zone. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. At a minimum, this includes rubber gloves and a protective face shield and may include aprons, sleeves, hats, shoulder protection, as well as full protective clothing. Train the welder not to touch the electrical parts and to insulate himself from work area ground.

Procedures for Cleanup or Spills or Leaks: NOT APPLICABLE.

Waste Disposal Method: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

MSDS-2.3-4

Date Revised: 4/26/88

SECTION III - PHYSICAL AND CHEMICAL DATA											
These products as shipped are noncorrosive, nonflammable, nonexplosive, and nonreactive.											
SECTION IV - FIRE AND EXPLOSION HAZARD DATA											
Hazardous: Welding arc and sparks are highly combustible. See 2-40.1 referenced in Section VI.											
SECTION V - REACTIVITY DATA											
HAZARDOUS DECOMPOSITION PRODUCTS: Welding fumes cannot be described simply. Their composition and quantity are dependent upon the metal being welded, the process, procedures and electrode used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: settings on the metal being welded (such as joint, position, or gas shielding), number of starts and restarts of work area, quality and amount of ventilation, position of worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as interrelated hydrocarbon vapors from cleaning and degreasing activities). The primary route of entry of welding fumes and gases is by inhalation. The materials in question, the fumes and gas decomposition products are different in percent and form from the ingredients listed in Section II. Specific products include those originating from the electrode, reaction, or oxidation of the materials shown in Section II plus those from base metal. AIRC is used above. These compounds are virtually always present in complex compounds and not as distinct (Chlorination of Arc Welding Fume from Welding Society). Increasingly reported toxic compounds from these products would include: fluorides (FLU-2 only) and complex oxides containing iron, manganese, silicon, nickel (XP-40, XP-70, XP-80 and XP-90), chromium (XP-40 and XP-80) and molybdenum (XP-40 and XP-80). Some reaction products may include carbon monoxide and carbon dioxide. Some and stronger action may be caused by the radiation from the arc. See recommended way to determine the composition and quantity of fumes and gases to which workers are exposed in a table in an example inside the welder's helmet. It refers to the worker's breathing zone. See ANSI/ASSE P1.1, available from the American Welding Society, P.O. Box 281040, Miami, FL 33120.											
SECTION VI - HEALTH HAZARD DATA											
Threshold Limit Value: The ACGIH recommended general limit for welding fume MFC (not Silver-silver Chloride) is 8 mg/M³. The ACGIH 1984-85 protocol states: "The TLV-TWA should be used as guide in the control of health hazards and should not be used as firm dose response rate and exposure recommendations." See Section V for specific fume measurements which may modify this TLV. Effects of Overexposure: FUMES AND GASES can be dangerous to your health. Symptoms of irritating respiratory or allergic conditions may occur in some workers. SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as: dizziness, nausea, or drowsiness or irritation of nose, throat, or eyes. LONG TERM (CHRONIC) OVEREXPOSURE may lead to ulcerate (raw deposits in the lung) and is believed by some investigators to affect pulmonary function. AISC SAYS you ignore eyes and have skin. ELECTRIC SHOCK can kill. See Section VII. Emergency & First Aid Procedures: Call for medical aid. Empty first aid booklets recommended by the American Red Cross.											
<table border="1"> <thead> <tr> <th>CAUTIONS/REMARKS</th> <th>WTP</th> <th>ARC Shielding?</th> <th>OSHA Regulation?</th> </tr> </thead> <tbody> <tr> <td>When present</td> <td>Cr, Ni</td> <td>Cr, Ni</td> <td>Cr</td> </tr> </tbody> </table>				CAUTIONS/REMARKS	WTP	ARC Shielding?	OSHA Regulation?	When present	Cr, Ni	Cr, Ni	Cr
CAUTIONS/REMARKS	WTP	ARC Shielding?	OSHA Regulation?								
When present	Cr, Ni	Cr, Ni	Cr								
SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES											
Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 351940, Miami, FL 33130 and OSHA Publication 2296 (20 C.F.R. 1910), U.S. Government Printing Office, Washington, D.C. 20462 for more detail on many of the following. Ventilation: Use enough ventilation, local exhaust of the arc, or both, to keep the fumes and gases below the TLV's in the worker's breathing zone and the general area. Trade the welder to keep his head out of the fumes. Respiratory Protection: Use respirator from respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld spot. Then go to the next lighter shade which gives sufficient view of the weld area. Provide protective screens and back goggles, if necessary, in shop areas. Protective Clothing: Wear hood, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. As a minimum, use leather welding gloves and a protective face shield and may include eye protection, apron, boots, electrical protection, as well as dirt resistant clothing. Trade the welder out to keep the electrical parts and to breathe himself from work and ground. Procedures for Cleanup of Spills or Leaks: NOT APPLICABLE. Spills/Spillage Method: Prevent waste from contaminating surrounding environment. Store any product, reaction, decomposition, or other in an appropriately acceptable manner, in full compliance with Federal, State and Local regulations.											

MSDS-2.3-4

Date Revised: 4/26/88

ALLOY ROSS CORPORATION
 MATERIAL SAFETY DATA SHEET (MSDS)
 For Welding Carbonaceous and Related Products
 Complies with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION I - IDENTIFICATION							
Identify: ARMOR ARC ELECTRODES							
Manufacturer's Name: ALLOY ROSS CORPORATION			Emergency Telephone No. 717/837-8911				
Address: P.O. Box 817, Whose Avenue, Hanover, PA 17331			Telephone No. for information: 717/837-8611				
Product Trade Name(s): ARMOR ARC B ARMOR ARC C ARMOR ARC M, ARMOR ARC M			Product Classification(s): Spec. MIL-E-13066C, Type MIL 2071-15, Type MIL 2071-16 Type MIL 2071-16, Type MIL 30886-1-16				
SECTION II - HAZARDOUS INGREDIENTS							
IMPORTANT: THIS SECTION COVERS THE MATERIALS FROM WHICH THE PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING WELDING WITH NORMAL USE OF THIS PRODUCT ARE COVERED IN SECTION V. THE TERM "HAZARDOUS" IN "HAZARDOUS MATERIALS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN OSHA HAZARD COMMUNICATION STANDARD (29 C.F.R. 1910.1200) AND IT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF ANY HAZARD.							
Ingredient	CAS No.	Exposure Limit mg/M ³	Source	Ingredient	CAS No.	Exposure Limit mg/M ³	Source
Iron	(7439-89-6)	10-6	(1) (2)	Chromium [Cr]	(7440-47-3)	1-5.5	(1) (2)
Nickel [Ni]	(7440-02-0)	1	(1) (2)	Manganese	(7439-96-5)	5 d	(1) (2)
Molybdenum	(7439-98-7)	5	(1) (2)	Calcium Carbonate	(1317-65-3)	10	(2)
Calcium Fluoride	(7789-75-6)	2.5 in F	(1) (2)	Sodium Silicate	(6834-97-0)	(N/A)	(3)
Potassium Aluminum Silicate	(88476-75-8)	(N/A)	(3)	Potassium Thiocyanate	(12830-47-8)	(N/A)	(3)
Thallium Oxide	(13483-67-7)	10	(2)	Borax	(1302-78-8)	(N/A)	(3)
1. Occupational Safety and Health Administration, 29 C.F.R. 1910.1000 Permissible Exposure Limit (PEL). 2. American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV(R)). 3. Not known; however particulate concentration per OSHA 1910.1000, Table 2-9, is 8 mg/M³ respirable dust, and per ACGIH is 10 mg/M³.							
(A) In Armor Arc C. (B) In Armor Arc B, Armor Arc M, and Armor Arc M. (C) In Armor Arc M.							
SECTION III - PHYSICAL AND CHEMICAL DATA							
These products as shipped are noncorrosive, nonflammable, nonexplosive, and nonreactive.							

MSDS-7.1-2

Date Revised: 02/15/88

SECTION III - PHYSICAL AND CHEMICAL DATA																																									
These products are shipped in accordance with applicable regulations, transportation, handling, and storage. 1. Identification: ALLOY MODS CORPORATION Product Name: ALLOY MODS CORPORATION Address: P.O. Box 117, Union Avenue, Monaca, CA 91321 Telephone: 717/637-0811 Emergency Telephone No.: 717/637-0811 Product Chemical Name: 2,4,6-Trichlorophenol MSDS No.: MSDS-19-1-2																																									
2. Physical and Chemical Data: <table border="1"> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Appearance</td> <td>White solid</td> </tr> <tr> <td>Color</td> <td>White</td> </tr> <tr> <td>Odor</td> <td>None</td> </tr> <tr> <td>Boiling Point (°C)</td> <td>150</td> </tr> <tr> <td>Boiling Point (°F)</td> <td>302</td> </tr> <tr> <td>Melting Point (°C)</td> <td>120</td> </tr> <tr> <td>Melting Point (°F)</td> <td>248</td> </tr> <tr> <td>Density (g/cm³)</td> <td>1.4</td> </tr> <tr> <td>Specific Gravity</td> <td>1.4</td> </tr> <tr> <td>Flash Point (°C)</td> <td>None</td> </tr> <tr> <td>Flash Point (°F)</td> <td>None</td> </tr> <tr> <td>Autoignition Temp (°C)</td> <td>None</td> </tr> <tr> <td>Autoignition Temp (°F)</td> <td>None</td> </tr> <tr> <td>Explosion Limits (vol %)</td> <td>None</td> </tr> <tr> <td>Stability</td> <td>Stable</td> </tr> <tr> <td>Reactivity</td> <td>Reactive</td> </tr> <tr> <td>Corrosivity</td> <td>Corrosive</td> </tr> <tr> <td>Compatibility</td> <td>Compatible</td> </tr> <tr> <td>Regulatory Data</td> <td>Regulatory Data</td> </tr> </tbody> </table>		Property	Value	Appearance	White solid	Color	White	Odor	None	Boiling Point (°C)	150	Boiling Point (°F)	302	Melting Point (°C)	120	Melting Point (°F)	248	Density (g/cm³)	1.4	Specific Gravity	1.4	Flash Point (°C)	None	Flash Point (°F)	None	Autoignition Temp (°C)	None	Autoignition Temp (°F)	None	Explosion Limits (vol %)	None	Stability	Stable	Reactivity	Reactive	Corrosivity	Corrosive	Compatibility	Compatible	Regulatory Data	Regulatory Data
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ALLOY MODS CORPORATION
 MATERIAL SAFETY DATA SHEET (MSDS)
 Compliance with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION IV - HAZARD INFORMATION																																									
1. Identification: ALLOY MODS CORPORATION Product Name: ALLOY MODS CORPORATION Address: P.O. Box 117, Union Avenue, Monaca, CA 91321 Telephone: 717/637-0811 Emergency Telephone No.: 717/637-0811 Product Chemical Name: 2,4,6-Trichlorophenol MSDS No.: MSDS-19-3-4																																									
2. Physical and Chemical Data: <table border="1"> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Appearance</td> <td>White solid</td> </tr> <tr> <td>Color</td> <td>White</td> </tr> <tr> <td>Odor</td> <td>None</td> </tr> <tr> <td>Boiling Point (°C)</td> <td>150</td> </tr> <tr> <td>Boiling Point (°F)</td> <td>302</td> </tr> <tr> <td>Melting Point (°C)</td> <td>120</td> </tr> <tr> <td>Melting Point (°F)</td> <td>248</td> </tr> <tr> <td>Density (g/cm³)</td> <td>1.4</td> </tr> <tr> <td>Specific Gravity</td> <td>1.4</td> </tr> <tr> <td>Flash Point (°C)</td> <td>None</td> </tr> <tr> <td>Flash Point (°F)</td> <td>None</td> </tr> <tr> <td>Autoignition Temp (°C)</td> <td>None</td> </tr> <tr> <td>Autoignition Temp (°F)</td> <td>None</td> </tr> <tr> <td>Explosion Limits (vol %)</td> <td>None</td> </tr> <tr> <td>Stability</td> <td>Stable</td> </tr> <tr> <td>Reactivity</td> <td>Reactive</td> </tr> <tr> <td>Corrosivity</td> <td>Corrosive</td> </tr> <tr> <td>Compatibility</td> <td>Compatible</td> </tr> <tr> <td>Regulatory Data</td> <td>Regulatory Data</td> </tr> </tbody> </table>		Property	Value	Appearance	White solid	Color	White	Odor	None	Boiling Point (°C)	150	Boiling Point (°F)	302	Melting Point (°C)	120	Melting Point (°F)	248	Density (g/cm³)	1.4	Specific Gravity	1.4	Flash Point (°C)	None	Flash Point (°F)	None	Autoignition Temp (°C)	None	Autoignition Temp (°F)	None	Explosion Limits (vol %)	None	Stability	Stable	Reactivity	Reactive	Corrosivity	Corrosive	Compatibility	Compatible	Regulatory Data	Regulatory Data
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Compatibility	Compatible																																								
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3. Hazard Information: Health: 2,4,6-Trichlorophenol is a skin irritant. It may cause allergic reactions in some individuals. It is also a potential carcinogen. Environment: 2,4,6-Trichlorophenol is toxic to aquatic life. It may also be toxic to birds and mammals. Physical and Chemical: 2,4,6-Trichlorophenol is a white solid. It is stable under normal conditions. It is not flammable. It is not explosive. It is not a gas. It is not a liquid. It is not a solid.																																									

ALLOY 8008 CORPORATION
MATERIAL SAFETY DATA SHEET (MSDS)
 For Welding Consumables and Related Products
 Complies with OSHA Hazard Communication Standard 29 C.F.R. 1910.1200

SECTION I - IDENTIFICATION

Product Name: ATOM ARC COVERED LOW HYDROGEN ELECTRODES	
Manufacturer's Name: ALLOY 8008 CORPORATION	Emergency Telephone No.: 717/637-8911
Address: P.O. Box 517, Allison Avenue, Nazareth, PA 17231	Telephone No.: 717/637-8911
Product Trade Name(s): ATOM ARC 7018, 7018-1, 7018-L, 7018-M, 7018 ALPHA 7018B, 8018, 8018-C1, 8018-CH, 8018-D2, 8018H, 8018H, 9018, 9018CH, 10018 10018H, 12018, T, 8018W, 8018-BZ 10018M1, 12018-M2 4130LN, 4130, 4140, 4340	
Product Classification(s): AWS A5.1, E7018; E7018-1, E7018; E7018 AWS A5.8, E7018-A1; E8018-C3, E8018-C1, E8018-B2, E8018-B2L, E8018-C2; E8018-H; E8018H, E8018-B2; E10018-M E10018-B2, E12018-M, E11018-M, E8018-B2L MIL-E-802200/10A, MIL 10018-M1, MIL 12018-M2 NOT CLASSIFIED (4130LN, 4130, 4140, 4340)	

SECTION II - HAZARDOUS INGREDIENTS

IMPORTANT: THIS SECTION COVERS THE MATERIALS FROM WHICH THE PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING WELDING WITH NORMAL USE OF THIS PRODUCT ARE COVERED IN SECTION V.
 THE TERM "HAZARDOUS" IN "HAZARDOUS MATERIALS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN OSHA HAZARD COMMUNICATION STANDARD (29 C.F.R. 1910.1200) AND IT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF ANY HAZARD.

Ingredient	(CAS No.)	Exposure Limit mg/M3	Source	Ingredient	(CAS No.)	Exposure Limit mg/M3	Source
Iron	(7420-84-6)	10-5	(1) (2)	Manganese	(7420-96-5)	5-1	(1) (2)
Chromium	(7440-47-3)	1-0.5	(1) (2)	Nickel	(7440-02-6)	1	(1) (2)
Silicon	(7440-21-3)	10	(2)	Molybdenum	(7429-96-7)	5	(1) (2)
Copper	(7440-50-4)	1 (Dust)	(1) (2)	Polysulfone	(1212-78-1)	(N/A)	(2)
Barium Sulfate	(6834-82-8)	(N/A)	(2)	Calcium Fluoride	(7784-75-3)	2.5-10 F	(1) (2)
Calcium Carbonate	(1317-65-3)	10	(2)	Polysulfone	(6847-75-5)	(N/A)	(2)
Thiophene Sulfide	(13463-67-7)	10	(2)	Zirconium Sulfate	(1440-67-2)	5	(1) (2)

- Occupational Safety and Health Administration, 29 C.F.R. 1910.1000 Permissible Exposure Limit (PEL).
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV(R)).
- Not known, maximum particulate concentration per OSHA 1910.1000, Table Z-3, is 5 mg/M³ respirable dust, and per ACGIH is 10 mg/M³.

- (A) In 8018CH, 8018CH, 12018, "T", 8018W, 8018-BZ, 8018-B2L, 4130LN, 4130, 4140, 4340
 (B) In 8018, 8018C1, 8018H, 8018H, 9018, 12018, "T", 8018W, 10018, 10018-M1, 12018-M2, 4130LN, 4130, 4140, 4340
 (C) In 7018B, 8018CH, 8018H, 9018, 8018CH, 10018H, 12018, "T", 8018-BZL, 8018-B2L, 12018-M1, 12018-M2, 4130LN, 4130, 4140, 4340
 (D) In 8018W
 (E) Not in 7018 Alpha

SECTION III - PHYSICAL AND CHEMICAL DATA

These products are shipped as nonhazardous, nonflammable, nonexplosive, and noncorrosive.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Nonflammable: Welding arc and sparks can ignite combustibles. See 2-49.1 referenced in Section VII.

SECTION V - REACTIVITY DATA**HAZARDOUS DECOMPOSITION PRODUCTS:**

Welding fumes cannot be classified simply. Their composition and quantity are dependent upon the metal being welded, the process, procedures and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include coatings on the metal being welded (such as paint, plating, or galvanizing), number of welds and volume of work area, quality and amount of ventilation, position of welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). The primary cause of injury of welding fumes and gases is by inhalation.

The electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section II. Reaction products include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from base metal, etc. as noted above. These components are virtually always present as complex compounds and not as metals (Characterization of Arc Welding Fume, American Welding Society).

Reasonably expected toxic constituents from these products would include fluorides and complex oxides of iron, manganese, silicon, and, when present, nickel, chromium, molybdenum, and copper. Various reaction products may include carbon monoxide and carbon dioxide. Oxides and nitrogen oxides may be formed by the reaction from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet, if worn, or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 351840, Miami, FL 33135.

SECTION VI - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume HOC (Not Otherwise Classified) is 5 mg/M³. The ACGIH 1964-65 peroxide states: "The TLV-TWA should be used as a guide in the control of health hazards and should not be used as the limit between safe and dangerous concentrations." See Section V for specific toxic constituents which may modify this TLV.

Effects of Overexposure: FUMES AND GASES can be dangerous to your health. Aggravation of preexisting respiratory or allergic conditions may occur in some workers. **SHORT-TERM (ACUTE) OVEREXPOSURE** in welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. **LONG TERM (CHRONIC) OVEREXPOSURE** may lead to silicosis (lung deposits in the lungs) and is believed by some investigators to affect pulmonary function. ARC RAYS can injure eyes and burn skin. **ELECTRIC SHOCK** can kill. See Section VII.

Emergency & First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

CARCINOGENICITY: NTP 1ARC Monographs? OSHA Registered?

When Present: Cr, Ni Cr, Ni Cr

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 351840, Miami, FL 33135 and OSHA Publication 2208 (29 C.F.R. 1910), U.S. Department of Labor, Washington, D.C. 20460 for more detail on many of the following.

Ventilation: Use enough ventilation, keep exhaust at the arc, or back, to keep the fumes and gases below the TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

Respiratory Protection: Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear head, hand and body protection which helps to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. At a minimum, this includes welder's gloves and a protective face shield and may include arm protectors, aprons, hats, shoe cover protection, as well as dark leathered clothing. Train the welder not to touch live electrical parts and to insure himself from work and ground.

Procedure for Cleanup of Spills or Leaks: NOT APPLICABLE

Waste Disposal Method: Prevent waste from contaminating surrounding environment. Discard any product residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

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MSDS-14.1-2

Date Revised: 04/04/88

MSDS-14.3-4

Date Revised: 04/04/88

MATERIAL SAFETY DATA SHEET

APPROVED BY U S LABOR DEPT, ESSENTIALLY SIMILAR TO FORM OSHA 174

PRODUCT IDENTITY: 82C TANK CLEANER

65633

I. SUPPLIER

CIRCLE N ENTERPRISES, INC.
P. O. BOX 7109
HUNTSVILLE, TX 77340
PHONE (409) 291-2876

II. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	PEL (OSHA)	TLV (ACGIH)	SARA TITLE III WT. % (REG. SECTION)
Heavy Aromatic Solvent Naphtha	*64742-94-5	100 ppm	5.0 mg/cu m	Not Applicable
Light Aromatic Solvent Naphtha	*64742-95-6	100 ppm	5.0 mg/cu m	Not Applicable
	CAS #	CEILING	STEL (OSHA & ACGIH)	
		None Known	None Known	None Known

HAZARD RATING

HEALTH (NFPA): 0 HEALTH (HMIS): 3 FLAMMABILITY: 2 REACTIVITY: 0

DOT SHIPPING NAME: Compound Cleaning, Liquid (NA1993)

DOT DRUM LABEL: None

III. PHYSICAL DATA

BOILING RANGE :	198 211 257°C / 389 412 494°F (*=End Point)
GRAVITY @ 60°F :	
API :	22.1
SPECIFIC GRAVITY (Water=1) :	.921
POUNDS/GALLON :	7.672
VAPOR PRESSURE (mm of Hg)@20 :	.4
VAPOR DENSITY (air=1) :	4.8
WATER ABSORPTION :	Moderate
ACID ABSORPTION (65% H ₂ SO ₄) :	Moderate
DRY TIME (Ether=1) :	Long
% VOLATILE BY VOL :	95.0
APPEARANCE :	Liquid, Water-White
ODOR :	Aromatic
SOLVENCY PARAMETERS:	
HBK (Hydrogen Bonding) :	19.1
PKB (Polarity) :	39.4
DKB (Dispersion) :	41.5
REFRACTIVE INDEX :	1.530

SAL 000006960

IV. FIRE & EXPLOSION HAZARDS

LOWER FLAMMABLE LIMIT IN AIR (% by vol): 1.0

FLASH POINT (TEST METHOD): 72°C / 162°F (PM)

FLAMMABILITY CLASSIFICATION: class III A

EXTINGUISHING : NFPA Class B extinguishers (CO₂ or foam)
MEDIA : for class III A liquid fires.
class III A

EXTINGUISHING : NFPA Class B extinguishers (CO₂ or foam)
MEDIA : for class III A liquid fires.

SPECIAL FIRE : Water spray may be ineffective on fire but can protect fire fighters & cool closed containers.
FIGHTING : Use fog nozzles if water is used. Do not enter confined fire-space without full
PROCEDURES : bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots).
: Use NIOSH approved positive-pressure self-contained breathing apparatus.

UNUSUAL : COMBUSTIBLE! Keep container tightly closed. Isolate from

EXPLOSION : oxidizers, heat, & open flame.

AND FIRE : Closed containers may explode if exposed to extreme heat.

PROCEDURES: Applying to hot surfaces requires special precautions.

: Empty container very hazardous! Continue all label precautions!

V. HEALTH EFFECT DATA

THRESHOLD LIMIT VALUE: Not Applicable

PREVENTION : Use only with adequate ventilation.
OF OVER- : Avoid prolonged breathing of vapor or spray mist.
EXPOSURE : Avoid prolonged or repeated contact with skin.

ORGANIC EFFECTS: INHALING: Anesthetic. Irritates respiratory tract.
OF ACUTE : Can cause serious nervous system depression.
OVER- : EYE & SKIN CONTACT: Primary irritation to skin, defatting, dermatitis.
EXPOSURE : Primary irritation to eyes, redness, tearing, blurred vision.
: SWALLOWING: Harmful or fatal if swallowed.
: Swallowing can cause abdominal irritation, nausea, vomiting and diarrhea.

ORGANIC EFFECTS: EYE & SKIN CONTACT: Liquid can cause eye irritation.
OF CHRONIC : Wash thoroughly after handling.
OVER- :
EXPOSURE :

CANCER HAZARD : Possible cancer hazard based on tests with laboratory animals using
: Ethylene Oxide. Overexposure may create cancer risk.

CONDITIONS : Persons with severe skin, liver or kidney problems should avoid use.
AGGRAVATED :

EMERGENCY & : In case of contact with skin, flush with plenty of water. For eyes.
FIRST AID : flush with plenty of water for 15 minutes & get medical attention.
PROCEDURES: After high vapor exposure, remove to fresh air. If breathing is difficult
: give oxygen. If breathing has stopped give artificial respiration.
: If swallowed, CALL A PHYSICIAN IMMEDIATELY!
: Never give anything by mouth to an unconscious person.

VI. REACTIVITY DATA

STABILITY : Stable

CONDITIONS TO AVOID: Isolate from oxidizers, heat, & open flame.

MATERIALS TO AVOID : Isolate from strong oxidizers such as permanganates, chromates & peroxides.

HAZARDOUS : Carbon Monoxide, Carbon Dioxide,
DECOMPOSITION: Phosphorus Pentoxide from burning.
PRODUCTS :

VII. SAFE HANDLING & USE PRECAUTIONS

SPILL OR LEAK : Stop spill at source. Dike area & contain. Pump spilled liquid & put contaminated soil
PROCEDURES : in DOT approved containers for disposal. Label immediately.
: Clean up remainder with absorbent materials.

WASTE DISPOSAL : Dispose of waste by legal methods complying with local, state & Federal regulations.
METHOD : If questions exist, contact the appropriate agencies.

OTHER : Store large amounts in structures made for OSHA Class III A liquids.
PRECAUTIONS : Avoid free fall of liquid.
: Ground containers when transferring. Do not flame cut, braze or weld.
: Empty container very hazardous! Continue all label precautions!

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION: Not Applicable
(SPECIFY TYPE) :

VENTILATION : LOCAL EXHAUST : Necessary MECHANICAL (GENERAL) : Acceptable
: SPECIAL : None OTHER : None

PROTECTIVE : Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.
CLOTHING: Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.

NOTICE

DELTA DISTRIBUTORS, INC. disclaims all expressed or implied warranties of merchantability or fitness for a particular purpose, with respect to the product or information provided herein.

All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.
DATE : 10/89

CIRCLE N ENTERPRISES, INC.
P. O. BOX 7109
HUNTSVILLE, TX 77340
Phone (409) 291-2876

#2C TANK CLEANER
CONTAINS: PETROLEUM NAPHTHA

G S 6 3 3

WARNING!

COMBUSTIBLE!

INHALING: ANESTHETIC. IRRITATES RESPIRATORY TRACT
ACUTE OVEREXPOSURE CAN CAUSE SERIOUS NERVOUS SYSTEM DEPRESSION
EYE & SKIN CONTACT: PRIMARY IRRITATION TO SKIN, DEFATTING, DERMATITIS
PRIMARY IRRITATION TO EYES, REDNESS, TEARING, BLURRED VISION
WASH THOROUGHLY AFTER HANDLING
SWALLOWING: HARMFUL OR FATAL IF SWALLOWED
SWALLOWING CAN CAUSE ABDOMINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA

POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS USING
ETHYLENE OXIDE. OVEREXPOSURE MAY CREATE CANCER RISK
PERSONS WITH SEVERE SKIN, LIVER OR KIDNEY PROBLEMS SHOULD AVOID USE

Isolate from oxidizers, heat, & open flame.

Use only with adequate ventilation.

Avoid prolonged breathing of vapor or spray mist.

Avoid prolonged or repeated contact with skin.

Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.

Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.

Keep container tightly closed & upright when not in use to prevent leakage.

Empty container very hazardous! Continue all label precautions!

Ground containers when transferring. Do not flame cut, braze or weld.

DISPOSAL: Recycle or dispose of observing local, state & Federal health,
safety & pollution laws. If spilled, mop up & dispose of.

FIRST AID : In case of contact with skin, flush with plenty of water. For eyes,
flush with plenty of water for 15 minutes & get medical attention.

After high-vapor exposure, remove to fresh air. If breathing is difficult

give oxygen. If breathing has stopped give artificial respiration.

If swallowed, CALL A PHYSICIAN IMMEDIATELY!

Never give anything by mouth to an unconscious person.

Consult MSDS for further information.

FOR INDUSTRY USE ONLY

KEEP OUT OF THE REACH OF CHILDREN

DATE : 10/59

DOT SHIPPING NAME: Compound Cleaning, Liquid (NA1993)

DOT DRUM LABEL: None

Legal responsibility is assumed only for the fact that
all studies reported here & opinions are those of
qualified experts. Buyer assumes all risk & liability.
He accepts & uses this material on these conditions.

ATTENTION!

THIS CONTAINER HAZARDOUS WHEN EMPTY OR
PARTIALLY EMPTY. SINCE CONTAINERS RETAIN
PRODUCT VAPOR OR LIQUID RESIDUES. ALL
HAZARD PRECAUTIONS MUST BE OBSERVED.
RESIDUAL VAPORS MAY EXPLODE ON IGNITION.
DO NOT CUT, DRILL, GRIND, OR WELD
ON OR NEAR THIS CONTAINER.

HAZARD RATING
HEALTH (NFPA): 0
HEALTH (HMIS): 3
FLAMMABILITY: 2
REACTIVITY: 0

SAL 000006963

TEXACO INC.
INDUSTRIAL HYGIENE, TOXICOLOGY, AND MATERIAL
SAFETY DATA SHEET



NOTE: NO REPRESENTATION IS MADE AS TO THE ACCURACY OF THE INFORMATION
HEREIN. SEE PAGE 7 FOR CONDITIONS UNDER WHICH DATA ARE FURNISHED.

Trade Name and Synonyms COPY SURFONIC N-95		6-8-98	
Manufacturer's Name Texaco Chemical Company		Emergency Telephone No. (409) 722-8381	
Address 4800 Fournace Place P.O. Box 430 Bellaire, TX 77401			
Chemical Name and/or Family or Description Alkyl Phenol Ethoxylate			
THIS PRODUCT IS CLASSIFIED AS: _____ NOT HAZARDOUS: ☒ HAZARDOUS BY DEFINITION NO.(S) <u>5</u> ON ATTACHED EXPLANATION SHEETS			

WARNING STATEMENT:
WARNING! CAUSES IRRITATION TO EYES

OCCUPATIONAL CONTROL PROCEDURES

Protective Equipment (Type)

Eyes: Chemical type goggles must be worn.

Skin: Exposed employes should exercise reasonable personal cleanliness; this includes cleansing exposed skin areas several times daily with soap and water, and laundering or dry cleaning soiled work clothing at least weekly. Gloves resistant to chemicals and petroleum distillates recommended.

Inhalation: None required when handling at minimum feasible temperatures.

Ventilation: Normal

Permissible Concentrations:

Air: None established

EMERGENCY AND FIRST AID PROCEDURES

First Aid

Eyes: Flush thoroughly with water for at least fifteen minutes. Get medical attention.

Skin: Wash exposed areas with soap and water.

Ingestion: None considered necessary.

Inhalation: None considered necessary.

Other Instructions: None.

SAL 000006964

G S 6 9 8



PHYSIOLOGICAL EFFECTS:

Code
No.

C5224

Effects of Exposure

Acute:

Eyes: Causes moderate eye irritation.

Skin: Slightly irritating with possible redness, edema or drying of the skin. May cause dermatitis on prolonged or repeated contact.

Respiratory System: Believed to be minimally irritating.

Chronic: Ames mutagenicity test = negative

Other: -Cell transformation - neg.; Rat hepatocyte (UDS) - neg.

Sensitization Properties:

Skin: Yes ☐ No ☐ Unknown ☒

Respiratory: Yes ☐ No ☐ Unknown ☒

Median Lethal Dose (LD₅₀ LC₅₀) (Species)

Oral: Approximately 3 g/kg (rat); slightly toxic

Inhalation: N.D.

Dermal: 3 g/kg (rabbit); practically non-toxic

Other: N. D.

Irritation Index, Estimation of Irritation (Species)

Skin: 2.4/8.0 (rabbit); slightly irritating

Eyes: 35.5/110 (rabbit); moderately irritating

Symptoms of Exposure: See above

FIRE PROTECTION INFORMATION

Ignition Temp. °F. N.D.

Flash Point °F. (Method) 460F (COC)

Flammable Limits (%) Lower N.D.

Upper N.D.

Products Evolved When Subjected to Heat or Combustion:

Heating in air may produce irritating aldehydes, acids, and ketones.

Recommended Fire Extinguishing Agents And Special Procedures:

According to the National Fire Protection Association Guide, use water spray, dry chemical, foam, or carbon dioxide.

Water or foam may cause frothing. Use water to cool fire-exposed containers. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop the leak.

Unusual or Explosive Hazards:

None.

SAL 000006965



65698

ENVIRONMENTAL PROTECTION

Code
No.

C5224

Waste Disposal Method:

Under RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixture, processes, etc. may render the resulting material hazardous. (See Remarks for Waste Classification.)

Procedures in Case of Breakage or Leakage: (Transportation Spills Call CHEMTREC (800) 424-9300)

Avoid contact with eyes. Contain spill if possible. Wipe up or absorb on suitable material and shovel up.

Remarks:

Waste Classification: Product has been evaluated for RCRA characteristics and does not meet criteria of a hazardous waste if discarded in its purchased form.

PRECAUTIONS

WARNING! CAUSES IRRITATION TO EYES

Avoid contact with eyes.
Wash thoroughly after handling.

Requirements for Transportation, Handling and Storage:
Minimum feasible handling temperatures should be maintained. Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

DOT Proper Shipping Name: Not regulated
DOT Hazard Class (if applicable): N.A.

CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point (°F) N.D. Vapor Pressure <1 (mmHg)

Specific Gravity 1.06 ($H_2O=1$) Vapor Density >1 (Air=1)

Appearance and Odor colorless-straw colored, slight odor

SAL 000006966

Solubility sol.

pH of undiluted product 7.0

Percent Volatile by Volume nil

Evaporation nil

Viscosity 110 cSt @ 100F

Air

Water

Heat

Strong Oxidizers

Others

None of These

Hazardous Polymerizations Occur X Do not occur
The Material Reacts Violently With (if others is checked below, see additional comments on page 6 for further details)

G S 6 9 8



COMPOSITION

Code
No.

C5224

Chemical/Common Name

CAS No.

Exposure Limit

Range in %

poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl)-
omega-hydroxy-

100.00

Evaluation of this product indicates that it is hazardous according to OSHA
Appendix A criteria and/or Texaco's hazard criteria.

SAL 000006967

PRODUCT SHIPPING LABEL

Code No.

C5224

C5224 SURFONIC N-95

WARNING! CAUSES IRRITATION TO EYES

Avoid contact with eyes.
Wash thoroughly after handling.

In case of contact flush eyes with plenty of water for at least 15 minutes.
Call a doctor.

Chemical/Common Name	CAS No.	Exposure Limit	Range in %
Poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl) - omega-hydroxy-	9016459		100.00

Evaluation of this product indicates that it is hazardous according to OSHA Appendix A criteria and/or Texaco's hazard criteria.
DOT Proper Shipping Name: Not regulated
DOT Hazardous Class : N.A.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.
HEALTH EMERGENCY TELEPHONE: (914) 831-3400 (EXT. 204)

Texaco Inc.
2000 Westchester Avenue
White Plains, New York 10650

For Additional Information Concerning:
Fuels/Lubricants/Antifreezes
Chemicals/Additives
Transportation Spills
call (409) 722-8381
call (914) 831-3400 (EXT. 204)
SAL 000006968
call CHEMTREC (800) 424-9300



65698

GS698



ADDITIONAL COMMENTS

Code
No.

CS224

STATE OF MICHIGAN CRITICAL MATERIALS ACT (REVISED 1984)

No critical materials present.

Considered to be relatively toxic to aquatic life at
concentration as low as 5 PPM.

SAL 000006969

By F. E. Bentley

Title

Coordinator of Product Safety

Date

11-15-85



New



Revised, Supersedes

10-15-85

ND - Not Determined

NA - Not Applicable

GS698



NOTE: THIS DATA IS FURNISHED GRATUITOUSLY INDEPENDENT OF ANY SALE OF THE PRODUCT. ONLY FOR YOUR INVESTIGATION AND INDEPENDENT VERIFICATION. WHILE THE INFORMATION IS BELIEVED TO BE CORRECT, TEXACO INC. MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN. TEXACO INC. SHALL IN NO EVENT BE RESPONSIBLE FOR ANY DAMAGES OF WHATSOEVER NATURE DIRECTLY OR INDIRECTLY RESULTING FROM THE PUBLICATION OR USE OF OR RELIANCE UPON DATA CONTAINED HEREIN. NO WARRANTY, EITHER EXPRESS OR IMPLIED OF MERCHANTABILITY OR FITNESS OF ANY NATURE WITH RESPECT TO THE PRODUCT OR TO THE DATA HEREIN IS MADE HEREUNDER. DATA SHEETS ARE AVAILABLE FOR ALL TEXACO PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL TEXACO PRODUCTS YOU BUY, PROCESS, USE, OR DISTRIBUTE, AND ENCOURAGED TO ADVISE ANYONE WORKING WITH OR EXPOSED TO SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

EXPLANATION OF THE INDUSTRIAL HYGIENE, TOXICOLOGY, AND MATERIAL SAFETY DATA SHEET

PRODUCT INFORMATION

Trade Name and Synonyms

Refer to the code number and name under which the product is marketed and the common commercial name of the product.

Manufacturer's Name and Address Self explanatory.

Chemical Name and/or Family or Description

Refer to chemical, generic, or descriptive name of single elements and compounds.

For purposes of this form, a product is defined as hazardous if it possesses one or more of the following characteristics: (1) has a flash-point below 200 degrees Fahrenheit, closed cup or subject to spontaneous heating; (2) has a threshold limit value below 500 ppm gases and vapor below 5 mg/m³ for dust, fumes and mist, and below 25 MPPCF for mineral dust; (3) a single dose oral LD50 below 500 mg/kg; (4) causes burns to the skin in the short-term exposure or is systemically toxic by skin contact; (5) has been demonstrated to be a skin or eye irritant or causes respiratory irritation; (6) may cause skin or respiratory sensitization; (7) has teratogenic, mutagenic or other toxic effects; (8) may cause asphyxia or pneumoconiosis; (9) in the course of normal operations may produce dusts, gases, fumes, vapor, mist or smoke which have one or more of the above characteristics; (10) contains a component which may be carcinogenic according to NTP (National Toxicology Program), IARC (International Agency for Research Cancer), OSHA (Occupational Safety and Health Administration), EPA (Environmental Protection Agency) and/or NCI (National Cancer Institute); (11) has a median LC50 in air of 200 ppm or less by volume of gas or vapor, or 20 mg/l or less of mist, fume or dust when administered by inhalation.

OCCUPATIONAL CONTROL PROCEDURES

(Consult your Industrial Hygienist or Occupational Health Specialist)

Protective Equipment

Type of protective equipment that is necessary for the safe handling and use of this product.

Ventilation

Normal means adequate to maintain permissible concentrations.

Ventilation type, i.e. local exhaust, mechanical, etc.

Permissible Concentrations

Indicates Threshold Limit Value (TLV) and/or Time Weighted Average (TWA) as established by the American Conference of Governmental Industrial Hygienists and/or standards promulgated by the Occupational Safety and Health Administration.

EMERGENCY AND FIRST AID PROCEDURES

Administer first aid and emergency procedures in case of eye and/or skin contact, ingestion and inhalation.

PHYSIOLOGICAL EFFECTS

Acute Exposures (Eye, Skin, Respiratory System)

Refers to the most common effects that would be expected to occur from direct contact with the product.

Chronic

Refers to the effects that are most likely to occur from repeated or prolonged exposure.

Sensitizer

Means a substance which will cause on or in normal living tissue, through an allergic or photodynamic process, a hypersensitivity which becomes evident on reapplication of, or exposure to, the same substance.

Median Lethal Dose or Concentration (LD50, LC50)

Refers to that dose or concentration of the material which will produce death in 50 per cent of the animals. For inhalation, exposure time is indicated.

Irritation Index

Refers to an empirical score (Draize Method) for eye and skin irritation which tested by the method described. If numbers are not available, a yes or no answer indicates whether or not the material is an irritant.

FIRE PROTECTION INFORMATION

Ignition Temperature SAL 000006970

Refers to the temperature in degrees Fahrenheit, at which a liquid will give off enough flammable vapor to ignite and burn continuously for 5 seconds.

Flash Point (State Method used)

Refers to the temperature in degrees Fahrenheit, at which a liquid will give off enough flammable

GS698



Flammable Limits

Refers to the range of gas or vapor concentration (percent by volume in air) which will burn or explode if an ignition source is present. Lower means the lower flammable limit and upper means the upper flammable limit given in percent.

Products Evolved When Subjected to Heat or Combustion

The products evolved when this material is subjected to heat or combustion. Includes temperature at which oxidation or other forms of degradation occurs.

Recommended Fire Extinguishing Agents and Special Procedures

Specifies the fire fighting agents that should be used to extinguish fires. If unusual fire hazards are involved or special procedures indicated, this is specified.

Unusual Fire or Explosive Hazards

Specifies hazards to personnel in case of fire, explosive danger.

ENVIRONMENTAL PROTECTION

Specifies how this product can be successfully disposed of.

Indicates precautions necessary in the event that leakage or breakage occurs. Included are (a) clean-up procedures, (b) personal protective equipment if necessary, (c) hazards that may be created, i.e. fire, explosion, etc.

PRECAUTIONARY LABEL

Label that is required or recommended.

Requirements for Transportation, Handling and Storage

Specifies handling and storage procedures. Gives ICA, DOT, or other regulations related to safety and health for transportation.

CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point (or Range)

In degrees Fahrenheit or Celsius Boiling Point at 760 mmHg.

Vapor Pressure

Pressure exerted when a solid or liquid is in equilibrium with its own vapor.

Specific Gravity

The ratio of the density of the product to the density of water.

Vapor Density

The ratio of the density of the vapor at saturation concentration (20 degrees Celsius or 68 degrees Fahrenheit) to the density of air at 760 mmHg.

Appearance and Odor

Refers to the general characterization of the material, e.g. powder, colorless liquid, aromatic odor, etc.

pH

Refers to the degree of acidity or basicity of the material in a specific concentration.

pH1-5 - STRONGLY ACIDIC
pH5-7 - WEAKLY ACIDIC
pH7-9 - WEAKLY BASIC
pH9-14 - STRONGLY BASIC

Solubility

Refers to the solubility of a material by weight in water at room temperature. The term negligible, less than 0.1 %; slight, 0.1 to 1%; moderate, 1 to 10%; appreciable, 10% or greater. Gives solubility in organic solvents where appropriate.

Percent Volatile By Volume

Refers to the amount volatilized at 20 degrees Celsius or 68 degrees Fahrenheit when allowed to evaporate.

Evaporation

Gives the rate of evaporation compared to a standard

Viscosity

Measure of flow characteristics in Kinematic viscosity in Centistokes.

Hazardous Polymerization

Hazardous polymerization is that reaction which takes place at a rate which produces large amounts of energy. Indicates whether it may or may not occur and under what storage conditions.

Does the Material React Violently

Indicates whether the material will react violently, releasing large amounts of energy when exposed under conditions listed.

Composition

Components of the product as manufactured.

Texaco Inc.
2000 Westchester Avenue
White Plains, New York 10650
Phone (914) 831-3400 (Beacon)

SAL 000006971

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

OS 699

IDENTITY (As Used on Label and List)
NIEDERHOFER TANK CLEANER #2, BLEND

Note: Blank spaces are not permitted. If any item is not applicable, or no
information is available, the space must be marked to indicate that.

Section I (50% CONCENTRATE IN WATER)

Manufacturer's Name

NIEDERHOFER ENTERPRISES

Emergency Telephone Number

713/424-7742

Address (Number, Street, City, State, and ZIP Code)

P. O. BOX 3236 BAYTOWN, TEXAS 77522

Telephone Number for Information

713/424-7742

7507 BAYWAY DRIVE

Date Prepared

DECEMBER 29, 1987

Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE KNOWN TO BE HAZARDOUS OR TOXIC				

OTHER:

WATER

50%

CONCENTRATE

50%

Section III — Physical/Chemical Characteristics

Boiling Point DEGREES F.	207-220	Specific Gravity (H ₂ O = 1)	0.9541
Vapor Pressure (mm Hg)	APPROX. 78	Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water

EMULSIFIED

Appearance and Odor

MILKEY EMMULSION

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	200° F.	Flammable Limits	LEL	UEL
P.M.C.C.		UNKNOWN		
Extinguishing Media	CO ₂ , HALAN, FOG, FOAM			

Special Fire Fighting Procedures

NOTIFY SAFETY, REMOVE SOURCE OF FLAME AND CONTAIN WITH DIKE. EXTINGUISH

Special Fire and Explosion Hazards

NO SPECIAL PROBLEMS KNOWN. USE STANDARD TECHNIQUES USED WITH PETROLEUM BASED MATERIALS

SAL 000006972

65699

Section V - Reactivity Data

Stability	Conditions to Avoid	
	Unstable	Stable
		X
		HIGH TEMPERATURES

Incompatibility (Materials to Avoid) NONE KNOWN

Hazardous Decomposition or Byproducts NONE KNOWN

Hazardous Polymerization	Conditions to Avoid	
	May Occur	Will Not Occur
		X

Section VI - Health Hazard Data

Route(s) of Entry: Inhalation? ☐ Skin? ☐ Ingestion? ☐

Health Hazards (Acute and Chronic) UNKNOWN

Carcinogenicity: NTP? ☐ IARC Monographs? ☐ OSHA Regulated? ☐

Signs and Symptoms of Exposure UNKNOWN

Reproductive Conditions: Unknown

Emergency and First Aid Procedures: WASH FROM SKIN WITH SOAP AND WATER. FLUSH EYES 15 MINUTES WITH RUNNING WATER. SEE PHYSICIAN

Section VII - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled

NOTIFY SAFETY, SHUT OFF SOURCE, DIKE AND CONTAIN. PICK UP WITH ABSORBANT.

Waste Disposal Method

REMOVE TO APPROVED LAND FILL.

Precautions to be Taken in Handling and Storing: KEEP COOL AND WELL VENTILATED

Other Precautions

KEEP AREA CLEAN AND FREE OF COMBUSTIBLES

Section VIII - Control Measures

Hazardous Concentration (Specify Type)

NOT REQUIRED

Ventilation: Local Exhaust ☐ Other ☐

Mechanical (General) ☐

EXPLOSION PROOF

Eye Protection

USE STANDARD GOGGLES

Respirator

Other Controls (Specify)

Other Controls (Specify)

SAL 000006973

CS700

MATERIAL SAFETY DATA SHEET
Substantially Similar to Form OMB No. 1218-0072

NAME: Niederhofer powdered detergent
for de-gassing (KT3)
MANUFACTURER: SEATEX CORPORATION
6325 HURST ST.
HOUSTON, TX 77008

EMERGENCY TEL. #: (713) 868-1461
DATE PREPARED: March 23, 1988

HAZARDOUS MATERIAL	HAZARDOUS INGREDIENTS C.A.S. #	OSHA PEL TLV	ACGIH TLV	OTHER
Sodium Hydroxide	1310-73-2	2 mg/m3	2 mg/m3	N.A.

HAZARD IDENTIFICATION: NFPA/HIMIS
HEALTH-2 FIRE-0 REACTIVITY-0 SPECIFIC HAZARD-ALK

PHYSICAL CHARACTERISTICS

BOILING POINT-Not Applicable FLASH POINT (DEGREES C)-N.A.
SPECIFIC GRAVITY (H2O=1)- Not Applicable
EVAPORATION RATE (BUTYL ACETATE=1) - N.A. PERCENT VOLATILE - 0
PHYSICAL DESCRIPTION - White granular powder with pine order
FLAMMABLE LIMITS=
LEL-N.A. UEL-N.A.
EXTINGUISHING MEDIA= The material will neither burn or support
combustion.
SPECIAL FIRE FIGHTING PROCEDURES= Not Applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS= None

REACTIVITY DATA

UNSTABLE- STABLE- X
CONDITIONS TO AVOID= None
MATERIALS TO AVOID: Strong acids
HAZARDOUS POLYMERIZATION: Will Not Occur

HEALTH HAZARD DATA

POSSIBLE ROUTES OF ENTRY:

INHALATION - No

SKIN - No

INJECTION - Yes

ACUTE HEALTH HAZARD: Will produce irritation to mucus membranes upon
ingestion or contact with eye.

CHRONIC HEALTH HAZARD: None known

CARCINOGENICITY:

NPT-No IARC MONOGRAPHS - No OSHA REGULATED - No

TOXICOLOGY

ORAL LD 50 - Not determined DERMAL IRRITATION-Not determined
EYE IRRITANT - Not determined

SAL 000006974

GS700

MATERIAL SAFETY DATA SHEET Page 2

SYMPTOMS OF EXPOSURE:

EYE - Irritation, burning and redness

SKIN - Burns, irritation, drying, and cracking.

INHALATION - Not likely to occur under circumstances of use.

INGESTION - Burns of mucosa, gastric distress and irritation.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:None known

EMERGENCY AND FIRST AID PROCEDURES

SKIN - Flush skin with water. Remove contaminated clothing and do not
rewear until cleaned.

EYES - Flush eye with water for 15 minutes while holding open lids. If
irritation persists, see a doctor.

INHALATION - Not likely to occur under conditions of use.

INGESTION - Drink a large quantity of water or milk. DO NOT INDUCE
VOMITING! Do not give acid neutralizing agents. See a doctor
immediately!

HANDLING AND DISPOSAL PROCEDURES

SPILL CONTROL PROCEDURE: Material should be collected.

WASTE DISPOSAL PROCEDURE: May be flushed to sewer.

HANDLING SAFETY: No special procedures.

PERSONAL HYGENE

RESPIRATORY PROTECTION: None TYPE REQUIRED: None

VENTILATION REQUIRED: LOCAL EXHAUST - No GENERAL MECHANICAL - Yes
SPECIAL - N.A. OTHER: N.A.

PROTECTIVE EQUIPMENT SUGGESTED:Chemical safety goggles, rubber (Non-
permiabile) gloves, rubber (non-permiabile) apron and boots

WORK HYGENE: Wash hands immediately use.

SAL 000006975

M A T E R I A L S A F E T Y D A T A S H E E T

~~48580~~

PREMIER INDUSTRIAL CORPORATION
4500 EUCLID AVENUE
CLEVELAND, OHIO 44103

* EMERGENCY/INFORMATION TELEPHONE:

*

*

216/391-8300

*

* FORMULA: 47866 DATE: 03/21/86

* MSDS EFFECTIVE: 03/15/90 BY: CMB

* SUPERSEDES MSDS OF: 08/28/89

*

* COF: 742394

* INVOICE: 378685

*

* SDS KEY: 074699B

*

MAIL TO:

CONOCO REFINERY WHSE
OLD SPANISH TRAIL
WESTLAKE LA 70669

DEAR CUSTOMER:

IN COMPLIANCE WITH THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA TITLE III, SECTION 313), FEDERAL HAZARD COMMUNICATIONS REGULATIONS (WHMIS AND OSHA 29 CFR 1910.1200) AND IN THE INTEREST OF INFORMED USE OF OUR PRODUCT, WE ARE PROVIDING YOU WITH THIS MATERIAL SAFETY DATA SHEET (MSDS).

THIS MSDS WILL BE UPDATED REGULARLY TO REFLECT THE MOST RECENT INFORMATION IN OUR POSSESSION. PLEASE ENSURE THAT OBSOLETE MSDS SHEETS IN YOUR FILES FOR THIS PART NUMBER ARE DISCARDED.

WE THANK YOU FOR YOUR CONTINUED PATRONAGE AND LOOK FORWARD TO PROVIDING YOU WITH ADDITIONAL QUALITY PRODUCTS AND SERVICES.

***** SECTION I - PRODUCT IDENTIFICATION *****

PART NUMBER: 92180

PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO

TRADE NAME/SYNONYMS: ETP CUTTING FLUID

CHEMICAL FAMILY: AEROSOL, LUBRICANT

***** SECTION II - HAZARDOUS INGREDIENTS *****

INGREDIENT	CAS NO.	WT %	PEL	TLV	STEL	UNITS	LC50, PPM	LD50, MG/KG
PROPANE	00074-98-6	5	1000	N/A	N/A	PPM	M LO 10000	N/A
ISOBUTANE	00075-28-5	5	N/A	N/A	N/A		N/A	N/A
PETROLEUM OIL	64742-63-8	80-90	5*	5*	10*MG/M3	N/A		RAT I13000 RAB A 2000

INGREDIENTS TOTAL WT % ARE BELOW 100% ONLY IF ALL OTHERS UNLISTED ARE NOT CONSIDERED HAZARDOUS BY ANY FEDERAL (OSHA, WHMIS, SARA), ANY STATE OR PROVINCE, OR LOCAL RIGHT-TO-KNOW REGULATIONS

SYMBOLS, ABBREVIATIONS AND NOTATIONS:

N/A=NOT AVAILABLE OR APPLICABLE, C=CEILING LIMIT, S=SKIN DESIGNATION

#=LISTED IN SARA TITLE III SECTION 313, *=IF FOUND AS DUST, MIST OR FUME

M=HUMAN, RAB=RABBITS, GPG=GUINEA PIGS, MIC=MICE

I=INGESTION, A=SKIN ABSORPTION, LO=LITTLE OBSERVABLE EFFECT, NO=NO EFFECT

PEL=OSHA PERMISSIBLE EXPOSURE LIMIT, TLV=ACGIH THRESHOLD LIMIT VALUE

STEL=SHORT TERM EXPOSURE LIMIT, @=AMONG 5 MOST PREDOMINANT SUBSTANCES

SAL 000006976

GS 580

RT: 92180 PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO PAGE 2 OF 3

***** SECTION III - PHYSICAL DATA *****

BOILING PT DEG F/C: -44F / -42C SPECIFIC GRAVITY: 0.93
VAPOR PRESSURE(MM HG): 4.7 ATM %VOLATILE VOLUME: 10
VAPOR DENSITY(AIR=1): 1.6 EVAPORATION RATE: (WATER=1) <1
SOLUBILITY IN WATER: NIL WATER/OIL DIST COEFF: 0
APPEARANCE AND ODOR: TAN LIQUID, PETROLEUM ODOR.
PHYSICAL STATE: LIQUID, AEROSOL
FREEZE PT DEG F/C: N/A THRESHOLD ODOR, PPM: N/A
OTHER: N/A PH: N/A

***** SECTION IV - FIRE AND EXPLOSION HAZARD DATA *****

CLASSIFICATION: FLAMMABLE AEROSOL NFPA RATING: 1, 4, 0
COMBUSTION PRODUCTS: CO, CO2
FLASH POINT DEG F/C: -40F/-40C LELX: 1.8 UELX: 9.5
EXTINGUISHING MEDIA: CO2, DRY CHEMICAL FOAM.
UN/NA/PIN#: UN1954 SPECIAL FIRE FIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING EQUIPMENT.
AUTO IGN. TEMP DEG F/C: 700F / 371C UNUSUAL FIRE AND EXPLOSION HAZARDS:
EXPOSURE TO FIRE, HEAT OR PROLONGED SUNLIGHT MAY CAUSE BURSTING.
IF USED IN CONFINED SPACES, HAZARDOUS VAPORS MAY SPREAD OR BUILD UP IN LOW
AREAS.

EXPLOSIVE POWER: HIGH IMPACT SENSITIVE: NO
BURNING RATE: HIGH STATIC SENSITIVE: YES FLAMMABLE

***** SECTION V - HEALTH HAZARD DATA *****

PRODUCT GUIDE: TLV (SEE SECTION II) STEL: (SEE SECTION II)
DURATION OF ENTRY: EYE, INHALATION
EFFECTS OF OVEREXPOSURE: ACUTE: YES EYE IRRITATION CHRONIC: YES LUNG CONGESTION
CAUSES EYE IRRITATION. VAPORS IN HIGH CONCENTRATION ARE ANESTHETIC AND
IRRITATE UPPER RESPIRATORY SYSTEM. EXCESS INHALATION MAY CAUSE DIZZINESS,
HEADACHES, AND NAUSEA. MISUSE OR DELIBERATE INHALATION MAY BE HARMFUL OR
FATAL. PROLONGED AND REPEATED INHALATION MAY BE HARMFUL TO RESPIRATORY
SYSTEM.

LISTED AS A SUSPECTED CARCINOGEN: NO

EMERGENCY AND FIRST AID PROCEDURES:

EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15 MIN. & CALL PHYSICIAN.
SKIN: WASH THOROUGHLY WITH PLENTY OF WATER & SOAP.
INHALATION: IF AFFECTED, REMOVE TO FRESH AIR. INGESTION: SEEK PHYSICIAN
IMMEDIATELY, SHOW MSDS OR LABEL, DO NOT INDUCE VOMITING.

***** SECTION VI - REACTIVITY DATA *****

STABLE: YES CONDITIONS TO AVOID:
KEEP AWAY FROM HEAT, SPARKS, FLAMES, OR SOURCES OF IGNITION.
INCOMPATIBILITY(MATERIALS TO AVOID): YES STRONG OXIDIZING AGENTS.
HAZARDOUS DECOMPOSITION PRODUCTS: YES CO, PYROLYSIS PRODUCTS
HAZARDOUS POLYMERIZATION: NO CONDITIONS TO AVOID:
N/A

***** SECTION VII - SPILL OR LEAK PROCEDURES *****

LISTED IN: SARA TITLE III, #302: NO #304, CERCLA: NO #313: NO
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
IN CASE OF SPILL: REMOVE ALL SOURCES OF IGNITION. VENTILATE THE AREA.
CLEAN UP WITH ABSORBENT MATERIAL. CONTAIN AND PICK-UP WASTE MATERIALS.
PUT IN A SEALED APPROVED CONTAINER.
REPORT QUANTITY, LB: N/A KG: N/A TPQ, LB: N/A
REGULATIONS: WHMIS, RCRA OTHER: N/A
HAZARD WASTE: FLAMMABLE, AEROSOL

: N/A DISPOSAL METHOD:
DISPOSE OF WASTES IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
DO NOT PUNCTURE, INCINERATE (OR BURN) CONTAINERS.

SAL 000006977

RT: 92180 PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO PAGE 3 OF 3

***** SECTION VIII - SAFE HANDLING AND PROTECTION INFORMATION *****
RESPIRATORY PROTECTION: USE ONLY IN WELL VENTILATED AREAS.VENTILATION-LOCAL: RECOMMENDED
MECHANICAL: REQUIREDSPECIAL: N/A
OTHER: N/A

PROTECTIVE GLOVES: SOLVENT RESISTANT

EYE PROTECTION: SAFETY GOGGLES

OTHER PROTECTIVE EQUIPMENT:

IF VENTILATION IS INADEQUATE, WEAR APPROVED RESPIRATORY EQUIPMENT.

ESTIMATED LD50, MG/KG: YES ORAL RAT 13000; DERMAL RABBIT 2000.

ESTIMATED LC50, PPM: YES INHALATION MAN 10000

SENSITIZATION: NO

IRRITANT: NO

SYNERGISTIC AGENTS: NO

***** SECTION IX - SPECIAL PRECAUTIONS *****
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:KEEP IN A COOL PLACE. KEEP AWAY FROM HEAT, SPARKS, FLAMES, OR SOURCES OF
IGNITION. AVOID PROLONGED OR REPEATED BREATHING OF GAS, FUMES, VAPOR OR
SPRAY MIST. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WASH THOROUGHLY
AFTER USING.

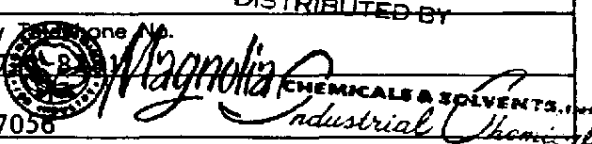
OTHER PRECAUTIONS:

DO NOT PUNCTURE, INCINERATE (OR BURN) CONTAINERS. KEEP OUT OF REACH OF
CHILDREN. ALWAYS READ AND FOLLOW DIRECTIONS ON PRODUCT LABEL. IN CASE OF
ACCIDENT OR ILLNESS, SEEK PHYSICIAN IMMEDIATELY, SHOW LABEL OR MSDS.ADDITIONAL TECHNICAL DATA SHEETS AND/OR MATERIAL SAFETY DATA SHEETS (MSDS)
RE AVAILABLE UPON REQUEST. FOR PROFESSIONAL AND INDUSTRIAL USE ONLY.THE INFORMATION AND RECOMMENDATIONS PROVIDED HEREIN ARE BELIEVED TO BE ACCURATE
OF THE DATE HEREOF. HOWEVER, SUCH INFORMATION AND RECOMMENDATIONS ARE
PROVIDED WITHOUT WARRANTY OF ANY KIND AND PREMIER INDUSTRIAL CORPORATION
DISCLAIMS ANY AND ALL LIABILITY OR LEGAL RESPONSIBILITY FOR USE OR RELIANCE
UPON SAME.

TEXACO
INDUSTRIAL HYGIENE, TOXICOLOGY, AND MATERIAL
SAFETY DATA SHEET

NOTE: NO REPRESENTATION IS MADE AS TO THE ACCURACY OF THE INFORMATION
HEREIN. SEE PAGE 7 FOR CONDITIONS UNDER WHICH DATA ARE FURNISHED.

CS226

Trade Name and Synonyms 70203 MORPHOLINE		DISTRIBUTED BY	
Manufacturer's Name Texaco Chemical Company		Emergency Telephone No. (409) 755-1111	
Address 3040 Post Oak Blvd. P.O. Box 27707 Houston, TX 77058		 Magnolia Chemicals & Solvents, Inc. <i>Industrial Chemicals</i>	
Chemical Name and/or Family or Description Morpholine		POST OFFICE BOX 10278 NEW ORLEANS, LA. 70181-0278 TELEPHONE 504 733-6600	
THIS PRODUCT IS CLASSIFIED AS: ____ CARCINOGENIC BY OSHA, IARC, OR NTP		X NOT CARCINOGENIC	
WARNING STATEMENT: DANGER! FLAMMABLE CAUSES SEVERE EYE & SKIN BURNS & MAY CAUSE BLINDNESS HARMFUL IF SWALLOWED; MAY FORM SUSPECTED CANCER- CAUSING NITROSAMINES IF MIXED WITH NITRITES			
OCCUPATIONAL CONTROL PROCEDURES			
Protective Equipment (Type)			
Eyes:	Chemical type goggles with face shield must be worn. Do not wear contact lenses.		
Skin:	When handling large quantities subject to splashes and spills, impervious suits, gloves and rubber boots must be worn.		
Inhalation:	Supplied air respiratory protection for cleaning large spills or upon entry into tanks, vessels, or other confined spaces.		
Ventilation:	Local exhaust ventilation recommended		
Permissible Concentrations:			
Air:	20 ppm (70 mg/cubic meter) 8 hr. TWA (ACGIH 1986-87) ACGIH skin, see Add. Cmts. Pg.6. 20 ppm OSHA Permissible Exposure Limit (PEL)		
EMERGENCY AND FIRST AID PROCEDURES			
First Aid			
Eyes:	Flush thoroughly with water for at least fifteen minutes. Get immediate medical attention.		
Skin:	If drenched, remove contaminated clothing under safety shower and flood exposed areas with water. Get immediate medical attention. Wash clothing before reuse. Destroy contaminated shoes.		
Ingestion:	Do NOT induce vomiting. Give large quantities of water. Call a doctor.		
Inhalation:	Remove to fresh air; if not breathing apply artificial respiration. Get medical attention. Keep affected person warm and at rest.		
Other Instructions:	None.		
SAL 000006979			



PHYSIOLOGICAL EFFECTS

Code No. 70203

Effects of Exposure

Acute:

Eyes: Believed to be extremely irritating with possible permanent eye injury. Vapor may cause transient corneal edema (hazy vision)

Skin: Corrosive; expected to cause severe skin damage with burns and blistering. Toxic effects due to skin absorption possible.

Respiratory System: May cause irritation of upper respiratory tract.

Chronic: Two-year inhalation oncogenic study negative in rats.

Other: -

Sensitization Properties:

Skin: Yes ☐ No ☐ Unknown ☒

Respiratory: Yes ☐ No ☐ Unknown ☒

Median Lethal Dose (LD₅₀ LC₅₀) (Species)

Oral 1.05 g/kg (rat); moderately toxic

Inhalation no deaths (rat), 12,000 ppm 8 hr; revers. respiratory tract injury

Dermal .500 g/kg (rabbit); moderately toxic

Other N. D.

Irritation Index, Estimation of Irritation (Species)

Skin Believed to be 6.6-8.0/8.0 (rabbit); corrosive

Eyes Believed to be 80-110/110 (rabbit); extremely irritating

Symptoms of Exposure See above and pg. 6 Additional Comments.

FIRE PROTECTION INFORMATION

Ignition Temp. °F. 590

Flash Point °F. (Method) 95°F (TCC)

Flammable Limits (%) Lower 1.8

Upper 10.8

Products Evolved When Subjected to Heat or Combustion:

Ammonia, carbon monoxide, and carbon dioxide may be formed on burning in limited air supply.

Recommended Fire Extinguishing Agents And Special Procedures:

According to the NFPA Guide 325M, water soluble, flammable liquid fires may be extinguished by dry chemical, foam, or carbon dioxide. Water may be ineffective on flames, but should be used 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 the leak.

Unusual or Explosive Hazards:

Explosive air-vapor mixtures may form.

SAL 000006980



ENVIRONMENTAL PROTECTION

Waste Disposal Method:

Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures and processes may change classification to non-hazardous or hazardous for reasons other than, or in addition to ignitability. (See Remarks for Waste Classification.)

Procedures in Case of Breakage or Leakage:

(Transportation Spills Call CHEMTREC (800) 424-9300)
Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Avoid breathing vapor. Use SCBA or supplied-air mask for lg spills or in confined areas. Contain spill. Remove with inert absorbant. Avoid all personal contact

Remarks:

Waste Classification: Product (as presently constituted) has the RCRA characteristic of ignitability and if discarded in its purchased form would have the hazardous waste number D001.

PRECAUTIONS

DANGER! FLAMMABLE

CAUSES SEVERE EYE & SKIN BURNS & MAY CAUSE BLINDNESS
HARMFUL IF SWALLOWED; MAY FORM SUSPECTED CANCER-
CAUSING NITROSAMINES IF MIXED WITH NITRITES

Do not get in eyes, on skin or clothing.
Keep away from heat, sparks and flame.
Avoid breathing vapor or mist.
Keep container closed.
Use only in well-ventilated locations.
Wash thoroughly after handling.

Requirements for Transportation, Handling and Storage:

Transport, handle and store in accordance with OSHA Regulation 1910.106 and applicable DOT regulations.

DOT Proper Shipping Name:

Morpholine

DOT Hazard Class (if applicable):

Flammable liq. UN2054/Corros.

CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point (°F) 263 Vapor Pressure 7 (mmHg)

Specific Gravity 1.0017 (H₂O=1) Vapor Density 3.0 (Air=1)

Appearance and Odor clear, colorless liq., ammonia odor

pH of undiluted product 11.2

Solubility Apprec

Percent Volatile by Volume 100

Evaporation N.D. ()=1

Viscosity 2.23 cP @ 20°C

Other -

Hazardous Polymerizations - Occur X Do not occur

The Material Reacts Violently With: (If others is checked below, see additional comments on page 6 for further details)

Air	Water	Heat	Strong Oxidizers	Others	None of These
			X	X	

G S 2 2 6



COMPOSITION

Chemical/Common Name	CAS No.	Exposure Limit	Range in %
*Morpholine	110918	20ppm TWA (SKIN) 20ppm TWA (SKIN) 30ppm STEL OSHA 30ppm STEL ACGIH	100.00

*Hazardous according to OSHA (1910.1200) or one or more state Right-To-Know lists.

SARA TITLE III

I. Title III Section 302/304 Extremely Hazardous Substance

Component
NONE

CAS No.

%

RQ (Lbs)

TPQ (Lbs)

II. CERCLA Section 102(a) Hazardous Substance

Component
NONE

CAS No.

%

RQ (Lbs)

III. Title III Section 311 Hazard Categorization

Acute
X

Chronic

Fire
X

Pressure

Reactive

Not Applicable

IV. Title III Section 313 Toxic Chemicals

Component
NONE

CAS No.

%

SAL 000006982

PRODUCT SHIPPING LABEL

70203 MORPHOLINE

DANGER! FLAMMABLE
CAUSES SEVERE EYE & SKIN BURNS & MAY CAUSE BLINDNESS
HARMFUL IF SWALLOWED; MAY FORM SUSPECTED CANCER-
CAUSING NITROSAMINES IF MIXED WITH NITRITES

Do not get in eyes, on skin or clothing.
Keep away from heat, sparks and flame.
Avoid breathing vapor or mist.
Keep container closed.
Use only in well-ventilated locations.
Wash thoroughly after handling.

In case of contact, immediately flush eyes or skin with
plenty of water for at least 15 minutes while removing
contaminated clothing and shoes.
Call a doctor.
Wash clothing before reuse.
Destroy contaminated shoes.
If swallowed, DO NOT induce vomiting. Call a doctor.
Never give anything by mouth to an unconscious person.
In case of fire use foam, dry chemical or CO2.
Use water spray to keep containers cool.

Chemical/Common Name	CAS No.	Range in %
Morpholine	110918	100.00

Hazardous according to OSHA (1910.1200) or one or more state Right-To-Know lists.

HMIS
Health : 3 Reactivity : 0
Flammability: 3 Special : -

DOT Proper Shipping Name: Morpholine
DOT Hazardous Class : Flammable liq. UN2054/Corros.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

HEALTH EMERGENCY TELEPHONE: (914) 831-3400 (EXT. 204)

Texaco
2000 Westchester Avenue
White Plains, New York 10650

For Additional Information Concerning:

Fuels/Lubricants/Antifreezes
call (914) 831-3400 (EXT.204)
Chemicals
call (512) 459-6543
Transportation Spills
call CHEMTREC (800) 424-9300



ADDITIONAL COMMENTS

76204

STATE OF MICHIGAN CRITICAL MATERIALS ACT (REVISED 1989)
No critical materials present.

DO NOT USE sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed. Aquatic toxicity rating: TLM-96 HRS = 100-1000 PPM; practically NON-TOXIC. ACGIH "SKIN" NOTATION—appropriate measures should be taken to prevent cutaneous absorption since the TLV is based on overexposure to the mucous membranes. Like many aliphatic amines, this product is not extensively biodegraded under laboratory conditions of the five day test. Reacts violently with acids.

SAL 000006984

To determine applicability or effect of any law or regulation with respect to the product, users should consult his legal advisor or the appropriate government agency. Texaco does not undertake to furnish advice on such matters.

By F. E. Bentley Title Coordinator of Product Safety
Date 09-14-89 ☐ New ☒ Revised, Supersedes 04-19-88

N.D. - Not Determined N.A. - Not Applicable
< - Less Than > - Greater Than

Q5 226



THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT AS PART OF TEXACO'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL TEXACO PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL TEXACO PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

EXPLANATION OF THE INDUSTRIAL HYGIENE, TOXICOLOGY, AND MATERIAL SAFETY DATA SHEET

PRODUCT INFORMATION

Trade Name and Synonyms

Refer to the code number and name under which the product is marketed and the common commercial name of the product.

Manufacturer's Name and Address Self explanatory.

Chemical Name and/or Family or Description

Refer to chemical, generic, or descriptive name of single elements and compounds.

OCCUPATIONAL CONTROL PROCEDURES

(Consult your Industrial Hygienist or Occupational Health Specialist.)

Protective Equipment

Type of protective equipment that is necessary for the safe handling and use of this product.

Ventilation

Normal means adequate to maintain permissible concentrations.
Ventilation: type, i.e. local exhaust, mechanical, etc.

Permissible Concentrations

Indicates worker exposure limits, such as the Threshold Limit Value (TLV) as established by the American Conference of Governmental Industrial Hygienists or standards, promulgated by the Occupational Safety and Health Administration (e.g., PEL).

TLV-Time Weighted Average (TWA) is the concentration in air averaged over an 8 hour daily exposure.

TLV-Ceiling (C) is the ceiling limit on concentration that should not be exceeded during any part of the working day.

"Skin" Notation (ACGIH) indicates that dermal absorption can contribute to overall exposure following direct contact or exposure to airborne material.

Permissible Exposure Level (PEL) is the time weighted concentration in air averaged over an 8 hour daily exposure.

EMERGENCY AND FIRST AID PROCEDURES

Administer first aid and emergency procedures in case of eye and/or skin contact, ingestion and inhalation.

PHYSIOLOGICAL EFFECTS

Acute Exposures (Eye, Skin, Respiratory System)

Refers to the most common effects that would be expected to occur from direct contact with the product.

Chronic

Refers to the effects that are most likely to occur from repeated or prolonged exposure.

Sensitizer

Means a substance which will cause on or in normal living tissue, through an allergic or photodynamic process, a hypersensitivity which becomes evident on reapplication of, or exposure to, the same substance.

Median Lethal Dose or Concentration (LD50,LC50)

Refers to that dose or concentration of the material which will produce death in 50 per cent of the animals. For inhalation, exposure time is indicated.

Irritation Index

Refers to an empirical score (Draize Method) for eye and skin irritation when tested by the method described. If numbers are not available, an estimated score indicates whether or not the material is an irritant.

FIRE PROTECTION INFORMATION

Ignition Temperature

Refers to the temperature in degrees Fahrenheit, at which a liquid will give off enough flammable vapor to ignite and burn continuously for 5 seconds.

Flash Point (Method used)

Refers to the temperature in degrees Fahrenheit, at which a liquid will give off enough flammable vapor to ignite.

Flammable Limits

Refers to the range of gas or vapor concentration (percent by volume in air) which will burn or explode if an ignition source is present. Lower means the lower flammable limit and upper means the upper flammable limit given in percent.

SAL 000006985



Products Evolved When Subjected to Heat or Combustion

The products evolved when this material is subjected to heat or combustion. Includes temperature at which oxidation or other forms of degradation occurs.

Recommended Fire Extinguishing Agents and Special Procedures

Specifies the fire fighting agents that should be used to extinguish fires. If unusual fire hazards are involved or special procedures indicated, this is specified.

Unusual Fire or Explosive Hazards

Specifies hazards to personnel in case of fire, explosive danger.

ENVIRONMENTAL PROTECTION

Specifies how this product may be disposed.

Indicates precautions necessary in the event that leakage or breakage occurs. Included are (a) clean-up procedures, (b) personal protective equipment if necessary, (c) hazards that may be created, i.e. fire, explosion, etc.

PRECAUTIONS

Label that is required or recommended.

Requirements for Transportation, Handling and Storage

Specifies handling and storage procedures. Gives ICC, DOT, or other regulations related to safety and health for transportation.

CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point (or Range)

In degrees Fahrenheit or Celsius Boiling Point at 760 mmHg.
Vapor Pressure

Pressure exerted when a solid or liquid is in equilibrium with its own vapor.

Specific Gravity

The ratio of the density of the product to the density of water.

Vapor Density

The ratio of the density of the vapor at saturation concentration (20 degrees Celsius or 68 degrees Fahrenheit) to the density of air at 760 mmHg.

Appearance and Odor

Refers to the general characterization of the material, e.g. powder, colorless liquid, aromatic odor, etc.

pH

Refers to the degree of acidity or basicity of the material in a specific concentration.

pH1-5 - STRONGLY ACIDIC
pH5-7 - WEAKLY ACIDIC
pH7-9 - WEAKLY BASIC
pH9-14 - STRONGLY BASIC

Solubility

Refers to the solubility of a material by weight in water at room temperature. The term negligible, less than 0.1 %; slight, 0.1 to 1%; moderate, 1 to 10%; appreciable, 10% or greater. Gives solubility in organic solvents where appropriate.

Percent Volatile By Volume

Refers to the amount volatilized at 20 degrees Celsius or 68 degrees Fahrenheit when allowed to evaporate.

Evaporation

Gives the rate of evaporation compared to a standard

Viscosity

Measure of flow characteristics in Kinematic viscosity in Centistokes.

Hazardous Polymerization

Hazardous polymerization is that reaction which takes place at a rate which produces large amounts of energy. Indicates whether it may or may not occur and under what storage conditions.

Does the Material React Violently

Indicates whether the material will react violently, releasing large amounts of energy when exposed under conditions listed.

Composition

Components of the product as required by OSHA (1910.1200) and one or more state Right to Know laws.

SAL 000006986



DELTA-OMEGA
Technologies, Ltd.

P. O. Box 81518
Lafayette, LA 70598-1518

24 HOUR EMERGENCY 318-237-5091
CHEMTREC 800-424-9300

PRODUCT NAME: OMNI-CLEAN™

PRODUCT CODE: EHAPO

~~CS070~~

HAZARD RATING

	HEALTH	FIRE	REACT	SPECIAL
4 - EXTREME 3 - HIGH 2 - MODERATE 1 - SLIGHT 0 - INSIGNIFICANT	NFPA 0	0	0	0
	HMIS 0	0	0	0

MATERIAL SAFETY DATA SHEET

DOT Hazard Class: Non-regulated
DOT Shipping Name: N/A

UN Number: N/A

MATERIAL: OMNI-CLEAN

I COMPONENT INFORMATION

COMPONENT SUMMARY

CASRN

WT%

OSHA/PEL

ACGIH/TWA

Omni-Clean is a patented, blended formulation of fatty acids and surface active agents which is completely non-hazardous, non-toxic and biodegradable and is listed on the U.S. Environmental Protection Agency National Contingency Plan contained in Section 300.86 of subpart H. All constituents are listed on the EPA's NCP Technical Bulletin D-42.

II PHYSICAL DATA

APPEARANCE: Clear

VISCOSITY

FREEZING PT: < 0°C

VAPOR PRESSURE: N/A

H₂O SOLUBILITY: complete

SPECIFIC GRAVITY: 1.00 25/25

BOILING PT: > 100°C

VAPOR DENSITY: N/A

PERCENT VOLATILE: N/A

EVAP RATE (BuAc=1): N/A

III FIRE AND EXPLOSION HAZARD DATA

FLASH PT: NONE

EXPLOSIVE LIMITS EXTINGUISHING MEDIA: NONE

1) TEMP: NONE

LEL: N/A UEL: N/A

SPECIAL FIRE FIGHTING PROCEDURES

Not a hazard, non-flammable. This product is an Emulsifying Film Forming Foam fire suppression agent.

UNUSUAL FIRE AND EXPLOSION HAZARDS

NONE

IV REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION

CONDITIONS TO AVOID

NONE

INCOMPATIBILITY (MATERIALS TO AVOID)

NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS

NONE KNOWN

INGESTION - Non-toxic
CHRONIC None known

SAL 000006987



DELTA-OMEGA
Technologies, Ltd.

P. O. Box 81518
Lafayette, LA 70598-1518

24 HOUR EMERGENCY 318-237-5091
CHEMTREC 800-424-9300

PRODUCT NAME: OMNI-CLEAN™

PRODUCT CODE: EHAPO **G S 6 7 0**

HAZARD RATING

	HEALTH	FIRE	REACT	SPEC
4 - EXTREME 3 - HIGH 2 - MODERATE 1 - SLIGHT 0 - INSIGNIFICANT	NFPA 0	0	0	0
	HMIS 0	0	0	0

MATERIAL SAFETY DATA SHEET

VI EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Not an expected route of exposure. If irritation or distress should occur, remove subject to fresh air.

EYE CONTACT: Flush eyes with water for at least 15 minutes.

SKIN CONTACT: None needed.

INGESTION: Drink one or two glasses of water.

VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Flush over with water

WASTE DISPOSAL METHODS

N/A Non-toxic, biodegradable - Acceptable for NPDES discharge or to POTW

VIII SPECIAL PROTECTION INFORMATION

VENTILATION

None

RESPIRATORY PROTECTION

None

PROTECTIVE GLOVES

Not required

EYE PROTECTION

None required - but splash goggles are recommended.

OTHER PROTECTIVE EQUIPMENT

None

IX TOXICITY INFORMATION

Skin PIS (RBT) - Non-irritating

Eye Irritant (RBT) - Slight irritant

X STORAGE AND HANDLING PROCEDURES

Agitation is recommended before use.

Use normal safety precautions when handling drums.

Store in tightly closed original shipment containers at ambient temperatures between 40° and 100°F.

XI REGULATORY AND ENVIRONMENTAL INFORMATION

We certify that none of the base chemical components of this product are listed on the TSCA inventory; each constituent is approved by the U.S. FDA. This product contains no chemicals identified by the State of California as carcinogens or reproductive toxicants. Biodegradable. Contains no heavy metals, cyanide or chlorinated hydrocarbons. D.O.T. Hazard Class: Non-regulated. U.S. EPA Classification: Non-hazardous. (All product constituents are non-hazardous and NOT included within the Hazardous Constituents section, Appendix VIII, Volume 45, No. 98, Rules and Regulations, Federal Register, May 19, 1980.)

Disclaimer

OMNI-CLEAN is on the U.S. Environmental Protection Agency's NCP Product Schedule. This listing does NOT mean that EPA approves, recommends, licenses, certifies, or authorizes the use of OMNI-CLEAN on an oil discharge. This listing means only that data have been submitted to EPA as required by Subpart H of the National Contingency Plan, section 300.86. Failure to comply with these restrictions or any other improper attempt of the product shall constitute grounds for removing the product from the NCP Product Schedule.

Prepared by
CHRIS DUGAS
Safety Manager

Effective Date
8/29/89

END of MATERIAL SAFETY DATA SHEET

SAL 000006988

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration

(Non-Mandatory Form)

Form Approved

OMB No. 1218-0072

G S 671



IDENTITY (As Used on Label and List)

FEMCO Grade H-RK

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name FILTER-MEDIA COMPANY	Emergency Telephone Number (713) 780-9000 or (713) 495-5654
Address (Number, Street, City, State, and ZIP Code) 3603 Westcenter Drive	Telephone Number for Information (713) 780-9000
Houston, Texas 77042	Date Prepared 1-22-90
	Signature of Preparer (optional) <i>E. R. Buttenwieser</i>

Section II -- Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
None	15 mg/m³	10mg/m³		
Chemical Name: Aluminum Silicate				
(Combined Form) (Non detectable free silica)				

FEDERAL AND STATE REGULATIONS SOMETIMES CHANGE AND DIFFER. WHILE FEMCO ALUMINUM SILICATE HAS BEEN DETERMINED TO OFFER NO MORE THAN A NUISANCE HAZARD WHICH CAN BE CONTROLLED WITH PROPER EXHAUSTING AND HOUSEKEEPING PROCEDURES, FILTER MEDIA, INC. MAKES NO WARRANTY WITH RESPECT TO FEDERAL AND STATE REGULATIONS AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

Section III -- Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	2.30
Vapor Pressure (mm Hg.)	N/A	Melting Point	2,400 deg.
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water

Insoluble

Appearance and Odor

White, inert, finely divided powder. Odorless.

Section IV -- Fire and Explosion Hazard Data

Flash Point (Method Used) Fire Proof	Flammable Limits N/A	LEL N/A	UEL N/A
--	--------------------------------	-------------------	-------------------

Extinguishing Media

None required. Product has been used to extinguish fires.

Special Fire Fighting Procedures

None. Fire Proof.

Unusual Fire and Explosion Hazards

None.

SAL 000006989

GS671

Section V -- Reactivity Data

Stability	Unstable		Conditions to Avoid	None known.
	Stable	X		

Incompatibility (Materials to Avoid)

Hydrofluoric Acid.

Hazardous Decomposition or Byproducts

None known.

Hazardous Polymerization

May Occur

Conditions to Avoid

None

Will Not Occur

X

Section VI -- Health Hazard Data

Route(s) of Entry: Inhalation? yes Skin? no Ingestion? yes

Health Hazards (Acute and Chronic) This is an innocuous dust. Excessive concentrations of such an innocuous dust may impair visibility and may cause deposits in the eyes, nasal passages, and ears. Use NIOSH approved devices for eye and respiratory protection, such as 3M9900 or MSA Comfo II for breathing and American Optical A01010 or AOR 1050 for eyes.

Carcinogenicity:

None

NTP?

N/A

IARC Monographs?

N/A

OSHA Regulated?

No

Signs and Symptoms of Exposure

Sneezing and dryness of mucous membrane (inhalation) dry chapped skin (contact). Tearing and redness of eyes.

Medical Conditions

Generally Aggravated by Exposure

Respiratory Ailments, Dermatitis and Eye Conditions, Contact Lenses.

Emergency and First Aid Procedures

Skin and eyes - wash well with water. Respiratory: Move to fresh air. Ingestion: no known specific effects. If irritation or discomfort occurs, seek medical help.

Section VII -- Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Sweep or vacuum and deposit in suitable container. Not or toxic, if unused.

Waste Disposal Method

Precautions to Be Taken in Handling and Storing

Keep dry. Avoid formation of dust. Ground equipment properly to prevent static discharge.

Other Precautions

None.

Section VIII -- Control Measures

Respiratory Protection (Specify Type)

Ventilation	Local Exhaust	As needed to reduce dust.	Special	N/A
	Mechanical (General)	N/A	Other	N/A

Protective Gloves

Not necessary

Eye Protection

Safety glasses: A01010 or AOR 1050

Other Protective Clothing or Equipment

None

Work/Hygenic Practices

Practice good housekeeping procedures.

SAL 000006990

GS672

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17541

Page: 1

PRODUCT NAME: DOWEX (R) MARATHON A CHLORIDE FORM ANION EXCHANGE RESIN

Effective Date: 04/17/89 Date Printed: 04/11/90

MSDS:001152

1. INGREDIENTS: (% w/w, unless otherwise noted)

Trimethylamine functionalized,
chloromethylated copolymer of
styrene and divinylbenzene in
the chloride form

Water

CAS# 060177-39-1

CAS# 007732-18-5

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: Not applicable

VAP DENSITY: Not applic.

SOL. IN WATER: Insoluble

SP. GRAVITY: Density 44 lb/ft³

APPEARANCE: White to amber solid (beads).

ODOR: No to low odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: Not applic.

METHOD USED: Not applic.

FLAMMABLE LIMITS

LFL: Not applic.

UFL: Not applic.

EXTINGUISHING MEDIA: Dry chemical.

(Continued on Page 2)

(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company

SAL 000006991

MATERIAL SAFETY DATA SHEET **GS672**

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17541

Page: 2

PRODUCT NAME: DOWEX (R) MARATHON A CHLORIDE FORM ANION EXCHANGE RESIN

Effective Date: 04/17/89 Date Printed: 04/11/90

MSDS:001152

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FIRE & EXPLOSION HAZARDS: Product is not combustible until moisture is removed, then resin starts to burn in flame at 230C. Autoignition occurs above 500C. Possible fire combustion products: Alkylbenzenes, vinylbenzenes, naphthalene, benzaldehydes, phenol, carbon dioxide, water, organic amines, chlorine, nitrogen oxides, ammonia, methyl chloride.

FIRE-FIGHTING EQUIPMENT: Wear positive pressure self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable under normal handling and storage conditions. See incompatibility statement.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Warning: Oxidizing agents such as nitric acid attack organic ion exchange resin under certain conditions and could result in a slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

HAZARDOUS DECOMPOSITION PRODUCTS: See possible combustion products in section 3.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Sweep up. Caution: May be slippery.

DISPOSAL METHOD: Bury resin in licensed landfill or burn in approved incinerator according to local, state, and federal regulations. For resin contaminated with hazardous material,

(Continued on Page 3)

(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company

SAL 000006992

MATERIAL SAFETY DATA SHEET

GS672

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17541

Page: 3

PRODUCT NAME: DOWEX (R) MARATHON A CHLORIDE FORM ANION EXCHANGE RESIN

Effective Date: 04/17/89 Date Printed: 04/11/90

MSDS:001152

5. ENVIRONMENTAL AND DISPOSAL INFORMATION: (CONTINUED)

dispose of mixture as hazardous material according to local, state and federal regulations.

6. HEALTH HAZARD DATA:

EYE: Solid or dust may cause irritation or corneal injury due to mechanical action.

SKIN CONTACT: Prolonged or repeated exposure not likely to cause significant skin irritation.

SKIN ABSORPTION: Skin absorption is unlikely due to physical properties.

INGESTION: Single dose oral LD50 has not been determined. Single dose oral toxicity is believed to be low. No hazards anticipated from ingestion incidental to industrial exposure.

INHALATION: Vapors are unlikely due to physical properties.

SYSTEMIC & OTHER EFFECTS: No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.

7. FIRST AID:

EYES: Irrigate immediately with water for at least 5 minutes. Mechanical irritation only.

SKIN: No adverse effects anticipated by this route of exposure.

INGESTION: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

INHALATION: No adverse effects anticipated by this route of exposure.

(Continued on Page 4)

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SAL 000006993

MATERIAL SAFETY DATA SHEET

GS672

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17541

Page: 4

PRODUCT NAME: DOWEX (R) MARATHON A CHLORIDE FORM ANION EXCHANGE RESIN

Effective Date: 04/17/89 Date Printed: 04/11/90

MSDS:001152

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): None established.

VENTILATION: Good general ventilation should be sufficient.

RESPIRATORY PROTECTION: No respiratory protection should be needed.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

EYE PROTECTION: Use safety glasses.

9. ADDITIONAL INFORMATION:

REGULATORY 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

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Practice reasonable care and caution. Metal equipment should be compatible with feed, regenerant, resin form, and effluent of that process.

TSCA CONSIDERATIONS:

Every different salt or ionic form of an ion-exchange resin is a separate chemical. If you use an ion-exchange resin for ion-exchange purposes and then remove the by-product resin from its vessel or container prior to recovery of the original or another form of the resin or of another chemical, the by-product resin must be listed on the TSCA Inventory (unless

(Continued on Page 5)

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MATERIAL SAFETY DATA SHEET

CS672

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17541

Page: 5

PRODUCT NAME: DOWEX (R) MARATHON A CHLORIDE FORM ANION EXCHANGE RESIN

Effective Date: 04/17/89 Date Printed: 04/11/90

MSDS:001152

9. ADDITIONAL INFORMATION: (CONTINUED)

an exemption is applicable). It is the responsibility of the customer to ensure that such isolated, recycled by-product resins are in compliance with TSCA. Failure to comply could result in substantial civil or criminal penalties being assessed by the Environmental Protection Agency.

MSDS STATUS: Revised Section 9.

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G S 678

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17543

Page: 1

PRODUCT NAME: DOWEX (R) MARATHON C HYDROGEN FORM CATION EXCHANGE RESIN

Effective Date: 04/14/89 Date Printed: 04/11/90

MSDS:001153

1. INGREDIENTS: (% w/w, unless otherwise noted)

Sulfonated copolymer of styrene and
divinylbenzene in the hydrogen form CAS# 069011-20-7
Water CAS# 007732-18-5

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: Not applicable
VAP DENSITY: Not applicable
SOL. IN WATER: Insoluble
SP. GRAVITY: Density 50 lb/ft³
APPEARANCE: Light yellow to amber solid (beads).
ODOR: Not applicable.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: Not applic.
METHOD USED: Not applic.

FLAMMABLE LIMITS
LFL: Not applic.
UFL: Not applic.

EXTINGUISHING MEDIA: Dry chemical.

FIRE & EXPLOSION HAZARDS: Product is not combustible until moisture is removed, then resin starts to burn in flame at

(Continued on Page 2)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17543

Page: 2

PRODUCT NAME: DOWEX (R) MARATHON C HYDROGEN FORM CATION EXCHANGE RESIN

Effective Date: 04/14/89 Date Printed: 04/11/90

MSDS:001153

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

230C. Autoignition occurs above 500C. Possible fire combustion products: alkylbenzenes, vinylbenzenes, naphthalene, benzaldehydes, phenol, carbon dioxide, water, sulfur oxides, organic sulfonates.

FIRE-FIGHTING EQUIPMENT: Wear positive pressure self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable under normal handling and storage conditions. See incompatibility statement.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Warning: Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions and could result in a slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

HAZARDOUS DECOMPOSITION PRODUCTS: See possible combustion products in section 3.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Sweep up. Caution: May be slippery.

DISPOSAL METHOD: Bury resin in licensed landfill or burn in approved incinerator according to local, state, and federal regulations. For resin contaminated with hazardous material, dispose of mixture as hazardous material according to local, state, and federal regulations.

(Continued on Page 3)

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MATERIAL SAFETY DATA SHEET

GS678

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17543

Page: 3

PRODUCT NAME: DOWEX (R) MARATHON C HYDROGEN FORM CATION EXCHANGE RESIN

Effective Date: 04/14/89 Date Printed: 04/11/90

MSDS:001153

6. HEALTH HAZARD DATA:

EYE: May cause severe eye irritation. May cause moderate corneal injury. Effects are likely to heal.

SKIN CONTACT: Prolonged exposure may cause skin irritation. May cause more severe response if skin is abraded (scratched or cut).

SKIN ABSORPTION: Skin absorption is unlikely due to physical properties.

INGESTION: Single dose oral toxicity is believed to be low. No hazards anticipated from ingestion incidental to industrial exposure.

INHALATION: Vapors are unlikely due to physical properties.

SYSTEMIC & OTHER EFFECTS: No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

INGESTION: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

INHALATION: No adverse effects anticipated by this route of exposure due to physical properties.

(Continued on Page 4)

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MATERIAL SAFETY DATA SHEET

G S 6 7 3

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17543

Page: 4

PRODUCT NAME: DOWEX (R) MARATHON C HYDROGEN FORM CATION EXCHANGE RESIN

Effective Date: 04/14/89 Date Printed: 04/11/90

MSDS:001153

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): None established

VENTILATION: Good general ventilation should be sufficient.

RESPIRATORY PROTECTION: No respiratory protection should be needed.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact could occur. If handling when skin is abraded (scratched or cut), wear a glove which provides a physical barrier.

EYE PROTECTION: Use chemical goggles.

9. ADDITIONAL INFORMATION:

REGULATORY 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:

An immediate health hazard

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Practice reasonable care and caution. Metal equipment should be compatible with feed, regenerant, resin form, and effluent of that process.

TSCA CONSIDERATIONS:

Every different salt or ionic form of an ion-exchange resin is a separate chemical. If you use an ion-exchange resin for ion-exchange purposes and then remove the by-product resin

(Continued on Page 5)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 17543

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PRODUCT NAME: DOWEX (R) MARATHON C HYDROGEN FORM CATION EXCHANGE RESIN

Effective Date: 04/14/89 Date Printed: 04/11/90

MSDS:001153

9. ADDITIONAL INFORMATION: (CONTINUED)

from its vessel or container prior to recovery of the original or another form of the resin or of another chemical, the by-product resin must be listed on the TSCA Inventory (unless an exemption is applicable). It is the responsibility of the customer to ensure that such isolated, recycled by-product resins are in compliance with TSCA. Failure to comply could result in substantial civil or criminal penalties being assessed by the Environmental Protection Agency.

MSDS STATUS: Revised Section 9.

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Material Safety Data Sheet



Emergency Medical Telephone (800) 441-3637

INCA® OIL

65667

I. MATERIAL IDENTIFICATION

Name
Inca® Oil

CAS Registry Number
Mixture; See Section XI

Synonyms
Steam Cylinder Oil,
Petroleum Lubricating Oil

Product Code
7161

Chemical Family
Petroleum Hydrocarbons

Transportation Emergency Phone
1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for federal and state regulatory information.

Hazardous Ingredients
Hydrogen Sulfide

CAS Registry Number
7783-06-4

Concentration
<0.1%

Hazardous Physical Properties
None

III. PHYSICAL DATA

Appearance and Odor
Black liquid;
Mild petroleum hydrocarbon odor

Specific Gravity (H₂O = 1)
0.89

Boiling Point/Range
900° - 1200°F

% Volatiles (by volume)
Nil

Vapor Pressure
Nil

Solubility in Water
Insoluble

Vapor Density (Air = 1.0)
> 1

Evaporation Rate
Nil

IV. REACTIVITY DATA

Stable: X Unstable:

Hazardous Decomposition Materials: Hazardous gases/vapors produced are carbon dioxide; incomplete combustion may produce carbon monoxide.

Conditions to Avoid: Strong oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): 470°F (PM)

Autoignition Temperature: 750°F

Handle and store in accordance with NFPA procedure for Class IIIB Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, CO₂, foam.

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

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification

Health 1 Fire 1 Reactivity 0

HAZARD RATING

Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT: Not Regulated

IATA/IMO: Not Restricted

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Inca® Oil

PEL: None Established

TLV: None Established

Exposure Limits for Hydrogen Sulfide

PEL: 10 ppm, 14 mg/m³
STEL 15 ppm, 21 mg/m³

Du Pont AEL: 10 ppm - 8 & 12 Hr. TWA

TLV: 10 ppm, 14 mg/m³
STEL 15 ppm, 21 mg/m³

Primary Routes of Exposure/Entry: Skin, inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

This product contains highly solvent-refined lubricating oils or other petroleum-derived oils which mouse skin painting studies have shown to not cause skin tumors. The product does not pose a significant health hazard, but as with many petroleum products, poor hygienic practices or inadequate engineering design that allow prolonged or repeated exposure may cause minor skin irritation.

This product may be a source of hydrogen sulfide if exposed to extremely high temperatures. If hydrogen sulfide is present, low concentrations are irritating to the eyes, skin and respiratory tract. At higher concentrations, loss of ability to smell hydrogen sulfide, respiratory paralysis and death may occur.

Remember that good hygienic practices are helpful in preventing adverse health effects. Exposure can be minimized by using protective clothing or devices and contaminated skin should be washed. Intermittent or occasional skin contact with the material is not expected to have serious health effects as long as good personal hygiene measures, such as those outlined in this material safety data sheet, are followed.

Carcinogenicity:

None of the components in the material is listed by NTP, IARC, or OSHA as a carcinogen.

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

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

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

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: Contain spill immediately in smallest possible area, being careful to avoid potential ignition sources. Recover as much of the product as possible by such methods as vacuuming or other mechanical means. Residual fluids should be recovered by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in the Health Hazard Information Section. Provide NIOSH-approved air-supplied respirator or self-contained breathing equipment for emergency or nonroutine situations where the level may be excessive. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure and published respiratory protection factors.

Ventilation: Normal shop ventilation.

Protective Gloves: Should be worn when the potential exists for prolonged or repeated skin contact. NBR or neoprene recommended.

Eye Protection: Safety glasses with side shields; chemical splash goggles if splashing is probable. Face shield is recommended where material is handled hot and splashing may occur.

Other Protective Equipment: Skin contact should be minimized. Complete protective clothing if material is being handled hot. Launder or discard contaminated clothing. Discard extremely contaminated leather shoes.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302
Not Applicable

GS667

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III
SECTIONS 302, 304, 311, 312, 313**

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

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

- | | |
|---|---|
| ☒ Immediate (Acute) Health Hazard | ☐ Sudden Release of Pressure |
| ☐ Delayed (Chronic) Health Hazard | ☐ Reactive |
| ☐ Fire | ☐ Not Applicable |

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

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

None

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, Regulations 40 CFR 262, 263, 264 and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116,

SECTION 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

Ingredient

Petroleum Hydrocarbon

Reportable Quantity

Film or sheen upon or discoloration of the water surface or adjoining shoreline

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178

Not Applicable

STATE REGULATIONS

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

The material does not contain ingredient(s) subject to the Act.

GS667

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

The material contains the following hazardous substances:

Categories: H = Hazardous Substance ($\geq 1.0\%$)
 S = Special Hazardous Substance ($\geq 0.01\%$)
 E = Environmental Hazard ($\geq 1.0\%$)

<u>Ingredient</u>	<u>CAS Registry Number</u>	<u>Category</u>
Hydrogen Sulfide	7783-06-4	E

Nonhazardous ingredient(s) information is withheld as trade secret in accordance with Section 11 of Pennsylvania Worker and Community Right to Know Act.

MSDS Code: LUBC0260

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

8/89 - Replaces MSDS dated 4/89

Environmental and Occupational Health Services

MSDS Analyst

Conoco Inc.

(713) 293-5550

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

3427002

I# 0210529

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

Page: 1

PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN

G S 6 6 8

Effective Date: 04/07/88 Date Printed: 04/20/88

MSDS:000796

1. INGREDIENTS:

Styrene monomer
Vinyl ester resinCAS# 000100-42-5 30-50%
CAS# 068002-44-8 BALANCE

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: 294F, 146C - based on styrene.
VAP. PRESS: 7 mmHg @ 20C - based on styrene.
VAP. DENSITY: 3.6 - based on styrene.
SOL. IN WATER: Insoluble.
SP. GRAVITY: 1.04-1.10
APPEARANCE: Straw yellow, viscous liquid.
ODOR: Pungent styrene odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 70-90F
METHOD USED: PMCC ASTM D-93

FLAMMABLE LIMITS

LFL: 0.88% - based on styrene
UFL: 6.8% By vol - based on styrene

EXTINGUISHING MEDIA: Water fog, foam, alcohol foam, CO2, dry
chemical.

FIRE & EXPLOSION HAZARDS: Upon exposure to heat or flame, an exothermic reaction can develop, followed by decomposition of product. Keep vapors away from possible ignition sources.

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

Page: 2

PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN **G S 6 6 8**

Effective Date: 04/07/88 Date Printed: 04/20/88

MSDS:000796

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FIRE-FIGHTING EQUIPMENT: Wear goggles and positive pressure, self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Do not store in direct sunlight at temperatures above 120F, 49C.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Oxidizing material.

HAZARDOUS DECOMPOSITION PRODUCTS: Pyrolysis products such as CO.

HAZARDOUS POLYMERIZATION: May occur. Avoid contact with metal salts such as ferric and aluminum chlorides, unintended contact with peroxides, and depletion of inhibitor levels. Avoid exposure to direct sunlight or temperatures above 120F (49C).

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Treat as flammable liquid; keep heat, flame or spark producing equipment away. Protect personnel from styrene vapors. Soak up spills in absorbent material such as sand and collect in suitable containers. Residual resin may be removed using steam or hot soapy water. Solvents, are not recommended for cleanup unless the recommended exposure guidelines and safe handling practices for the specific solvent are followed. Consult appropriate solvent MSDS for handling information and exposure guidelines. For large spills, evacuate upwind up spills and contain with dike.

DISPOSAL METHOD: Resin can be disposed of through burning in an adequate incinerator or burying in an approved landfill in accordance with federal, state, and local regulations.

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(Continued on Page 3)

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MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

Page: 3

PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN

GS668

Effective Date: 04/07/88 Date Printed: 04/20/88

MSDS:000796

6. HEALTH HAZARD DATA:

EYE: May cause moderate eye irritation. May cause slight corneal injury. Vapors may irritate eyes. Vapors may cause lachrymation (tears).

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. Material may stick to skin causing irritation upon removal.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD50 for skin absorption in rabbits is >2000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is >4000 mg/kg. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Excessive vapor concentrations are attainable and could be hazardous on single exposure. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Excessive exposure may cause irritation to upper respiratory tract.

SYSTEMIC & OTHER EFFECTS: Repeated excessive exposures to high amounts may cause central nervous system, liver, kidney effects and respiratory or eye irritation. Repeated excessive exposures to smaller amounts may cause central nervous system effects and respiratory or eye irritation. Styrene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations (sixteen times the TLV and higher); however, the relevance of this to humans is unknown. Neither the data from various long-term animal studies nor from epidemiology of workers exposed to styrene provide an adequate basis to conclude that styrene is carcinogenic. In laboratory animals, styrene did not produce any effects on the fetus even at exposure concentrations having an adverse effect on the mother. In animal studies, styrene has been shown not to

(Continued on Page 4)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

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PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN

G S 6 6 8

Effective Date: 04/07/88 Date Printed: 04/20/88

MSDS:000796

6. HEALTH HAZARD DATA: (CONTINUED)

Interfere with reproduction. Results of in vitro ('test tube') and animal mutagenicity tests on styrene have been inconclusive.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): The OSHA permissible exposure limit (PEL) for styrene is 100 ppm, 8-hour time weight average. The ceiling is 200 ppm and the peak is 600 ppm. Dow internally uses the ACGIH threshold limit value (TLV) of 50 ppm, 8-hour time weighted average and a short term exposure limit (STEL) of 100 ppm.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

(Continued on Page 5)

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MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

Page: 5

PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN **G S 6 6 8**

Effective Date: 04/07/88 Date Printed: 04/20/88

MSDS:000796

8. HANDLING PRECAUTIONS: (CONTINUED)

RESPIRATORY PROTECTION: When airborne exposure guidelines and/or comfort levels may be exceeded, use an approved air-purifying respirator.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation.

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye irritation, use a full-face respirator. Eye wash fountain should be located in immediate work area.

9. ADDITIONAL INFORMATION:

REGULATORY 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:

An immediate health hazard
A delayed health hazard
A fire hazard

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Practice good care and caution to avoid skin and eye contact and to avoid breathing vapors. For additional precautions, see Dow bulletin, DERAKANE (R) vinyl ester resins - fabricating tips.

MSDS STATUS: Revised section 1.

(Continued on Page 6)

(R) Indicates a Trademark of The Dow Chemical Company

SAL 000007010

* An Operating Unit of The Dow Chemical Company

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 19677

Page: 6

PRODUCT NAME: DERAKANE (R) 470-36 VINYL ESTER RESIN

G S 6 6 8

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The Information Herein Is Given In Good Faith, But No Warranty,
Express Or Implied, Is Made. Consult The Dow Chemical Company
For Further Information.

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Material Safety Data Sheet

PARTIAL FILM #10

QUICK IDENTIFIER

Common Name: (used on label and list)

D.O.T. SHIPPING: ALCOHOL N.O.I. FLAMMABLE LIQUID; FLAMMABLE LIQUID UN 1987
N.M.F.C. 142690-2 RVNX \$.50/LB.

SECTION 1 -

Date Prepared NOVEMBER 1, 1987

Manufacturer's

Name

REXCO

Address

P.O. BOX 1045

City, State, and ZIP

CARPINTERIA, CA 93013

HAZARD RATING
LEAST 0 SEVERE 1
MODERATE 2 HIGH 3 EXTREME 4

HEALTH	2
ENVIRONMENT	3
REACTIVITY	0

Emergency Telephone No.

Chemtec 1-800-424-9300
REXCO 1-805-963-6505

Other Information Calls

REXCO 1-805-963-6505

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Components (chemical & common names)	OSHA PEL	ACGIH TLV	CAS NO.
ETHYL ALCOHOL	1000	1000	64-17-5
NORMAL BUTYL ALCOHOL (SKIN ABSORBABLE)	100	50	71-36-3

DENATURING AGENTS: (ONE OR MORE OF THE FOLLOWING MAY BE PRESENT)

METHYL ALCOHOL (SKIN ABSORBABLE)	200	200	(LESS THAN 3%)	67-56-1
ETHYL ACETATE	400	400	(LESS THAN 1%)	141-76-6
METHYL ISOBUTYL KETONE	100	50	(LESS THAN 1%)	106-10-1

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point °F	156-220	Specific Gravity (H ₂ O = 1)	0.914	Vapor Pressure (mm Hg)	25.67
Vapor Density (Air = 1)		1.2			
Solubility in Water	COMPLETE	Reactivity in Water	NO		
Appearance and Odor	GREEN LIQUID/ALCOHOLIC	Melting Point	N/A		

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point 70° F.	Method Used	C.C.C.	Flammable Limits in Air % by Volume	LEL Lower	3.3%	UEL Upper	16.7%
Auto-ignition Temperature	570° F.	Extinguisher Media	USE FOAM, CO ₂ OR DRY CHEMICAL				

Special Fire Fighting Procedures: THE USE OF SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED FOR FIRE FIGHTERS. WATER MAY BE UNSUITABLE AS AN EXTINGUISHING MEDIA; BUT HELPFUL IN KEEPING ADJACENT CONTAINERS COOL. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

Unusual Fire and Explosion Hazards: LOW FLASH POINT. KEEP WORK AREAS FREE OF HOT METAL SURFACES AND OTHER SOURCES OF IGNITION.

SECTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)

Stability	Unstable	Conditions to Avoid	OPEN FLAMES, HOT SURFACES, ELECTRICAL ARCS OR ANY IGNITION SOURCE.
Incompatibility (Materials to Avoid)	THIS PRODUCT IS INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG ACIDS OR BASES, ALKALI METALS, HALOGENS AND STRONG ALKALIES.		
Hazardous Decomposition Products	THERMAL DECOMPOSITION IN THE PRESENCE OF AIR MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE. ABOVE 200° C, ACETALDEHYDE, CROTONALDEHYDE AND ACETONE.		
Hazardous Polymerization	May Occur	Will Not Occur	

ALTHOUGH THE INFORMATION AND SUGGESTIONS CONTAINED HEREIN HAVE BEEN COMPILED FROM SOURCES BELIEVED TO BE RELIABLE, THERE IS NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF.

SAL 000007012

SECTION 6 - HEALTH HAZARDS**CS669****ACUTE HEALTH EFFECTS AND ROUTES OF POTENTIAL ENTRY, PLUS SYMPTOMS OF OVEREXPOSURE:**

1. **INHALATION:** IRRITATES EYE, NOSE, THROAT, AND RESPIRATORY TRACT. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION WITH SYMPTOMS OF HEADACHE, DIZZINESS, LOSS OF COORDINATION, UNCONSCIOUSNESS, AND EVEN DEATH IN EXTREME CASES.
2. **SKIN:** EXPOSURE TO LIQUID CAN CAUSE DEFATTING, DRYING, AND IRRITATION.
3. **EYES:** IRRITATION TO CONJUNCTIVA
4. **INGESTION:** GASTROINTESTINAL IRRITATION, BLINDNESS, DIZZINESS, HEADACHE, NAUSEA, AND VOMITING LEADING TO SEVERE ILLNESS, UNCONSCIOUSNESS, AND PERHAPS EVEN DEATH. NOTE: TOXIC EFFECTS ARE FROM DENATURING AGENTS.

CHRONIC HEALTH EFFECTS:

CLASSIC ALCOHOLIC SYMPTOMS INCLUDING BIZARRE BEHAVIOR, SLURRED SPEECH AND LACK OF COORDINATION. POSSIBLE LIVER AND KIDNEY DAMAGE. DEFATTING OF SKIN, CHRONIC CONJUNCTIVITIS, CENTRAL NERVOUS SYSTEM DEPRESSION.

Signs and Symptoms of Exposure	OVEREXPOSURE TO FUMES - LIGHT HEADED, NAUSEOUS; EXPOSE VICTIM TO FRESH AIR.		
Medical Conditions Generally Aggravated by Exposure	PREEXISTING EYE, SKIN, CENTRAL NERVOUS SYSTEM OR RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.		
Chemical Listed as Carcinogen or Potential Carcinogen	National Toxicology Program	Yes ☐ No ☒	I.A.R.C. Monographs Yes ☐ No ☒ OSHA Yes ☐ No ☒
Emergency and First Aid Procedures			
ROUTES OF ENTRY	1. Inhalation	IF LIGHT HEADED OR HAVING BREATHING DIFFICULTIES EXPOSE VICTIM TO FRESH AIR AND/OR OXYGEN. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK MEDICAL ATTENTION.	
	2. Eyes	FLUSH IMMEDIATELY WITH COLD WATER FOR 15 MINUTES, AND SEEK MEDICAL ATTENTION.	
	3. Skin	WASH WITH SOAP AND WATER. IF IRRITATION FROM CONTACT PERSISTS, SEEK MEDICAL ATTENTION.	
	4. Ingestion	IF THIS PRODUCT IS SWALLOWED, INDUCE VOMITING IF THE VICTIM IS CONSCIOUS. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.	

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage	STORE AWAY FROM OPEN FLAMES, HEAT AND SPARKS. STORE ONLY IN AREAS APPROVED FOR FLAMMABLE LIQUIDS. REPACK ONLY INTO D.O.T. APPROVED GLASS OR POLYETHYLENE CONTAINERS SUITABLE FOR FLAMMABLE LIQUIDS.		
Other Precautions	WATER MAY BE UNSUITABLE AS AN EXTINGUISHING MEDIA, BUT HELPFUL IN KEEPING ADJACENT AREAS COOL. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES. EMPTY CONTAINERS MAY CONTAIN VAPORS THAT ARE FLAMMABLE AND/OR EXPLOSIVE.		
Steps to be Taken in Case Material is Released or Spilled	KEEP SOURCES OF IGNITION AND HOT METAL SURFACES ISOLATED FROM THE SPILL. FLUSH SPILLED MATERIAL INTO SUITABLE RETAINING AREAS OR CONTAINERS. SMALL AMOUNTS OF SPILLED MATERIAL MAY BE ABSORBED WITH ANY STANDARD ABSORBANT. <u>CAUTION!</u> FLOORS COVERED WITH RESIDUAL MATERIAL BECOME EXTREMELY SLIPPERY WHEN WET.		
Waste Disposal Methods (Consult federal, state, and local regulations)			

SECTION 8 - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (Specify Type)	THE USE OF RESPIRATORY PROTECTION DEPENDS ON VAPOR CONCENTRATIONS ABOVE THE TIME-WEIGHTED TLV; USE A NIOSH APPROVED CARTRIDGE RESPIRATOR OR GAS MASK.		
Isolation	Local Exhaust	Mechanical (General)	Special
			EXPLOSION PROOF VENTILATION
Protective Gloves	IMPERMEABLE GLOVES FOR SENSITIVE INDIVIDUALS.		Eye Protection
			SAFETY GLASSES, GOGGLES OR FACE SHIELD.
Other Protective Clothing or Equipment	EYE WASHES AND SAFETY SHOWERS ARE RECOMMENDED IN WORK AREA. SAL 000007013		
Work/Hygiene Practices	CONTAMINATED CLOTHING SHOULD BE REMOVED AND WASHED IN HOT WATER WITH SOAP.		



BETZ PROCESS
CHEMICALS, INC.

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The Woodlands, Texas 77387
(713) 367-2442

65664

MATERIAL SAFETY DATA SHEET
24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) (215) 355-3300

DISTRIBUTED: MAY-10-1990

PRODUCT : PROCHEM 3F28

(PAGE 1 OF 3)
EFFECTIVE DATE 12-13-89
PRINTED: 10-Apr-1990

REVISIONS TO SECTIONS: APPENDIX/9

PRODUCT APPLICATION : AN OIL BASED ANTIFOULANT.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

HEAVY AROMATIC NAPHTHA;***CAS#64742-06-9;COMBUSTIBLE LIQUID;IRRITANT(EYE);
MANUFACTURERS SUGGESTED EXPOSURE LIMIT:100PPM;PEL:NONE;TLV:NONE.

TRADE SECRET INGREDIENT(E256);IRRITANT;PEL/TLV:NONE. THIS CHEMICAL IS NOT
ON ANY STATE RIGHT-TO-KNOW LIST. TSRN 125438 - 5139P

TRADE SECRET INGREDIENT(014);FLAMMABLE;CORROSIVE;REPRODUCTIVE TOXIN;TOXIC;
PEL/TLV:10PPM. TSRN 125438 - 5175P

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 50% EXTRACT (APPROX.) 11.6	ODOR: HYDROCARBON
FL.PT.(DEG.F): 145 P-M(CC)	SP.GR.(70F)OR DENSITY: 7.5LBS/GAL
VAPOR PRESSURE(mmHG): <10	VAPOR DENSITY(AIR=1): >1
VISC cps70F: 13	%SOLUBILITY(WATER): 0
EVAP.RATE: ND WATER=1	APPEARANCE: LIGHT YELLOW TO AMBER
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): <-30

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000007014



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MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: PROCHEM 3F28

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

SEVERE IRRITANT TO THE SKIN.MAY CAUSE DERMATITIS.MAY BE ABSORBED.

ACUTE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES, POSSIBLY CORROSIVE

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS,GASES,MISTS OR AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

CHRONIC EFFECTS OF THIS FORMULATION HAVE NOT YET BEEN FULLY EVALUATED

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

EXCESSIVE DERMAL EXPOSURE CAUSES DEFATTING AND DRYING OF SKIN;EXCESSIVE INHALATION OF VAPORS CAUSES DIZZINESS,HEADACHE AND NAUSEA.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
REMOVE IGNITION SOURCES.FLUSH AREA WITH WATER.SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT(AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

SAL 000007015



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MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: PROCHEM 3F28

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

NEOPRENE GLOVES

WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----
STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE IN COOL VENTILATED LOCATION. STORE AWAY FROM OXIDIZERS

HANDLING INSTRUCTIONS***

COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS
DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR
ABOVE THE PRODUCT FLASH POINT.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
1.8 GALLONS DUE TO (014);TREAT AS OIL SPILL
...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: NOT APPLICABLE
...DOT HAZARD/UN#/ER GUIDE# IS: COMBUSTIBLE LIQUID NA1993/#27
...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE),DELAYED(CHRONIC) AND FIRE
...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
NFPA/HMIS : HEALTH - 3 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

SAL 000007016



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MATERIAL SAFETY DATA SHEET
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GS665

DISTRIBUTED: MAY-10-1990

PRODUCT : BETZ DM-1588

(PAGE 1 OF 3)
EFFECTIVE DATE 12-12-89
PRINTED: 10-Apr-1990

REVISIONS TO SECTIONS: 2, APPENDIX/9

PRODUCT APPLICATION : AN OIL BASED ANTIFOULANT.

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HEAVY AROMATIC NAPHTHA;***CAS#64742-06-9; COMBUSTIBLE LIQUID; IRRITANT(EYE);
MANUFACTURERS SUGGESTED EXPOSURE LIMIT: 100PPM; PEL: NONE; TLV: NONE.

TRADE SECRET INGREDIENT(190); COMBUSTIBLE; EYE IRRITANT; PEL: NONE; TLV: NONE.
TSRN 125438 - 5231P

TRADE SECRET INGREDIENT(108); COMBUSTIBLE LIQUID; IRRITANT(EYE AND SKIN);
PEL: NONE; TLV: NONE. TSRN 125438 - 5210P

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 50% EXTRACT (APPROX.) 12.2	ODOR: HYDROCARBON
FL.PT.(DEG.F): 145 P-M(GC)	SP.GR.(70F)OR DENSITY: 7.4LBS/GAL
VAPOR PRESSURE(mmHG): <10	VAPOR DENSITY(AIR=1): >1
VISC cps70F: 18	%SOLUBILITY(WATER): 0
EVAP.RATE: ND WATER=1	APPEARANCE: YELLOW
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): -15

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

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MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: BETZ DM-1588

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SEVERE IRRITANT TO THE SKIN

ACUTE EYE EFFECTS ***

CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS ***

IRRITATION OF UPPER RESPIRATORY TRACT. PROLONGED EXPOSURE MAY CAUSE

DIZZINESS AND HEADACHE

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED EXPOSURES MAY CAUSE DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

DERMAL EXPOSURES WILL DEFAT AND DRY SKIN AND CAUSE SEVERE SKIN IRRITATION;

INHALATION OF VAPORS/MISTS/AEROSOLS CAUSES EYE AND RESPIRATORY

IRRITATION, DIZZINESS, HEADACHE, NAUSEA.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

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DO NOT INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF

STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS. REMOVE IGNITION SOURCES. FLUSH AREA WITH WATER. SPREAD SAND/GRIT.

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DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER

SAL 000007018



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MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: BETZ DM-1588

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
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RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
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RECOMMENDED RESPIRATORY PROTECTION***
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USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.
RECOMMENDED SKIN PROTECTION***
NEOPRENE GLOVES
WASH OFF AFTER EACH USE. REPLACE AS NECESSARY
RECOMMENDED EYE PROTECTION***
SPASH PROOF CHEMICAL GOGGLES

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HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

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...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
TREAT AS OIL SPILL
...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: D002=CORROSIVE (PH)
...DOT HAZARD/UN#/ER GUIDE# IS: COMBUSTIBLE LIQUID NA1993/#27
...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE), DELAYED(CHRONIC) AND FIRE
...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
NFPA/HMIS : HEALTH - 3 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

SAL 000007019

APR 10 1990

Betz Laboratories, Inc.
4636 Somerton Road, Trevose, Pa. 19047 **GS666**
Betz Material Safety Data Sheet
24 Hour Emergency Telephone (Health or Accident) 215/355-3300

REAGENT : POTASSIUM CHROMATE INDICATOR CODE 213 EFFECTIVE DATE 01-17-90
PRINTED: 04/03/90
REVISIONS TO SECTIONS: APPENDIX;EDIT:5

REAGENT APPLICATION : FIELD TEST REAGENT

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC REAGENT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

POTASSIUM CHROMATE(CR VI)***CAS#7789-00-6;OXIDIZER;CORROSIVE;POTENTIAL SKIN SENSITIZER;POTENTIAL KIDNEY TOXIN;SUSPECT CARCINOGEN;
PEL:0.1MG/M3(CEILING)AS CR;TLV:0.05 MG/M3 AS CR.

ALTHOUGH EVIDENCE IS INCONCLUSIVE,EPA AND OSHA CONSIDER ALL CrVI COMPOUNDS POTENTIAL HUMAN CARCINOGENS.INCREASED RISK OF LUNG CANCER HAS BEEN OBSERVED IN CHROME PRODUCING,PLATING,ALLOY AND PIGMENT INDUSTRIES. RESULTS OF ANIMAL TESTS INDICATE SOME CrVI COMPOUNDS MAY BE CARCINOGENIC TO MAN BY INHALATION.IT IS THEREFORE PRUDENT TO TREAT ALL CrVI COMPOUNDS AS SUSPECT CARCINOGENS AND TO MINIMIZE WORKER EXPOSURE TO DUSTS/MISTS.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: AS IS	(APPROX.) 8.9	ODOR: NONE
FL.PT.(DEG.F): >200	SETA(CC)	SP.GR.(70F)OR DENSITY: 1.013
VAPOR PRESSURE(mmHG): ND		VAPOR DENSITY(AIR=1): ND
VISC cps70F: ND		%SOLUBILITY(WATER): 100
EVAP.RATE: <1	ETHER=1	APPEARANCE: YELLOW
PHYSICAL STATE: LIQUID		FREEZE POINT(DEG.F): ND

-----SECTION 3-----REACTIVITY DATA-----

STABLE. BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000007020

MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

REAGENT: POTASSIUM CHROMATE INDICATOR **G S 6 6 6**

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

MODERATELY IRRITATING TO THE SKIN. POTENTIAL SKIN SENSITIZER

ACUTE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS ***

MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED OVEREXPOSURES MAY CAUSE LIVER AND KIDNEY TOXICITY; MAY INCREASE RISK OF CANCER; MAY CAUSE SKIN SENSITIZATION.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

INHALATION MAY CAUSE IRRITATION OF RESPIRATORY TRACT; SKIN CONTACT MAY CAUSE ITCHING AND/OR REDNESS.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

IN CONTACT***

REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR. APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM. DILUTE CONTENTS OF STOMACH. INDUCE VOMITING BY ADMINISTERING SOAP SOLUTION EMETIC, OR OTHER STANDARD METHOD IF SOAP SOLUTION IS NOT AVAILABLE. IMMEDIATELY CONTACT A PHYSICIAN.

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

GENERAL-VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.

SPECIFIC- SPILL RESIDUE MAY BE REDUCED WITH ACID BISULFITE SOLUTION
DISPOSAL INSTRUCTIONS***

FOR DISPOSAL USE A COMMERCIAL WASTE TREATMENT OR DISPOSAL COMPANY OR IN-HOUSE USE A CHROMATE REMOVAL SYSTEM IN ACCORDANCE WITH RCRA REGULATIONS. INCINERATION OF CHROMATES WITH CHLORIDES OR CHLORINE BEARING ORGANICS MAY BE HAZARDOUS.

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (FULL FACE-PIECE TYPE). PROPER FIRE EXTINGUISHING MEDIA:

FLOOD WITH WATER. USE OF CO2 OR FOAM MAY NOT BE EFFECTIVE.

MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

G 8 6 6 6

REAGENT: POTASSIUM CHROMATE INDICATOR

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT REAGENT EXPOSURE IS LIKELY,
USE HIGH EFFICIENCY PARTICULATE CARTRIDGES

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP CONTAINER CLOSED WHEN NOT IN USE.

DO NOT FREEZE. IF FROZEN, THAW AND MIX COMPLETELY PRIOR TO USE

HANDLING INSTRUCTIONS***

CONTAINS AN OXIDIZER. AVOID ALL CONTACT WITH REDUCING AGENTS,
OILS, GREASES, ORGANICS AND ACIDS. DO NOT ALLOW TO DRY.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

7.9 GALLONS DUE TO POTASSIUM CHROMATE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS: D007=CHROMIUM

...DOT HAZARD/UN# / ER GUIDE# IS: NOT APPLICABLE

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY: POTASSIUM CHROMATE(7789-00-6)

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: POTASSIUM CHROMATE(7789-00-6) , 11.0-15.0% ;

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE) AND DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: POTASSIUM CHROMATE(7789-00-6) ;

...FPA/HMIS : HEALTH - 2 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

MATERIAL SAFETY DATA SHEET

GS663

EASTMAN CHEMICAL PRODUCTS, INC.
EASTMAN KODAK COMPANY
Kingsport, Tennessee 37662

For Health Hazard Information, Call: (615) 229-6094

For Other Information, Call Your Eastman Representative

Eastman Operator: (615) 229-2000

Date of Preparation 05-31-89

SECTION I. IDENTIFICATION

Name:

"TENOX" 4A Food-Grade Antioxidant

-- Synonym: PM 3539

-- Formula: Mixture

SECTION II. COMPONENT AND PRECAUTIONARY DATA

COMPONENT:	Approx Weight %	CAS Reg No	Eastman Kodak No
Corn oil*	70	8001-30-7	023399
Butylated hydroxyanisole* (citric acid free)	30	25013-16-5	951177

See Section VI-A for information on exposure limits.

*Hazardous chemical as defined by OSHA, 29 CFR 1910.1200.

B. PRECAUTIONARY LABEL STATEMENTS:

Caution! MAY CAUSES SKIN AND EYE IRRITATION
AT ELEVATED TEMPERATURE, VAPOR MAY CAUSE IRRITATION OF EYES,
NOSE, AND THROAT

Avoid contact with eyes and prolonged or repeated contact with skin.
Avoid breathing vapor from heated material.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes and skin with plenty
of water. Get medical attention if symptoms persist. Wash clothing before
reuse. In case of irritation of eyes, nose, and throat by vapor, remove
from exposure, treat symptomatically, and get medical attention if symptoms
persist.

Since emptied containers retain product residue, follow label warnings even
after container is emptied.

FOR MANUFACTURING USE ONLY

SAL 000007023

MSDS-10,535A-1 (05-89)
Replaces 11-87 Edition

GS668

SECTION III. PHYSICAL DATA (1)

- Appearance and Odor: Light, straw-colored liquid; slight phenolic odor.
- Boiling Point: $>482^{\circ}\text{C}$ ($>900^{\circ}\text{F}$).
- Specific Gravity water= 1): 0.951 at 20°C .
- Vapor Pressure: Negligible.
- Solubility in Water: Negligible.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA (1)

- Flash Point: 152°C (306°F), Method Used: Setaflash Closed Cup.
- Flammable Limits: Not determined.
- Extinguishing Agent: Water spray, dry chemical, foam, or CO_2 .
- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Water or foam may cause frothing which can be violent and possibly endanger the life of the fire fighter.
- Unusual Fire and Explosion Hazards: None.

SECTION V. REACTIVITY DATA

- Stability: Stable.
- Incompatibility: Oxidizing materials can cause a reaction.
- Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

- Threshold Limit Value (TLV) for vegetable oil mist: 10 mg/m^3 -TWA, ACGIH, 1988-1989.
- Threshold Limit Value (TLV) for other components: Not established.
- OSHA Permissible Exposure Limit (PEL) for vegetable oil mist: 15 mg/m^3 -TWA (total), 5 mg/m^3 -TWA (respirable fraction).
- OSHA Permissible Exposure Limit (PEL) for other components: Not established.

B. EXPOSURE EFFECTS

Inhalation: Vapor from heated material may cause irritation.

Eyes: Liquid and vapor from heated material may cause irritation.

Skin: May cause irritation.

Carcinogenicity Status: Butylated hydroxyanisole (BHA), a component of this material, has been classified in Group 2B by the International Agency for Research on Cancer (IARC) (2); and, for hazard communication purposes, BHA is considered a carcinogen or potential carcinogen under the OSHA Hazard Communication standard. U. S. Food and Drug Administration (FDA) and U. S. Department of Agriculture (USDA) regulations continue to permit the use of BHA as an antioxidant in foods.

SAL 000007024

The safety of BHA as a food-grade antioxidant was originally demonstrated in a large number of feeding studies carried out with rats and dogs in several laboratories (3). These studies showed no adverse effects at levels several hundred times those currently permitted in the diets of humans in the U.S. More recently, long-term feeding at high levels (1-2% in the diet) to rats, hamsters, and mice has produced benign and malignant tumors of the forestomach, but no other sites (4). In these studies, food containing high levels of BHA may be in almost constant contact with squamous epithelium in the rodent forestomach (5). Experiments in these rodents with forestomachs and in a species with an equivalent structure (pars esophagea in pigs) have shown that levels of BHA above 0.5% in the diet produce hyperplasia of the forestomach (and possibly of the pars esophagea in pigs), but no such changes were found in similar studies in animals (including a rodent) that do not have a forestomach, i.e., dogs, monkeys, and guinea pigs (3). Humans do not have any region of the stomach comparable to a forestomach, and no-effect levels were far above those to which humans could reasonably be exposed under current regulatory limits. A weight-of-the-evidence assessment of the available evidence strongly suggests that the finding of forestomach tumors in mice, rats, and hamsters given very high doses of BHA is not relevant to humans ingesting BHA at levels currently permitted in food in the U.S.

C. FIRST AID

Inhalation: Remove to fresh air, treat symptomatically, and get medical attention if symptoms persist.

Eyes: Immediately flush with plenty of water for at least 15 min and get medical attention if symptoms persist.

Skin: Wash skin with soap and plenty of water. Get medical attention if symptoms persist. Wash clothing before reuse.

D. TOXICITY DATA

Toxicity data for the antioxidant used in this formulation are available in the following EASTMAN CHEMICAL PRODUCTS, INC. MSDS:

Butylated hydroxyanisole (citric acid free) MSDS-10,991A

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION

Good general ventilation (typically 10 air changes per hour) should be sufficient to control airborne levels. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances such as poorly ventilated spaces, spraying, heating, etc.

B. RESPIRATORY PROTECTION

If respiratory protection is needed, an appropriate NIOSH-approved respirator for organic vapor and/or mist should be worn. If respirators are used, a program should be established to assure compliance with OSHA Standard 29 CFR 1910.134.

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MSDS-10,535A-3 (05-89)
Replaces 11-87 Edition

CS668

C. SKIN AND EYE PROTECTION

Wear safety glasses with side shields (or goggles). A face shield is recommended. Impermeable gloves should be worn. An eye bath and washing facilities should be available. Wash thoroughly after handling.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials. Since emptied containers retain product residue, follow label warnings even after container is emptied.

SECTION IX. SPILL, LEAK, AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled: Spills may be collected with absorbent materials. Prevent runoff from entering drains, sewers, or streams.

Waste Disposal Method: Incineration. Observe all federal, state, and local laws concerning health and environment.

SECTION X. ENVIRONMENTAL EFFECTS DATA

This material has not been tested for environmental effects. Data for the components of this material (6-12) have been used to provide the following estimate of environmental impact: this material is expected to have a high biochemical oxygen demand and significant potential to cause oxygen depletion in aqueous systems, a high potential to affect some aquatic organisms, a moderate potential to affect the germination and/or early growth of some plants, and a low potential to affect the growth of some plant seedlings. The direct, instantaneous discharge to a receiving body of water of an amount of this material which will rapidly produce by dilution a final concentration of 1.0 mg/L or less is not expected to cause adverse environmental effects. After dilution with a large amount of water, followed by secondary waste treatment, this material is not expected to cause adverse environmental effects.

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Not regulated by DOT.

SECTION XII. REFERENCES

1. File data, Material Safety Program, Eastman Chemicals Division, Eastman Kodak Company, Kingsport, Tennessee.
2. IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO HUMANS, Vol. 40. International Agency for Research on Cancer, Lyon, France, 1986, pp. 123-159.
3. Butylated Hydroxyanisole - A Monograph. Washington, DC, International Life Sciences Institute (ILSI), 1986.
4. GANN 77, 1083-1090 (1986).
5. George, W. Comparative anatomy and physiology of rodent stomachs. European meeting of the Toxicology Forum. Geneva, Switzerland, September 22-26, 1986.

SAL 000007026

MSDS-10,535A-4 (05-89)
Replaces 11-87 Edition

6663

6. Unpublished data, Health and Environment Laboratories, Eastman Kodak Company, Rochester, New York.
7. K. Verschueren. HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS, 2nd Edition. Van Nostrand Reinhold Company, New York, 1983.
8. Batelle's Columbus Laboratories. WATER QUALITY CRITERIA DATA BOOK - VOLUME 3 - EFFECTS OF CHEMICALS ON AQUATIC LIFE, Selected Data from the Literature Through 1968. U.S. Environmental Protection Agency, Washington, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.
9. WATER RES 13, 627-630 (1979).
10. WATER RES 13, 623-626 (1979).
11. Z WASSER ABWASSER FORSCH 15, 1-6 (1982).
12. Z WASSER ABWASSER FORSCH 11, 161-164 (1978).

SECTION XIII. HAZARD RATINGS

	Health	Flammability	Reactivity
HMIS* Rating:	1	1	0
NFPA** Rating:	1	1	0

NOTICE: These ratings involve data and interpretations that may vary from company to company and 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. The customer is responsible for determining the proper personal protective equipment needed for its particular use of this material.

*Hazardous Materials Identification System's [HMIS] Revised RAW MATERIALS RATING MANUAL, National Paint & Coatings Association, Fall 1984.

**NFPA 704 Standard System for the Identification of the Fire Hazards of Materials, National Fire Protection Association, 1985.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

C/10535A/220912/R-1, S-1, F-1, C-0

SAL 000007027

APR 02 1990

257932
GS662MATERIAL SAFETY DATA SHEET

Date: February 26, 1990

I. PRODUCT IDENTIFICATION

Trade Name: MARK-IT

Synonyms: None

Chemical Family: Metal Soap(s) in solvent

Formula: Proprietary

Hazardous Ingredients / OSHA:

A. Trichlorotrifluoroethene = 88%-98%

B. Metal Salts of 2-Ethylhexanoic acid = 12%-2%

Warning Statement: Do not ingest

II. PHYSICAL DATA

Boiling Point: 117° F.

Melting Point: n/a

Specific Gravity: 1.5 (Water=1)

Vapor Pressure: 330 mm.

Vapor Density: 2.9 (Air=1)

Solubility (H₂O): .02 % by wt.

Appearance & odor: Clear to dark amber liquid - mineral spirits odor.

III. FIRE AND EXPLOSION DATA

Flash Point: None (Closed Cup)

Flammable Limits: None

Extinguishing Media: Foam, CO₂, Water Spray, Dry Chemical

Special Firefighting Procedures: None

Unusual Hazards: Exposure to heat builds up pressure in containers.
Cool with water stream.IV. HEALTH HAZARD DATA

Threshold Limit Value: 1000 PPM

Effects of Overexposure: Lightheadedness, giddiness, shortness of
breath, possible narcosis at high concentration

Emergency and First Aid Procedures:

Inhalation: Remove to fresh air. Call a doctor. Do not give
epinephrine or similar drugs

Eye Contact: Flush with water

Skin Contact: Wash well with soap and water

Ingestion: Call doctor immediately. Report ingestion of product by
chemical name and family (above). In case of severe
emergency, call Trace Systems for specific trace
elements in formulation.

(CONTINUED)

SAL 000007028

CS662

E E SYSTEMS, INC.

SDS - February 26, 1990

V. REACTIVITY DATA

Stability: Stable

Conditions to avoid: Open flames or high temperatures

Incompatibility: Alkalai or alkaline earth metals

Hazardous Decomposition Products: Hydrofluoric and hydrochloric acids;
possible phosgenes

Hazardous Polymerization: Will not occur

VI. SPILL OR LEAK PROCEDURES

Steps to be Taken: Ventilate area - especially low points
Remove open flames

Waste Disposal Method: Evaporate outdoors

VII. SPECIAL PROTECTION INFORMATION

Respiratory: Use air mask in very high concentrations

Ventilation: Local exhaust if large amount of vapor present

Mechanical exhaust in low areas

Protective Equipment: Gloves and goggles when handling liquid

VIII. SPECIAL PRECAUTIONS

Handling and Storing: Store in clean dry area. Do not heat above 125° F.

SAL 000007029

APR 03 1988

Material Safety Data Sheet

FILE NO. 920:405-923RO-2
QUICK IDENTIFIER (in Plain Common Name)

1827 Red Oil

G S 6 5 8

Manufacturer's Name Meriam Instrument
Address 10920 Madison
Cleveland, OH 44102

Emergency Telephone No. 216-281-1100

Other Information Code 216-281-1100

Signature of Person Responsible for Preparation

Date Prepared 9/1/88

SECTION 1 - IDENTITY

Common Name (used on label)
(Trade Name & Synonym)

1827 Red Oil

CAS No. N.A.

Chemical Name

N.A.

Chemical Family

Petroleum Hydrocarbon

Formula

N.A.

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical & common names)	%	Threshold Limit Value (msd)
Deodorized Kerosine (CAS # 8008-20-6)	50	50mg/M ³ as mist
Petroleum Distillate (CAS#64741-77-1)	40	5mg/M ³ as mist
Petroleum Lube Oil (CAS#64742-65-0)	10	5mg/M ³ as mist
Red Dye (CAS#4477-79-6)	Trace	N.A.

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

Boiling Point	370 F	Specific Gravity (H ₂ O=1)	.827	Vapor Pressure (mm Hg)	1
Percent Volatile by Volume (%)	N.A.	Vapor Density (Air = 1)	> 1	Evaporation Rate (_____ = 1)	N.A.
Solubility in Water	Negligible	Reactivity in Water	N.A.		
Appearance and Odor	Red, odorless				
Flash Point	280 F	Flammable Limits in Air % by Volume	Lower 1.1 Upper 6.0	Extinguisher	CO ₂ , Dry Chem., Auto-Ignition Temperature N.A.
Special Fire Fighting Procedures	Do not extinguish with water				

Unusual Fire and Explosion Hazards

N.A.

SAL 000007030

65658

FILE NO. 920:405-923RO-2

SECTION 4 - PHYSICAL HAZARDS

Stability ☐ Unstable ☒ Stable ☐ Conditions ☒ to Avoid

Avoid exposure to heat

Incompatibility
Of Materials to Avoid

Strong oxidizing agents

Hazardous
Decomposition Products CO, CO₂

Hazardous
Polymerization May Occur ☐ Conditions ☒ to Avoid
Will Not Occur ☒

SECTION 5 - HEALTH HAZARDS

Threshold
Limit Value 5 mg/M³ as mist

Signs and
Symptoms of Exposure 1. Acute
Overexposure High concentration of vapors cause headache, nausea

2 Chronic
Overexposure N.A.

Medical Conditions Generally
Aggravated by Exposure N.A.

Chemical Listed as Carcinogen
or Potential Carcinogen

National Toxicology
Program Yes ☐ No ☒

IARC
Monographs Yes ☐ No ☒

OSHA Yes ☐ No ☒

OSHA Permissible
Exposure Limit N.A.

ACGIH Threshold
Limit Value N.A.

Other Exposure
Limit Used N.A.

Emergency and
First Aid Procedures

1. Inhalation Remove to fresh air

2. Eyes Flush with water

3. Skin Wash with soap and water

4. Ingestion Do not induce vomiting, consult physician

SECTION 6 - SPECIAL PROTECTION INFORMATION

Respiratory Protection
(Specify Type) Not required

Ventilation N.A. Local Exhaust N.A. Mechanical General N.A. Special N.A. Other N.A.

Protective
Gloves Oil proof Eye
Protection Safety Glasses

Other Protective
Clothing or Equipment None

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken
in Handling and Storage Keep container closed

Other
Precautions N.A.

Steps to be Taken in Case
Material is Released or Spilled Use absorbant to soak up

Waste Disposal
Methods Incineration

SAL 000007031

IMPORTANT

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

A-34284

APR 03 1988

920:405-923RU-2

QUICK IDENTIFIER (a First Common Name)

#100 Red Unity Oil

G S 6 5 9.

Manufacturer's Name Meriam Instrument
 Address 10920 Madison Ave.
 Cleveland, Ohio 44102

Emergency Telephone No. 216-281-1100

Other Information 216-281-1100

Signature of Person Responsible for Preparation

Date Prepared 9-1-88

SECTION 1 - IDENTITY

Common Name (used on label) (Trade Name & Synonyms) #100 Red Unity Oil

Cas No. N.A.

Chemical Name N.A.

Chemical Family N.A.

Formula N.A.

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical & common names)

Threshold Limit Value (TLV)

Monochloronaphthalene (CAS# 25586-43-0) 54 N.A.

Naphthalene (CAS# 91-20-3) 1 10 ppm

Dichloronaphthalene (CAS# 1825-30-5) Trace N.A.

Petroleum Distillate (CAS# 64741-77-1) 36 5mg/m³ as mist

Petroleum Lube Oil (CAS# 64742-65-0) 9 5mg/M³ as mist

Red Dye (CAS# 4477-79-6) Trace N.A.

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

Boiling Point: 430 F

Specific Gravity (H₂O=1) 1.0

Vapor Pressure (mm Hg) <1

Percent Volatile by Volume (v/v) N.A.

Vapor Density (Air = 1) > 1

Evaporation Rate (H₂O = 1) N.A.

Solubility in Water Nil

Reactivity in Water Nil

Appearance and Odor Red, moth ball odor

Flash Point 285 F

Flammable Limits in Air % by Volume

Lower N.A.

Upper N.A.

Extinguisher Media

CO₂ Dry Chem. Foam

Auto Ignition Temperature

N.A.

Special Fire Fighting Procedures

Toxic vapors may be produced, use self-contained breathing apparatus

Unusual Fire and Explosion Hazards

N.A.

SAL 000007032

G S 6 59

FILE NO. 920:405-923RU-2

SECTION 4 - PHYSICAL HAZARDS

Hazardous Variable ☐ Conditions ☒ Do not heat

Incompatibility Materials to Avoid: Oxidizing agents

Hazardous Decomposition Products HCl

Hazardous Polymerization May Occur ☐ Conditions ☒ N.A.

SECTION 5 - HEALTH HAZARDS

Threshold Limit Value 50 mg/M³

Signs and Symptoms of Exposure 1. Acute Overexposure Vapors may irritate eyes, skin dermatitis

2. Chronic Overexposure N.A.

Medical Conditions Generally Aggravated by Exposure N.A.

Chemical Listed as Carcinogen or Potential Carcinogen

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 Used N.A.

Hazardous and Acute Procedures

1. Inhalation Remove to fresh air

2. Eyes Flush with water for 15 minutes

3. Skin Wash with water, remove contaminated clothing

4. Ingestion Do not induce vomiting, consult physician

SECTION 6 - SPECIAL PROTECTION INFORMATION

Respiratory Protection Specific Type N.A.

Ventilation Yes Local Exhaust N.A. Mechanical (General) N.A. Special N.A. Other N.A.

Protective Gloves Oil proof Eye Protection Safety Glasses

Other Protective Clothing or Equipment N.A.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage Keep container closed

Other Precautions Avoid breathing vapors and contact with skin (Clean up spills with absorbent)

Steps to be Taken in Case Material is Released or Spilled Incineration

Waste Disposal Methods

SAL 000007033

IMPORTANT

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

A-34285

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910.1200. Standard must be consulted for specific requirements.

FILE NO. 920:405-924BA-3

QUICK IDENTIFIER
Common Name: (used on label and list)

#295 Fluid

G S 6 6 0

SECTION 1 -

Manufacturer's Name Meriam Instrument

Address 10920 Madison Ave

City, State, and ZIP Cleveland, Ohio 44102

Emergency Telephone No. (216) 281-1100

Other Information Calls (216) 281-1100

Signature of Person Responsible for Preparation (Optional)

Date Prepared 2-23-90

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV	Other Exposure Limit	% (optional)	CAS NO.
Acetylene Tetrabromide (CAS#79-27-6)	N.A.	14mg/M ³	N.A.	100%	
Monochloronaphthalene (CAS#25586-43-0)	N.A.	N.A.	N.A.	> 1%	
Naphthalene (CAS#91-20-3)	N.A.	10 ppm	N.A.	Trace	
Dichloronaphthalene (CAS#1825-30-5)	N.A.	N.A.	N.A.	Trace	
Red Dye (CAS#4477-79-6)	N.A.	N.A.	N.A.	Trace	

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	474°F	Specific Gravity (H ₂ O=1)	2.95	Vapor Pressure (mm Hg)	.02
		Vapor Density (Air = 1)	12		

Solubility in Water	.062G/100G @ 80°F	Reactivity in Water	None
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Appearance and Odor	Red color, moth-ball type odor	Melting Point	
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SECTION 4 - FIRE & EXPLOSION DATA

Flash Non-Point	Flashing	Method Used	Flammable Limits in Air % by Volume	LEL Lower	N.A.	UEL Upper	N.A.
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Auto-ignition Temperature	N.A.	Extinguisher Media	Non-flammable
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Special Fire Fighting Procedures Full protective gloves, clothes and boots. Use self contained breathing apparatus.

Unusual Fire and Explosion Hazards N.A.

SAL 000007034

SECTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)

65660

Stability: Variable ☐ Conditions ☐ Stable ☐ to Avoid N.A.

Hazardous Decomposition Products: Bromine and Hydrogen Bromide. Decomposition by base

liberates flammable gas

Hazardous Polymerization: Will Not Occur ☐ to Avoid N.A.

SECTION 6 - HEALTH HAZARDS

1. Acute: Disagreeable odor, organic injury ☐ Chronic N.A.

Signs and Symptoms of Exposure

Medical Conditions Generally Aggravated by Exposure N.A.

Chemical Listed as Carcinogen or Potential Carcinogen: National Toxicology Program Yes ☐ No ☐ IARC Monographs Yes ☐ No ☐ OSHA Yes ☐ No ☐

Emergency and First Aid Procedures

ROUTES OF ENTRY

1. Inhalation

Remove to fresh air, seek medical attention.

2. Eyes

Flush with water for 15 minutes, seek medical attention.

3. Skin

Wash with soap and water, remove contaminated clothing.

4. Ingestion

Do not induce vomiting, seek medical attention.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage

Control vapors to 1 ppm (OSHA Guide). Practice care to

avoid eye and skin contact. Keep container closed.

Other Precautions

Steps to be Taken in Case Material is Released or Spilled

Ventilate area, use absorbing compound to sweep up.

Waste Disposal Methods (Consult federal, state, and local regulations)

Contact local EPA.

SECTION 8 - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (Specify Type)

Avoid breathing vapors.

Ventilation

Yes

Local Exhaust N.A.

Mechanical

N.A.

Special

N.A.

Other

N.A.

Protective Clothing or Equipment

Impervious gloves

Eye Protection

Safety goggles

N.A.

Work Hygienic Practices

SAL 000007035

IMPORTANT

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Material Safety Data Sheet

FILE NO. 920:405-92488-3

CHECK IDENTIFIER

Common Name: (used on label and list)

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910.1200. Standard must be consulted for specific requirements.

#175 Blue Fluid

GS661

SECTION 1 -

Manufacturer's Name Meriam Instrument

Address 10920 Madison Ave.

City, State, and ZIP
Cleveland, Ohio 44102

Emergency Telephone No. (216) 281-1100

Other Information Calls (216) 281-1100

Signature of Person Responsible for Preparation (Optional)

Date Prepared 2-23-90

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS NO.
Mixture of Brominated Ethyl Benzenes	N.A.	N.A.	N.A.	100%	
- Bromoethylbenzenes (CAS#1585-07-5)					
- Dibromoethylbenzenes (CAS#30812-87-4)					
- Tribromoethylbenzenes (CAS#31195-17-2)					
Kerosene (CAS#8008-20-6)	N.A.	50mg/M ³	N.A.	>2%	
Blue Dye (CAS#17354-14-2)	N.A.	N.A.	N.A.	Trace	

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	400°-500° F (250-300°C)	Specific Gravity (H ₂ O=1)	1.73-1.75	Vapor Pressure mm Hg	N.A.
	Vapor Density (Air = 1)	9.4			

Solubility in Water	Negligible	Reactivity in Water	N.A.
Appearance and Odor	Clear liquid, light to straw yellow, moth ball odor.	Melting Point	N.A.

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point	None	Method Used	Flammable Limits in Air % by Volume	LEL Lower	N.A.	UEL Upper	N.A.
Auto-Ignition Temperature		Extinguisher Media	Water, CO ₂ , Chemical Foam				
Special Fire Fighting Procedures	Non-flammable						

Unusual Fire and Explosion Hazards N.A.

SAL 000007036

SECTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)**G S 6 6 1**Stability ☐ Unstable
Stable ☒ Conditions
to Avoid

Avoid contact with finely divided reducing metals (Aluminum).

Incompatibility
(Materials to Avoid)

Avoid contact with finely divided reducing metals.

Hazardous

Decomposition Products

Hydrogen Bromide, Carbon Monoxide, Carbon Dioxide

Hazardous

May Occur

☐ Conditions

Polymerization

Will Not Occur

☒ to Avoid**SECTION 6 - HEALTH HAZARDS**

1. Acute

2. Chronic

Nasal or skin irritation

Possible liver and kidney damage

Signs and

Symptoms of Exposure Nasal irritation

Medical Conditions Generally
Aggravated by Exposure

N.A.

Chemical Listed as Carcinogen
or Potential Carcinogen

N.A.

National Toxicology
ProgramYes ☐
No ☒IARC
MonographsYes ☐
No ☒OSHA Yes ☐
No ☒Emergency and
First Aid Procedures

Skin wash with soap and water.

**ROUTES
OF
ENTRY**

1. Inhalation

Remove to fresh air.

2. Eyes

Flush with water.

3. Skin

Wash with water and soap.

4. Ingestion

Induce vomiting.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURESPrecautions to be Taken
in Handling and Storage

Avoid skin and eye contact and avoid breathing vapors.

Other

Precautions

N.A.

Steps to be Taken in Case

Material is Released or Spilled

Position pail or drum to minimize leak.

Absorb spilled material with absorbent.

Waste Disposal

Methods (Consult federal, state, and local regulations)

Contact local EPA.

SECTION 8 - SPECIAL PROTECTION INFORMATION/CONTROL MEASURESRespiratory Protection
(Specify Type)

Organic Vapor Cannister

Ventilation

Yes

Local
Exhaust

N.A.

Mechanical
(General)

N.A.

Special

N.A.

Other

N.A.

Protective
Gloves

Rubber Gloves

Eye
Protection

Safety Goggles

Other Protective
Clothing or Equipment

Coveralls

SAL 000007037

Work Hygienic Practices

Wash thoroughly with soap and water after use.

IMPORTANT

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

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MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5270 LIQUID

Emergency Telephone Number
Medical (312) 920-1510 (24 hours)

GS 657

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 5270 LIQUID

DESCRIPTION: A blend of alkyl phosphates alkyl phosphoramidate salt in heavy aromatic naphtha

NFPA 704M RATING 1 HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Heavy aromatic naphtha	64742-94-5	10-20

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause irritation to skin and eyes. Prolonged inhalation of vapor may be harmful. Avoid contact with skin, eyes, and clothing. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Wash thoroughly with soap and rinse with water. Call a physician.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

GS657**MATERIAL SAFETY DATA SHEET**PRODUCT **NALCO 5270 LIQUID****Emergency Telephone Number**

Medical (312) 920-1510 (24 hours)

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: May cause irritation with prolonged contact.
SKIN CONTACT: May cause irritation with prolonged contact.
INHALATION: Prolonged inhalation of vapor may be harmful.

SYMPTOMS OF EXPOSURE:

ACUTE: Inhalation of high concentrations of heavy aromatic naphtha can cause nausea, dizziness, vomiting, stupor or unconsciousness.

CHRONIC: Prolonged skin contact with heavy aromatic naphtha can cause dry skin and defatting resulting in irritation and dermatitis.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: No toxicity studies have been conducted on this product.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Pale yellow	FORM: Liquid	ODOR: Kerosene
DENSITY:	7.7 lbs/gal. @ 60 Degrees F	
SOLUBILITY IN WATER:	Insoluble	
SPECIFIC GRAVITY:	0.94 @ 60 Degrees F	ASTM D-1298
pH (NEAT) =	6.5	ASTM E-70
VISCOSITY:	110 cts @ 100 Degrees F	ASTM D-2983
POUR POINT:	-40 Degrees F	ASTM D-97
FLASH POINT:	150 Degrees F (PMOC)	ASTM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: 150 Degrees F (PMOC) ASTM D-93

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5270 LIQUID

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

GS657

SECTION 8 FIRE AND EXPLOSION INFORMATION

(CONTINUED)

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions. Containers exposed in a fire should be cooled with water to prevent vapor pressure buildup leading to a rupture.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed. If significant vapors, mists or aerosols are generated, wear a NIOSH approved or equivalent respirator, (ANSI Z 88.2, 1980 for requirements and selection).

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment or doing maintenance.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (312-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as saw dust, clay, soil or any commercially available absorbent. Shovel



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5270 LIQUID

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it must be solidified before disposal in a landfill. Can be incinerated in accordance with local, state and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA:

96 hour static acute LC50 to Bluegill Sunfish = 54 ppm

96 hour static acute LC50 to Rainbow Trout = 72 ppm

96 hour static acute LC50 to Bull Minnows = 4.7 ppm

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - COMBUSTIBLE LIQUID, N.O.S. NA 1993
CONTAINS - AROMATIC HYDROCARBONS

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredient in this product is hazardous and the reason is shown below.

Heavy aromatic naphtha - Combustible, irritant

Heavy aromatic naphtha = 100 ppm TLV



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5270 LIQUID

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

CS657

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

Manufacturer's recommendation

CERCLA, 40 CFR 117, 302:

Notification of spills of this product is not required.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does not meet the criteria of a hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):

None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:

This product does not contain ingredients listed by State Right To Know Laws.

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your



MATERIAL SAFETY DATA SHEET

PRODUCT **NALCO 5270 LIQUID**

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)

SECTION 16 USER'S RESPONSIBILITY

(CONTINUED)

local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: John J. Kasper, MSc., Manager Product Safety

DATE CHANGED: 11/04/86

DATE PRINTED: 03/12/87

APR 11 REC



CYTHION[®]

The Premium Grade Malathion

GS656

AMERICAN CYANAMID
WAYNE, NEW JERSEY 07470

Page 1 of 5

MATERIAL SAFETY DATA SHEET

MSDS NO. 0086-03
CAS NO. 000121-75-5
DATE: 3/22/89

EMERGENCY TELEPHONE: (201) 835-3100

PRODUCT
IDENTIFICATION

TRADE NAME: CYTHION Insecticide, "The Premium Grade Malathion"
SYNONYMS: MALATHION; 0,0-dimethyl phosphorodithioate of diethyl mercaptosuccinate; Butanedioic acid, [(dimethoxyphosphinothioyl)thio], diethyl ester; S-[1,2-bis(ethoxycarbonyl)ethyl]0,0-dimethyl phosphorodithioate
CHEMICAL FAMILY: Organophosphate
MOLECULAR FORMULA: $C_{10}H_{19}O_6PS_2$
MOLECULAR WGT.: 330.36

WARNING
STATEMENTS

CAUTION.
KEEP OUT OF REACH OF CHILDREN. HARMFUL BY SWALLOWING, INHALATION, OR SKIN CONTACT.

HAZARDOUS
INGREDIENTS

COMPONENT	CAS. NO.	%	TWA/CEILING
Malathion	000121-75-5	91-96	10 mg/m ³ 8hr TWA

REFERENCE: Malathion 10.0 mg/m³: ACGIH-88 (skin)PHYSICAL
PROPERTIES

APPEARANCE AND ODOR: Clear, brown to colorless liquid; characteristic mercaptan odor
BOILING POINT: 312.8°F 156°C @ 0.7 mm Hg.
MELTING POINT: 37.13°F 2.85°C
VAPOR PRESSURE: 0.00004 mm Hg @ 30°C
SPECIFIC GRAVITY: 1.23 @ 25°C
VAPOR DENSITY: Not Applicable
% VOLATILE (BY VOL.): Negligible
OCTANOL/H₂O PARTITION COEF.: 777
EVAPORATION RATE: Negligible
SATURATION IN AIR (BY VOL.): Not Available
PH: In water it is neutral or slightly acidic. On standing in water it will become more acidic.
SOLUBILITY IN WATER: 145 ppm @ 25°C

SAL 000007044

**FIRE AND
EXPLOSION
HAZARD
INFORMATION**

FLASH POINT:	>325°F >162.7°C (METHOD: TAG Open Cup)
FLAMMABLE LIMITS:	Not Applicable
AUTOIGNITION TEMP.:	Not Available
DECOMPOSITION TEMP:	Slow decomposition above 48.8°C (120°F)

FIRE EXTINGUISHING MEDIA:

Use water, foam, carbon dioxide, or dry chemical to extinguish fires.

FIRE CONTROL TACTICS:

Wear self-contained, positive pressure breathing apparatus and full fire fighting protective clothing.

Keep unnecessary people away. Use as little water as possible. Dike area of fire to prevent pesticide run-off. Use spray or fog - solid stream may cause spreading.

Do not decontaminate personnel or equipment, or handle broken packages or containers without protective equipment as specified in the Exposure Control Section. Decontaminate emergency personnel with soap and water before leaving the fire area.

Avoid breathing dusts, vapors and fumes from burning materials. Control run-off water - if water enters a drainage system, advise the authorities downstream.

**NFPA HAZARD
RATING**

Hazard rating not assigned by NFPA.

REACTIVITY DATA

Stable @ 25°C	Unstable @ >48.8°C
CONDITIONS TO AVOID:	Storage at 50-115°C leads to nonhazardous decomposition. Heating at >150°C causes rapid decomposition. Reactivity with strong base may generate excessive heat. Unstable @ pH 12.

POLYMERIZATION:	Will not occur
------------------------	----------------

INCOMPATIBLE MATERIALS:	Strong alkalies and strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition may produce hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and oxides of carbon, sulfur, and phosphorus.

HEALTH HAZARD
INFORMATION

TOXICITY DATA AND
EFFECTS OF
OVEREXPOSURE:

The oral LD₅₀ for male rats is 2,800 mg/kg and for female rats it is 1,000 mg/kg.

The dermal LD₅₀ for rabbits is 4,100 mg/kg.

This product is considered to be slightly toxic by ingestion in single doses and to be no more than slightly toxic by single skin applications.

This product is not irritating to the rabbit eye but it is slightly irritating to the rabbit skin.

Inhalation exposure is not likely to produce any significant effects due to the low vapor pressure of the product. Overexposure to an aerosol may produce cholinesterase-depression.

EMERGENCY &
FIRST AID
PROCEDURES:

If Swallowed: Induce vomiting by giving 2 glasses of water and (a) stimulating back of throat with finger or (b) giving syrup of ipecac 30 ml. Never give anything by mouth or induce vomiting in an unconscious person. Obtain medical care without delay. Give oxygen if person has difficulty breathing. Give artificial respiration if person is not breathing.

If on Skin: Remove contaminated clothing without delay. Wear impervious gloves. Cleanse skin thoroughly with soap and water. Do not omit cleansing hair or under fingernails if contaminated. Obtain medical care without delay. Give oxygen if person has difficulty breathing. Give artificial respiration if person is not breathing.

If in Eyes: Immediately irrigate with plenty of water for 15 minutes.

If Inhaled: Remove from exposure. Administer oxygen if there is difficulty in breathing. Obtain medical care without delay.

NOTES TO PHYSICIAN:

MALATHION ULV is a parasympathomimetic agent. Erythrocyte cholinesterase activity should be measured. Signs and symptoms include, progressively: headache, lightheadedness, mioses with loss of accommodation, nausea, vomiting, hyperhidrosis, muscle fasciculations, sphincter failure, coma, and death. If signs or symptoms are present, give atropine, 4 mg, I.V. Repeat every 10 minutes until atropinized. Observe for at least 48 hours. Opiates and phenothiazine tranquilizers are contraindicated.

EXPOSURE CONTROL METHODS	Exposure to eyes and skin should be prevented by wearing chemical splash goggles, rubber gloves, apron, and boots. A long sleeve shirt and full length pants (or coveralls) should also be worn. Wash hands with soap and water before eating, smoking, or using the toilet. Shower after completion of work shift. Launder clothing prior to reuse.
-----------------------------	--

SPILL OR LEAK PROCEDURES	Wear rubber boots, gloves, and splash goggles. Absorb spilled material with clay or soda ash. Sweep up and place in closed container. Treat contaminated area with full-strength liquid chlorine bleach; let stand for 15 minutes and repeat procedure. Flush area with water.
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WASTE DISPOSAL: Dispose in accord with local, state, and federal regulations.

ADDITIONAL REGULATORY INFORMATION

SARA Title III Data

Section 311 & 312 Hazard Categories

Immediate Health Hazard - <u>Y</u>	Reactive Hazard - <u>N</u>
Delayed Health Hazard - <u>N</u>	Sudden Pressure Release Hazard - <u>N</u>
Fire Hazard - <u>N</u>	

Section 302 Extremely Hazardous Substances - None

Section 313 Toxic Chemicals - None

CERCLA Reportable Quantity

Malathion 100 lbs. (45.4kg)

SAL 000007047

**SPECIAL
PRECAUTIONS****HANDLING AND
STORAGE:**

Because of this material's flash point, areas containing this material should conform to the codes (such as, NFPA 30 and NFPA 70) governing Class III Combustible Liquids.

Do not contaminate water, food, or feed by storage or disposal. Store in a secure, dry, well-ventilated separate room, building or covered area.

Not for use or storage in the home.

Keep away from sources of ignition and protect from exposure to fire and heat.

Segregate from oxidizers and incompatible materials listed in the Reactivity Data Section.

APPENDIX

CYTHION® Insecticide, "The Premium Grade Malathion" is a registered trademark American Cyanamid Company

SOURCE AND	SHEET NO.:	0086-03
DATE INFORMATION	DATE:	3/22/89

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

SAL 000007048

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.

Mallinckrodt makes no representations, or warranties, express or implied, of merchantability, fitness for a particular purpose with respect to the information set forth herein or to the product to which the information refers. Accordingly, Mallinckrodt will not be responsible for damages resulting from use of or reliance upon this information.

Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

ETHYL ALCOHOL DENATURED

PRODUCT IDENTIFICATION:

Synonyms: Deaatured ethyl alcohol; alcohol; potato alcohol

Formula CAS No.: 64-17-5

Molecular Weight: 46.07

Chemical Formula: C_2H_6O (major component)

Hazardous Ingredients:

CAS# 67-56-1 Methyl alcohol

141-78-6 Ethyl acetate

108-10-1 Methyl isobutyl ketone

8006-61-9 Gasoline

PRECAUTIONARY MEASURES

DANGER! MAY BE FATAL IF SWALLOWED.

HAZARDOUS IF INHALED. FLAMMABLE!

AFFECTS CENTRAL NERVOUS SYSTEM. MAY CAUSE BLINDNESS.
CAUSES IRRITATION.

Keep away from heat, sparks and flame.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

Avoid contact with eyes, skin and clothing.

Avoid breathing vapor.

EMERGENCY/FIRST AID

If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. 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: Flammable Liquid

SECTION 1 Physical Data

Appearance: Clear, colorless liquid.

Odor: Mild odor.

Solubility: Infinite in water.

Boiling Point: 78°C (172.4°F)

Melting Point: <-114°C (-173°F)

Specific Gravity (water = 1): 0.80

Vapor Density (Air = 1): 1.6

Vapor Pressure (mm Hg): 47 @ 25°C (77°F)

Evaporation Rate: (BuAc = 1): ca. 3.3

SECTION 2 Fire and Explosion Information

Fire:

Flammable. Fire data is for ethyl alcohol:

Flash point: 13°C (55°F) (closed cup).

Auto ignition temperature: 422°C, (793°F)

Flammable limits in air, % by volume:

lcl = 3.3, ucl = 19.0.

Dangerous fire hazard when exposed to heat or flame.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures.

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. Vapors can flow along surfaces to distant ignition source and flash back.

SECTION 3 Reactivity Data

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

May produce carbon monoxide and carbon dioxide when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizers, heat and sources of ignition.

SECTION 4 Leak/Spill Disposal Information

Ventilate area of leak or spill. Remove all sources of ignition. Clean-up personnel require protective clothing and respiratory protection from vapors. Contain and recover liquid when possible. Collect as hazardous waste and atomize in a suitable RCRA approved combustion chamber, or absorb with vermiculite, dry sand, earth or similar material for disposal as hazardous waste in a RCRA approved facility. Do not flush to sewer!

Ensure compliance with local, state and federal regulations.

SECTION 5 Health Hazard Information**A. EXPOSURE / HEALTH EFFECTS****Inhalation:**

Inhalation may cause irritation to the upper respiratory tract. Prolonged exposures to high concentration may cause drowsiness, loss of appetite, and inability to concentrate. Methyl alcohol component affects vision by acting upon the optic nerve. Exposure may result in vision impairment or blindness.

Ingestion:

Can cause gastritis, vomiting, central nervous system depression, headache, and dizziness. Other symptoms may parallel those from inhalation exposure.

Skin Contact:

May cause irritation. Prolonged contact may produce discoloration. Skin absorption of methyl alcohol component may occur with symptoms paralleling those of inhalation exposure.

Eye Contact:

May cause severe irritation. Splashes may cause pain, blurred vision, and eye damage.

Chronic Exposure:

Prolonged skin exposure may cause drying and cracking of skin. May affect the nervous system. May cause vision impairment, liver injury and pancreatitis.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired kidney or respiratory 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:

If swallowed, induce vomiting immediately by giving two glasses of water, or milk if available and sticking finger down throat. Call a physician immediately. Never give anything by mouth to an unconscious person.

Skin Exposure:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

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 DATA (RTECS, 1982)

Ethyl alcohol: Oral rat LD50: 7060 mg/kg. Inhalation rat LC50: 20,000 ppm/10H. Mutation references cited. Reproductive effects cited. Irritation skin rabbit: 400mg open mild eye rabbit 100mg/24H severe. Methyl alcohol: Oral rat LD50: 5628 mg/kg. Skin rabbit LD50: 20 gm/kg. Mutation references cited. Reproductive effects cited. Ethyl acetate: Oral rat LD50: 11300 mg/kg. Inhalation rat LC50: 1600 ppm/8H.

SECTION 6 Occupational Control Measures**Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL):

1,000 ppm (TWA) for Ethyl Alcohol

200 ppm (TWA) for Methyl Alcohol

400 ppm (TWA) for Ethyl acetate

-ACGIH Threshold Limit Value (TLV):

1,000 ppm (TWA) For Ethyl Alcohol

200 ppm (TWA) 250 ppm (STEL) skin for Methyl Alcohol

400 ppm (TWA) for Ethyl acetate

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 up to the maximum use concentration specified by the respirator supplier. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

Skin Protection:

Gloves and lab coat, apron or coveralls.

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.

SECTION 7 Storage and Special Information

Protect against physical damage. Store in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from oxidizing materials. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment.

.....
ETHDA

SAL 000007050

65655

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.

Mallinckrodt makes no representations, or warranties, either express or implied, of merchantability, fitness for a particular purpose with respect to the information set forth herein or to the product to which the information refers. Accordingly, Mallinckrodt will not be responsible for damages resulting from use of or reliance upon this information.

Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361

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

(Chem.Key: ETHDA)

Hazard Categories for SARA Section 311/312 Reporting				
Acute	Chronic	Fire	Pressure	Reactive
-----	-----	----	-----	-----
X	X	X		

Product or Components
of Product:

SARA EHS Sect. 302
RQ (lbs.) TPQ (lbs.)

SARA Section 313 Chemicals
Name List Chemical Category

CERCLA Sec.103
RQ (lbs.)

RCRA
Sec. 261.33

ETHYL ALCOHOL DENATURED codes: 2849 2902 2866
2919 H867 The following percentages
correspond one to one with the product codes
given here.

Ethyl alcohol (64-17-5) 85%, 90%, 89%, 94%, 94%	No	No	No	No	No	No
Methyl alcohol (67-56-1) 3.6%, 3.6%, 3.7%, 3.7%, 3.7%	No	No	Yes	No	5000	U154
Ethyl acetate (141-78-6) 5%, 5%, < 1%, < 1%, < 1%	No	No	No	No	5000	U112
Methyl isobutyl ketone (108-10-1) 0.9%, 0.9%, 0.9%, 0.9%, 0.9%	No	No	Yes	No	5000	U161
Gasoline (8006-61-9) < 1%, < 1%, < 1%, < 1%, < 1%	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 Environmental 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

Effective Date: 07-13-87 Supersedes 01-15-86

SAL 000007051

ETHYL ALCOHOL DENATURED

65655

MAY 07 1989
20883

259865
MATERIAL SAFETY DATA SHEET

POB: 516-LPA 259865
MACH ORDERS: 698483

MSDS DATE: 3/29/90
CHANGE NO.: 6617

For Assistance, Contact:
Regulatory Affairs Dept.
PO Box 987 Ames, IA 50010
(800) 227-4224

HACH COMPANY
PO BOX 987
AMES, IA 50010

Emergency Telephone #
Rocky Mountain Poison Ctr.
(503) 423-5716

I. PRODUCT IDENTIFICATION

CATALOG NO.: 20883
CAS NO.: NA
FORMULA: Not applicable
PRODUCT NAME: Nachchromix
CHEMICAL NAME: Not applicable
CHEMICAL FAMILY: Not applicable

II. INGREDIENTS

Proprietary components
PCT: 100 CAS NO.: Proprietary SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Not determined

III. PHYSICAL DATA

STATE: solid APPEARANCE: White crystalline powder ODOR: Acid
SOLUBILITY IN: WATER: 62.12 g/100 mL @ 20C ACID: Soluble in H2SO4
OTHER: Not determined BOILING POINT: NA MELTING PT.: 175C decomp.
SPEC GRAVITY: 1.9 pH: 10% soln = 4-5 VAPOR PRESSURE: Not applicable
VAPOR DENSITY (air=1): NA EVAPORATION RATE: NA
METAL CORROSIVITY - ALUMINUM: ND STEEL: ND STABILITY: Stable
STORAGE PRECAUTIONS: Store in a cool, dry place away from oxidizable material.

IV. FIRE, EXPLOSION HAZARD AND REACTIVITY DATA

FLASH PT.: Not applicable METHOD: NA
FLAMMABILITY LIMITS - LOWER: NA UPPER: NA
SUSCEPTIBILITY TO SPONTANEOUS HEATING: None
SHOCK SENSITIVITY: None AUTOIGNITION PT.: NA EXTINGUISHING MEDIA: water
FIRE/EXPLOSION HAZARDS: Strong oxidizer; may react violently with reducers and combustible materials
HAZARDOUS DECOMP. PRODUCTS: Not determined
OXIDIZER: strong NFPA Codes: Health: 3 Flammability: 0 Reactivity: 0
CONDITIONS TO AVOID: Heat, moisture; contact with nitric acid, silver salts, oxidizable or combustible material, reducers, aluminum, sodium peroxide

V. HEALTH HAZARD DATA

THIS PRODUCT MAY BE: Irritating to eyes, skin, respiratory tract, and may cause allergic skin reaction.
ACUTE TOXICITY: Oral rat LD50 = 820 mg/Kg = Moderately toxic
ROUTES OF EXPOSURE: Ingestion, Inhalation, contact
TARGET ORGANS: Not determined
CHRONIC TOXICITY: Not determined
ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Not determined
CANCER INFORMATION: Not applicable
ROUTES OF EXPOSURE: Not applicable
TARGET ORGANS: Not applicable
OVEREXPOSURE: Irritation, nausea; chronic overexposure may cause skin rash
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None reported

VI. PRECAUTIONARY MEASURES

Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Do not breathe chemicals.
Store away from oxidizable material.
PROTECTIVE EQUIPMENT: adequate ventilation, safety glasses, disposable gloves

VII. FIRST AID

EYE AND SKIN CONTACT: Immediately flush eyes with water for 15 minutes. Call physician. Flush skin with plenty of water.
INGESTION: Give large quantities of water or milk. Call physician immediately.
INHALATION: Remove to fresh air. Give artificial respiration if necessary. Call physician.

VIII. SPILL AND DISPOSAL PROCEDURES

IN CASE OF SPILL OR RELEASE: Cover with a reducer (a bisulfite, or a ferrous salt but not carbon, sulfur or strong reducing agents). Mix well and spray with water. A sulfite or a ferrous salt will require addition of some 3M-H2SO4 to promote rapid reduction. Scoop slurry into a container of water and soda ash. Wash down the drain with excess water. Wash site thoroughly with a soap solution containing some reducer.
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

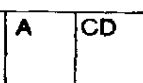
IX. TRANSPORTATION DATA

D.O.T. PROPER SHIPPING NAME: Ammonium Persulfate
HAZARD CLASS: Oxidizer ID: UN1444
I.C.A.O. PROPER SHIPPING NAME: Ammonium Persulphate
HAZARD CLASS: 5.1 ID: UN1444 GROUP: III
I.M.O. PROPER SHIPPING NAME: Ammonium Persulphate
HAZARD CLASS: 5.1 ID: UN1444 GROUP: III

X. REFERENCES

- 1) TLV's Threshold Limit Values and Biological Exposure Indices for 1988-1989. American Conference of Governmental Industrial Hygienists, 1988.
- 2) 29 CFR 1910 - 1910 (Code of Federal Regulations - Labor)
- 3) Vendor Information.
- 4) Technical Judgment

SAL 000007052



Previous P.O.

NORMAL

Tagging Instructions

F.O.B. Point	
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Freight Terms	
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Conoco Inc.
Refinery Warehouse
Old Spanish Trail
P.O. Box 37
Westlake, LA 70669

LOVELAND, CO 80539

Carrier

Project ID

Clauses

Attn:

Payment Terms

AFE Reporting

MAILED 800-227-4224

Requisitioner

Date _____

Distribution Charge	
---------------------	--

RACHELLE 318-491-5406 X4/23/90

7411-3-0-149-03-13

Tax Status

Special Instructions

Charge

Exempt

 $\frac{1}{2}$

ticket	Date	Control W.O.	Equip. No.	Init.	Stat.	Time Ordered	Time Req'd	Unit Code	Date Required
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SAL 000007053

XXXX	42/3/90	S149	MR 9 MAIL	NOR	7411-3-0-149E-C3-13
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459865 No.

Description

Item
No.Quantity
OrderedUnits of
issue**Price**

Qty. Issued

#20883-00 No CHromix

1

3

boxes

#22791-00 Safety Cap

2

5

each

APPROVED: R COWDEN

MAILED ORDER TO HACH

ACCOUNT #82797

Approvals - Operating Dept.

Approval - Purchasing Dept.

9-165 X8, 11-03

14070

MATERIAL SAFETY DATA SHEET

HACH ORDER# 660684

MADE DATE: 4/19/90
CHANGE NO.: 0745For Assistance, Contact:
Regulatory Affairs Dept.
PO Box 907 Ames, IA 50010
(800) 227-4224HACH COMPANY
PO BOX 907
AMES, IA 50010Emergency Telephone 8
Rocky Mountain Poison Ctr.
(303) 423-5716

C-5652

I. PRODUCT IDENTIFICATION

CATALOG NO.: 14070
CAS NO.: NA
FORMULA: Not applicable
PRODUCT NAME: DPD Free Chlorine Reagent
CHEMICAL NAME: Not applicable
CHEMICAL FAMILY: Not applicable

II. INGREDIENTS

Organic Salt (Trade Secret)
PCT: <60 CAS NO.: ConfidentialSARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Toxicity unknownSodium Phosphate, Dibasic, Anhydrous
PCT: <60 CAS NO.: 7558-79-4 SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Moderately toxic; may cause IrritationDPD Salt (Trade Secret)
PCT: <6 CAS NO.: ConfidentialSARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Moderately toxic; may cause skin sensitizationOther component
PCT: <1 CAS NO.: NA SARA: NOT LISTED
TLV: Not applicable PEL: Not applicable
HAZARD: Not applicable

Any component of this mixture not specifically listed (eg. "other components") is not considered to present a carcinogen hazard.

III. PHYSICAL DATA

STATE: solid APPEARANCE: White to pale pink powder ODO: None
SOLUBILITY IN: WATER: Soluble ACID: Soluble OTHER: Not determined
BOILING POINT: NA MELTING PT.: NA SPEC GRAVITY: ND pH: Not determined
VAPOR PRESSURE: Not applicable VAPOR DENSITY (air=1): NA
EVAPORATION RATE: NA METAL CORROSIVITY - ALUMINUM: ND STEEL: ND
STABILITY: Stable
STORAGE PRECAUTIONS: Store in a cool, dry, dark place.

IV. FIRE, EXPLOSION HAZARD AND REACTIVITY DATA

FLASH PT.: Not applicable METHOD: NA
FLAMMABILITY LIMITS - LOWER: NA UPPER: NA
SUSCEPTIBILITY TO SPONTANEOUS HEATING: None
SHOCK SENSITIVITY: None AUTOIGNITION PT.: ND
EXTINGUISHING MEDIA: water, dry chemical, alcohol foam or carbon dioxide
FIRE/EXPLOSION HAZARDS: May emit toxic fumes in fire
HAZARDOUS DECOMP. PRODUCTS: May emit toxic fumes of phosphorus oxides in fire
OXIDIZER: No NFPA Codes: Health: 1 Flammability: 1 Reactivity: 0
CONDITIONS TO AVOID: Extreme temperatures, excess moisture, exposure to light

V. HEALTH HAZARD DATA

THIS PRODUCT MAY BE: Irritating to eyes and respiratory tract, and may cause allergic skin reaction.

ACUTE TOXICITY: Slightly toxic
ROUTES OF EXPOSURE: Ingestion, Inhalation
TARGET ORGANS: Not determinedCHRONIC TOXICITY: Not determined
ROUTES OF EXPOSURE: Ingestion, Inhalation
TARGET ORGANS: Not determinedCANCER INFORMATION: Not determined
ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Not determinedOVEREXPOSURE: Contact may cause irritation, skin sensitization
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Allergy or sensitivity to salts of N,N-Diethyl-p-Phenylenediamine

VI. PRECAUTIONARY MEASURES

Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Do not breathe dust.
Wash thoroughly after handling.
PROTECTIVE EQUIPMENT: adequate ventilation, safety glasses, disposable gloves

VII. FIRST AID

EYE AND SKIN CONTACT: Immediately flush eyes with water for 15 minutes. Call physician. Remove contaminated clothing. Wash skin with soap and plenty of water.
INGESTION: Give large quantities of water or milk. Call physician immediately.
INHALATION: Remove to fresh air.

VIII. SPILL AND DISPOSAL PROCEDURES

IN CASE OF SPILL OR RELEASE: Sweep up powder. Avoid breathing material. Dissolve in water. Flush down the drain with excess water.
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

IX. TRANSPORTATION DATA

D.O.T. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: Not applicable ID: NAI.C.A.O. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: NA ID: NA GROUP: NAI.M.D. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: NA ID: NA GROUP: NA

X. REFERENCES

- 1) TLV's Threshold Limit Values and Biological Exposure Indices for 1980-1989. American Conference of Governmental Industrial Hygienists, 1988.
- 2) Air Contaminants, Federal Register, Vol. 54, No. 12, Thursday, January 19, 1989, pp. 2332-2763.
- 3) In-house information
- 4) Technical judgment

SPECIAL NOTE: This product may only be used as an analytical reagent for the determination of chlorine in water due to requirements of the Toxic Substances Control Act (TSCA).

SAL 000007054

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

(C) HACH CO. 1990

Hach Company, WORLD HEADQUARTERS, PO Box 389, Loveland, CO 80539

Hach Europe, BP 229, B5000 Namur 1, BELGIUM

PAGE 1 OF 1

Hach Europe, BP 229, B5000 Namur 1, BELGIUM

PAGE 1 OF 1

14070

MATERIAL SAFETY DATA SHEET

ONLY QUALITY MATTER

MSDS DATE: 4/19/99
CHANGE NO.: 0745For Assistance, Contact:
Regulatory Affairs Dept.
PO Box 187 Ames, IA 50010
(515) 237-4224HACH COMPANY
PO BOX 187
AMES, IA 50010Emergency Telephone 8
Rocky Mountain Poison Ctr.
(303) 625-5716

G.S. 658

I. PRODUCT IDENTIFICATION

ATLANTIC NO.: 14070
CAS NO.: NA
FORMULA: Not applicable

PRODUCT NAME: DPD Free Chlorine Reagent
CHEMICAL NAME: Not applicable
CHEMICAL FAMILY: Not applicable

II. INGREDIENTS

Organic Salt (Trade Secret)

PCT: <60 CAS NO.: Confidential SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Toxicity unknown

Sodium Phosphate, Dibasic, Anhydrous

PCT: <60 CAS NO.: 7558-79-4 SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Moderately toxic; may cause irritation

DPD Salt (Trade Secret)

PCT: <60 CAS NO.: Confidential SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Moderately toxic; may cause skin sensitization

Other component

PCT: <60 CAS NO.: NA SARA: NOT LISTED
TLV: Not applicable PEL: Not applicable
HAZARD: Not applicable

Any component of this mixture not specifically listed (eg. "other components") is not considered to present a carcinogen hazard.

III. PHYSICAL DATA

STATE: solid APPEARANCE: White to pale pink powder ODOR: None
SOLUBILITY IN: WATER: Soluble ACID: Soluble OTHER: Not determined
BOILING POINT: NA MELTING PT.: NA SPEC GRAVITY: NA PH: Not determined
VAPOR PRESSURE: Not applicable VAPOR DENSITY (air=1): NA
EVAPORATION RATE: NA METAL CORROSIVITY - ALUMINUM: ND STEEL: ND
STABILITY: Stable
STORAGE PRECAUTIONS: Store in a cool, dry, dark place.

IV. FIRE, EXPLOSION HAZARD AND REACTIVITY DATA

FLASH PT.: Not applicable METHOD: NA
FLAMMABILITY LIMITS - LOWER: NA UPPER: NA
SUSCEPTIBILITY TO SPONTANEOUS HEATING: None
SHOCK SENSITIVITY: None AUTOIGNITION PT.: ND
EXTINGUISHING MEDIA: water, dry chemical, alcohol foam or carbon dioxide
FIRE/EXPLOSION HAZARDS: May emit toxic fumes in fire
HAZARDOUS DECOMP. PRODUCTS: May emit toxic fumes of phosphorus oxides in fire
OXIDIZER: No NFPA Codes: Health: 1 Flammability: 1 Reactivity: 0
CONDITIONS TO AVOID: Extreme temperatures, excess moisture, exposure to light

V. HEALTH HAZARD DATA

THIS PRODUCT MAY BE: Irritating to eyes and respiratory tract, and may cause allergic skin reaction.
ACUTE TOXICITY: Slightly toxic
ROUTES OF EXPOSURE: Ingestion, Inhalation
TARGET ORGANS: Not determined
CHRONIC TOXICITY: Not determined
ROUTES OF EXPOSURE: Ingestion, Inhalation
TARGET ORGANS: Not determined
CANCER INFORMATION: Not determined
ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Not determined
OVEREXPOSURE: Contact may cause irritation, skin sensitization
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Allergy or sensitivity to salts of N,N-Diethyl-p-Phenylenediamine

VI. PRECAUTIONARY MEASURES

Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Do not breathe dust.
Wash thoroughly after handling.
PROTECTIVE EQUIPMENT: adequate ventilation, safety glasses, disposable gloves

VII. FIRST AID

EYE AND SKIN CONTACT: Immediately flush eyes with water for 15 minutes. Call a physician. Remove contaminated clothing. Wash skin with soap and plenty of water.
INGESTION: Give large quantities of water or milk. Call physician immediately.
INHALATION: Remove to fresh air.

VIII. SPILL AND DISPOSAL PROCEDURES

IN CASE OF SPILL OR RELEASE: Sweep up powder. Avoid breathing material. Dissolve in water. Flush down the drain with excess water.
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

IX. TRANSPORTATION DATA

D.O.T. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: Not applicable ID: NA

I.C.A.D. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: NA ID: NA GROUP: NA

I.M.O. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: NA ID: NA GROUP: NA

X. REFERENCES

- 1) TLV's Threshold Limit Values and Biological Exposure Indices for 1980-1989. American Conference of Governmental Industrial Hygienists, 1986.
- 2) Air Contaminants, Federal Register, Vol. 54, No. 12, Thursday, January 19, 1989, pp. 2332-2383.
- 3) In-house information
- 4) Technical judgment

SPECIAL NOTE: This product may only be used as an analytical reagent for the determination of chlorine in water due to requirements of the Toxic Substances Control Act (TSCA).

SAL 000007056

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

(C) HACH CO. 1999

Hach Company, WORLD HEADQUARTERS, PO Box 349, Loveland, CO 80539

Hach Europe, BP 229, B5000 Namur 1, BELGIUM

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Hach Europe, BP 229, B5000 Namur 1, BELGIUM

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APR 02 1989

ES600



MATERIAL SAFETY DATA SHEET

EASTMAN CHEMICAL PRODUCTS, INC.
EASTMAN KODAK COMPANY
Kingsport, Tennessee 37662

For Health Hazard Information, Call: (615) 229-6094

For Other Information, Call Your Eastman Representative

Eastman Operator: (615) 229-2000

Date of Preparation: 05-19-89

SECTION I. IDENTIFICATION

-- Name:

"TECSOL" A Solvent, 95%

-- Synonyms: PM 3957; Denatured ethyl alcohol

-- Formula: Mixture

SECTION II. COMPONENT AND PRECAUTIONARY DATA

A. COMPONENTS:	Approx Percent	CAS Reg No	Eastman Kodak No
Ethanol*	80	64-17-5	113301
Isopropanol*	9	67-63-0	900212
Methanol* **	4	67-56-1	900467
Methyl isobutyl ketone* **	1	108-10-1	900416
Water	6	7732-18-5	035290

See Section VI-A for information on exposure limits.

*Hazardous chemical as defined by OSHA, 29 CFR 1910.1200.

**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.

B. PRECAUTIONARY LABEL STATEMENTS:

WARNING! FLAMMABLE LIQUID AND VAPOR
CAUSES EYE IRRITATION

Keep away from heat, sparks, and flame.
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

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FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if symptoms persist.

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IN CASE OF FIRE: Use water spray, dry chemical, "alcohol" foam, or CO₂. Water may be ineffective in fighting the fire. Use water spray to keep fire-exposed containers cool.

IN CASE OF SPILL: Eliminate all ignition sources. Use water spray to disperse vapors and to dilute to a nonflammable mixture. Use water spray to protect personnel attempting to stop the leak. Prevent runoff from entering drains, sewers, and streams.

Since emptied containers retain product residue, follow label warnings even after package is emptied. Do not cut, drill, grind, or weld on or near this container.

FOR MANUFACTURING USE ONLY

SECTION III. PHYSICAL DATA (1)

- Appearance and Odor: Clear liquid; alcohol odor.
- Boiling Point: Approx 78°C (172°F).
- Specific Gravity (H₂O = 1): Approx 0.79 at 72°F/60°F.
- Vapor Pressure: 40² mm Hg at 19°C (66°F).
- Volatile Fraction by Weight: 1.0.
- Vapor Density (Air = 1): 1.59.
- Solubility in Water: Appreciable.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA (1)

- Flash Point (ethanol): 13°C (56°F), Method Used: Tag Closed Cup.
- Autoignition temperature: >404°C (760°F); Method Used: ASTM D 2155.
- Flammable Limits (ethanol): LEL 3.53% (at 25°C [77°F])
UEL 21.2% (at 64°C [147°F]).
- Extinguishing Agent: Water spray, dry chemical, "alcohol" foam, or CO₂.
- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Water may be ineffective in fighting fire. Use water spray to keep fire-exposed containers cool.
- Unusual Fire and Explosion Hazards: Flammable liquid and vapor. (See Section VIII.) Vapors are heavier than air and may travel along the ground or may be moved by ventilation to an ignition source and may flash back.

SECTION V. REACTIVITY DATA

- Stability: Stable.
 - Incompatibility: Oxidizing materials can cause a vigorous reaction.
 - Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
 - Hazardous Polymerization: Will not occur.
-

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B. RESPIRATORY PROTECTION

An appropriate NIOSH-approved respirator for organic vapor must be worn if exposure is likely to exceed recommended exposure limits (see Section VI-A). If respirators are used, a program should be established to assure compliance with OSHA Standard 29 CFR 1910.134.

C. SKIN AND EYE PROTECTION

Wear safety glasses with side shields (or goggles). For operations where prolonged or repeated skin contact may occur, impervious gloves are recommended. An eye bath and washing facilities should be available.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Material is classified as a Flammable Liquid. Keep away from heat, sparks, and flame. Keep container closed. Use with adequate ventilation. Vapors are heavier than air and may travel along the ground or may be moved by ventilation to an ignition source and flash back. Comply with all federal, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids. Since emptied containers retain product residue, follow label warnings even after container is emptied. Do not cut, drill, grind, or weld on or near this container.

SECTION IX. SPILL, LEAK, AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled: Eliminate all ignition sources. Small spills may be collected with absorbent materials. Use water spray to disperse vapors and to dilute to a nonflammable mixture. Prevent runoff from entering drains, sewers, or streams.

Waste Disposal Method: Mix with compatible chemical which is less flammable and incinerate. Observe all federal, state, and local laws concerning health and environment.

SECTION X. ENVIRONMENTAL EFFECTS DATA

Data for the major components of this material (3-9) have been used to provide the following estimate of environmental impact: this material is expected to have a high biological oxygen demand, a significant potential to cause oxygen depletion in aquatic systems, a low potential to affect aquatic organisms and secondary waste treatment microorganisms, ready biodegradability, and a low potential to bioconcentrate. If diluted with a large amount of water, a moderate quantity of this solvent released directly or indirectly into the environment is not expected to have a significant impact.

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Flammable liquid.
Hazardous components: See Section II.
Flashpoint: See Section IV.
Proper DOT Shipping Name: Denatured alcohol.
NA Number: 1986.

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SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

Exposure Limits in ppm for Hazardous Components

Component	ACGIH, 1988-89			OSHA		
	TLV TWA	TLV STEL	Skin Notation	PEL TWA	STEL	Skin Design.
Ethanol	1000	-	No	1000	-	No
Isopropanol	400	500	No	400	500	No
Methyl alcohol	200	250	Yes	250	-	Yes
Methyl isobutyl ketone	50	75	No	50	75	No

-- NIOSH industrial hygiene analytical methods are available for the preceding components. (2,3)

B. EXPOSURE EFFECTS

Inhalation: High vapor concentrations may cause upper respiratory tract irritation and narcosis (sleepiness, dizziness, etc.).

Eyes: Liquid and vapor cause irritation.

Skin: Low hazard for usual industrial handling.

C. FIRST AID

Inhalation: Remove to fresh air. Treat symptomatically. If breathing is difficult, give oxygen. Get medical attention if symptoms persist.

Eyes: Immediately flush with plenty of water for at least 15 minutes and get medical attention if symptoms are present after washing.

D. TOXICITY DATA

Toxicity data for the components of this material are available in EASTMAN CHEMICAL PRODUCTS, INC. MSDSs as follows:

Ethanol	ECPI MSDS-10,681A
Isopropanol	ECPI MSDS-10,145A
Methanol	ECPI MSDS-10,486A
Methyl Isobutyl Ketone	ECPI MSDS-10,599A

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Local exhaust ventilation or an enclosed handling system may be needed to control air-borne levels below recommended exposure limits (see Section VI-A).

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SECTION XII. REFERENCES

1. File data, Material Safety Program, Eastman Chemicals Division, Eastman Kodak Company, Kingsport, Tennessee.
2. NIOSH MANUAL OF ANALYTICAL METHODS, 3rd Edition. Issued by the National Institute for Occupational Safety and Health. U.S. Government Printing Office, Washington, 1984, Methods 1300, 1400, 2000.
3. Unpublished data, Health and Environment Laboratories, Eastman Kodak Company, Rochester, New York.
4. K. Verschueren. HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS, 2nd Edition. Van Nostrand Reinhold Company, New York, 1983.
5. WATER RES 13, 623-626 (1979).
6. Z WASSER ABWASSER FORSCH 15, 1-6 (1982).
7. Z WASSER ABWASSER FORSCH 10, 161-166 (1977).
8. Z WASSER ABWASSER FORSCH 11, 161-164 (1978).
9. A. J. Leo and C. Hansch, Editors. CHEMICAL PARAMETER DATA BASE. Medicinal Chemistry Project, Pomona College, Seaver Chemistry Laboratory, Claremont, California, June 21, 1985.

SECTION XIII. HAZARD RATINGS

	Health	Flammability	Reactivity
HMIS* Rating:	1	3	0
NFPA** Rating:	1	3	0

NOTICE: These ratings involve data and interpretations that may vary from company to company and 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. The customer is responsible for determining the proper personal protective equipment needed for its particular use of this material.

*Hazardous Materials Identification System's [HMIS] Revised RAW MATERIALS RATING MANUAL, National Paint & Coatings Association, Fall 1984.

**NFPA 704 Standard System for the Identification of the Fire Hazards of Materials, National Fire Protection Association, 1985.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

C/10214A/091374/R-1, S-2, F-3, C-0

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ARCADIAN

G S R 77

EMERGENCY TELEPHONE: (504) 642-4573

A. GENERAL INFORMATION

Trade Name (common name or synonym) ANHYDROUS AMMONIA		0183	C.A.S. No. 7664-41-7
Chemical name ANHYDROUS AMMONIA, AMMONIA GAS			
Formula NH ₃		Molecular Wt. SEE SECT. K	
Address (No., Street, City, State and Zip Code) Arcadian Corporation P.O. Box 265 Parsippany, N.J. 07054			
Contact Director, Product Safety	Phone Number (504) 642-4507	Issue Date MAY 1978	Revised Date AUG. 18, 1989

B. FIRST AID

FLOOD AFFECTED BODY AREA, EYES, WITH WATER IMMEDIATELY FOR AT LEAST 15 MINUTES. IMMEDIATELY REMOVE PATIENT TO UNCONTAMINATED AREA. IN CASE OF SEVERE EXPOSURE, CALL A PHYSICIAN AND KEEP PATIENT COMFORTABLE, WARM AND QUIET UNTIL HIS ARRIVAL. PROMPT ARTIFICIAL RESPIRATION WITH 100% OXYGEN MAY BE REQUIRED.

INGESTION: GIVE LARGE QUANTITIES OF WATER, BUT DO NOT INDUCE VOMITING. CALL A PHYSICIAN. GIVE NEUTRALIZING AGENTS, SUCH AS CITRUS FRUIT JUICES OR DILUTE VINEGAR.

*** NOTICE ***

This product safety data sheet is offered solely for your information, consideration and investigation.

Arcadian Corporation provides no warranties, either express or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.

MATERIAL SAFETY DATA SHEET

ARCADIAN

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>>>>ANHYDROUS AMMONIA

GS377

C. HAZARDS INFORMATION - Health

Inhalation

HIGHLY IRRITATING TO THROAT AT APPROX. 400 PPM. CAUSES EDEMA, DYSPNEA, BRONCHOSPASM, CHEST PAIN, PINK FROTHY SPUTUM. LC50(MOUSE): 4837 PPM/1H. LCLO(RAT): 2000 PPM/4H. 2500-6500 PPM CONSIDERED DANGEROUS TO LIFE IN 30 MINUTES. REF. (a) & (b).

Ingestion

SYMPTOMS SIMILAR TO INHALATION. LUNG IRRITATION AND PULMONARY EDEMA AFTER 12-24 HOURS' DELAY.

Skin

IF CONTACT WITH GAS PROLONGED MORE THAN A FEW MINUTES, SEVERE BURNING PAIN AND CORROSIVE DAMAGE. CONTACT WITH LIQUID INTENSELY IRRITATING.

Eyes

CONTACT WITH LIQUID IS INTENSELY IRRITATING. CONTACT WITH GAS AT 700 PPM CAUSES IRRITATION.

Permissible Concentration

Air: 35 PPM - OSHA STANDARD AT A 35 PPM STEL FOR 15 MINUTES EXPOSURE
BASED ON CONSIDERATION OF NASAL AND AIRWAY IRRITATION. REF.(g).
Biological: NONE ESTABLISHED.

Unusual chronic toxicity

WE KNOW OF NO REPORTS.

C. HAZARDS INFORMATION - Fire and Protection

Flash Point: N/A C

Auto Ignit.
Temperature: 651 CFlammable limits in air (% by vol)
Upper: 25
Lower: 16 (HORIZONTAL PROPAGATION)
☐ Open cup
☐ Closed cup
Unusual fire and explosion hazards

PRESENCE OF OIL OR OTHER COMBUSTIBLE MATERIALS WILL INCREASE THE FIRE HAZARD. SEE HAZARDOUS COMBUSTION PRODUCTS, SECTION C.

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MATERIAL SAFETY DATA SHEET

EMERGENCY TELEPHONE: (504) 642-4573

>>>>ANHYDROUS AMMONIA

CS377**D. PRECAUTIONS/PROCEDURES****Fire extinguishing agents RECOMMENDED**

STOP FLOW OF GAS.

Fire extinguishing agents to AVOID

ALL STANDARD AGENTS ARE ACCEPTABLE. (WATER, CARBON DIOXIDE, DRY CHEMICAL, FOAM)

Special fire fighting precautions

STOP FLOW OF GAS. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL AND TO PROTECT MEN EFFECTING THE SHUT-OFF. WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS APPROVED BY NIOSH.

VentilationNATURAL VENTILATION SHOULD BE PROVIDED.
MECHANICAL (GENERAL) VENTILATION IF NATURAL VENTILATION IS FOUND INADEQUATE.**Normal Handling**

AVOID HEATING CONTAINERS. ELECTRICAL INSTALLATIONS MUST BE SPECIAL. REF. (a), P. 46. SEE REF. (c) FOR ADDITIONAL INFORMATION. SEE SECTION K.

Storage

PREFERABLY STORED OUTSIDE. OTHERWISE IN COOL, WELL-VENTILATED, NON-COMBUSTIBLE LOCATION, AWAY FROM ALL POSSIBLE SOURCES OF IGNITION.

Spill or leak

FOR LIQUID SPILL DUE TO TANK OR CYLINDER FAILURE, EVACUATE AREA AND WAIT FOR EVAPORATION. A PERSON WITH COMPLETE PROTECTION MAY BE SENT BACK TO DIKE SPILL AND THUS MINIMIZE AREA FROM WHICH EVAPORATION TAKES PLACE. FOR GAS LEAK, EVACUATE, BUT A PERSON WITH COMPLETE PERSONNEL PROTECTION MAY BE SENT BACK TO CLOSE OFF VALVE, ETC. KEEP IGNITION SOURCES AWAY.

Special Precautions/Procedures/Label Instructions

FOR ADDITIONAL HANDLING PROCEDURES, SEE COMPRESSED GAS ASSN'S PAMPHLETS: G-2, "ANHYDROUS AMMONIA... TRANSPORT, STORAGE AND USE"; AND G-2, AMERICAN NATIONAL STANDARD: "SAFETY REQUIREMENTS FOR STORAGE AND HANDLING OF ANHYDROUS AMMONIA."

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MATERIAL SAFETY DATA SHEET

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EMERGENCY TELEPHONE: (504) 642-4573

>>>>ANHYDROUS AMMONIA

G S 8 7 7

E. PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection

UP TO 100 PPM CHEMICAL CARTRIDGE RESPIRATOR*, SUPPLIED-AIR RESPIRATOR, OR SELF-CONTAINED BREATHING APPARATUS. 100-300 PPM, CHEMICAL CARTRIDGE RESPIRATOR* WITH FULL FACEPIECE. 300-500 PPM, CANISTER GAS MASK*, SUPPLIED-AIR RESPIRATORS, OR SELF-CONTAINED BREATHING APPARATUS. SEE SECTION K.

Eyes and face

CHEMICAL GOGGLES IF (1) ANY POSSIBILITY OF CONTACT WITH GREATER THAN 10% AQUEOUS AMMONIA; OR (2) REASONABLE POSSIBILITY OF CONTACT WITH LESS THAN 10% AQUEOUS AMMONIA. DO NOT WEAR CONTACT LENSES. SAFETY GLASSES UNDER OTHER CONDITIONS.

Hands, arms, and body

PROTECTIVE CLOTHING UNDER THE SAME CONDITIONS AS FOR CHEMICAL GOGGLES. IMMEDIATELY REMOVE UNDER WATER STREAM, NON-IMPERVIOUS CLOTHING THAT BECOMES CONTAMINATED WITH GREATER THAN 10% AQUEOUS AMMONIA. PROMPTLY REMOVE SAME WITH 10% OR LESS AQUEOUS AMMONIA.

Other clothing and equipment

EYE-WASH FACILITY AT SITES OF HANDLING OR STORAGE IF AQUEOUS AMMONIA STRONGER THAN 10% IS PRESENT.

F. PHYSICAL DATA

Material is (at normal conditions)			Appearance and Odor	
☐ LIQUID	☐ SOLID	☒ GAS	SHIPPED AS A LIQUID IN COMPRESSED, GREEN (NON-FLAMMABLE GAS) LABEL. SEE SECT. K.	
Boiling Point: -33.35 DEG. C Melting Point: -77.7 DEG. C Specific Gravity (H ₂ O=1): 0.62 Vapor Density (Air=1): 0.596				
Solubility in Water (X by wt.) (@ 15 DEG. C) 47		pH SEE SECTION K.		Vapor Pressure ☐ ☒ (mm Hg at 20C) (PSIG) 109.6
Evaporation Rate ☐ ☒ 100% Acetate = 1) (Ether = 1) Time: <1		% Volatiles by volume (at 20 C) 100		

MATERIAL SAFETY DATA SHEET

ARCADIAN

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>>>>ANHYDROUS AMMONIA

GS377

G. REACTIVITY DATA

Stability ☐ Unstable ☒ Stable		Conditions to Avoid NOT APPLICABLE.
Incompatibility (materials to avoid) *SEPARATE FROM OTHER CHEMICALS, PARTICULARLY OXIDIZING GASES, CHLORINE, BROMINE, IODINE, AND ACIDS.* - REF. (c), PG. 47. SEE SECTION K.		
Hazardous decomposition products NORMAL COMBUSTION OF AMMONIA IN AIR YIELDS NITROGEN AND WATER (STEAM). UNDER CERTAIN CONDITIONS OF TEMPERATURE AND PRESSURE SOME QUANTITY OF OXIDES OF NITROGEN MAY ALSO BE FORMED.		
Hazard polymerization ☐ Will Occur ☒ Will Not Occur		Conditions to Avoid NOT APPLICABLE.

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

Material or Composition/C.A.S. #	Wt.%	Hazard Data (see Sect. J)
NOT APPLICABLE.		

MATERIAL SAFETY DATA SHEET

ARCADIAN

EMERGENCY TELEPHONE: (504) 642-4572

>>>>ANHYDROUS AMMONIA

GS377**I. ENVIRONMENTAL****Degradability/aquatic toxicity**

NOT APPLICABLE - INORGANIC. AMMONIA IS A FERTILIZER, IT MAY PROMOTE EUTROPHICATION IN WATERWAYS. USE AND DISPOSAL EMPLOYING PROPER ENVIRONMENTAL CONTROL PRACTICES SHOULD NOT CAUSE SIGNIFICANT ENVIRONMENTAL IMPACT.

EPA hazardous substance? ☒ YES ☐ NO If so, reportable quantity: 100 #

40 CFR
116-117**Waste disposal methods(disposer must comply with disposal and discharge laws)**

DISPOSAL OF ANHYDROUS OR AQUEOUS AMMONIA MAY BE SUBJECT TO FEDERAL, STATE AND LOCAL REGULATIONS. USERS OF THIS PRODUCT SHOULD REVIEW THEIR OPERATIONS IN TERMS OF APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS THEN CONSULT WITH APPROPRIATE REGULATORY AGENCIES BEFORE DISCHARGING OR DISPOSING OF WASTE MATERIAL.

RCRA Status of unused material:
NOT A "HAZARDOUS WASTE".
SARA - SEE SECTION K.

40 CFR
261**REFERENCES**

Is this listed material?	YES	NO	YES	NO
NTP (List)	☐	☒	OSHA (Carcinogen)	☐
IARC (Monographs)	☐	☒	ACGIH (TLV List)	☒

Permissible concentration references

OSHA REGULATIONS, 29 CFR 1910.1000. OSHA PERMISSIBLE EXPOSURE LIMIT VALUE IS: 35 PPM - STEL (SHORT TERM EXPOSURE LIMIT) (15 MINUTES) BASED ON THE STANDARD REFERENCED ABOVE.

Regulatory Standards D.O.T. Classification NON-FLAMMABLE GAS

49 CFR

DOT HAZARDOUS MATERIALS TABLE 49 CFR 172.101.

General

- (a) TECH. GUIDE NO. 7, "HANDBOOK OF HAZARDOUS MATERIALS," AM. MUTUAL INSURANCE ALLIANCE, 20 NO. WACKER, DR, CHICAGO.
(b) DREISBACH, R.H., "HANDBOOK OF POISONING", 9TH ED., 1977, LANGE MEDICAL PUB. LOS ALTOS.
SEE SECTION K.

MATERIAL SAFETY DATA SHEET

ARCADIAN

EMERGENCY TELEPHONE: (504) 642-4573

>>>>ANHYDROUS AMMONIA

GS377**K. ADDITIONAL INFORMATION****SECTION A - MOLECULAR WEIGHT 17.04 (FORMULA WEIGHT)****SECTION D - NORMAL HANDLING - THE LATTER SHOWS THE NEED FOR PERSONNEL TRAINING, ADEQUATE INSPECTION OF EQUIPMENT. SEE REF. (d) FOR FEDERAL OSHA STANDARDS.****SECTION E - RESPIRATION PROTECTION - *REFERS TO A SPECIFIC CARTRIDGE OR CANISTER FOR NH₃ GAS.****SECTION F - APPEARANCE AND ODOR - COLORLESS GAS IS DRAWN FROM THE CYLINDERS. IT HAS A STRONG, PUNGENT, CHARACTERISTIC ODOR.****SECTION F - pH - 11.6 FOR 1.0 N AQ. SOLN.; 11.1 FOR 0.1 N AQ. SOL.; 10.6 FOR 0.01 N AQ. SOLN.****SECTION G - INCOMPATIBILITY (MATERIALS TO AVOID) - NOTE HAZARDOUS REACTIONS HAVE BEEN DOCUMENTED FOR CONTACT OF ANHYDROUS AMMONIA WITH: ACETALDEHYDE, ACROLEIN, BORON, BORON TRIOXIDE, BROMINE, CHLORINE, CHLORITES, CHROMIUM TRIOXIDE, ETHYLENE OXIDE, FLUORINE, GOLD, HYPOCHLOROUS ACID, IODINE, MERCURY, NITRIC ACID, NITROGEN TETROXIDE, NITROGEN TRICHLORIDE, NITROGEN TRIFLUORIDE, PHOSPHOROUS TRIOXIDE, PICRIC ACID, POTASSIUM CHLORATE, POTASSIUM FERRICYANIDE, SILVER, SILVER CHLORIDE. REF. (d), PP. 35-37. LIQUIFIED GASSES IN CONTACT WITH WATER CAN EXPLODE VIOLENTLY.****SECTION I - TITLE III - SARA ANHYDROUS AMMONIA/COMPONENTS/IMPURITIES LISTED IN: (REQUIRING REPORTING)**

40 CFR PART 355 - EXTREMELY HAZARDOUS SUBSTANCES - AMMONIA

40 CFR PART 370 - HAZARDOUS CHEMICAL REPORTING - APPLICABLE

SARA - SECTION 311 - EPA HAZARD CATEGORIES

IMMEDIATE	DELAYED	SUDDEN PRESSURE		
HEALTH	HEALTH	FIRE	RELEASE	REACTIVE
X		X	X	X

40 CFR PART 372 - TOXIC CHEMICALS - AMMONIA

SECTION J - GENERAL

- (c) NFPA MANUAL 49, "HAZARDOUS CHEMICALS DATA", 1975, NATIONAL FIRE PROTECTION ASSOCIATION, 470 ATLANTIC AVE., BOSTON, MA 02210
- (d) NFPA MANUAL 491M, "MANUAL OF HAZARDOUS CHEMICAL REACTIONS", 1975, SAME PUBLISHER AS REF. (c) ABOVE.
- (e) NCA, "CASE HISTORIES OF ACCIDENTS IN THE CHEMICAL INDUSTRY", VOLS. 1-3 COVERING 1951-66, WITH SUPPLEMENTS. MANUFACTURING CHEMISTS ASSOCIATION, 1825 CONNECTICUT AVE., WASHINGTON, DC 20009.
- (f) FEDERAL OSHA SAFETY AND HEALTH STANDARDS, SUBPART H - "HAZARDOUS MATERIALS", SECTION 1910.101, "COMPRESSED GASSES (GENERAL REQUIREMENTS)", SECTION 1910.111, "STORAGE AND HANDLING OF ANHYDROUS AMMONIA", AND OTHER SECTIONS. PROPOSED REVISION: 41 FEDERAL REGISTER 17227, APRIL 23, 1976.
- (g) NIOSH CRITERIA DOCUMENT, 1974, HEW, PB246699, NTIS.
- (h) NIOSH "RECOMMENDED STD. FOR OCCUPATIONAL EXPOSURE TO AMMONIA", JAN. 1975
- (i) NIOSH/OSHA "POCKET GUIDE TO CHEMICAL HAZARDS", 1978.

MATERIAL SAFETY DATA SHEET

 EP&P 4830-A
 October 1985


An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
 available from OSHA regional or area offices.
 (Essentially similar to U.S. Department of Labor Form OSHA-20
 and generally accepted in Canada for information purposes)
 Do Not Duplicate This Form. Request an Original.



CA002

I. PRODUCT IDENTIFICATION

PRODUCT	PSA Adsorbent H-5		
CHEMICAL NAME	Activated Alumina	SYNONYMS	Alumina Hydrate Adsorbent Alumina
FORMULA	Al ₂ O ₃ ·H ₂ O	CHEMICAL FAMILY	Aluminum Oxide
		MOLECULAR WEIGHT	101.94
TRADE NAME	PSA Adsorbent H-5		

II. HAZARDOUS INGREDIENTS

MATERIAL (CAS NO.)	Wt (%)	1984-1985 ACGIH TLV-TWA (OSHA-PEL)	
Aluminum Oxide (1344-28-1)	< 95	Nuisance particulate 10 mg/m ³ Total dust 5 mg/m ³ Respirable dust	(Nuisance dust) (15 mg/m ³ Total dust) (5 mg/m ³ Respirable dust)
Water (7732-18-5)	< 10	Not applicable	(Not applicable)
Sodium Oxide (1313-59-3)	< 1	None currently established	(None currently established)
Iron Oxide (1309-37-1)	< 1	5 mg/m ³ (Rouge)	(10 mg/m ³)
Silica, Amorphous (7631-86-9)	< 1	10 mg/m ³ Total dust 5 mg/m ³ Respirable dust	(20 mppcf) (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	Not Applicable	FREEZING POINT	Not Applicable
SPECIFIC GRAVITY (H ₂ O = 1)	3.1-3.3 depending on grade	VAPOR PRESSURE AT 20°C	Not Applicable
VAPOR DENSITY (air = 1)	Not Applicable	SOLUBILITY IN WATER, % by wt.	Insoluble
PERCENT VOLATILES BY VOLUME	Not Applicable	EVAPORATION RATE (Butyl Acetate = 1)	Not Applicable

APPEARANCE AND ODOR No odor—depending on product, may appear as off-white bead, pellet or mesh.

IV. EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:
 In the USA 304—744-3487 In Canada 514—645-5311
 For routine information contact your local supplier

Union Carbide requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE CORPORATION ☐ ENGINEERING PRODUCTS & PROCESSES
 UNION CARBIDE CANADA LIMITED ☐ ENGINEERING PRODUCTS & PROCESSES

Slua 021516

CA002

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING—No evidence of adverse effects from available information.

SKIN ABSORPTION—No evidence of adverse effects from available information.

INHALATION—May cause irritation of the nose and throat, accompanied by cough and chest discomfort.

SKIN CONTACT—May cause irritation and local reddening.

EYE CONTACT—May cause eye irritation seen as excess redness of the conjunctiva.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Prolonged inhalation may cause chronic lung injury.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Breathing of dust may aggravate asthma and inflammatory or fibrotic pulmonary disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST-AID PROCEDURES:

SWALLOWING—If ingested in large quantities, drink two glasses of water. Induce vomiting if the patient is conscious.

SKIN—Wash with soap and water.

INHALATION—Remove to fresh air. If symptoms persist, see a physician.

EYES—Flush eyes with water for 15 minutes.

NOTES TO PHYSICIAN: *This product is a desiccant and generates heat as it adsorbs water. The used product can contain material of a hazardous nature. Identify that material and treat accordingly.*

SAL 000007070

PRODUCT: PSA Adsorbent H-5

EP&P 4830-A

October 1985

C A 0 0 2

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
(test method) Not Applicable

AUTOIGNITION
TEMPERATURE Not Applicable

FLAMMABLE LIMITS
IN AIR, % by volume

LOWER

Not Applicable

UPPER

Not Applicable

EXTINGUISHING MEDIA: Activated alumina is nonflammable. Use media appropriate for surrounding fire. May use foam, CO₂, dry chemical or water.

SPECIAL FIRE FIGHTING PROCEDURES: Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None currently known.

REACTIVITY DATA

STABILITY

UNSTABLE	STABLE
	X

CONDITIONS TO AVOID: Reacts violently with chlorine trifluoride, producing flame. May cause ethylene oxide to polymerize violently, releasing heat.

HAZARDOUS DECOMPOSITION PRODUCTS: Pure product does not burn. Other decomposition products will come from the retained products of use and would include the decomposition products of the retained product.

HAZARDOUS POLYMERIZATION

May Occur	Will not Occur
	X

CONDITIONS TO AVOID: None currently known.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Sweep the spill area, collect and place the spilled material in a waste disposal container. Avoid raising dust.

WASTE DISPOSAL METHOD: Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

CA002

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): Where there is excessive dustiness, wear a respirator selected as per OSHA 29 CFR 1910.134 and approved by NIOSH/MSHA.

VENTILATION	LOCAL EXHAUST — As appropriate to minimize dust
	MECHANICAL (general) — Not Applicable
	SPECIAL — Not Applicable
	OTHER — Not Applicable

PROTECTIVE GLOVES: Use gloves impermeable to dust where prolonged hand contact is possible.

EYE PROTECTION: Safety glasses or goggles selected as per OSHA 29 CFR 1910.133

OTHER PROTECTIVE EQUIPMENT: Eyewash fountain

IX. SPECIAL PRECAUTIONS

CAUTION: Causes severe or mild eye irritation. Breathing dust may be harmful. May cause skin irritation. Open container slowly to avoid dust. Do not get in eyes. Avoid breathing dust and prolonged contact with skin. Use with adequate ventilation. Keep container closed. Wash thoroughly after handling. Do not ingest.

Before using you should know the hazards of the products adsorbed on the Adsorbent. The products could be flammable or toxic. You should know and follow the safety precautions related to the adsorbed product.

OTHER HANDLING AND STORAGE CONDITIONS: Pouring dry material can cause static electricity build-up. Ground container where electric sparks must be prevented. Keep container sealed tightly to maintain product quality.

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

**GENERAL OFFICES**

IN THE USA:
Union Carbide Corporation
Engineering Products & Processes
39 Old Ridgebury Road
Danbury, CT 06817-0001

IN CANADA:
Union Carbide Canada Limited
Engineering Products & Processes
123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.

MATERIAL SAFETY DATA SHEET

 EP&P 4828-A
 October 1985


An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200, available from OSHA regional or area offices.
 (Essentially similar to U.S. Department of Labor Form OSHA-20 and generally accepted in Canada for information purposes)
 Do Not Duplicate This Form. Request an Original.

PRODUCT IDENTIFICATION

PRODUCT	PSA Adsorbent H-3		
CHEMICAL NAME	Silica Gel	SYNONYMS	Amorphous Silicon Dioxide, Silicic Acid
FORMULA	SiO ₂ plus water (H ₂ SiO ₃)	CHEMICAL FAMILY	Amorphous Silica
		MOLECULAR WEIGHT	Not Applicable

TRADE NAME PSA Adsorbent H-3

HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Materials Safety Data Sheets
 See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1984-1985 ACGIH TLV-TWA (OSHA-PEL)	
Amorphous Silica (7631-86-9)	100	10 mg/m ³ Total dust 5 mg/m ³ Respirable dust	(20 mppcf) (None currently established)

PHYSICAL DATA

BOILING POINT, 760 mm. Hg	Not Applicable	FREEZING POINT	Not Applicable
SPECIFIC GRAVITY (H ₂ O = 1)	2.1	VAPOR PRESSURE AT 20°C	Not Applicable
VAPOR DENSITY (air = 1)	Not Applicable	SOLUBILITY IN WATER, % by wt.	Insoluble
PERCENT VOLATILES BY VOLUME	Not Applicable	EVAPORATION RATE (Butyl Acetate = 1)	Not Applicable

APPEARANCE AND ODOR No odor—depending on product, may appear as a dry white bead, pellet or mesh.

EMERGENCY ACTION

IN CASE OF EMERGENCIES involving this material, further information is available at all times:
 In the USA 304—744-3487 In Canada 514—645-5311
 For routine information contact your local supplier

Union Carbide requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE CORPORATION □ ENGINEERING PRODUCTS & PROCESSES
 UNION CARBIDE CANADA LIMITED □ ENGINEERING PRODUCTS & PROCESSES

Shea 021520

PRODUCT: PSA Adsorbent H-3

EP&P 4828-A
October 1985

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING—No evidence of adverse effects from available information.

SKIN ABSORPTION—No evidence of adverse effects from available information.

INHALATION—May cause irritation of the nose and throat, accompanied by cough and chest discomfort.

SKIN CONTACT—May cause irritation and local reddening.

EYE CONTACT—May cause eye irritation, retina diseases, and choroid atrophy.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: May cause upper respiratory tract irritation with discomfort of nose and throat. If high concentrations are inhaled over a long period of time, lower respiratory tract irritation may result in coughing and production of sputum. Submicron amorphous silica does not cause pneumoconiosis in man.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: A knowledge of the available toxicology information and of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST-AID PROCEDURES:

SWALLOWING—If ingested in large quantities, drink two glasses of water. Induce vomiting if the patient is conscious.

SKIN—Wash with soap and water.

INHALATION—Remove to fresh air. If symptoms persist, see a physician.

EYES—Flush eyes with water for 15 minutes. See a physician, preferably an ophthalmologist; immediately.

NOTES TO PHYSICIAN: This product is a desiccant and generates heat as it adsorbs water. The used product may be contaminated by material of a hazardous nature. Appropriate treatment will be dependent upon the identity of such contaminants.

SAL 000007074

PRODUCT: PSA Adsorbent H-3

EP&P 4828-A
October 1985

CA050

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not Applicable	AUTOIGNITION TEMPERATURE	Not Applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER Not Applicable	UPPER Not Applicable	

EXTINGUISHING MEDIA: Silica Gel is nonflammable. Use media appropriate for surrounding fire. May use foam, CO₂, dry chemical or water.

SPECIAL FIRE FIGHTING PROCEDURES: Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None currently known.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID: Reacts with Hydrogen Fluoride.
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid): Chlorine trifluoride, manganese trifluoride, oxygen difluoride, fluorine.

HAZARDOUS DECOMPOSITION PRODUCTS: Pure product does not burn.

Other decomposition products will come from the retained products of use and would include the decomposition products of the retained product.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Sweep the spill area, collect and place the spilled material in a waste disposal container. Avoid raising dust.

WASTE DISPOSAL METHOD: Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SAL 000007075

PRODUCT: PSA Adsorbent H-3

EP&P 4828-A
October 1985

C 4 0 5 0

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): Where there is excessive dustiness, wear a respirator selected as per OSHA 29 CFR 1910.134 and approved by NIOSH/MSHA.

VENTILATION	LOCAL EXHAUST — As appropriate to minimize dust.
	MECHANICAL (general) — Not Applicable
	SPECIAL — Not Applicable
	OTHER — Not Applicable

PROTECTIVE GLOVES: Use gloves impermeable to dust where prolonged hand contact is possible.

EYE PROTECTION: Safety glasses or goggles selected as per OSHA 29 CFR 1910.133

OTHER PROTECTIVE EQUIPMENT: Eyewash fountain

IX. SPECIAL PRECAUTIONS

CAUTION: Causes eye irritation. Breathing dust may be harmful. May cause skin irritation. Open container slowly to avoid dust. Do not get in eyes. Avoid breathing dust and prolonged contact with skin. Use with adequate ventilation. Keep container closed. Wash thoroughly after handling. Do not ingest.

Pouring dry material can cause static electricity build-up. Ground container where electric sparks must be prevented. Keep container sealed tightly to maintain product quality.

Before using you should know the hazards of the products adsorbed on the Adsorbent. The products could be flammable or toxic. You should know and follow the safety precautions related to the adsorbed product.

OTHER HANDLING AND STORAGE CONDITIONS: pH in 5% slurry is approximately 3.5–8.0 depending on grade.

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



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123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.

MALLINCKRODT

Material Safety Data Sheet

Mallinckrodt, Inc. Science Products Division, P.O. Box M Paris, KY 40361

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Emergency Telephone Number: 314-982-5000

XYLENE

PRODUCT IDENTIFICATION:

Synonyms: Dimethyl benzene, xylol

Formula CAS No.: 1330-20-7

Molecular Weight: 106.17

Chemical Formula: C_8H_{10}

Hazardous Ingredients:

Xylene isomers p,m,o 100-41-4 Ethyl benzene

PRECAUTIONARY MEASURES

DANGER! HARMFUL OR FATAL IF SWALLOWED.

HARMFUL IF INHALED.

VAPOUR HARMFUL. FLAMMABLE! AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION.

Keep away from heat, sparks and flame.

Avoid contact with eyes, skin and clothing.

Keep container closed.

Use with adequate ventilation.

Avoid breathing vapor.

Wash thoroughly after handling.

EMERGENCY/FIRST AID

If irritation develops call a physician. If swallowed, do not induce vomiting. Call a physician immediately. 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: Flammable Liquid

SECTION 1 Physical Data

Appearance: Clear, colorless liquid.

Odor: Characteristic odor.

Solubility: Insoluble in water.

Boiling Point: 137-140°C (279-284°F)

Melting Point: -25°C (-13°F)

Specific Gravity: 0.86

Vapor Density (Air=1): 3.7

Vapor Pressure (mm Hg): 8 @ 20°C (68°F)

Evaporation Rate: (Butylacetate = 1) 0.7

SECTION 2 Fire and Explosion Information

Fire:

Flammable. Flashpoint: 26.2°C (79°F)(TCC)(Minimum)

Autoignition: ca. 463.5°C (867°F).

Flammable limits in air, volume % (1.0-7.0).

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. 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. Vapors can flow along surfaces to distant ignition source and flash back.

SECTION 3 Reactivity Data

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Involvement in a fire causes formation of carbon monoxide and unidentified organic components.

Hazardous Polymerization:

This substance does not polymerize.

Incompatibilities:

Strong oxidizers, heat and sources of ignition.

SECTION 4 Leak/Spill Disposal Information

Ventilate area of leak or spill. Remove all sources of ignition. Handling equipment must be grounded to prevent sparking. Clean-up personnel require protective clothing and respiratory protection from vapors. Dike spill. Contain and recover liquid when possible. **Dispose:** Collect as hazardous waste and atomize in a suitable RCRA approved combustion chamber, or 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 (RQ)(CWA/CTERCLA): 1000 lbs.

Ensure compliance with local, state and federal regulations.

SAL 000007077

NFPA Ratings: Health: 2 Flammability: 3 Reactivity: 0

Effective Date: 02-16-89 Supersedes 07-13-87

XYLENE

653510
AD

SECTION 5 Health Hazard Information**A. EXPOSURE / HEALTH EFFECTS****Inhalation:**

Inhalation of vapors may be irritating to the nose and throat. Inhalation of high concentrations may result in nausea, vomiting, headache, ringing in the ears, and severe breathing difficulties which may be delayed in onset. Substernal pain, cough, and hoarseness are also reported. High vapor concentrations are anesthetic and central nervous system depressants.

Ingestion:

Ingestion causes burning sensation in mouth and stomach, nausea, vomiting and salivation. Minute amounts aspirated into the lungs can produce a severe hemorrhagic pneumonia with severe pulmonary injury or death.

Skin Contact:

Skin contact results in loss of natural oils and often results in a characteristic dermatitis.

Eye Contact:

Vapors can cause irritation. Splashes are toxic to eye tissue. Hemorrhagic inflammatory lesions may develop.

Chronic Exposure:

Chronic inhalation can cause headache, loss of appetite, nervousness and pale skin. Repeated or prolonged skin contact may cause a skin rash. Repeated exposure of the eyes to high concentrations of vapor may cause reversible eye damage.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

B. FIRST AID**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:**Aspiration hazard.**

If swallowed, get immediate medical attention. Vomiting may occur spontaneously, but **DO NOT INDUCE**. If vomiting occurs, keep head below hips to prevent aspiration into lungs.

Skin Exposure:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

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 DATA (RTECS, 1986)

Xylene: Oral rat LD50: 4300

mg/kg Inhalation rat LC50: 5000 ppm/4H Irritation eye rabbit 87 mg mild Skin rabbit 500 mg/24 moderate Mutation data cited. Reproductive data cited. **Ethyl benzenes:** Oral rat LD50: 3500 mg/Kg Skin rabbit LD50: 17800 mg/Kg mutation data cited reproduction data cited.

SECTION 6 Occupational Control Measures**Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL):

100 ppm (TWA) 150 ppm (STEL) xylene

100 ppm (TWA) 125 ppm (STEL) ethyl benzene

-ACGIH Threshold Limit Value (TLV):

100 ppm (TWA) 150 ppm (STEL) xylene

100 ppm (TWA) 125 ppm (STEL) ethyl benzene

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 up to the maximum use concentration specified by the respirator supplier. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn. Use explosion-proof equipment.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls 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 fountains and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from oxidizing materials. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment. **EMPTY CONTAINERS:** Can contain explosive vapors. Do attempt to clean since residue is difficult to remove. Do not pressure wash, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

XYLE1

MALLINCKRODT

Material Safety Data Sheet

Mallinckrodt, Inc. Science Products Division, P.O. Box M Paris, KY 40361

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Emergency Telephone Number: 314-982-5000

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

(Chem.Key: XYLE1)

Hazard Categories for SARA
Section 311/312 Reporting .
Acute Chronic Fire Pressure Reactive

X X X

Product or Components
of Product:

SARA EHS Sect. 302
RQ (lbs.) TPO (lbs.)

SARA Section 313 Chemicals
Name List Chemical Category

CERCLA Sec.103
RQ (lbs.)

RCRA
Sec. 261.33

XYLENE

Xylene (1330-20-7) 83%

Ethylbenzene (100-41-4) 17%

No
No

No
No

Yes
Yes

No
No

1000
1000

U239
No

SAL 000007079

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA Section 302 EHS TPO: 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 Environmental 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

Effective Date: 02-16-89 Supersedes 07-13-87

XYLENE

65351

GS644**MATERIAL SAFETY DATA SHEET**

APPROVED BY U S LABOR DEPT, ESSENTIALLY SIMILAR TO FORM OSHA 174

PRODUCT IDENTITY: 660366 KCI #1

I. SUPPLIER

SOUTHWEST SOLV & CHEM
P O BOX 49065
HOUSTON, TX 77241
PHONE: 713-937-9300
CHEMTREC PHONE: 1-800-424-9300

II. HAZARDOUS INGREDIENTS**Section 313 Supplier Notification**

This product contains the indicated toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-to-Know Act of 1996 & of 40 CFR 372.

MATERIAL	CAS #	PFL (OSHA)	TLV (ACGIH)	SARA TITLE III w/ 4 (HEB. SECTION)
Toluene	108-88-3	100 ppm	100 ppm	21 (311,312,313,RCRA)
Acetone	67-64-1	750 ppm	750 ppm	19 (311,312,313,RCRA)
	CAS #	CEILING	STEL (OSHA & ACGIH)	
Toluene	108-88-3	300 ppm	150 ppm	
Acetone	67-64-1	None Known	1000 ppm	
LOWEST KNOWN L50 (DRL)	108-88-3	3000 mg/kg (Rats)		
LOWEST KNOWN L50 (VAPORS)	108-88-3	5300 ppm (Mice)		
BEST KNOWN L50 (SEMI)	108-88-3	4000 mg/kg (Rabbits)		

HAZARD RATING

HEALTH (H302): 2 HEALTH (H315): 1 FLAMMABILITY: 3 REACTIVITY: 0

A SECTION 313 HAZARDS: Acute Health, Fire

DOT SHIPPING NAME: Compound Cleaning, Liquid (HA1993)
DOT DRAK LABEL: Flammable Liquid

III. PHYSICAL DATA

BOILING RANGE :	57 101 111°C / 135 213 232°F
DENSITY @ 60°F :	
API :	34.2
SPECIFIC GRAVITY (Water=1) :	1.054
POUNDS/GALLON :	7.114
VAPOR PRESSURE (in Hg) @ 20 :	53.2
VAPOR DENSITY (air=1) :	3.0
WATER ABSORPTION :	Appreciable
ACID ABSORPTION (5% H ₂ SO ₄) :	Appreciable
DRY TIME (Ether=1) :	4.1
% VOLATILE BY VOL :	100.0
APPEARANCE :	Liquid, Water-White
ODOR :	Ketone
SOLVENCY PARAMETERS:	
HEB (Hydrogen Bonding) :	21.0
PFB (Polarity) :	41.7
DKB (Dispersion) :	37.3
REFRACTIVE INDEX :	1.469

SAL 000007080

GS644

PRODUCT IDENTITY: 660366 KCI #1

PAGE 2

IV. FIRE & EXPLOSION HAZARDS

LOWER FLAMMABLE LIMIT IN AIR (L by vol): 1.6

FLASH POINT (TEST METHOD): -16°C / 2°F (TCC)

FLAMMABILITY CLASSIFICATION: class 1 B

EXTINGUISHING : NFPA Class B extinguishers (CO₂ or foam)
MEDIA : for class 1 B liquid fires.SPECIAL FIRE : Water spray may be ineffective on fire but can protect fire fighters & cool closed containers.
FIGHTING : Use fog nozzles if water is used. Do not enter confined fire-space without full
PROCEDURES : bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots).
: Use NIOSH approved positive pressure self-contained breathing apparatus.HARMFUL : EXTREMELY FLAMMABLE!! Keep container tightly closed. Isolate from
EXPLOSION : oxidizers, heat, sparks, electric equipment & open flame.
AND FIRE : Closed containers may explode if exposed to extreme heat.
PROCEDURES : Applying to hot surfaces requires special precautions.
: Empty container very hazardous! Continue all label precautions!**V. HEALTH EFFECT DATA**

THRESHOLD LIMIT VALUE: 125 ppm (Evaporated Blend)

PREVENTION : Use only with adequate ventilation.
OF OVER- : Avoid breathing of vapor or spray mist.
EXPOSURE : Avoid contact with skin & eyes.ORGANIC EFFECTS: INHALING: Anesthetic. Irritates respiratory tract.
OF ACUTE : Can cause serious nervous system depression.
OVER- : Can cause damage to kidneys, blood, nerves, liver & lungs.
EXPOSURE : EYE & SKIN CONTACT: Primary irritation to skin, dermatitis, dermatitis.
: Primary irritation to eyes, redness, tearing, blurred vision.
: Absorption thru skin increases exposure.
: SWALLOWING: Harmful or fatal if swallowed.
: Swallowing can cause abdominal irritation, nausea, vomiting and diarrhea.ORGANIC EFFECTS: Vapor harmful. Can cause damage to kidneys, blood, nerves, liver & lungs.
OF CHRONIC : EYE & SKIN CONTACT: Liquor can cause eye irritation.
OVER- : Wash thoroughly after handling.
EXPOSURE :CANCER HAZARD : This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA or ACGIH,
: as of this date, greater or equal to 0.1%.
: This product may contain less than 100 ppm of Benzene.
: Not considered hazardous in such low concentrations.CONDITIONS : Persons with severe skin, liver or kidney problems should avoid use.
AGGRAVATED :EMERGENCY & : In case of contact with skin, flush with plenty of water. For eyes,
FIRST AID : flush with plenty of water for 15 minutes & get medical attention.
PROCEDURES : After high vapor exposure, remove to fresh air. If breathing is difficult
: give oxygen. If breathing has stopped give artificial respiration.
: If swallowed, CALL A PHYSICIAN IMMEDIATELY!
: Never give anything by mouth to an unconscious person.

SAL 000007081

GS644

PRODUCT IDENTITY: 660366 KCI #1

PAGE 3

VI. REACTIVITY DATA

STABILITY : Stable

CONDITIONS TO AVOID: Isolate from oxidizers, heat, sparks, electric equipment & open flame.

MATERIALS TO AVOID : Isolate from strong oxidizers such as permanganates, chromates & peroxides.

HAZARDOUS : Carbon Monoxide, Carbon Dioxide from burning.

DECOMPOSITION:
PRODUCTS :**VII. SAFE HANDLING & USE PRECAUTIONS**SPILL OR LEAK : Stop spill at source, Dike area & contain, Pump spilled liquid & put contaminated seal
PROCEDURES : in DOT approved containers for disposal. Label immediately.
: Clean up remainder with absorbent materials.WASTE DISPOSAL : Dispose of waste by legal methods complying with local, state & federal regulations.
METHOD : If questions exist, contact the appropriate agencies.OTHER : Vapors may ignite explosively & spread long distances. Prevent vapor buildup.
PRECAUTIONS : Put out pilot lights & turn off
: Ignition sources during use & until all vapors are gone.
: Do not smoke about 100/125'P.
: Store large amounts in structures made for OSHA Class I B liquids.
: Avoid free fall of liquid.
: Ground containers when transferring. Do not flame cut, saw, drill, braze or weld.
: Empty container very hazardous! Continue all label precautions!**VIII. CONTROL MEASURES**RESPIRATORY PROTECTION: Ventilate to keep air below 65 ppm. If over TLV, in accordance with 29 CFR 1910.134,
(SPECIFY TYPE) : Use NIOSH approved positive-pressure self-contained breathing apparatus.
: Consult Safety Equipment Supplier, use explosion-proof equipment.VENTILATION : LOCAL EXHAUST : Necessary MECHANISM (GENERAL) : Acceptable
: SPECIAL : None OTHER : NonePROTECTIVE : Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.
CLOTHING: Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.**NOTICE**

SOUTHWEST SOLV & CHEM disclaims all expressed or implied warranties of merchantability or fitness for a particular purpose, with respect to the product or information provided herein.

All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own working conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

DATE : 10/87

SAL 000007082

MATERIAL SAFETY DATA SHEET

Mobay Corporation
a BASF COMPANY

Bayer



DIVISION ADDRESS

MOBAY CORPORATION
AGRICULTURAL CHEMICALS DIVISION
P.O. Box 4913, Hawthorn Road
Kansas City, Missouri 64120

ISSUE DATE
SUPERSEDES

06/30/89
02/18/89

TRANSPORTATION EMERGENCY CALL CHEMTREC
TELEPHONE NO 800 424 9300 DISTRICT OF COLUMBIA 202 462 7818

MOBAY NON-TRANSPORTATION EMERGENCY NO
(816) 242-2582

I. PRODUCT IDENTIFICATION

PRODUCT NAME..... TEMPO 20% Wettable Powder
PRODUCT CODE NUMBER..... Formula No. 021642
CHEMICAL FAMILY..... Pyrethroid Insecticide
CHEMICAL NAME..... Cyano(4-fluoro-3-phenoxyphenyl)methyl
3-(2,2-dichloroethenyl)-2,2-dimethyl-
cyclopropanecarboxylate
SYNONYMS..... Cyfluthrin
T.S.C.A STATUS..... Registered under FIFRA, therefore, excluded from
TSCA regulation.

OSHA HAZARD COMMUNICATION
STATUS..... This product is hazardous under the criteria
of the Federal OSHA Hazard Communication
Standard 29 CFR 1910.1200.

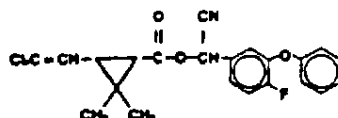
SARA TITLE III DATA..... Section 311 & 312 EPA Hazard Categories:

X Immediate Health Hazard _ Fire Hazard
_ Delayed Health Hazard _ Reactive Hazard
_ Sudden Pressure Release Hazard

NFPA 704M RATINGS..... 0-Insignificant 1-Slight 2-Moderate
3-High 4-Extreme

2 Health 0 Flammability
0 Other 0 Reactivity

STRUCTURE.....



II. HAZARDOUS INGREDIENTS

COMPONENTS:	%	OSHA-PEL	ACGIH-TLV
TEMPO CAS #68359-37-5	20	Not Established	Not Established
Ingredient 1476 (Trade Secret)	5-10	Not Established	Not Established
Ingredient 1968 (Trade Secret)	1-5	Not Established	Not Established
Ingredient 1878 (Trade Secret)	1-5	Not Established	Not Established

Product Code: 021642
Page 1 of 2

III. PHYSICAL DATA

APPEARANCE..... Powder
COLOR..... Tan
ODOR..... Slightly aromatic
ODOR THRESHOLD..... Not Established
MOLECULAR WEIGHT..... 434.2 (for TEMPO)
MELT POINT/FREEZE POINT..... Not Applicable
BOILING POINT..... Not Applicable
VAPOR PRESSURE..... 3.3 x 10⁻⁶ mm Hg @ 20°C (for TEMPO)
VAPOR DENSITY (AIR=1)..... Not Known
pH..... 9.2 (1% Solution)
SPECIFIC Gravity..... Not Applicable
BULK DENSITY..... Approximately 30 lbs/cu ft
SOLUBILITY IN WATER..... 1.3-2.6 ppb (for TEMPO)
% VOLATILE BY VOLUME..... Not Established

IV. FIRE & EXPLOSION DATA

FLASH POINT *F(*C)..... Not Applicable
FLAMMABLE LIMITS -
Lel..... Not Applicable
Uel..... Not Applicable
EXTINGUISHING MEDIA..... Water Spray.
SPECIAL FIRE FIGHTING PROCEDURES/UNUSUAL FIRE OR EXPLOSION HAZARDS: If
involved in a fire, wear self-contained breathing apparatus and stay up wind.

V. HUMAN HEALTH DATA

PRIMARY ROUTE(S) OF ENTRY.....

Dermal contact and inhalation of the product are the primary routes of entry. Inhalation of aerosol during spray application of the product as part of its end use is another potential route of entry.

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE..... The active ingredient in this product has low toxicity and no specific systemic symptoms of overexposure are known to occur in humans. Moderate eye or skin irritation may occur from contact with the powder or spray mixture. Paresthesia (a tingling or burning sensation on the surface of the skin) may also result from skin contact. This is a frequently reported symptom of overexposure to synthetic pyrethroids and normally subsides without treatment within 24 hours. Allergic skin reactions may also occur in some susceptible individuals. Mucous membrane irritation involving the nose, throat and upper respiratory tract may occur from inhalation of aerosols during end use of the product such as spray application.

Product Code: 021642
Page 2 of 2

SAL 000007083

65648

CHRONIC.....: Based on animal studies no adverse effects or symptoms would be expected from chronic exposure to the active ingredient in this product during normal use.

MEDICAL CONDITIONS
AGGRAVATED BY EXPOSURE.: No specific medical conditions are known which may be aggravated by exposure to the active ingredient in this product. Although, as with all materials which can cause upper respiratory tract irritation, persons with a history of asthma, emphysema, of hyperreactive airways disease may be more susceptible to overexposure.

CARCINOGENICITY: NTP: Not Listed
IARC: Not Listed
OSHA: Not Listed

EXPOSURE LIMITS:
OSHA PEL.....: Not Established
ACGIH TLV.....: Not Established

VI. EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT.....: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.

SKIN CONTACT.....: Wash skin immediately with soap and warm water. Get medical attention if irritation persists.

INGESTION.....: If ingestion is suspected, call a physician or poison control center. If medical assistance cannot be given immediately, induce vomiting and get to a hospital. To induce vomiting, administer 1 or 2 glasses of water and stick finger down throat. Repeat until vomitus is clear.

Do not attempt to give anything by mouth to an unconscious or convulsing person.

INHALATION.....: If a person is overcome by excessive exposures to dusts or aerosols of this material, remove to fresh air or uncontaminated area. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention as soon as possible.

NOTE TO PHYSICIAN.....: No specific antidote is available. Treat poisoning victims symptomatically.

Product Code: 021642
Page 3 of 2

VII. EMPLOYEE PROTECTION RECOMMENDATIONS

EYE PROTECTION.....: Goggles should be used when needed to prevent dust or spray mixture from getting into the eyes.

SKIN PROTECTION.....: Avoid skin contact. Use chemical-resistant gloves and additional protective clothing when needed to prevent dermal exposure.

RESPIRATORY PROTECTION...: Under normal handling conditions no respiratory protection is needed. However, if needed to prevent respiratory irritation, a respirator approved for dusts and mist by NIOSH may be used.

VENTILATION.....: Control airborne concentrations of TYCOR 50 DF through the use of general and local exhaust ventilation where needed.

OTHER.....: Clean water should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of the product. Follow all label instructions. Launder clothing after use. Wash thoroughly after handling.

VIII. REACTIVITY DATA

STABILITY.....: Stable under normal use conditions

POLYMERIZATION.....: Will not occur

INCOMPATIBILITY
(MATERIALS TO AVOID)....: Alkaline media

HAZARDOUS DECOMPOSITION
PRODUCTS.....: Not Established

IX. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: Isolate area. Avoid breathing dusts and skin contact. Use recommended protective equipment while carefully sweeping up and place in covered container for re-use if possible. Scrub contaminated area with soap and water. Repeat and rinse with water. Prevent contamination of streams, sewers, or other waterways.

CERCLA (SUPERFUND) REPORTABLE QUANTITY: No components are listed.

WASTE DISPOSAL METHOD: Follow all federal, state and local regulations. Bury material in EPA-approved landfill or but in an incinerator approved for pesticide destruction. Empty containers must be handled with care due to product residue.

RCRA STATUS: This product is not a hazardous waste under RCRA.

Product Code: 021642
Page 4 of 2

SAL 000007084

GS 643

SUPERFUND AMENDMENT AND REAUTHORIZATION ACT (SARA), TITLE III:

Section 302 - Extremely Hazardous Substances:

No Components Listed

Section 313 - Toxic Chemicals:

No Components Listed

X. SPECIAL PRECAUTIONS & STORAGE DATA

STORAGE TEMPERATURE

(MIN./MAX.):..... None/30-day average not to exceed 100°F.

SPECIAL SENSITIVITY

(HEAT, LIGHT, MOISTURE): Heat, moisture

PRECAUTIONS TO BE TAKEN

IN HANDLING AND STORING: Store in a cool, dry area designated specifically for pesticides. Do not store near any material intended for use or consumption by humans or animals.

XI. SHIPPING DATA

D.O.T. SHIPPING NAME..... Not Regulated

TECHNICAL SHIPPING NAME... Cyfluthrin

D.O.T. HAZARD

CLASSIFICATION..... Not Applicable

UN/NA NO..... Not Applicable

REPORTABLE QUANTITY..... None

D.O.T. LABELS REQUIRED.... None

D.O.T. PLACARDS..... None

FRT. CLASS BULK..... Insecticide, Agricultural, N.O.I., O/T Liquid

FRT. CLASS PKG..... Insecticide, Agricultural, N.O.I., O/T Liquid

XII. ANIMAL TOXICITY

ORAL, LD50..... Male Rats (fasted): 3084 mg/kg
Female Rats (fasted): 1733 mg/kg

DERMAL, LD50..... Male and female Rabbits (24 hrs.): >2000 mg/kg

INHALATION, LC50..... Male and Female Rats (4 hrs.): >1.180 mg/L
(analytical); >12.052 mg/L (nominal). Male and
Female Rats (1 hr.): >24 mg/L (extrapolated from
nominal value).

EYE EFFECTS..... Rabbit (no wash) = Transient primary eye irritant
with all effects being reversible by Day 7 after
application.

Product Code: 021642
Page 5 of 2

SKIN EFFECTS..... Rabbits (4 hrs.) - Mild primary dermal irritant.

SENSITIZATION..... Male Guinea Pig (Buehler) - no evidence of inducing
delayed dermal sensitization.

SUBCHRONIC/CHRONIC TOXICITY

No studies have been conducted on this product as formulated.

In a subchronic inhalation toxicity study with the active ingredient, rats were
exposed 6 hours per day for 5 days per week for 13 weeks. The rats which were
exposed to 0.09 mg active ingredient/m³ air tolerated the treatment without ill
effect.

A 3-month feeding study indicated that rats can tolerate dietary concentrations
up to and including 100 ppm technical material without ill effects.

In chronic feeding studies on the active ingredient, NOELs (no-effect levels)
of 200 ppm, and 160 ppm were obtained for mice, rats and dogs, respectively.

OTHER

Carcinogenicity..... The active ingredient was tested for carcinogenicity
in feeding studies using rats and mice. Dietary levels up to and including 450 ppm
in rats and 800 ppm in mice were employed in these studies. These studies revealed
no evidence of carcinogenic potential for the active ingredient.

Teratogenicity..... Gavage studies with the active ingredient using rats have
shown maternal toxicity at 10 mg/kg body weight, but no embryotoxicity or
teratogenicity at levels up to and including 30 mg/kg body weight. When rabbits
were subjected to the same testing, maternal toxicity was evidenced at 15 mg/kg, but
no embryotoxic or teratogenic effects were seen at levels up to and including
45mg/kg body weights.

Reproduction..... A reproduction study in which rats were fed the active
ingredient in their diet revealed no detrimental effects on reproduction at a level
of 50 ppm. Levels of 150 ppm and above produced overt toxicity in the parental
animals. At these toxic levels, effects including reduced litter size and reduced
body weights in pups, were observed.

Neurotoxicity..... Studies which have been done utilizing the active ingredient
in hens have indicated that at extremely high dose levels (5000 mg/kg), very minimal
to minimal nerve damage occurs. When rats were exposed to 40 or 80 mg AI/kg/day for
14 days and then observed for 3 months, minimal nerve effects were seen immediately
after dosing. At 3 months, no effects were observed. Studies which have been done
that are more relevant to field exposure (dermal and inhalation exposure) were
uniformly negative.

Mutagenicity..... In vitro and in vivo mutagenesis data exist on the
technical material, the vast majority of which are negative.

Product Code: 021642
Page 6 of 2

AQUATIC/AVIAN TOXICITY

Data exist only on the active ingredient. They include:

LC50 - 96 hr. (static).....	1.5 ppb (Bluegill)
LC50 - 96 hr. (static).....	2.914 ppb (Rainbow Trout)
LC50 - 48 hr. (static).....	0.14 ppb (<u>Daphnia magna</u>)
8-day Dietary LC50 (Bobwhite Quail)...	>2000 ppm
8-day Dietary LC (Mallard Ducks).....	>5000 ppm
Oral LD50 (Bobwhite Quail).....	>5000 mg/kg

XIII. DOCUMENTATION

REASON FOR ISSUE.....: To add SARA Title III Data and NFPA 704M Data and
to revise the Vapor Pressure Value
APPROVED BY.....: William J. Brinkman
TITLE.....: Industrial Hygiene Manager

SAL 000007086

MATERIAL SAFETY DATA SHEET

ICI Americas Inc.

001206

Wilmington, Delaware 19897

Phone (302) 575-3000 (24 hours)

Form No.: 4104h(C)

Date: 03/12/86

SECTION 1 NAME & HAZARD SUMMARY

Material name:

~~TALON~~ Rodenticide Bait Pack

G S 6 3 9

Hazard summary (as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200):

Physical hazards: None

Health hazards: Harmful (The active ingredient is designed to cause bleeding after repeated ingestion)

Read the entire MSDS for a more thorough evaluation of the hazards.

SECTION 2 INGREDIENTS

Brodifacoum (CAS 56073-10-0)

Cereal formulation

%	TLV (ACGIH)
0.005	Not listed

Ingredients not precisely identified are proprietary or nonhazardous. All ingredients appear on the EPA TSCA Inventory. Values are not product specifications. gt = greater than, lt = less than, ca = approximately

SECTION 3 PHYSICAL DATA

Boiling point: 228-230°C (Brodifacoum)

Vapor pressure (mmHg at 20°C): Negligible

or density (air = 1): Not applicable

Solubility in water: Insoluble

pH: No data

Bulk density: 38-42 lbs./cu.ft.

% Volatile by volume: Negligible

Appearance and odor: Green pellets with faint odor

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

Flash point (and method): Not applicable

Autoignition temp.: No data

Flammable limits (STP): Not applicable

Extinguishing media:

Water fog, foam, carbon dioxide, dry chemical, halon 1211.

Special fire fighting protective equipment:

Self-contained breathing apparatus with full facepiece and protective clothing.

Unusual fire and explosion hazards:

None known.

SECTION 5 REACTIVITY DATA

Stability:

Stable under normal conditions.

SAL 000007087

GS 639

MATERIAL SAFETY DATA SHEET (continued)

TALON-6

SECTION 5 REACTIVITY DATA (continued)

Incompatibility (materials to avoid):
None known.

Hazardous decomposition products:
Combustion products: carbon dioxide, carbon monoxide.

Hazardous polymerization:
Will not occur.

SECTION 6 HEALTH HAZARD ASSESSMENT

General:

No toxicity data are available on this preparation; information on its active components is used for the health hazard assessment.

Ingestion:

The acute oral LD₅₀ in rat is probably above 5 g/kg. Relative to other materials, a single dose of this product is practically nontoxic by ingestion. Hodge, H.C. and Sterner, J.H., American Industrial Hygiene Association Quarterly, 10:4, 93, Dec. 1949.

Eye contact:

No irritation is likely to develop following contact with human eyes.

Skin contact:

No irritation is likely to develop following contact with human skin.

Skin absorption:

Rat and rabbit acute dermal LD₅₀ of 0.25% liquid concentrate is above 5 g/kg. Systemically toxic concentrations are unlikely to be absorbed through the skin in man.

Inhalation:

No toxic effects are known to be associated with inhalation of dust from this material.

Other effects of overexposure:

Effects are those of anticoagulant overdosage: reduced blood clotting ability with spontaneous bleeding in various body organs. Body accumulation is likely to result from repeated exposures to Brodifacoum since its half-life is estimated to be 120 days.

First aid procedures:

Skin: Wash material off the skin with copious amounts of soap and water. If redness, itching or a burning sensation develops, get medical attention.
Eyes: Immediately flush with copious amounts of water for at least 15 minutes. If redness, itching or a burning sensation develops, have eyes examined and treated by medical personnel.

---continued---

A. ARIAL SAFETY DATA SHEET (continued)

TALON®-G

SECTION 6 HEALTH HAZARD ASSESSMENT (continued)

First aid procedures (continued):

Ingestion: Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. (Never give anything by mouth to an unconscious person.)

Inhalation: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel.

Note to Physician: Vitamin K₁ is antidotal at doses of 10-20 mg combined with blood (or plasma) transfusions as cases of severe hemorrhage. Treatment should be continued until prothrombin times have stabilized at normal levels. Half life of brodifacoum is estimated to be 120 days in animal work.

SECTION 7 SPILL OR LEAK PROCEDURES

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

Sweep up and recover or mix material with moist absorbent and shovel into waste container.

Disposal method:

This material is toxic to fish and wildlife. Do not contaminate waterways by cleaning of equipment or by disposal of wastes. Untreated effluent should not be discharged where it will drain into lakes, streams, or ponds. Discarded product is not a hazardous waste under RCRA, 40 CFR 261.

Container disposal:

Puncture or otherwise destroy empty container before disposal.

SECTION 8 SPECIAL PROTECTION INFORMATION

TLV® or suggested control value:

No TLV assigned. Minimize exposure in accordance with good hygiene practice. ICIA controls exposures to brodifacoum (active ingredient) to below 2 ug/m³.

Ventilation:

As needed to control exposures.

Respiratory protection (specify type):

If needed, use MSHA-NIOSH approved respirator for pesticides.

Protective clothing:

Impervious gloves and apron. PVC has been shown to be impervious to brodifacoum.

Eye protection:

Safety glasses with side shields.

Other protective equipment:

Eyewash station in work area.

68689

MATERIAL SAFETY DATA SHEET (continued)

TALON-6

SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS

Precautions to be taken in handling or storing:

Store in a cool dry area away from products with strong odors. Keep in an area suitable for pesticide storage. Do not store near feed, food, or within the reach of children or pets. Prevent accumulation of dust. Prevent skin contact promote good personal hygiene.

The information herein is given in good faith
but no warranty, expressed or implied, is made.

Rev. of M3508-A

SAL 000007090

MATERIAL SAFETY DATA SHEET

002116

ICI Americas Inc.

Wilmington, Delaware 19897

Phone (302) 575-3000 (24 hours)

Form No.: 4696h(A)

Date: 07/25/86

SECTION 1 NAME & HAZARD SUMMARY

Material name:

GS 640

Hazard summary (as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200):

Physical hazards: None

Health hazards: Inhalation (TLV), irritant (skin, eye), skin sensitizer, harmful (respiratory)

Read the entire MSDS for a more thorough evaluation of the hazards.

SECTION 2 INGREDIENTS

	%	TLV (ACGIH)
Cypermethrin (CAS 52315-07-8)	40	Not listed
Calcium silicate (CAS 1344-95-2)		10 mg/m ³
Amorphous silica (CAS 7631-86-9)		10 mg/m ³
Other ingredients		Not listed

Ingredients not precisely identified are proprietary or nonhazardous. This material is exempt from TSCA registration. Values are not product specifications. gt = greater than, lt = less than, ca = approximately

SECTION 3 PHYSICAL DATA

Boiling point: Not applicable

Vapor pressure (mmHg at 20°C): No data

Vapor density (air = 1): No data

Solubility in water: Dispersible

pH: 8.6

Specific gravity: No data

% Volatile by volume: Negligible

Appearance and odor: Off-white, slightly aromatic powder

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

Flash point (and method): Not applicable

Autoignition temp.: No data

Flammable limits (STP): Not applicable

SAL 000007091

Extinguishing media:

Water fog, foam, carbon dioxide, dry chemical, halon 1211.

Special fire fighting protective equipment:

Self-contained breathing apparatus with full facepiece and protective clothing.

Unusual fire and explosion hazards:

None known

SECTION 5 REACTIVITY DATA

Stability:

Stable under normal conditions.

GS640

MATERIAL SAFETY DATA SHEET (continued)

DEMON® 40 WP

SECTION 5 REACTIVITY DATA (continued)

Incompatibility (materials to avoid):

Oxidizing agents

Hazardous decomposition products:

Combustion products: Carbon dioxide, carbon monoxide, nitrogen oxides, ammonia, halogen, halogen acids, possible trace amounts of carbonyl halide.

Hazardous polymerization:

Will not occur.

SECTION 6 HEALTH HAZARD ASSESSMENT

General:

The health hazard assessment is based on acute toxicity screening studies.

Ingestion:

The acute oral LD₅₀ in rat is 1.8 g/kg. Relative to other materials, a single dose of this product is slightly toxic by ingestion, Hodge, H.C. and Sterner, J.H., American Industrial Hygiene Association Quarterly, 10:4, 93, Dec. 1949.

Eye contact:

This material is moderately irritating in a rabbit eye irritation test. It will probably irritate human eyes.

Skin contact:

This material is mildly irritating in a rabbit dermal irritation test. Irritation will probably develop following repeated and/or prolonged contact with human skin. This material is a skin sensitizer in animal testing. Dermatitis and skin sensitization can develop after repeated and/or prolonged contact with human skin.

Skin absorption:

The acute dermal LD₅₀ in rabbit is above 2.0 g/kg. Systemically toxic concentrations are unlikely to be absorbed through the skin in man.

Inhalation:

No toxic effects are known to be associated with inhalation of dust from this material.

Other effects of overexposure:

Nausea, vomiting with colicky pain, tenesmus, diarrhea, convulsions, unconsciousness, and respiratory failure can develop following ingestion of this product.

SAL 000007092

SECTION 6 HEALTH HAZARD ASSESSMENT (continued)

First aid procedures:

Skin: Wash material off the skin with copious amounts of soap and water. If redness, itching or a burning sensation develops, get medical attention. Wash contaminated clothing and decontaminate footwear before reuse.

Eyes: Immediately flush with copious amounts of water for at least 15 minutes. If redness, itching or a burning sensation develops, have eyes examined and treated by medical personnel.

Ingestion: Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. (Never give anything by mouth to an unconscious person.)

Inhalation: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel.

SECTION 7 SPILL OR LEAK PROCEDURES

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

Wear skin, eye and respiratory protection during cleanup. Keep out of sewers and drains. Sweep up and recover or mix material with moist absorbent and shovel into waste container.

Disposal method:

This material is extremely toxic to fish. Do not contaminate waterways by cleaning of equipment or by disposal of wastes. Untreated effluent should not be discharged where it will drain into lakes, streams or ponds.

Container disposal:

Empty container retains product residue. Observe all hazard precautions. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product. Remove all hazardous residue from container using appropriate solvents (e.g., triple rinsing). Then offer for recycling/reconditioning or puncture or otherwise destroy empty container and dispose of in facility permitted for nonhazardous waste.

SECTION 8 SPECIAL PROTECTION INFORMATION

TLV® or suggested control value:

No TLV assigned. Minimize exposure in accordance with good hygiene practice.

ICI operates its facilities such that employee exposure to this material is kept below 0.5 mg/m³ 8-hour TWA.

Ventilation:

Use local exhaust to keep exposures to a minimum.

Respiratory protection (specify type):

If needed, use MSHA-NIOSH approved respirator for pesticides.

Protective clothing:

Impervious gloves. Depending upon conditions of use, additional protection may be required such as apron, arm covers or full body suit.

Eye protection:

Chemical tight goggles.

GS 640

MATERIAL SAFETY DATA SHEET (continued)

DEMON 40 WP

SECTION 8 SPECIAL PROTECTION INFORMATION (continued)

Other protective equipment:

Eyewash station and safety shower in work area.

SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS

Precautions to be taken in handling or storing:

Prevent skin and eye contact. Observe TLV limitations. A sensitized individual should not be exposed to the product which caused the sensitization. Do not store near feed or food.

The information herein is given in good faith
but no warranty, expressed or implied, is made.

SAL 000007094

MATERIAL SAFETY DATA SHEET

PAGE 1

BAIT BLOCKS (PEANUT BUTTER)

REVISION OF: 4-27-88

GS641

SHIP TO:

45700174
MCKENZIE PEST CONTROL
717 GULF STREETUPPER NO: 45700174
PROD NO: 074-5742

LAKE CHARLES

LA 70601-8615

VAN LINTERS & ROGERS INC. 1800 NORTON BLDG. SEATTLE, WA 98104-1564

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC
(800) 424-9300.

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN LINTERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: BAION'S BAIT BLOCKS
GEN. NAME/SYNONYMS: DIPHACINONE (2-
DIPHENYLACETYL 1,3-DIINDANIDIONE)CAS NO.: UNASSIGNED
UPPER CODE: F4501FORMULA: MIXTURE
HAZ. RATING (HFW 704 CRITERIA)
HEALTH: 1
FIRE: 0
REACTIVITY: 0
SPECIAL: NONEDATE ISSUED: 03/88
SUPERCEDES: NONE
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	Z	EXPOSURE LIMITS, PER			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
DIPHACINONE	42721-99-3	0.0052	NONE	NONE	NONE	NONE
INERTS		BALANCE	NONE	NONE	NONE	NONE

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: NO DATA FOUND	VAPOR PRESSURE, MM HG/20 DEG C: NO DATA FOUND
MELTING POINT, DEG F: NO DATA FOUND	VAPOR DENSITY (AIR=1): NO DATA FOUND
DENSITY, GRAVITY (WATER=1): NO DATA FOUND	WATER SOLUBILITY, G: INADEQUATE
WATER AND OILS: NO DATA FOUND	EVAPORATION RATE (BUOIL ACETATE=1): NO DATA FOUND
WATER SOLUBILITY IN FOODS, WITH FISH, APPLE, POTATO, POTATO, CARROTS, OILS	

-----FIRST AID MEASURES-----

INHALATION: MOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

SKIN AND EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER LIDDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: IMMEDIATELY DASH SWALLOW WITH LOTS OF SOAP AND WATER.

FORM: 65076506 14:42:02 17 NOV 1988 CUST: 45700174 INVOICE: 457007666

SAL 000007095

1 GS641 MATERIAL SAFETY DATA SHEET

PG 2

TOP 5 BAIT BLOCKS (PLANT BUTTER)

REVISION OF: 04-27-88

1. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

2. SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON. ORAL AND INTRAVENOUS ADMINISTRATION OF VITAMIN K (OIL SOLUBLE) AND BLOOD TRANSFUSION MAY ALSO BE NECESSARY.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SWALLOWED

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: NONE CURRENTLY KNOWN.

SKIN CONTACT: NONE CURRENTLY KNOWN.

SWALLOWED: NORMAL REACTION TO OVERDOSE OF ANTICOAGULANT. INITIAL SYMPTOMS MAY INCLUDE BACK PAIN, ABDOMINAL PAIN, VOMITING, ATTACKS OF NOSE BLEED AND GUM BLEEDING, PALLOR AND WEAKNESS.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

LD50: RAT LD50 = 100 G/KG (BAIT BLOCK;
2.8 G/KG (PURE DIPHACINONE)

EXAMPLE: NO DATA FOUND

INHALATION: NO DATA FOUND

ACRIDITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

GEN DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING DUST EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE DUSTS, WEAR A HIGH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR WITH PARTICULATE FILTERS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE AVAILABLE AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NONE

FLAMMABLE LIMITS IN AIR, %

METHOD USED: NONE

LOWER: NONE UPPER: NONE

EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL

HAZARD

SAL 000007096

FORM: 001-00001 11-17-1981 BY: HWM 1981 CUST: 4010-117 INVOICE: 4010-117

A N'S BAIT BLOCKS (PEANUT BUTTER)

REVISION OF: 04-27-88

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FINAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE

POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE

MATERIALS TO AVOID: KEEP WATER AND MOIST AIR OUT OF THE CONTAINER.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE OR CARBON DIOXIDE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED WITH PARTICULATE FILTERS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS, SWEEP UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, SHOVEL INTO DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP BAGS OR FIBER DRUMS DRY AT ALL TIMES. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS ONLY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT DOUGLAS FISHER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (206) 447-5511

-----NOTICE-----

VAN WATERS & ROGERS INC. ("VWR") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VWR MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VWR'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICA-

4031 **GS641** MATERIAL SAFETY DATA SHEET

PG 4

BAITON'S BAIT BLOCKS (PEANUT BUTTER)

REVISION OF: 04-27-88

ION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS
INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

**** E N D O F M S D S ****

PROD: 05086526 14:42:02 17 NOV 1988 CUST: 45700174 INVOICE: 459507866

SAL 000007098

168
AEROSOL CB PURGE CB-80

MATERIAL SAFETY DATA SHEET

PG 1
REVISION OF: 02-14-89

65642

SHIP TO:

45700174
MCKENZIE PEST CONTROL
717 GULF STREET

ORDER NO: 450503490
PROD NO: 05045866

LAKE CHARLES LA 70601-8635

VAN WATERS & ROGERS INC. 1600 NORTON BLDG. SEATTLE, WA 98104-1564

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC
(800) 424-9300.

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: VWAR CB-80 AEROSOL
INSECT KILLER EPA REG. NO. 9444-96-350

CAS NO.: UNASSIGNED

COMMON NAMES/SYNONYMS: NONE

VWAR CODE: P4469

FORMULA: MIXTURE
HAZARD RATING (NFPA 704 CRITERIA)
HEALTH: 1
FIRE: 0
REACTIVITY: 0
SPECIAL: NONE

DATE ISSUED: 12/88
SUPERCEDES: 03/89
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, MG/M3			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
PYRETHRINS	800-34-7	UNK	5	5	NONE	TOXIC
ODORLESS MINERAL	64742-48-9	UNK	500	100	NONE	OSHA/ACGIH LIST
PROPANE	74-98-6	UNK	NONE	1000	NONE	FLAMMABLE

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: NOT APPLICABLE VAPOR PRESSURE, MM HG/20 DEG C: 33&2
MELTING POINT, DEG F: NOT APPLICABLE VAPOR DENSITY (AIR=1): NOT APPLICABLE
SPECIFIC GRAVITY (WATER=1): 1.20 WATER SOLUBILITY, %: INSOLUBLE
APPEARANCE AND ODOR: EVAPORATION RATE (BUTYL ACETATE=1): NO DATA
COPY DRY FOG WITH CHARACTERISTIC PYRETHRIN ODOR IN AEROSOL DISPENSER FOUND
SAL 000007099

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.

PROD: 05045866 10.03:42 27 JUN 1989 COST 45700174 INVOICE: 450503490

PROSOL CB PURGE CB-80

REVISION OF: 02-14-89

GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: PRODUCT IS A GAS OR SPRAY AND CANNOT BE SWALLOWED.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: INHALATION

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: MAY CAUSE HEADACHE, NAUSEA, VOMITING.

EYE CONTACT: NONE CURRENTLY KNOWN.

SKIN CONTACT: MAY CAUSE DERMATITIS

SWALLOWED: PRODUCT IS A GAS OR SPRAY AND CANNOT BE SWALLOWED.

CHRONIC EFFECTS OF EXPOSURE: MAY CAUSE CARBOXYHEMOGLOBINEMIA.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

NO DATA FOUND FOR THE PRODUCT HOWEVER, FOR ITS COMPONENTS:

	ORAL RAT LD50	DERMAL RABBIT LD50	INHALATION RAT LC50
PYRETHRINS	200 MG/KG	NO DATA FOUND	NO DATA FOUND
ODORLESS MINERAL SPIRITS	>25 ML/KG	>5 ML/KG	592 PPM/4 HRS (NO DEATH)
METHYLENE CHLORIDE	2.52 G/KG	>4.64 G/KG	14,400 PPM/7 HRS
PROPANE	-----NO DATA FOUND-----		

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: METHYLENE CHLORIDE HAS BEEN SHOWN TO INCREASE THE RATE OF SPONTANEOUSLY OCCURRING MALIGNANT TUMORS IN ONE STRAIN OF LABORATORY A HAZARD ALERT ISSUED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES REPORTS RECENT STUDIES SHOW THAT METHYLENE CHLORIDE CAUSES CANCER IN LABORATORY ANIMALS. THE IARC CARCINOGENIC DETERMINATION IS ANIMAL INDEFINITE. AN EPIDEMIOLOGICAL STUDY OF MALE HUMANS CONTINUALLY EXPOSED TO ESTIMATED TWA CONCENTRATIONS OF 30-125 PPM FOR UP TO 30 YEARS INDICATED NO INCREASE IN MORTALITY COMPARED TO THE GENERAL MALE HUMAN POPULATION.

IN ANIMAL STUDIES, METHYLENE CHLORIDE HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION. EXPOSURES HAVING NO EFFECT ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS. METHYLENE CHLORIDE DID NOT CAUSE BIRTH DEFECTS IN ANIMALS; OTHER EFFECTS WERE IN THE FETUS ONLY AT DOSES WHICH CAUSED TOXIC EFFECTS TO THE MOTHER.

ALTHOUGH RESULTS OF AMES BACTERIAL TESTS HAVE GENERALLY BEEN POSITIVE, OVERALL THE DATA SUGGEST TO SOME SCIENTISTS THAT GENOTOXIC POTENTIAL DOES NOT APPEAR TO BE A SIGNIFICANT FACTOR IN METHYLENE CHLORIDE TOXICITY.

-----PERSONAL PROTECTION-----

VENTILATION: GENERAL ROOM VENTILATION.

RESPIRATORY PROTECTION: NONE REQUIRED.

SAL 000007100

EYE PROTECTION: NONE REQUIRED.

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CS642

PROTECTIVE CLOTHING: NONE REQUIRED.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NONE

FLAMMABLE LIMITS IN AIR, %

METHOD USED: NONE

LOWER: N/D UPPER: N/D

EXTINGUISHING MEDIA: USE DRY CHEMICAL, CO2, OR ALCOHOL FOAM. DO NOT USE WATER TO FIGHT FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: EXPOSURE TO TEMPERATURE ABOVE 130 DEGREES MAY CAUSE BURSTING.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE

POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: OPEN FLAMES, WELDING ARCS, OR OTHER HIGH TEMPERATURE SOURCES WHICH MAY INDUCE THERMAL DECOMPOSITION.

MATERIALS TO AVOID: ACIDS, OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE, HYDROGEN CHLORIDE, CHLORINE, OR PHOSGENE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: IF CONTAINER BEGINS TO LEAK (THROUGH PUNCTURE, ETC.) ALLOW IT TO DISCHARGE COMPLETELY IN A WELL VENTILATED AREA, THEN DISPOSE IN A SAFE PLACE. IF SPILL OR LEAK IS INDOOR, VENTILATE AREA BY OPENING WINDOWS AND TURNING ON FANS. STAY OUT OF AREA AS MUCH AS POSSIBLE UNTIL CLEARED.

COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT PUNCTURE OR INCINERATE.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

SAL 000007101

-----FOR ADDITIONAL INFORMATION-----

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC DURING BUSINESS HOURS, PACIFIC TIME (206)447-5911

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EROSOL CB PURGE CS-80

REVISION OF: 02-14-89

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-----REVISION-----

12/88: EXPANDED FORM AND APPEARANCE; REVISED FIRST AID AND HAZARD OF SWALLOWING. REVISED PERSONAL PROTECTION, SPILL AND LEAK PROCEDURE AND HANDLING ADVICE.

**** E N D O F M S D S ****

PROD: 05045866 10:03:42 27 JUN 1989 CUST: 45700174 INVOICE: 450503490

SAL 000007102

MATERIAL SAFETY DATA SHEET

G S 6 38

I. IDENTIFICATION

Name State Scrub Lotionized Skin Cleaner - New Improved Type A formulated lotionized skin cleaner

D.O.T.

Shipping Name: N/A

Hazard Class: N/A

ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
Aliphatic petroleum distillates (CAS # 64741-65-7)	< 50%	500 ppm
Silica abrasive (CAS #7631-86-9)	< 10%	None listed

III. PHYSICAL DATA

Boiling Point (F) no data Specific Gravity (Water = 1) 0.935

Volatile By Weight (%) < 80 Weight Per Gallon: (Pounds) 7.8

Solubility in Water appreciable pH N/A

Appearance & Odor: A viscous abrasive blue green emulsion with a mild odor.

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°)(Method Used): 126°F., by T.C.C.

Extinguishing Media: Foam, dry chemical or carbon dioxide.

Special Fire Fighting Procedures: NOTE: contains petroleum distillate.

Unusual Fire & Explosion Hazards None

6 S 6 38

V. HEALTH HAZARD DATA

Effects of Overexposure DANGER: Harmful or fatal if
swallowed. Contains petroleum distillates.

Direct contact with eyes may cause irritation.

FIRST AID PROCEDURES

If Swallowed Do not induce vomiting. Call a
physician immediately. Contains petroleum
distillates.

If Inhaled N/A

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. If
irritation persists contact a physician.

If On Skin: N/A

SAL 000007104

G S 6 3 8

VI. REACTIVITY DATA

Stability STABLE

Conditions To Avoid: None

INCOMPATIBILITY (Materials To Avoid) Do not mix with any other chemicals.

Hazardous Decomposition Products: Thermal decomposition may produce carbon dioxide and/or carbon monoxide.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Soak up spill on State Oil Absorbent, sand or vermiculite and discard. Flush residue with plenty of water to the drain

Waste Disposal Method Do not reuse empty containers for any purpose. Flush thoroughly with water, crush and discard.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

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VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection None required

Ventilation Normal room

Protective Gloves None required Eye Protection N/A

Other Protective Equipment N/A

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

DANGER: Harmful or fatal if swallowed. Contains petroleum distillates.

Product is combustible. Do not use near heat, sparks or open flame. Do not weld or cut empty drums.

OTHER PRECAUTIONS: Do not reuse empty drums for any purpose. Destroy by crushing or return to a drum reconditioner.

Read and follow all label directions and precautions before using the product. These products are intended for industrial and institutional use only. Not intended for household use or resale.

KEEP OUT OF THE REACH OF CHILDREN.

While we believe that the data contained herein is factual and the opinions expressed are those of qualified experts, the data are not to be taken as a warranty or representation for which the company 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 applicable Federal, State, and Local laws and regulations.

HEALTH AND SAFETY INFORMATION (216) 861-7114
MAY 1989

SAL 000007106

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION

Name State Scrub Lotionized Skin Cleaner - New Improved Type A formulated lotionized skin cleaner

D.O.T.

Shipping Name: N/A

Hazard Class: N/A

ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
Aliphatic petroleum distillates (CAS # 64741-65-7)	< 50%	500 ppm
Silica abrasive (CAS #7631-86-9)	< 10%	None listed

III. PHYSICAL DATA

Boiling Point (F) no data Specific Gravity (Water = 1) 0.935

Volatile By Weight (%) < 80 Weight Per Gallon: (Pounds) 7.8

Solubility In Water appreciable pH N/A

Appearance & Odor: A viscous abrasive blue green emulsion with a mild odor.

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°) (Method Used): 126°F., by T.C.C.

Extinguishing Media: Foam, dry chemical or carbon dioxide.

Special Fire Fighting Procedures: NOTE: contains petroleum distillate.

Unusual Fire & Explosion Hazards None

V. HEALTH HAZARD DATA

Effects of Overexposure DANGER: Harmful or fatal if swallowed. Contains petroleum distillates.

Direct contact with eyes may cause irritation.

FIRST AID PROCEDURES

If Swallowed Do not induce vomiting. Call a physician immediately. Contains petroleum distillates.

If Inhaled N/A

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. If irritation persists contact a physician.

If On Skin: N/A

SAL 000007107

VI. REACTIVITY DATA

Stability STABLE

Conditions To Avoid: None

INCOMPATIBILITY (Materials To Avoid) Do not mix with any other chemicals.

Hazardous Decomposition Products: Thermal decomposition may produce carbon dioxide and/or carbon monoxide.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Soak up spill on State Oil Absorbent, sand or vermiculite and discard. Flush residue with plenty of water to the drain

Waste Disposal Method Do not reuse empty containers for any purpose. Flush thoroughly with water, crush and discard.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection None required

Ventilation Normal room

Protective Gloves None required Eye Protection N/A

Other Protective Equipment N/A

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

DANGER: Harmful or fatal if swallowed. Contains petroleum distillates.

Product is combustible. Do not use near heat, sparks or open flame. Do not weld or cut empty drums.

OTHER PRECAUTIONS: Do not reuse empty drums for any purpose. Destroy by crushing or return to a drum reconditioner.

Read and follow all label directions and precautions before using the product. These products are intended for industrial and institutional use only. Not Intended for household use or resale.

KEEP OUT OF THE REACH OF CHILDREN.

While we believe that the data contained herein is factual and the opinions expressed are those of qualified experts, the data are not to be taken as a warranty or representation for which the company 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 applicable Federal, State, and Local laws and regulations.

SAL 000007108



Conoco Inc.

Purchase Requisition

Page

of

Shaded Areas
for Purchasing
Dept. Use Only

RQ Loc

316

Requisition No.

256867

A CB

Vendor Information

Priority

RLOC

Department

Ship
Via

Date Req'd at Dest.

Order
Type

Previous P.O.

REB

Refining

now

ALLSTATE CHEMICALS

Ship To

Tagging Instructions

F.O.B. Point

Freight Terms

Conoco Inc.
Refinery Warehouse
Old Spanish Trail
P.O. Box 37
Westlake, LA 70669

Carrier

Project ID

Clauses

Payment Terms

AFE Reporting

Requisitioner

Date

Distribution Charge

91-5558 SUE ANDERSON 02-22-90

7411-3-0-55-03-08

Tax Status

Special Instructions

Charge

Exempt

6%

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Date

Control
W.O.Equip.
No.

Init.

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Time
OrderedTime
Req'dUnit
Code

Date Required

7 02-22-90 S0-55 PV *** 1155 norm 7411-3-0-55-03-08

ord Stock No.

Description

Item
No.Quantity
OrderedUnits of
Issue

Price

Qty. Issued

SCRUB W DISPENSER

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5

EACH

FLOYD VINCENT

NOTIFY FLOYD ON ARRIVAL

CONFIRMING ORDER ANDERSON TO STATE DO NOT DUPLICATE

op. - Operating Dept.

Approval - Purchasing Dept.



MATERIAL SAFETY DATA SHEET

Emergency Tel. Number
(203) 278-1280

I. PRODUCT IDENTIFICATION

GS637

Product Name: Hydraulic Jack Oil

ITEM: No.: 80054, 55

Product Type: Hydraulic Fluid

Part No.: 78E, 78F

II. COMPOSITION

Ingredients	% by Wt.	Hazard
Zinc Compound*	<0.5	Skin/Eye, Irritant
Severely Hydrotreated **	>95	TLV 5mg/m ³ (mist)
Naphthenic Oil		
Methacrylate Polymer	1-5	Skin/eye irritant
Surfactant	<0.05	

*It has been shown in preliminary tests, that certain zinc compounds, when applied to skin of male experimental animals adversely affect spermatogenic activity.

**Skin/eye/inhalation irritant.

It is our best technical judgement that, with proper precautions, normal use of this product poses no such chronic hazard.

III. CHEMICAL AND PHYSICAL PROPERTIES

Vapor Pressure: <5 mm	Specific Gravity: 0.905 @ 60 Deg. F.
Vapor Density: Not available	Boiling Point: 175°-300°F
Solubility in Water: Negligible	pH: Does not apply
Appearance: Amber Liquid	Odor: Mild petroleum

Page 1 of 3

SAL 000007110

GS687

HYDRAULIC JACK OIL

Page 2 of 3

IV. TOXICITY AND HEALTH HAZARD DATA

Toxicity Low order of toxicity
Skin and eye irritant.

TLV: 5mg/M³ (mist)

Symptoms of Overexposure

Prolonged exposure may cause dermatitis. Breathing of mist or vapor may cause irritation of the pulmonary tract or aspiration pneumonia.

EMERGENCY TREATMENT PROCEDURES

Ingestion

Do not induce vomiting. Consult physician.

Inhalation

Not likely to occur except as mist. Remove to fresh air. If symptoms persist, obtain medical attention.

Skin Contact:

Wash with soap and water. If irritation persists, consult a physician.

Eye Contact:

Rush with water for at least 15 minutes. Seek medical attention

PERSONAL PROTECTION:

Eye

Safety glasses or goggles.

Skin

Neoprene or plastic gloves.

Ventilation

Sufficient to maintain vapor concentration below TLV.

V. FLAMMABILITY AND EXPLOSIVE PROPERTIES

Flash Point: >200°F

Method: Open Cup

Explosive Limits (% by volume in air) Lower: DNA Upper: DNA%

Recommended Extinguishing Agents: Carbon dioxide, Foam, Dry Chemical,

Hazardous Products Formed by Fire or Thermal Decomposition
Irritating organic vapors.

Unusual Fire or Explosion Hazards

None known

Compressed Gases Name:

None

Pressure at Room Temperature: Does not apply

SAL 000007111

VI. REACTIVITY DATA

65687

ability X Stable Unstable
Hazardous Polymerization May Occur X Will Not Occur
Hazardous Decomposition Products (non-thermal)
None known
Incompatibility
Strong oxidizers.

VII. SPILL OR LEAK AND DISPOSAL PROCEDURES

Steps to be taken in case of spill or leak:

Contain spill. Soak up in an inert absorbent. Clean up residue with soap and water. Store in a closed container until disposal.

Recommended methods of disposal:

Incinerate or landfill following EPA and local regulations.

VIII. STORAGE AND HANDLING PROCEDURES

Storage

Keep away from flames, sparks, or hot surfaces.

Handling

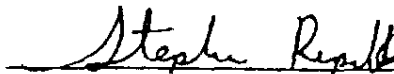
Avoid skin contact. Keep away from eyes. Avoid prolonged breathing of vapors.

IX. SHIPPING REGULATIONS

Type or Class DOT: Unrestricted

IATA: Unrestricted

Prepared By: Stephen Repetto



Title: Research Chemist, Environmental Health & Safety

Date: January 1, 1989



CS637

SARA TITLE III

HYDRAULIC JACK OIL

80054, 80055

The ingredients listed below are listed in Section 313 of Title III of the Superfund Amendments and Reauthorization Act.

INGREDIENT

CAS NUMBER

AMOUNT

None

January 1, 1989

A handwritten signature in cursive script, reading "Stephen Repetto".

Stephen Repetto

Research Chemist, Environmental Health & Safety

SR/rbh

SAL 000007113

256859

The **State**[®] CHEMICAL MANUFACTURING CO.
MAIN OFFICE AND PLANT: CLEVELAND, OHIO 44114
DISTRIBUTION CENTERS/SALES OFFICES: NATIONWIDE

MATERIAL SAFETY DATA SHEET

G S 636

I. IDENTIFICATION

A formulated solvent
based degreaser

Name FORMULA 360 STA GEL Type

D.O.T.

Shipping Name: N/A

Hazard Class: N/A

ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
Aromatic Petroleum Distillates (CAS #64742-95-6)	> 80%	100 ppm

III. PHYSICAL DATA

Boiling Point (F) 370-413°F Specific Gravity (Water = 1) 0.904

Volatile By Weight (%) > 85% Weight Per Gallon: (Pounds) 7.6lbs
gal.

Solubility In Water emulsifiable pH N/A

Appearance & Odor: A clear colorless liquid with a
petroleum odor.

SAL 000007114

GS 636

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°) (Method Used): 145°F by T.C.C.

Extinguishing Media: Carbon dioxide, foam, or dry chemical

Special Fire Fighting Procedures: Contains petroleum distillates, water may be ineffective.

Unusual Fire & Explosion Hazards: Firefighters should wear self-contained breathing apparatus.

V. HEALTH HAZARD DATA

Effects of Overexposure _____

DANGER: Harmful or fatal if swallowed. Contains Petroleum Distillates. Direct contact with eyes or skin may result in irritation. Prolonged breathing of vapors may result in dizziness, drowsiness, headache or nausea.

FIRST AID PROCEDURES

If Swallowed Do not induce vomiting. Contains Petroleum Distillates. Contact a physician immediately.

If Inhaled Remove person to fresh air. If irritation or difficulty in breathing persists, contact a physician.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. Contains Petroleum Distillates. Contact a physician immediately. Do not wear contact lenses while using this product.

If On Skin: Wash thoroughly with soap and water. If irritation persists, contact a physician.

VI. REACTIVITY DATA

GS636

Stability STABLE

Conditions To Avoid: Exposure to heat, sparks and open flame

INCOMPATIBILITY (Materials To Avoid) Strong oxidizers. May adversely effect some plastics.

Hazardous Decomposition Products: Burning State Sta-Gel Concentrate may result in formation of Carbon Monoxide and/or Carbon Dioxide gases.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Remove all sources of heat, sparks or flame. Ventilate the area of the spill. Absorb the spill on State Oil Absorbant, sand or vermiculite. Flush residue with plenty of water.

Waste Disposal Method Do not reuse empty drums. Flush thoroughly with water, crush and discard; or give rinsed drums to a drum reconditioner for recycling.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

SAL 000007116

G 8 6 3 6

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection Use in well ventilated areas.

Ventilation Local mechanical exhaust ventilation is recommended.

Protective Gloves required Eye Protection required

Other Protective Equipment A source of clean water
should be nearby in case of accidental eye contact

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

CAUTION: Combustible. Keep away from heat and open flames. Harmful or fatal if swallowed. Contains Petroleum Distillates. Avoid prolonged breathing of vapor. Use with adequate ventilation. Keep container tightly closed and stored away from heat, sparks, open flames or where temperatures may exceed 120°F. OTHER PRECAUTIONS: Do not reuse empty drums for any purpose. Do not cut or weld empty drums. Destroy empty drums by crushing or returning to a drum reconditioner.

OTHER PRECAUTIONS

Read and follow all label directions and precautions before using the product. These products are intended for industrial and institutional use only. Not intended for household use or resale.

KEEP OUT OF THE REACH OF CHILDREN.

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78R3

HEALTH AND SAFETY INFORMATION (216) 861-7114

SEPTEMBER 1988

SAL 000007117

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION A formulated solvent
based degreaser
Name FORMULA 360 STA GEL Type

D.O.T.
Shipping Name: N/A
Hazard Class: N/A
ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
Aromatic Petroleum Distillates (CAS #64742-95-6)	> 80%	100 ppm

III. PHYSICAL DATA

Bolling Point (F) 370-413°F Specific Gravity (Water = 1) 0.904
7.6lbs
Volatile By Weight (%) > 85% Weight Per Gallon: (Pounds) gal.
Solubility in Water emulsifiable pH N/A
Appearance & Odor: A clear colorless liquid with a
petroleum odor.

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°)(Method Used): 145°F by T.C.C.
Extinguishing Media: Carbon dioxide, foam, or dry chemical
Special Fire Fighting Procedures: Contains petroleum
distillates, water may be
ineffective.
Unusual Fire & Explosion Hazards Firefighters should
wear self-contained breathing apparatus.

V. HEALTH HAZARD DATA

Effects of Overexposure

DANGER: Harmful or fatal if swallowed. Contains Petroleum Distillates. Direct contact with eyes or skin may result in irritation. Prolonged breathing of vapors may result in dizziness, drowsiness, headache or nausea.

FIRST AID PROCEDURES

If Swallowed Do not induce vomiting. Contains
Petroleum Distillates. Contact a physician
immediately.

If Inhaled Remove person to fresh air. If irritation
or difficulty in breathing persists, contact a
physician.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. Contains
Petroleum Distillates. Contact a physician
immediately. Do not wear contact lenses while
using this product.

If On Skin: Wash thoroughly with soap and water. If
irritation persists, contact a physician.

SAL 000007118

VI. REACTIVITY DATA

STABLE

Stability

Conditions To Avoid: Exposure to heat, sparks and open flame

INCOMPATIBILITY (Materials To Avoid) Strong oxidizers. May adversely effect some plastics.

Hazardous Decomposition Products: Burning State Sta-Gel Concentrate may result in formation of Carbon Monoxide and/or Carbon Dioxide gases.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken if Material is Released Or Spilled Remove all sources of heat, sparks or flame. Ventilate the area of the spill. Absorb the spill on State Oil Absorbant, sand or vermiculite. Flush residue with plenty of water.

Waste Disposal Method Do not reuse empty drums. Flush thoroughly with water, crush and discard; or give rinsed drums to a drum reconditioner for recycling.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection Use in well ventilated areas.

Ventilation Local mechanical exhaust ventilation is recommended.

Protective Gloves required Eye Protection required

Other Protective Equipment A source of clean water should be nearby in case of accidental eye contact

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

CAUTION: Combustible. Keep away from heat and open flames. Harmful or fatal if swallowed. Contains Petroleum Distillates. Avoid prolonged breathing of vapor. Use with adequate ventilation. Keep container tightly closed and stored away from heat, sparks, open flames or where temperatures may exceed 120°F. OTHER PRECAUTIONS: Do not reuse empty drums for any purpose. Do not cut or weld empty drums. Destroy empty drums by crushing or returning to a drum reconditioner.

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78R3

HEALTH AND SAFETY INFORMATION (216) 861-7114

SEPTEMBER 1988

SAL 000007119

MATERIAL SAFETY DATA SHEET **G S 6 3 5**

I. IDENTIFICATION

Name BC-1 Type A formulated solvent degreaser

D.O.T.

Shipping Name: Consumer Commodity

Hazard Class: ORM-D

ID No. N/A Label None required

II. HAZARDOUS MATERIALS

Material	Weight %	TLV
Tetrachloroethylene (CAS #127-18-4)	< 24	50 ppm
Methylchloroform (CAS #71-55-6)	< 73	350 ppm
Carbon Dioxide (CAS #124-38-9)	< 3	5000 ppm

This product contains Tetrachloroethylene (Perchloroethylene) and Methylchloroform (1,1,1-trichloroethane) which are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

III. PHYSICAL DATA

Boiling Point (F) N/A Specific Gravity (Water=1) N/A

Volatile By Weight (%) 100% Weight Per Gallon: (Pounds) N/A

Solubility In Water < 1 pH N/A

Appearance & Odor: A clear aerosol spray with a chlorinated odor.

SAL 000007121

IV. FIRE & EXPLOSION HAZARD DATA

45635

Flashpoint (°F)(Method Used): None. No flame extension.

Extinguishing Media: N/A

SPECIAL FIREFIGHTING PROCEDURES: Keep containers cool. Use shielding to protect personnel from venting, rupturing, or bursting containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Exposure to temperatures above 120°F may cause cans to vent, rupture, or burst.

V. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE: WARNING: Vapor may be harmful. Prolonged or repeated breathing of vapors may result in dizziness, drowsiness, headache, nausea, or nasal and/or respiratory irritation. Direct contact with skin or eyes may cause irritation. Do not take internally. CHRONIC OVEREXPOSURE: Overexposure to this material (or its components) has been suggested as a cause of liver abnormalities, kidney damage, lung damage, brain damage, and spleen damage in humans. The National Cancer Institute has concluded from the results of a bioassay that tetrachloroethylene is a liver carcinogen when given orally to mice. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Liver disease and rhythm disorders of the heart.

FIRST AID PROCEDURES

If Swallowed

Seek medical attention immediately. If a doctor is not immediately available, induce vomiting using Syrup of Ipecac (follow all label directions). Do not make an unconscious person vomit.

If Inhaled

Get person to fresh air. Administer artificial respiration if breathing has stopped. Get immediate medical attention. NOTE TO PHYSICIAN: Do not give stimulants. Epinephrine or ephedrine may adversely affect the heart with fatal results.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. Consult
a physician immediately. Contact lenses should
not be worn when working with this product.

If On Skin: Wash with plenty of soap and water.

Remove contaminated clothing. If irritation
persists, consult a physician.

Health & Safety Information (216)861-7114

SAL 000007122

GS635

VI. REACTIVITY DATA

Stability STABLE

Conditions To Avoid: Exposure to temperatures above 120°F

INCOMPATIBILITY (Materials To Avoid) Pure oxygen, strong caustics, strong oxidizers, chemically active light metals such as lithium or sodium.

Hazardous Decomposition Products: Burning this product may result in the formation of HCl, CO, Phosgene, or Chlorine gases.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Ventilate area. Absorb spill with State Oil Absorbent, sand, or vermiculite.

Waste Disposal Method _____

Do not puncture or incinerate. Give empty cans to a waste disposal service equipped to safely handle and dispose of pressurized containers.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

SAL 000007123

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

When TLV is exceeded, wear NIOSH approved cartridge respirator fitted with organic vapor cartridges. Self-contained breathing apparatus required

Respiratory Protection - only when working in confined areas with no ventilation.

Ventilation Always use adequate ventilation. Do not use this product in poorly ventilated spaces.

Protective Gloves Recommended **Eye Protection** Required

Other Protective Equipment

A source of clean water should be nearby in case of accidental eye contact.

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

WARNING: Contents under pressure. Do not store in open sunlight or other areas where temperatures may exceed 120°F. Do not puncture can or dispose of in fire or incinerator. Use with adequate ventilation. BC-1 is a powerful solvent. Although it is safe on most plastics, it may attack some plastics, rubber, polymeric fibers, and some coatings.

NFPA RATING: Health: 2 Flammability: 0 Reactivity: 0

Other Precautions

Read and follow all label directions and precautions before using the product. These products are intended for industrial use only.

NOT FOR HOUSEHOLD USE OR RESALE

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REACH OF CHILDREN.**

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58R9

JANUARY, 1989

SAL 000007124

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION

Name BC-1 Type A formulated solvent degreaser

D.O.T.

Shipping Name: Consumer Commodity

Hazard Class: ORM-D

ID No. N/A Label None required

II. HAZARDOUS MATERIALS

Material	Weight %	TLV
Tetrachloroethylene (CAS #127-18-4)	< 24	50 ppm
Methylchloroform (CAS #71-55-6)	< 73	350 ppm
Carbon Dioxide (CAS #124-38-9)	< 3	5000 ppm

This product contains Tetrachloroethylene (Perchloroethylene) and Methylchloroform (1,1,1-trichloroethane) which are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

III. PHYSICAL DATA

Boiling Point (F) N/A Specific Gravity (Water=1) N/A

Volatile By Weight (%) 100% Weight Per Gallon: (Pounds) N/A

Solubility in Water < 1 pH N/A

Appearance & Odor: A clear aerosol spray with a chlorinated odor.

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (°F)(Method Used): None. No flame extension.

Extinguishing Media: N/A

SPECIAL FIREFIGHTING PROCEDURES: Keep containers cool. Use shielding to protect personnel from venting, rupturing, or bursting containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Exposure to temperatures above 120°F may cause cans to vent, rupture, or burst.

V. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE: WARNING: Vapor may be harmful. Prolonged or repeated breathing of vapors may result in dizziness, drowsiness, headache, nausea, or nasal and/or respiratory irritation. Direct contact with skin or eyes may cause irritation. Do not take internally. CHRONIC OVEREXPOSURE: Overexposure to this material (or its components) has been suggested as a cause of liver abnormalities, kidney damage, lung damage, brain damage, and spleen damage in humans. The National Cancer Institute has concluded from the results of a bioassay that tetrachloroethylene is a liver carcinogen when given orally to mice. MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Liver disease and rhythm disorders of the heart.

FIRST AID PROCEDURES

If Swallowed

Seek medical attention immediately. If a doctor is not immediately available, induce vomiting using Syrup of Ipecac (follow all label directions). Do not make an unconscious person vomit.

If Inhaled

Get person to fresh air. Administer artificial respiration if breathing has stopped. Get immediate medical attention. NOTE TO PHYSICIAN: Do not give stimulants. Epinephrine or epedrine may adversely affect the heart with fatal results.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. Consult

a physician immediately. Contact lenses should not be worn when working with this product.

If On Skin: Wash with plenty of soap and water.

Remove contaminated clothing. If irritation persists, consult a physician.

SAL 000007125

VI. REACTIVITY DATA

Stability STABLE

Conditions To Avoid Exposure to temperatures above 120°F

INCOMPATIBILITY (Materials To Avoid) Pure oxygen, strong caustics, strong oxidizers, chemically active light metals such as lithium or sodium.

Hazardous Decomposition Products: Burning this product may result in the formation of HCl, CO, Phosgene, or Chlorine gases.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Ventilate area. Absorb spill with State Oil Absorbent, sand, or vermiculite.

Waste Disposal Method _____

Do not puncture or incinerate. Give empty cans to a waste disposal service equipped to safely handle and dispose of pressurized containers.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

When TLV is exceeded, wear NIOSH approved cartridge respirator fitted with organic vapor cartridges. Self-contained breathing apparatus required

Respiratory Protection only when working in confined areas with no ventilation.

Ventilation Always use adequate ventilation. Do not use this product in poorly ventilated spaces.

Protective Gloves Recommended **Eye Protection** Required

Other Protective Equipment A source of clean water should be nearby in case of accidental eye contact.

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

WARNING: Contents under pressure. Do not store in open sunlight or other areas where temperatures may exceed 120°F. Do not puncture can or dispose of in fire or incinerator. Use with adequate ventilation. BC-1 is a powerful solvent. Although it is safe on most plastics, it may attack some plastics, rubber, polymeric fibers, and some coatings.

NEPA RATING: Health: 2 Flammability: 0 Reactivity: 0

Other Precautions

Read and follow all label directions and precautions before using the product. These products are intended for industrial use only.

NOT FOR HOUSEHOLD USE OR RESALE

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REACH OF CHILDREN.**

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MATERIAL SAFETY DATA SHEET

G S 6 3 4

I. IDENTIFICATION

Name CONCRETE PATCH Type A concrete
patching compound

D.O.T.

Shipping Name: N/A

Hazard Class: N/A

ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
----------	---------	-----

This product contains no hazardous ingredients,
at greater than one percent, as defined by
Federal and State Worker Right-to-Know Laws.

III. PHYSICAL DATA

Boiling Point (F) N/A Specific Gravity (Water = 1) N/A

Volatile By Weight (%) Not volatile Weight Per Gallon: (Pounds) N/A

Solubility In Water Slight pH N/A

Appearance & Odor: A fine brown odorless powder.

G S 6 3 4

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°) (Method Used): N/A

Extinguishing Media: Concrete Patch is itself a good
extinguishing agent.

Special Fire Fighting Procedures: None

Unusual Fire & Explosion Hazards N/A

V. HEALTH HAZARD DATA

Effects of Overexposure Inhalation of dust will cause
respiratory tract irritation. Direct eye contact
causes irritation. May be harmful if swallowed.

FIRST AID PROCEDURES

If Swallowed Contact a physician or Poison Control
Center immediately.

If Inhaled Remove person to fresh air. If irritation
continues, seek medical attention.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. If
irritation continues, get immediate medical
attention.

If On Skin: Wash with soap and water.

SAL 000007128

G S 6 3 4

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection Dust mask

Ventilation Normal room ventilation

Protective Gloves recommended Eye Protection required

Other Protective Equipment None

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

Store in a cool, dry place. Do not reuse empty
containers for any purpose.

OTHER PRECAUTIONS

Read and follow all label directions and precautions before using the product. These products are intended for industrial and institutional use only. Not intended for household use or resale.

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HEALTH AND SAFETY INFORMATION (216) 861-7114
MAY 1989

SAL 000007129

VI. REACTIVITY DATA

G S 6 3 4

Stability STABLE

Conditions To Avoid: Damp or high humidity storage.

INCOMPATIBILITY (Materials To Avoid) None known.

Hazardous Decomposition Products: Slight amount of ammonia.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken if Material Is Released Or Spilled Sweep up and discard.

Waste Disposal Method Discard in nonburnable trash.
This is a nonhazardous waste.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

SAL 000007130

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION

Name CONCRETE PATCH Type A concrete patching compound

D.O.T.

Shipping Name: N/A

Hazard Class: N/A

ID No. N/A Label N/A

II. HAZARDOUS INGREDIENTS

Material	Weight%	TLV
This product contains no hazardous ingredients, at greater than one percent, as defined by Federal and State Worker Right-to-Know Laws.		

III. PHYSICAL DATA

Boiling Point (F) N/A Specific Gravity (Water = 1) N/A

Volatile By Weight (%) Not volatile Weight Per Gallon: (Pounds) N/A

Solubility in Water Slight pH N/A

Appearance & Odor: A fine brown odorless powder.

IV. FIRE & EXPLOSION HAZARD DATA

Flashpoint (F°) (Method Used): N/A

Extinguishing Media: Concrete Patch is itself a good extinguishing agent.

Special Fire Fighting Procedures: None

Unusual Fire & Explosion Hazards N/A

V. HEALTH HAZARD DATA

Effects of Overexposure Inhalation of dust will cause respiratory tract irritation. Direct eye contact causes irritation. May be harmful if swallowed.

FIRST AID PROCEDURES

If Swallowed Contact a physician or Poison Control Center immediately.

If Inhaled Remove person to fresh air. If irritation continues, seek medical attention.

If In Eyes: Flush eyes immediately with plenty of cool water for at least 15 minutes. If irritation continues, get immediate medical attention.

If On Skin: Wash with soap and water.

SAL 000007131

VI. REACTIVITY DATA

Stability STABLE

Conditions To Avoid: Damp or high humidity storage.

INCOMPATIBILITY (Materials To Avoid) None known.

Hazardous Decomposition Products: Slight amount of ammonia.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material Is Released Or Spilled Sweep up and discard.

Waste Disposal Method Discard in nonburnable trash.
This is a nonhazardous waste.

Follow All Federal, State and Local Regulations Regarding Waste Disposal.

VIII. SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended any time you work with any concentrated industrial strength cleaning products.

Respiratory Protection Dust mask

Ventilation Normal room ventilation

Protective Gloves recommended Eye Protection required

Other Protective Equipment None

IX. SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling Storage

Store in a cool, dry place. Do not reuse empty containers for any purpose.

OTHER PRECAUTIONS

SAL 000007132

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Conoco Inc.

Purchase Requisition

Page

of

**Shaded Areas
for Purchasing
Dept. Use Only**

RQ Loc

316

Requisition No.

256868

A

Vendor Information		Priority	RLOC	Department Refining	Ship Via	Date Req'd at Dest. now	Order Type	Previous P.O.
STATE CHEMICAL			Ship To Conoco Inc. Refinery Warehouse Old Spanish Trail P.O. Box 37 Westlake, LA 70669		Tagging Instructions			
					F.O.B. Point		Freight Terms	
					Carrier			
					Project ID		Clauses	
					Payment Terms		AFE Reporting	
Attn:								
Requisitioner		Date		Distribution Charge				
491-5558 SUE ANDERSON		02-22-90		7411-3-1310-46-14-5001				
Tax Status		Special Instructions						
Charge 6%	Exempt							

Ticket	Date	Control W.O.	Equip. No.	Init.	Time Stat.	Time Ordered	Time Req'd	Unit Code	Date Required
5868	02-22-90	R5001		AG	#	1255	NORM	46	7411-3-1310-46-14-5001
Card	Stock No.	Description	Item No.	Quantity Ordered	Units of Issue	Price	Qty. Issued		
		CONCRETE PATCH	1	6	RACH	(450#)			
		STA PATCH # 5 ASPHALT PATCH	2	6	RACH	(450#)			
		ARTHUR GUILLORY							
		CALL							

No MSDS
Rec'd - 03/12/90

CONFIRMING ORDER DO NOT DUPLICATE

~~CONFIRMING ORDER DO NOT DUPLICATE~~

g - Operating Dept.

Approval - Purchasing Dept.

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

MANUFACTURING SITE	Lake Charles Chemical Plant		
ADDRESS	P.O. Box 727, Old Spanish Trail Rd., Westlake, LA 70669		
TRADE NAME	HEAVY AROMATIC DISTILLATE	C I 0 5 4	
SYNONYMS	Hydrocarbon mixture containing cyclic and unsaturated compounds		
CAS NUMBER(S)	68513-69-9 Residues (Petroleum), steam-cracked light		
TELEPHONE NO.	(713) 588-3491	EMERGENCY TELEPHONE NO.	(318) 494-5142

2. COMPONENTS AND HAZARD CLASSIFICATION

HAZARDOUS INGREDIENTS: Napthalene 20% Ethylbenzene 6.5%
Indan/Styrene/Tetralins 20% Toluene 6.5%
Benzene 5.5%

- Components of this product are listed carcinogens - see Section 5.
- Carcinogen, irritant, and flammable as defined by the OSHA Hazard Communication Standard.
- Contains no chemicals subject to SARA 302 reporting.
- SARA 311/312 "Fire Hazard", "Immediate (Acute) Health Hazard", and "Delayed (Chronic) Health Hazard"
- Contains a maximum of 5.5% benzene (CAS# 71-43-2), 6.5% Toluene (CAS# 108-88-3), and 6.5% ethylbenzene (CAS# 100-41-4) which are chemicals subject to SARA 313 reporting.

3. PHYSICAL DATA

BOILING POINT (°F)	164	SPECIFIC GRAVITY (H ₂ O = 1)	0.921
VAPOR PRESSURE (mm Hg.)	Unknown	MELTING POINT	Unknown
SOLUBILITY IN WATER	Negligible	VAPOR DENSITY	Unknown
APPEARANCE AND ODOR	Brown, oily liquid; strong aromatic odor.		

4. FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	70°F (PM)	AUTOIGNITION TEMPERATURE		Unknown	
FLAMMABLE LIMITS IN AIR. % BY VOL.		LOWER	Unknown	UPPER	Unknown
EXTINGUISHING MEDIA	Water spray (fog), foam, dry chemical, or CO ₂ .			SAL 000007134	
SPECIAL FIRE FIGHTING PROCEDURES	Stop source of leak. Cool exposed equipment with water spray. Use self-contained breathing apparatus if fighting fire in confined spaces.				
UNUSUAL FIRE AND EXPLOSION HAZARD	This material can release sufficient vapor to form an explosive mixture in air. Produces thick, black smoke when burning.				

5. HEALTH HAZARD INFORMATION**FIRST AID**

- EYES:** Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. Call a physician.
- SKIN:** Remove contaminated clothing. Wash with soap and water. If irritation persists, seek medical attention.
- INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- INGESTION:** If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

NATURE OF HAZARD

- EYE:** Vapors and liquid may be irritating to the eyes.
- SKIN:** Repeated or prolonged skin contact can cause defatting and lead to dermatitis. Skin absorption can occur.
- INHALATION:** Irritating to nose and upper respiratory tract. May cause CNS depression and reversible effects on liver and kidneys. Chronic effects due to the benzene content include possible cancer (leukemia), bone marrow effects, and injuries to the blood-forming tissues.
- INGESTION:** Systemic effects may occur.

EXPOSURE LIMITS

None established. Based on benzene content, a value of 1.0 ppm for an 8-hour TWA is recommended by Vista. STEL of 5 ppm for 15 minutes.

TOXICITY DATA

No specific data available on this product. Data for benzene and other similar aromatic hydrocarbons would indicate this material to be an eye and skin irritant, and possibly toxic through skin absorption. Benzene LC₅₀ of 10,000 ppm after 7 hours exposure has been reported.

This product contains polynuclear aromatic hydrocarbons. Some polynuclear aromatic hydrocarbons have been shown to cause skin tumors in laboratory animal tests.

Benzene has been recognized as a human carcinogen by IARC and NTP. Styrene has been recognized as a human carcinogen by IARC.

Benzene is regulated by OSHA as a carcinogen.

SAL 000007135

SPECIAL PRECAUTIONS

AVOID INHALATION AND REPEATED SKIN CONTACT.

6. REACTIVITY DATA**CONDITIONS CONTRIBUTING TO INSTABILITY:**

High Temperatures

INCOMPATIBILITY:

Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS:CO, CO₂**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:**

Should not occur.

7. SPILL OR LEAK PROCEDURES

Evacuate the area and eliminate all sources of ignition. Contain the spill. Absorb spill with inert material, then place in a chemical waste container. For large spills, dike for later disposal. Dispose of only in accordance with local, state, and federal regulations.

REPORTING: Contains a maximum 5.5% benzene (CERCLA RQ = 10 lbs.), 6.5% toluene (RQ = 1,000 lbs.), 6.5% ethylbenzene (RQ = 1,000 lbs.), 20% styrene (RQ = 1,000 lbs), and 20% naphthalene (RQ = 5,000 lbs.)

WASTE CLASSIFICATION: The product has the RCRA characteristic of ignitability and if discarded in its purchased form would have the EPA Hazardous Waste Number of D001. Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, and mixtures may change the classification to non-hazardous or hazardous for reasons other than, or in addition to, ignitability.

8. SPECIAL PROTECTION INFORMATION**VENTILATION RECOMMENDATIONS**

Adequate ventilation to reduce levels of air contaminants below that which may cause personnel injury or illness. Exposure limits listed under Section 5. **HEALTH HAZARD INFORMATION.**

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

EYES: Chemical goggles or safety shield.

SKIN: Full protective clothing, boots, and gloves.

RESPIRATORY PROTECTION:

If needed, use NIOSH/MSHA-approved organic vapor respiratory protection.

SAL 000007136

9. SHIPPING, TRANSFER AND STORAGE**SHIPPING INFORMATION**

DOT PROPER SHIPPING NAME:	Flammable Liquid, N.O.S.
DOT HAZARD CLASS:	Flammable Liquid
DOT IDENTIFICATION NUMBER:	UN 1993
ADDITIONAL INFORMATION:	See Section 7 for reportable quantities.
IATA NAME AND DESCRIPTION:	Flammable Liquids, N.O.S.
IATA UN OR ID NO.:	UN 1993
IATA CLASS OR DIVISION:	3
IATA SUBSIDIARY RISK:	None

TRANSPORTATION AND STORAGE

ELECTROSTATIC ACCUMULATION HAZARD:	Yes - ground all equipment.
USUAL SHIPPING CONTAINERS:	Pipeline, tank cars, tank trucks
STORAGE/TRANSPORT TEMPERATURE:	Ambient
STORAGE/TRANSPORT PRESSURE:	Ambient
LOADING/UNLOADING TEMPERATURE:	Ambient

HANDLING AND STORAGE MATERIALS AND COATINGS

SUITABLE: Carbon Steel

THE ABOVE DATA IS BASED ON TESTS AND EXPERIENCE WHICH VISTA BELIEVES RELIABLE AND ARE SUPPLIED FOR INFORMATIONAL PURPOSES ONLY. VISTA'S PRODUCTS ARE INTENDED FOR SALE TO INDUSTRIAL AND COMMERCIAL CUSTOMERS. VISTA REQUESTS THAT CUSTOMERS INSPECT AND TEST OUR PRODUCTS BEFORE USE AND SATISFY THEMSELVES AS TO CONTENTS AND SUITABILITY. VISTA DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA AND NOTHING CONTAINED THEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY VISTA WITH RESPECT TO THE DATA, THE PRODUCT DESCRIBED, OR THEIR USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO VISTA.

ROCKWOOD SYSTEMS CORPORATION

40 EAST MAIN STREET
 ANCASTER, TEXAS 75146
 14/227-3100

MSDS #: 1.4.4.2

MATERIAL SAFETY DATA SHEET

TRADE NAME: RSC Jet-X Concentrate
 RSC I.D. NUMBER: 526-0018
 ISSUED: March 22, 1989
 SUPERSEDES: August 8, 1986

GS631

1. INGREDIENT	*C.A.S. NO.	OSHA TWA	ACGIH TWA	% (OPTIONAL)
a. Ethanol	64-17-5	1000 PPM	1000 PPM	Less than 5%
b. Dipropylene Glycolmethyl Ether	34590-94-8	100 PPM	100 PPM	1-7 %
c. Sodium Phosphate Monobasic	7558-80-7	None**	None**	1/2% or less
d. Disodium Orthophosphate	7558-79-4	None**	None**	1/2% or less
e. Fluorinated Surfactant (not assigned)		None**	None*	5% or less
f. Alkyl & Alkoxy Sulfonates		None**	None**	20-35%
g. Mixed Fatty Alcohols		None**	None**	1-5%

** No limits given; not rated hazardous.

* CAS# req. only for hazardous ingredients; others optional

2. PHYSICAL DATA

BOILING POINT.....Not determined

VAPOR PRESSURE:.....Not determined

VAPOR DENSITY:.....Not determined

EVAPORATION RATE:.....Not determined

SOLUBILITY IN WATER:.....Soluble

SP. GRAVITY.....1.01 - 1.03

PERCENT VOLATILE:.....Not determined

VOLATILE ORGANICS:.....Not determined

pH:.....5.8 - 6.8

VISCOSITY:.....5 - 20 cps @ 78 Deg. F.

APPEARANCE AND ODOR:.....Clear Green Pourable Liquid

SAL 000007138

Abbreviations: N/D - Not Determined N/A - Not Applicable

 ROCKWOOD SYSTEMS CORPORATION**GS631****MATERIAL DATA SHEET**

MSDS: 1.4.4.2

MARCH 22, 1989

PAGE 2 OF 3

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT.....Not flammable

FLAMMABLE LIMITS - LEL:.....N/A

FLAMMABLE LIMITS - UEL:.....N/A

EXTINGUISHING MEDIA:.....Use media proper to primary cause of fire

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS TO AVOID: Strong Oxidizers

HAZARDOUS POLYMERIZATION: Will Not Occur

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE: Spill area may be slippery, rinse thoroughly. Maybe soaked up with sand or other inert material and disposed of via regulations for non-hardous waste. May be gradually rinsed to sewer only with copius amounts of water to prevent nuisance foaming.

RECOMMENDED DISPOSAL: Dispose of in compliance with all State, Local and Federal Regulations.

6. SUGGESTED FIRST AID

EYE CONTACT: Flush with water 15 minutes

SKIN CONTACT: Wash with soap and water.

INHALATION: Remove to fresh air.

IF SWALLOWED: If conscious, give large amount of fresh water, if symptoms continue, seek medical help.

OTHER FIRST AID:

SAL 000007139

 ROCKWOOD SYSTEMS CORPORATION**GS681****MATERIAL DATA SHEET**MSDS: 1.4.4.2
MARCH 22, 1989

PAGE 3 OF 3

7. PRECAUTIONARY INFORMATION

Store in Original Container; Do not mix agents; Avoid skin and eye contact; Avoid ingestion.

SPECIAL PROTECTION:

EYE PROTECTION: Chemical Goggles Recommended. Eyewash availability.

SKIN PROTECTION: N/A

VENTILATION: Mechanical (general) recommended.

RESPIRATORY PROTECTION: Not normally necessary.

8. HEALTH HAZARD DATA

EYE CONTACT: Mild Irritant

SKIN CONTACT: May cause a mild transient irritation.

INHALATION: Not anticipated to be a problem

INGESTION: Irritating to mucous membranes - large dose could produce narcosis.

SIGNS AND SYMPTOMS OF EXPOSURE: Skin redness, eye redness or watering.

MEDICAL CONDITIONS: Chronic dermatitis

Carcinogenicity: NTP - No IARC Monographs - No OSHA Reg. - No

SAL 000007140

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this product under normal conditions. Any use of the product which is not in conformance with this information, which involves using the product in combination with any

(024453-0409M -E0016293-5004)

DATE OF ISSUE
01/28/80SUPERSEDES
01/28/80

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS

N/A

TRADE NAME & SYNONYMS

B-LUBE AEROSOL

G.S.632

CHEMICAL FAMILY
AEROSOL BELT DRESSINGFORMULA
X<--MIXTUREMANUFACTURERS NAME:
NATIONAL CHEMSEARCH DIV. OF NCH CORP.ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)
BOX 152170
IRVING, TEXAS 75015PREPARED BY:
KELLY SEALS/T.S.CHEMISTPRODUCT CODE NUMBER
5004EMERGENCY TELEPHONE NUMBER
214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL
COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED
AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
1,1,1 TRICHLOROETHANE	IRRITANT	350PPM	350PPM	71-55-6
CARBON DIOXIDE	ASPHYXIAANT	5000PPM	10,000PPM	124-38-9

SECTION IIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE
SECRET REGISTRY # 409363-5134P

B-LUBE AEROSOL

SECTION III - PHYSICAL DATA

PAGE : 02

BOILING PT. (FAHRENHEIT)	165	SPEC GRAVITY (H2O=1)	1.050
VAPOR PRESSURE (MM HG)	80	COLOR	AMBER
VAPOR DENSITY (AIR=1)	4.6	ODOR	CHLORINATED
PH @ 100%	N/A	CLARITY	TRANSPARENT
PERCENT VOLATILE BY VOLUME (%)	82	EVAPORATION RATE (BU AC = 1)	5.0
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	NON-FLAMT.C.C.	FLAMMABLE LIMITS	N/A	LEL	N/A	UEL
EXTINGUISHING MEDIA	"ALCOHOL"					
X<--FOAM	<--FOAM	X<--CO2	X<--CHEMICAL	X<--WATER	X<--SPRAY	<--OTHER

SPECIAL FIRE FIGHTING PROCEDURES

SPRAY WATER ON AEROSOL CONTAINERS TO COOL THEM AND AVOID RUPTURING.

UNUSUAL FIRE & EXPLOSION HAZARDS

N/A

LEVEL 1 AEROSOL (NFPA 308)

NFPA HAZARD RATING (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE; 3=HIGH; 4=EXTREME):
3<--HEALTH 1<--FLAMMABILITY 0<--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

SAL 000007141

EFFECTS OF OVEREXPOSURE

HEADACHE, BLURRED VISION, NAUSEA, AND DIZZINESS - ACUTE - (SHORT TERM EXPOSURE)
 CHRONIC - (LONG TERM EXPOSURE)
 ASPHYXIATING UPON PROLONGED BREATHING OF CONCENTRATED VAPORS. MAJOR
 RESPONSE IS CNS DEPRESSION. IRRITATING TO SKIN AND MUCOUS MEMBRANES.
 PRIMARY ROUTE OF ENTRY: X-- INHALATION <-- INGESTION <-- ABSORPTION
 EMERGENCY & FIRST AID PROCEDURES
 INHALATION:
 MOVE TO FRESH AIR AND TREAT SYMPTOMATICALLY. GIVE OXYGEN IF BREATHING
 IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF BREATHING STOPS.
 GET MEDICAL HELP.

EYE CONTACT:
 FLUSH WITH WATER 5-6 MINUTES. SEE A PHYSICIAN IF IRRITATION
 PERSISTS.

SKIN CONTACT:
 WASH WITH SOAP AND WATER. IF IRRITATION PERSIST, SEEK MEDICAL
 ATTENTION.

INGESTION:
 DO NOT INDUCE VOMITING EVEN IF VOMITING OCCURS. IF IT OCCURS, KEEP
 HEAD BELOW KNEES TO PREVENT ASPIRATION OF LIQUID INTO LUNGS. GET
 MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:
 DEPENDING ON THE AMOUNT INGESTED AND RETAINED AS WELL AS THE TOXICITY
 OF THE PRODUCT, GASTRIC LAVAGE SHOULD BE EMPLOYED BECAUSE OF PULMONARY
 ASPIRATION. IF COMATOSE A CUFFED ENDOTRACHEAL TUBE WILL PREVENT
 ASPIRATION. CONSULT A POISON CONTROL CENTER.

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC <--YES NTP <--YES OSHA <--YES ACGIH <--YES OTHER <--YES
 X<--NO X<--NO X<--NO X<--NO X<--NO

1,1,1 TRICHLOROETHANE
 ORL-HMN TDLO: 670MG/KG TFX:CN 2.
 IHL-HMN TCLO: 920PPM/MG TEX:CSN 2.
 ORL-RAT LD50: 10,300MG/KG 2.

SECTION VII - REACTIVITY DATA

STABILITY X<--STABLE <--UNSTABLE CONDITIONS TO AVOID

B-LUBE AEROSOL

(CONTINUED)

SECTION VII - REACTIVITY DATA

PAGE : 04

INCOMPATIBILITY (MATERIALS TO AVOID)

STRONG ALKALIES, ACIDS, AND SELECTED AMINES.

HAZARDOUS DECOMPOSITION PRODUCTS
 CAN AT DECOMPOSITION TEMPERATURES RELEASE CARBON DIOXIDE,
 HYDROGEN CHLORIDE, AND PHOSGENE, AND CARBON MONOXIDE

HAZARDOUS WILL NOT MAY
 X <--OCCUR <--DOCCUR CONDITIONS TO AVOID

POLYMERIZATION N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
 SPILL IS UNLIKELY. PRODUCT IS IN AN AEROSOL CONTAINER. IF SPILLED,
 PREVENT FROM ENTERING SEWER OR WATER SOURCES. VENTILATE ENCLOSED AREA.
 CLEAN UP WITH RAGS OR ABSORB WITH SAND, COTTON WASTE OR OTHER
 ABSORBANTS.

WASTE DISPOSAL METHOD
 DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL POLLUTION
 REGULATIONS. NORMAL METHOD: WRAP EMPTY CAN WITH SEVERAL LAYERS OF NEWS-
 PAPER AND DISCARD IN TRASH.

NEUTRALIZING AGENT

N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
 SUFFICIENT VENTILATION TO BE EQUAL TO OR BELOW THE ALLOWABLE
 CONCENTRATION.

RESPIRATORY PROTECTION
 TYPICAL USE OF PRODUCT DOES NOT REQUIRE THE USE OF A RESPIRATOR. IF
 PRODUCT IS MISTED, USE NIOSH APPROVED MASK FOR SPRAY MISTS. IN
 EMERGENCY SITUATIONS, THE FOLLOWING RESPIRATORS ARE RECOMMENDED:
 500PPM CCRDV/SA/SCBA
 1000PPM CCRDV/GMDV/SAF/SCBAF
 ESCAPE: GMDV/SCBA

PROTECTIVE GLOVES
 VITON, PVA OR EQUIVALENT FOR REPEATED OR PRO-
 LONGED SKIN CONTACT IS ANTICIPATED.

SAL 000007142

(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

G S 6 3 2

EYE PROTECTION
 CHEMICAL GOGGLES IF METHOD OF USE PRESENTS THE
 LIKELIHOOD OF EYE CONTACT.

OTHER PROTECTION
 N/A

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE
 120 F. <--MAX 35 F. <--MIN INDOOR HEATED REFRIGERATED OUTDOOR

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
 FOLLOW LABEL DIRECTIONS.

OTHER PRECAUTIONS
 KEEP OUT OF REACH OF CHILDREN.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
1,1,1 TRICHLOROETHANE	71-55-6	80

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.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE JANITORIAL WORK OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION - (FOR FUTURE USE)

APPLICABLE REGULATIONS
 <--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)
 SHIPPING NAME

HAZARD CLASS | IC NUMBER | REPORT QTY

B-LUBE AEROSOL

(CONTINUED)

SECTION XII - TRANSPORTATION - (FOR FUTURE USE)

PAGE : 06

LABELS | LIMITED QTY

UNIT CONTAINER

DDT SPS CONTAINER | NET EXPLDSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. THRESHOLD LIMIT VALUE FOR CHEMICAL SUBSTANCES IN THE WORK ENVIRONMENT, 2ND EDITION, ACGIH, 1985
2. NIOSH REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES 1982.

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 THIS DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL 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.

SAL 000007143

SAL 000007144



MATERIAL SAFETY DATA SHEET

APPROVED BY U S LABOR DEPT, ESSENTIALLY SIMILAR TO FORM OSHA 174

PRODUCT IDENTITY:

Tank Cleaner #2C

GS633**I. SUPPLIER**

DELTA DISTRIBUTORS
14826 WOODPECK RD
HOUSTON, TX 77047
PHONE: 713-433-6771
CHEMTREC PHONE: 1-800-424-9300

II. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	PEL (OSHA)	TLV (ACGIH)	SARA TITLE III WT. % (REG. SECTION)
Heavy Aromatic Solvent Naphtha	864742-94-5	100 ppm	5.0 mg/cu m	Not Applicable
Light Aromatic Solvent Naphtha	864742-95-6	100 ppm	5.0 mg/cu m	Not Applicable
	CAS #	CEILING	PEAK (OSHA)	
		None Known	None Known	
		No ACGIH STEL values given		

HAZARD RATING

HEALTH (NFPA): 0 HEALTH (HMIS): 3 FLAMMABILITY: 2 REACTIVITY: 0
DOT SHIPPING NAME: Combustible Liquid, NOS (NA1993)
DOT DRUM LABEL: None

III. PHYSICAL DATA

BOILING RANGE: 198 211 257°C / 389 412 494°F (8=End Point)
GRAVITY @ 60°F: API: 22.1 SP.GR. (Water=1): .921 LB/GAL: 7.672
VAPOR PRESSURE (mm of Hg) @ 20: .4
VAPOR DENSITY (air=1): 4.8
WATER ABSORPTION: Moderate
ACID ABSORPTION (85% H₂SO₄): Moderate
DRY TIME (Ether=1): Long
% VOLATILE BY VOL: 95.0
APPEARANCE: Liquid, Light Straw
ODOR: Aromatic
HKB (Hydrogen Bonding): 19.2 PKB (Polarity): 39.6 DKB (Dispersion): 41.2
REFRACTIVE INDEX: 1.530
MIXED ANILINE POINT (Acid Insol): 23°C / 74°F

IV. FIRE & EXPLOSION HAZARDS

LOWER FLAMMABLE LIMIT IN AIR (% by vol): 1.0
FLASH POINT (TEST METHOD): 72°C / 162°F (TCC)
FLAMMABILITY CLASSIFICATION: class III A
EXTINGUISHING: NFPA Class B extinguishers (CO₂ or foam)
MEDIA: for class III A liquid fires.
SPECIAL FIRE: Water spray may be ineffective on fire but can protect fire fighters & cool closed containers.
FIGHTING: Use fog nozzles if water is used. Do not enter confined fire-space without full
PROCEDURES: bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots).
Use NIOSH approved positive-pressure self-contained breathing apparatus.
UNUSUAL: COMBUSTIBLE! Keep container tightly closed. Isolate from
EXPLOSION: oxidizers, heat, & open flame.
AND FIRE: Closed containers may explode if exposed to extreme heat.
PROCEDURES: Applying to hot surfaces requires special precautions.
Empty container very hazardous! Continue all label precautions!

Legal responsibility is assumed only for the fact that all studies reported here & opinions are those of qualified experts. Buyer assumes all risk & liability. He accepts & uses this material on these conditions. He must keep a copy of this MSDS where material is handled.

SAL 000007145

GS638

PRODUCT IDENTITY:

Tank Cleaner #2C

V. REACTIVITY DATA

STABILITY : Stable

CONDITIONS TO AVOID: Isolate from oxidizers, heat, & open flame.

MATERIALS TO AVOID: Isolate from strong oxidizers such as permanganates, chromates & peroxides.

HAZARDOUS : Carbon Monoxide, Carbon Dioxide from burning.

DECOMPOSITION:

PRODUCTS :

VI. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: Not Applicable

PREVENTION : Use only with adequate ventilation.

OF OVER- : Avoid prolonged breathing of vapor or spray mist.

EXPOSURE : Avoid prolonged or repeated contact with skin.

ORGANIC EFFECTS: EYE & SKIN CONTACT: Primary irritation to skin, defatting, dermatitis.

OF ACUTE : Primary irritation to eyes, redness, tearing, blurred vision.

OVER- : SWALLOWING: Harmful or fatal if swallowed.

EXPOSURE : Swallowing can cause abdominal irritation, nausea, vomiting and diarrhea.

ORGANIC EFFECTS: EYE & SKIN CONTACT: Liquid can cause eye irritation.

OF CHRONIC : Wash thoroughly after handling.

OVER- :

EXPOSURE :

CANCER HAZARD : possible cancer hazard based on tests with laboratory animals using

: Ethylene Oxide. Overexposure may create cancer risk.

CONDITIONS : Persons with severe skin, liver or kidney problems should avoid use.

AGGRAVATED :

EMERGENCY & : In case of contact with skin, flush with plenty of water. For eyes,

FIRST AID : flush with plenty of water for 15 minutes & get medical attention.

PROCEDURES : After high vapor exposure, remove to fresh air. If breathing is difficult

: give oxygen. If breathing has stopped give artificial respiration.

: If swallowed, CALL A PHYSICIAN IMMEDIATELY!

: Never give anything by mouth to an unconscious person.

VII. SAFE HANDLING & USE PRECAUTIONS

SPILL OR LEAK : Stop spill at source. Dike area & contain. Pump spilled liquid & put contaminated soil

PROCEDURES : in DOT approved containers for disposal. Label immediately.

: Clean up remainder with absorbent materials.

WASTE DISPOSAL : Dispose of waste by legal methods complying with local, state & federal regulations.

METHOD : If questions exist, contact the appropriate agencies.

OTHER : Store large amounts in structures made for OSHA Class III A liquids.

PRECAUTIONS : Avoid free fall of liquid.

: Ground containers when transferring. Do not flame cut, braze or weld.

: Empty container very hazardous! Continue all label precautions!

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION: Not Applicable

(SPECIFY TYPE) :

VENTILATION : LOCAL EXHAUST : Necessary MECHANICAL (GENERAL) : Acceptable

: SPECIAL : None OTHER : None

PROTECTIVE : Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.

CLOTHING: Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.

DATE : 02/89

SAL 000007146

MATERIAL SAFETY DATA SHEET
Substantially Similar to Form OMS No. 174 **6-9-48**

PRODUCT NAME: SUPER STEAM/HDL

MANUFACTURER: Seatex Corporation
6325 Hurst St.

EMERGENCY TELEPHONE NO.: 713-868-1461 **DATE PREPARED:** 06/27/89 **Houston, Tx. 77008**

HAZARDOUS INGREDIENTS	C.A.S. #	OSHA PEL/TLV	ACGIH TLV	STEL	OTHER LIMITS
Sodium Hydroxide	1310-73-2	2 mg/m3	2 mg/m3	mg/m3	None
	-	mg/m3	mg/m3	mg/m3	
	-	mg/m3	mg/m3	mg/m3	

HEALTH - 2 FIRE -0 REACTIVITY -0 SPECIFIC HAZARD -Alk

BOILING POINT - 212 DEG.F **FLASH POINT -** **DEG.F** **METHOD USED:** CDC
SPECIFIC GRAVITY - 1.09 **EVAPORATION RATE (BUTYL ACETATE=1):** 1 **%VOLATILE:** na
PHYSICAL DESCRIPTION: Yellow-green, water clear liquid; mild odor.

FLAMMABLE LIMITS: LEL - na UEL - na **EXTINGUISHING MEDIA:** Material will not burn.

SPECIAL FIRE FIGHTING PROCEDURE: Firefighters should wear selfcontained breathing apparatus as in all chemical fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

UNSTABLE - **STABLE -** X **HAZARDOUS DECOMPOSITION PRODUCTS:** May produce oxides of carbon upon oxidation.

CONDITIONS TO AVOID:

MATERIALS TO AVOID: Strong acids, strong oxidizing agents.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

POSSIBLE ROUTES OF ENTRY: INHALATION - Yes INGESTION -Yes SKIN -Yes

ACUTE HEALTH HAZARD: Dehydration and defatting of skin. Severe irritation and burning of all mucus membranes.

CHRONIC HEALTH HAZARD:

CARCINOGENICITY: NTP -No IARC MONOGRAPHS -No OSHA REGULATED -No

ORAL LD/50 - Unknown **DERMAL IRRITATION -** Serious **EYE IRRITATION -** Severe

SYMPTOMS OF EXPOSURE:

EYE - Irritation, burning.

SKIN - Irritation, burning.

INHALATION - Irritation and damage to mucus membranes.

INGESTION - Irritation and damage to mucus membranes.

CONDITIONS AGGRAVATED BY EXPOSURE -Unknown

FIRST AID

SKIN: Flush with water and neutralize with vinegar. **SAL** 000007147

EYES: Flush with water for 15 minutes. See a physician immediately.

INHALATION: Remove to fresh air.

INGESTION: Drink water or milk followed by citrus juice. See a physician immediately.

SPILL SAFETY: Stop, leak, dilute material spilled with acetic acid (vinegar) to less than pH 10.

DISPOSAL INFORMATION: Flush diluted material to sewer.

GS448

A. RIAL SAFETY DATA SHEET pg. 2

TORAGE AND HANDLING: Store in a dry, cool place.

PERSONAL HYGENE:

ESPIRATORY PROTECTION - Yes

YPE - Mist mask.

ENTILATION:

ENERAL MECHANICAL - X

LOCAL -

SPECIAL - None required

ROTECTIVE EQUIPMENT REQUIRED:

RUBBER GLOVES - X RUBBER APRON - RUBBER BOOTS - CHEMICAL SPLASH GOGGLES - X
ACE SHEILD -

SHIPPING INFORMATION:

DOT LABEL NONE REQUIRED - X REQUIRED -

CORROSIVE - OXIDIZER - POISON - FLAMMABLE (COLOR) - ()

I.N. NUMBER - NOT REQUIRED - X

SPECIAL INFORMATION:

CREATED BY S.K

SAL 000007148



MATERIAL SAFETY DATA SHEET

Consumer Products Division, Division of Borden, Inc.
180 EAST BROAD STREET, COLUMBUS, OHIO 43215

Emergency Telephone
(614) 457-5200
(OPERATION ALERT)

THE OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 REQUIRES THAT
THE INFORMATION CONTAINED ON THIS SHEET BE MADE AVAILABLE TO YOUR WORKER

INSTRUCT YOUR WORKERS TO HANDLE THIS PRODUCT PROPERLY

NAME: KRYLON CRYSTAL CLEAR SPRAY COATING
TYPE: AEROSOL ACRYLIC SPRAY
APPLICATION: ITEMS 1301, 1302, 1303, 1304

G S 6 2 6

22-Nov-85

SIGNAL WORD—DANGER!

THIS MATERIAL IS A "HEALTH HAZARD" AND/OR A "PHYSICAL HAZARD" AS DETERMINED WHEN REVIEWED ACCORDING TO THE REQUIREMENT
OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION 29 CFR PART 1910.1200 "HAZARD COMMUNICATION" STANDARD.

CHEMICAL HAZARD RATING

HEALTH = 2(MODERATE)

FIRE = 4(EXTREME)

REACTIVITY = 0(LEAST)

29CFR1910.1200 HAZARDOUS INGREDIENTS/REPORTED HEALTH EFFECTS CAS REGISTRY NO. MATERIAL DESCRIPTION % BY WT.

67-64-1 ACETONE 11.2
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. SIGNS AND
SYMPTOMS MAY INCLUDE HEADACHE, DIZZINESS, NAUSEA,
VOMITING, UNCONSCIOUSNESS AND EVEN ASPHYXIATION.
ACGIH EXPOSURE LIMIT: 750 PPM, 8-HR TWA
OSHA 29CFR1910 EXPOSURE LIMIT: 1000 PPM, 8-HR TWA
NIOSH DOCUMENT NUMBER: 78-173

74-98-6 PROPANE 12.9
THIS MATERIAL IS A SIMPLE ASPHYXIANT. SIGNS AND SYMPTOMS
OF OVEREXPOSURE INCLUDE CYANOSIS, RESPIRATORY DISTRESS,
HEADACHE, DIZZINESS, DROWSINESS, UNCONSCIOUSNESS AND
ASPHYXIATION.
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION.
ACGIH EXPOSURE LIMIT: SEE ACGIH TLVS, APPENDIX E
OSHA 29CFR1910 EXPOSURE LIMIT: 1000 PPM, 8-HR TWA

75-28-5 ISOBUTANE 17.1

108-88-3 TOLUENE 11.1
OVEREXPOSURE MAY CAUSE LIVER DAMAGE.
OVEREXPOSURE MAY CAUSE KIDNEY DAMAGE.
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. SIGNS AND
SYMPTOMS MAY INCLUDE HEADACHE, DIZZINESS, NAUSEA,
VOMITING, UNCONSCIOUSNESS AND EVEN ASPHYXIATION.
ACGIH EXPOSURE LIMIT: 100 PPM, 8-HR TWA
OSHA 29CFR1910 EXPOSURE LIMIT: 200 PPM, 8-HR TWA
NIOSH DOCUMENT NUMBER: 73-11023

142-82-5 HEPTANE 22.4
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. SIGNS AND
SYMPTOMS MAY INCLUDE HEADACHE, DIZZINESS, NAUSEA,
VOMITING, UNCONSCIOUSNESS AND EVEN ASPHYXIATION.
ACGIH EXPOSURE LIMIT: 400 PPM, 8-HR TWA
OSHA 29CFR1910 EXPOSURE LIMIT: 500 PPM, 8-HR TWA
NIOSH DOCUMENT NUMBER: 77-151

1330-20-7 XYLENE 15.
OVEREXPOSURE MAY CAUSE LIVER DAMAGE
OVEREXPOSURE MAY CAUSE KIDNEY DAMAGE.
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. SIGNS AND
SYMPTOMS MAY INCLUDE HEADACHE, DIZZINESS, NAUSEA,
VOMITING, UNCONSCIOUSNESS AND EVEN ASPHYXIATION.
ACGIH EXPOSURE LIMIT: 100 PPM, 8-HR TWA
OSHA 29CFR1910 EXPOSURE LIMIT: 100 PPM, 8-HR TWA
NIOSH DOCUMENT NUMBER: 75-168

64742-94-5 HEAVY AROMATIC SOLVENT NAPHTHA (PETROLEUM) 2.
CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. SIGNS
AND SYMPTOMS MAY INCLUDE HEADACHE, DIZZINESS, NAUSEA,
VOMITING, UNCONSCIOUSNESS AND EVEN ASPHYXIATION.

PHYSICAL DATA

VAPOR PRESSURE — SEE CAN PRESSURE
VAPOR DENSITY HEAVIER THAN AIR
SOLUBILITY IN WATER — SLIGHT
SPECIFIC GRAVITY LIGHTER THAN WATER
EVAP RATE FASTER THAN BUTYL ACETATE
BOILING POINT: APPEARANCE: ODOR—N.A.
PERCENT VOLATILE BY WEIGHT: 94
PERCENT NON-VOLATILE BY WEIGHT: 6
PRESSURE IN CONTAINER, PSIG @ 70 F. APPROX. 60

ACUTE HEALTH HAZARD DATA

SKIN ABSORPTION: NO HAZARDS KNOWN TO BORDEN.
INGESTION: MAY BE HARMFUL IF SWALLOWED.
INHALATION: MAY BE HARMFUL IF INHALED. LIQUID OR VAPOR
CAN CAUSE IRRITATION OF NOSE, THROAT AND LUNGS.
SKIN: CAUSES IRRITATION.
EYES: CAUSES IRRITATION.

HANDLING PRECAUTIONS

INHALATION: AVOID BREATHING VAPOR OR MIST.
USE WITH ADEQUATE VENTILATION.
SKIN: AVOID CONTACT WITH SKIN.
EYES: AVOID CONTACT WITH EYES.
WASH THOROUGHLY AFTER HANDLING.

EMERGENCY AND FIRST AID PROCEDURES

INTERNAL: IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A
PHYSICIAN IMMEDIATELY.
INHALATION: REMOVE TO FRESH AIR.
SKIN CONTACT: FLUSH SKIN WITH WATER. IF IRRITATION
PERSISTS, CALL A PHYSICIAN.
EYE CONTACT: IMMEDIATELY FLUSH WITH PLenty OF WATER
FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.
SEE REVERSE SIDE

GS626

FLAMMABLE AND EXPLOSION HAZARD DATA

EXTREMELY FLAMMABLE.

CONTENTS UNDER PRESSURE; EXPOSURE TO HIGH TEMPERATURE MAY CAUSE BURSTING. AVOID RADIATORS, STOVES, DIRECT SUNLIGHT, OR OTHER HEAT SOURCE.

DO NOT PUNCTURE OR INCINERATE CONTAINER.

DO NOT SPRAY NEAR OPEN FLAME.

WASTE DISPOSAL METHOD

DISPOSE OF ACCORDING TO LOCAL, STATE, AND FEDERAL REQUIREMENTS.

EMPTY CONTAINER: MAY CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, PUNCTURE OR WELD ON OR NEARBY. INCINERATION WILL CAUSE CONTAINER TO BURST VIOLENTLY.

STORAGE PRECAUTIONS

DO NOT STORE AT TEMPERATURES OVER 120 F.

DOT CLASSIFICATION

ORM-D CONSUMER COMMODITY

REACTIVITY DATA

NORMALLY STABLE AS DEFINED IN FNPA 704-12(4-3.1).

MAJOR DECOMPOSITION PRODUCTS: CO, CO₂

SPECIAL PROTECTION INFORMATION

APPROVED RESPIRATORY PROTECTION REQUIRED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL.

USE GOGGLES OR FACE SHIELD IF SPLASHING IS LIKELY.

WEAR IMPERVIOUS GLOVES AS REQUIRED TO PREVENT SKIN CONTACT.

WEARING SAFETY GLASSES, SAFETY SHOES, HARD HATS AND SUITABLE CLOTHING IS STANDARD PRACTICE IN MANY INDUSTRIAL OPERATIONS.

SPILL OR LEAK PROCEDURES

ELIMINATE ALL IGNITION SOURCES.

SOAK UP WITH ABSORBENT MATERIAL AND REMOVE TO A CHEMICAL DISPOSAL AREA.

PREVENT ENTRY INTO NATURAL BODIES OF WATER.

NOR (M)

KD-1301

11/13/85

DISCLAIMER

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY BORDEN, except that the product shall conform to contracted specifications, and that the product does not infringe any valid United States patent. The information provided herein was believed by Borden to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

SAL 000007150

MATERIAL SAFETY DATA SHEET

TECH SPRAY

PO BOX 949 Amarillo, Texas 79105

Emergency Phone: 806-372-8523

CS627

Product Name: MP. MICRO PROCESSOR CLEANER

Number: 1680 Aerosol

Hazardous

Description: Compressed Gas N.O.S. Non-Flammable Gas UN1956

Hazard Rating Health: 1 Fire: 0 Reactivity: 1

0-Least 1-Slight 2-Moderate 3-High 4-Extreme

I - HAZARDOUS COMPONENTS

Ingredient	CAS No.	%	Hazard
1,1,2-Trichlorotrifluoroethane (Freon TF)	76-13-1	74	OSHA PEL 1000ppm ACGIH TLV 1000ppm (STEL 1250ppm)
Dichlorodifluoromethane	75-71-8	25	OSHA PEL 1000ppm ACGIH TLV 1000ppm
Carbon Dioxide	124-38-9	<2	OSHA PEL 5000ppm ACGIH TLV 5000ppm

II - PHYSICAL DATA

Boiling Point: 47 C 116 F

Specific Gravity: NIF

Solubility in Water: 0

Vapor Density (Air = 1): 6.5

Appearance: Clear water-white mobile liquid with slight ethereal odor.

pH: NA

% Volatile: 100

% Solids: 0

Evaporation Rate (H₂O = 1): NIF

III - FIRE AND EXPLOSION HAZARD DATA

Flash Point: None TCC Method

Explosion Limits

LEL: NA UEL: NA

Extinguishing Media: Water, foam, dry chemical, carbon dioxide.

Special Fire Fighting Procedures:

Fire fighters should wear self contained, positive-pressure breathing apparatus and avoid skin contact.

Unusual Fire and Explosion Hazards:

SAL 000007151

Aerosol cans may erupt with force at temperatures above 120 degrees F.

IV - HEALTH HAZARD DATA

Effects of Overexposure

INHALATION: Major route of exposure. Vapor is heavier than air and can cause suffocation by reducing the available oxygen for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, confusion, and may lead to narcosis, cardiac irregularities, unconsciousness or even death.

EYES: Liquid can cause slight, temporary irritation with slight temporary corneal injury. Vapors can irritate eyes.

SKIN: Not a corrosive or irritant; however, repeated or prolonged exposure can cause defatting of skin.

INGESTION: Single dose toxicity is low to moderate. If vomiting occurs the liquid can be aspirated into lungs, which can cause chemical pneumonia and systemic effects. Human psychotropic, gastrointestinal, and central nervous system effects possible.

Emergency and First Aid Procedures

INHALATION: Remove to fresh air. If breathing has stopped, administer artificial respiration. Seek medical attention.

EYES: Flush eyes for at least fifteen minutes with clear water. If irritation persists, seek medical attention.

SKIN: Wash with soap and water.

INGESTION: DO NOT INDUCE VOMITING! Give 2 glasses of water and immediately seek medical attention.

NOTE: Adrenalin and other similar cardiac stimulants should NOT be used to treat effects of overexposure to this product. See section I.

None of the ingredients in this product are listed on the OSHA, IARC, NTP list of possible carcinogenic, mutagenic, or teratogenic chemicals.

V - REACTIVITY DATA

SAL 000007152

Stability: STABLE

Conditions to Avoid: Contact with open flame, heat.

Incompatibility (materials to avoid)

Reactive alkali metals, strong acids & bases.

Hazardous Decomposition Products:

Hydrogen chloride, phosgene, chlorine, carbon dioxide, and carbon monoxide.

Hazardous Polymerization: WILL NOT OCCUR

Conditions to Avoid: None

VI - SPILL OR LEAK PROCEDURES

G S 6 27

Evacuate area. Ventilate area well and avoid breathing vapors. Vapor concentration will be highest along floor and in low lying areas. Pick up liquid on suitable absorbent and store in sealed containers.

VII - WASTE DISPOSAL METHODS

Material may be disposed of by a licensed reclaimer or incineration facility. Consult local, state, and federal disposal authorities for approved procedures.

Do not incinerate or destroy aerosol cans.

VIII - EMPLOYEE PROTECTION

Respiratory Protection:

Use NIOSH approved organic vapor mask.

Ventilation: Do not use in closed space. Ventilation required.

Hands: Solvent resistant gloves such as Neoprene or PVA.

Eyes: Wear splash proof safety goggles or glasses.

Special Precautions:

Keep aerosol cans in cool place out of direct sunlight. Keep this and all chemicals out of reach of children. This product for industrial use only.

IX - OTHER INFORMATION

SAL 000007153

6-8628

Static Free®
C1600

IDENTIFICATION

Name: Static Free	Chemical Family: Halogenated hydrocarbon, alcohol
Synonyms: Freon® TF, Freon® 113, IPA	Formula: CCl ₂ FCF ₂ Cl CH ₂ CHOHCH ₃
CAS Name: 1,1,2-Trichloro- 1,2,2-Trifluoroethane Isopropanol Carbon Dioxide Propellant Anti-Static Agent	CAS Registry No.: 76-13-1 67-63-0 124-38-9 N/A

Manufacturer: Chemtronics Inc. 681 Old Willets Path Hauppauge, NY 11788	Medical/Transportation Emergency Phone: 516-582-3322
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PHYSICAL DATA (Propellant Free Basis)

Boiling Point (°F): 118 (initial)	Vapor Pressure: 474 mm Hg @ 70°F
Density: 1.54 @ 70°F	Solubility in H₂O: Negligible
Vapor Density (Air = 1): > 1	Evaporation Rate (Ether = 1): > 1 (faster)
pH Information: N/A	Appearance: Clear
Form: Volatile solution	Odor: Slight alcohol-like
Color: Colorless	
Percent Volatile by Volume: 99	

HAZARDOUS COMPONENTS

Material(s)	Approximate %:
1,1,2-Trichloro- 1,2,2-Trifluoroethane	—
Isopropanol	—
Carbon Dioxide Propellant	4
Coco Alkylbis (2-Hydroxyethyl)	—
Methyl Ammonium Chlorides	—

HAZARDOUS REACTIVITY

Stability: Materials are stable but cans are under pressure. Avoid spraying near open flame or red hot surfaces.

Decomposition: Can be decomposed by high temperatures (open flames, glowing surfaces, etc.) forming halogen acids, phosgene in small amounts.

Incompatibility: Finely divided reactive metals—powdered Al, Zn, Be, etc.

Polymerization: Will not occur.

FIRE AND EXPLOSION DATA

Flash Point: Nonflammable	Method: Not determined
Autoignition Temperature: Not determined	Flammable Limits in Air, % by Vol.: Lower: Not determined Upper: Not determined

Autodecomposition Temperature: Not determined.

Fire and Explosion: Pressurized aerosol containers at elevated temperatures may vent, rupture or burst and add to flying and falling debris. Intense heat may cause decomposition with emission of halogen acids.

Extinguishing Media: Nonflammable	Special Fire Fighting Instructions: Self-contained breathing apparatus (SCBA) may be required if aerosols rupture and contents are spilled under fire conditions.
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HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Excessive inhalation of concentrated vapor can cause light-headedness, giddiness, shortness of breath, dizziness and may lead to narcosis, anesthesia, cardiac irregularities, unconsciousness or death. Trichlorotrifluoroethane LC 50 Rats 52,000 ppm/4 hrs.

Eye: Contact may cause irritation.

Oral: Although oral toxicity is low (Trichlorotrifluoroethane LD 50 Rats 43,000 mg/kg) ingestion of this material is to be avoided.

Skin: Contact may cause dryness and irritation. This material is poorly absorbed through the skin (Trichlorotrifluoroethane Rabbit ALD > 11,000 mg/kg).

Exposure Limits:

Material:	TLV (ACGIH):	PEL (OSHA):
Trichlorotrifluoroethane	1000 ppm	1000 ppm
Isopropanol	480 ppm	400 ppm

Safety Precautions: Avoid breathing vapors and prolonged skin exposure. Use only in well-ventilated area.

First Aid:

Inhalation: Excessive vapor inhalation: Move patient to fresh air. If necessary, give artificial respiration or oxygen. DO NOT give epinephrine or similar drugs as such drugs may induce ventricular arrhythmia.

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

Skin: Flush with water. Get medical attention if irritation is present.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary. DO NOT induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the GI tract.

Note to Physician: Because of possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life-threatening emergencies.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Health Hazards, Inhalation Section.

Other Health Hazards:

Freon® 113, is not listed as a carcinogen by IARC, NTP or OSHA. Based on animal studies and human experiences, this fluorocarbon poses no direct hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity or teratogenicity when occupational exposures are below its TLV. Isopropanol is listed on NTP carcinogen list and IARC potential carcinogen list.

SAL 000007154

PROTECTION INFORMATION

Generally Applicable Control Measures: Normal ventilation. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment: Do not spray liquid on skin.

DISPOSAL INFORMATION

Spill, Leak or Release: Ventilate area. Remove open flames or red hot surfaces. Allow to evaporate.

Waste Disposal: Allow to evaporate. Do not puncture or incinerate aerosol cans. Comply with federal, state and local regulations.

SHIPPING INFORMATION

Domestic—Other Than Air (DOT):

Proper Shipping Name: Consumer Commodity

Hazard Class: ORM D

UN No.:

DOT Label:

DOT Placard:

International Water or Air (IMO/ICAO):

Proper Shipping Name: Aerosol, nonflammable gas NOS.

Hazard Class: 2

UN No.: 1950

IMO/ICAO Label: Aerosol, nonflammable gas contains CO₂

OTHER INFORMATION

Shipping Containers: Aerosol Cans

Storage Conditions: Do not store near sources of heat, in direct sunlight or where temperatures exceed 120°F. Do not puncture or damage containers. Rotate stock.

Date Revised: 6/87

Person Responsible: S.H. Stein, Ph.D.



Chemtronics Inc.
681 Old Willets Path
Hauppauge, NY 11788
(516) 582-3322

The information contained herein is based on current technical data and tests which we believe to be accurate and reliable. It is intended for use by persons having technical knowledge and skill, at their own discretion and risk. We can assume no liability for results obtained or damages incurred through improper use of product or application of data. Contact Chemtronics for further information.

*Registered trademark of E.I. DuPont de Nemours & Company (Inc.)

Freez-It®/Freez-It® Antistat C150, C220, C150-S, C151

G S 6 2 9

IDENTIFICATION

Name: Freez-It	Chemical Family: Halogenated Hydrocarbon
Synonyms: Freon® 12, FC-12 Dymel® 12, Dichlorodifluoromethane	Formula: CCl ₂ F ₂
CAS Name: Methane, Dichlorodifluoro	CAS Registry No.: 75-71-8
Manufacturer: Chemtronics Inc. 681 Old Willets Path Hauppauge, NY 11788	Medical/Transportation Emergency Phone: 516-582-3322

PHYSICAL DATA

Boiling Point (°F): -21.6	Percent Volatile by Volume: 100
Density: 1.311 g/cc @ 77°F	Vapor Pressure: 80 psig @ 77°F
Vapor Density (Air=1): 4.2	Solubility in H₂O: 0.028% by wt @ 77°F
pH Information: Neutral	Evaporation Rate (Ether=1): > 8
Form: Liquefied Gas	Appearance: Clear
Color: Colorless	Odor: Slight ethereal odor

HAZARDOUS COMPONENTS

No carcinogens as per OSHA, IARC and NTP lists.

Material(s): Dichlorodifluoromethane	Approximate %: 100
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HAZARDOUS REACTIVITY

Stability: Material is stable. However, avoid open flames and high temperatures.

Decomposition: Can be decomposed by high temperatures (open flames, glowing surfaces, etc.) forming hydrochloric and hydrofluoric acids, possibly carbonyl halides.

Incompatibility: Alkali or alkaline earth metals—powdered Al, Zn, Be, etc.

Polymerization: Will not occur.

FIRE AND EXPLOSION DATA

Flash Point: None	Method: TOC
Autoignition Temperature: Not determined	Flammable Limits in Air, % by Vol.: Lower: Nonflammable Upper: Nonflammable

Autodecomposition Temperature: Not determined

Fire and Explosion: Pressurized aerosol containers at elevated temperatures may vent, rupture or burst and add to flying and falling debris. Intense heat may cause decomposition with emission of halogen acids.

Extinguishing Media:
Nonflammable

**Special Fire Fighting
Instructions:** Self-contained
breathing apparatus (SCBA)
may be required if aerosol
cans rupture and contents
are released under fire
conditions.

HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. LC 50 Rats, 800,000 ppm/30 min.

Skin: Liquid contact can cause frostbite.

Eye: Liquid contact can cause frostbite. Tests in rabbit eyes with a 50% solution in mineral oil and with vapors resulted in no observable damage.

Oral: Rats were fed Dichlorodifluoromethane dissolved in peanut oil. No deaths occurred at highest feasible dose 1000 mg/kg.

Exposure Limits:

Material:	TLV (ACGIH):	PEL (OSHA):
Dichlorodifluoromethane	1000 ppm	1000 ppm

Safety Precautions: Avoid breathing vapors and liquid contact with skin or eyes. Use only in well-ventilated area.

First Aid:

Inhalation: Remove to fresh air, call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

Eye: In case of liquid contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: Flush with water. Treat for frostbite if necessary.

Note to Physician: Because of a possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life-threatening emergencies.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Health Hazards, Inhalation Section.

Other Health Hazards:

Dichlorodifluoromethane is not classified as carcinogenic by IARC, NTP or OSHA. Based on animal studies and human experiences this fluorocarbon poses no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity or teratogenicity when occupational exposures are below its TLV.

PROTECTION INFORMATION

Generally Applicable Control Measures: Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment: Lined butyl gloves should be used when handling liquid. Chemical splash goggles should be worn when handling liquid. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

GS629

DISPOSAL INFORMATION

Spill, Leak or Release: Ventilate area—especially low places where heavy vapors might collect. Remove open flames.

Waste Disposal: Allow to evaporate. Do not puncture or incinerate aerosol cans. Comply with federal, state and local regulations.

SHIPPING INFORMATION

Domestic—Other Than Air (DOT):

Proper Shipping Name: Consumer Commodity

Hazard Class: ORM-D

UN No.:

DOT Label:

DOT Placard:

International Water or Air (IMO/ICAO):

Proper Shipping Name: Dichlorodifluoromethane

Hazard Class: 2

UN No.: 1028

IMO/ICAO Label: Nonflammable Gas

OTHER INFORMATION

Shipping Containers: Aerosol Cans

Storage Conditions: Do not store near sources of heat, in direct sunlight or where temperatures exceed 49°C/120°F. Do not puncture or damage containers. Rotate stock.

Date Revised: 6/87

Person Responsible: S.H. Stein, Ph.D.



Chemtronics Inc.
681 Old Willets Path
Hauppauge, NY 11788
(516) 582-3322

The information contained herein is based on current technical data and tests which we believe to be accurate and reliable. It is intended for use by persons having technical knowledge and skill, at their own discretion and risk. We can assume no liability for results obtained or damages incurred through improper use of product or application of data. Contact Chemtronics for further information.

*Registered trademark of E.I. Du Pont De Nemours & Company (Inc.)

SAL 000007157

Electro-Wash®

C80, C160, C240, C240-4

G S 6 8 0

IDENTIFICATION

Name:	Chemical Family:
Electro-Wash	Halogenated Hydrocarbon
Synonyms:	Formula:
Trichlorotrifluoroethane, Freon® TF, FC-113, Trichloro- fluoromethane, R-11, Freon® 11	$\text{CCl}_2\text{FCClF}_2/\text{CCl}_3\text{F}/\text{CO}_2$
CAS Name:	CAS Registry No.:
1,1,2-Trichloro-1,2,2-Tri- fluoroethane	76-13-1
Trichlorofluoromethane	75-69-4
Carbon Dioxide Propellant	124-38-9
Manufacturer:	Medical/Transportation
Chemtronics Inc.	Emergency Phone:
681 Old Willets Path	516-582-3322
Hempstead, NY 11788	

PHYSICAL DATA (Propellant Free Basis)

Boiling Point (°F): 75-118	Vapor Pressure:
Density: 1.46 g/cc @ 77°F	334mm Hg @ 77°F
Vapor Density (Air=1):	Solubility in H₂O:
4.6 @ 77°F	Negligible
pH Information: Neutral	Evaporation Rate
Form: Liquid	(Ether=1): 1
Color: Colorless	Appearance: Clear
Percent Volatile by Volume:	Odor: Faint solvent odor
100	

HAZARDOUS COMPONENTS

No carcinogens as per NTP, IARC or OSHA lists.

Material(s):	Approximate %:
Trichlorotrifluoroethane	20-50
Trichlorofluoromethane	50-70
Carbon Dioxide Propellant	3

HAZARDOUS REACTIVITY

Stability: Material is stable. However, avoid spraying near open flames or red hot surfaces. Do not heat aerosol containers above 49°C/120°F.

Decomposition: This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, possibly carbonyl halides.

Incompatibility: Alkali or alkaline earth metals—powdered Al, Zn, Be, etc.

Polymerization: Will not occur.

FIRE AND EXPLOSION DATA

Flash Point: None	Method: TOC
Autoignition Temperature:	Flammable Limits in Air,
Not determined	% by Vol.:
	Lower: Nonflammable
	Upper: Nonflammable

Autodecomposition Temperature: Not determined.

Fire and Explosion: Pressurized aerosol containers at elevated temperatures may vent, rupture or burst and add to flying and falling debris. Decomposition may occur.

Extinguishing Media:	Special Fire Fighting
Nonflammable	Instructions: Self-contained breathing apparatus (SCBA) may be required if aerosols rupture and contents are spilled under fire conditions.

HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing high concentrations of these products can cause light-headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. Trichlorotrifluoroethane LC 50 Rats 52,000 ppm/4 hrs. Trichlorofluoromethane LC 50 Rats 26,200 ppm/4 hr.

Skin: Not a corrosive or irritant after single contact. However, repeated liquid contact can cause defatting of the skin resulting in irritation. This material is poorly absorbed through the skin (Trichlorotrifluoroethane Rabbit ALD > 11,000 mg/kg).

Eye: Liquid contact can cause discomfort, usually no extended effect.

Oral: Although oral toxicity is low (Trichlorotrifluoroethane LD 50 Rats 43,000 mg/kg; ALD for Trichlorofluoromethane is greater than 37.25 mg/kg in Rats) ingestion of Trichlorotrifluoroethane is to be avoided.

Exposure Limits:

Material:	TLV (ACGIH):	PEL (OSHA):
Trichlorotrifluoroethane	1000 ppm	1000 ppm
Trichlorofluoromethane	1000 ppm	1000 ppm
Carbon Dioxide Propellant	5000 ppm	5000 ppm

Safety Precautions: Avoid breathing vapors and prolonged skin exposure. Use only in well-ventilated area.

First Aid:

Inhalation: Remove to fresh air, call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

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

Skin: Flush with water. Get medical attention if irritation is present.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary. Do not induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the intestinal tract.

Note to Physician: Because of possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening emergencies.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Health Hazards, Inhalation Section.

Other Health Hazards:

Electro-Wash is not listed as a carcinogen by IARC, NTP or OSHA. Based on animal studies and human experiences, this mixture poses no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity or teratogenicity when occupational exposures are below its recommended TLV.

SAL 000007158

PROTECTION INFORMATION

Generally Applicable Control Measures: Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment: Butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal manufacturing conditions no respiratory protection is required when using this product. Self-contained breathing apparatus is required if a large spill occurs. Do not spray liquid on skin.

DISPOSAL INFORMATION

Spill, Leak or Release: Ventilate area. Remove open flames or red hot surfaces. Allow to evaporate.

Waste Disposal: Allow to evaporate. Do not puncture or incinerate aerosol cans. Comply with federal, state and local regulations.

SHIPPING INFORMATION

Domestic—Other Than Air (DOT):

Proper Shipping Name: Consumer Commodity

Hazard Class: ORM-D

UN No.:

DOT Label:

DOT Placard:

International Water or Air (IMO/ICAO):

Proper Shipping Name: Aerosol, nonflammable, NOS

Hazard Class: 2

UN No.: 1950

IMO/ICAO Label: Aerosol, nonflammable gas, contains CO₂

OTHER INFORMATION

Shipping Containers: Aerosol Cans

Storage Conditions: Do not store near sources of heat, in direct sunlight or where temperatures exceed 120° F. Do not puncture or damage containers. Rotate stock.

Date Revised: 6/87

Person Responsible: S.H. Stein, Ph.D.



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681 Old Willets Path
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MANUFACTURER/SUPPLIER:
Welchem, Inc.
P. O. Box 920941
Houston, Texas 77292-0941
TEL. (713) 462-4783

EMERGENCY HEALTH INFORMATION: (800) 447-8735
EMERGENCY SPILL INFORMATION: (800) 424-9300
CHEMTREC, U.S.A.
OTHER PRODUCT SAFETY INFORMATION: (312) 856-3516

IMPORTANT COMPONENTS: Hydrophyllic polyacrylate: trade secret
polymerized polyol: trade secret.
No exposure limit established.

WARNING STATEMENT: Danger! Causes eye damage and skin burns. Can cause irritation of the mouth, throat and esophagus.

HMIS/NEPA CODES:(HEALTH;3)(FLAMMABILITY;1)(REACTIVITY;1)

APPEARANCE AND ODOR: Clear, viscous solution.

HEALTH HAZARD INFORMATION

EYE

EFFECT: Causes eye damage.

FIRST AID: Immediately flush eyes with plenty of water for at least 15 minutes, then get immediate medical attention.

PROTECTION: Do not get in eyes. Wear chemical goggles.

SKIN

EFFECT: Causes skin burns.

FIRST AID: Immediately wash exposed skin with soap and water. Get prompt medical attention if irritation develops. Remove contaminated clothing, including shoes, and thoroughly clean and dry before reuse.

PROTECTION: Do not get on skin or clothing. Wear impervious clothing and gloves. Wear face shield.

INHALATION

EFFECT: No significant health hazards identified.

SAL 000007160

FIRST AID: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get medical attention.

PROTECTION: None required; however, use of adequate ventilation is good industrial practice.

INGESTION

EFFECT: Can cause severe irritation of the mouth, throat and esophagus. See Toxicology Section.

FIRST AID: If swallowed, drink plenty of water, get immediate medical attention.

FIRE AND EXPLOSION INFORMATION

FLASHPOINT: Above 200°F (93°C) ASTM D56

EXTINGUISHING MEDIA: Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, halogenated agents, foam, steam) or water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Toxic vapors are given off when heated.

REACTIVITY INFORMATION

DANGEROUS REACTIONS: Mixing with bases can evolve heat and cause spattering.

HAZARDOUS DECOMPOSITION: Can form toxic gases if exposed to open flame or high heat. Incomplete burning can produce carbon monoxide, carbon dioxide, and other harmful products.

STABILITY: Stable.

CHEMICAL AND PHYSICAL PROPERTIES

BOILING POINT: Above 95°F (35°C)

pH: 10.4

SOLUBILITY IN WATER: Totally soluble.

SPECIFIC GRAVITY (WATER = 1): 0.971

VISCOSITY: 1613 cP @ 25°C

POUR POINT: 25°F (4°C) ASTM D97

STORAGE AND ENVIRONMENTAL PROTECTION

CS624

STORAGE REQUIREMENTS: No special requirements.

SPILLS AND LEAKS: Remove mechanically or contain on an absorbent material.

WASTE DISPOSAL: Disposal must be in accordance with applicable federal, state, or local regulations. Enclosed-controlled incineration is recommended unless directed otherwise by applicable ordinances. Do not landfill. Residues and spilled material are hazardous waste due to corrosivity.

EMPTY CONTAINERS: The container for this product can present explosion or fire hazards, even when emptied! To avoid risk of injury, do not cut, puncture or weld on or near this container. Since the emptied containers retain product residue, follow label warnings even after container is emptied.

TOXICOLOGICAL INFORMATION

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

This product is considered harmful by ingestion because it is corrosive and may cause severe irritation or burns of the mouth, throat and esophagus.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by NTP, IARC or OSHA.

REGULATORY INFORMATION

CERCLA REPORTABLE QUANTITY:

This product is not reportable under 40 CFR Part 302.4.

DOT PROPER SHIPPING NAME: Corrosive Liquid, N.O.S., UN1760.

OSHA HAZARD COMMUNICATION STANDARD: Corrosive.

RCRA STATUS:

This product is not subject to the 40 CFR Part 268.30 land ban on the disposal of certain hazardous wastes.

SARA STATUS:

This product is regulated under the following section(s) of SARA Title III, 42 USC 9601. Spills or releases of the product may be reportable as determined by the information given below:

SECTIONS 311 AND 312 OF SARA AND 40 CFR PART 370:

This product is defined as hazardous by OSHA under 29 CFR Part 1910.1200(d).

SAL 000007162

CS624

REGULATORY INFORMATION - CONTINUED

TSCA STATUS: All of the components of this product are listed on the TSCA Inventory.

ISSUE INFORMATION

BY:

R G Farmer

R. G. Farmer, Director,
Product Safety & Toxicology

ISSUED: February 23, 1990

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 cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

SAL 000007163

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

C4884 -02
EFFECTIVE: 05/01/89

COBALT, 1000 PPM (0.100% W/V)

GS625

PAGE: 1
ISSUED: 05/16/89

J.T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

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SECTION I - PRODUCT IDENTIFICATION

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PRODUCT NAME: COBALT, 1000 PPM (0.100% W/V)
COMMON SYNONYMS: N/A
CHEMICAL FAMILY: ATOMIC ABSORPTION STANDARDS
FORMULA: CO IN HNO3
FORMULA WT.: 58.90
CAS NO.: N/A
NIOSH/RTECS NO.: N/A
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 6927

=====

PRECAUTIONARY LABELING

=====

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	0	NONE
REACTIVITY	-	1	SLIGHT
CONTACT	-	3	SEVERE (CORROSIVE)

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

U.S. PRECAUTIONARY LABELING

DANGER

CAUSES BURNS. HARMFUL IF SWALLOWED.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID BREATHING VAPOR. KEEP IN
TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY
AFTER HANDLING.

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: WHITE (CORROSIVE)

CONTINUED ON PAGE: 2

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C4884 -02 **68625** COBALT, 1000 PPM (0.100% W/V)
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SECTION II - COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
WATER	7732-18-5	97-99	N/E	N/E
NITRIC ACID	7697-37-2	1-2	2 PPM	2 PPM
COBALT	7440-48-4	<1	.1 MG/M3	.05 MG/M3

SECTION III - PHYSICAL DATA

BOILING POINT: 100 C (212 F)
(AT 760 MM HG) VAPOR PRESSURE (MMHG): N/A

MELTING POINT: 0 C (32 F)
(AT 760 MM HG) VAPOR DENSITY (AIR=1): N/A

SPECIFIC GRAVITY: 1.00
(H2O=1) EVAPORATION RATE: N/A

SOLUBILITY(H2O): COMPLETE (100%)
% VOLATILES BY VOLUME: N/A
(21 C)

PH: 1.0 (0.1M HNO3)

ODOR THRESHOLD (P.P.M.): N/A PHYSICAL STATE: LIQUID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: CLEAR, PURPLE LIQUID.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): N/A NFPA 704M RATING: 3-0-0

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS: UPPER - N/A LOWER - N/A

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

=====

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.

TOXIC GASES PRODUCED
OXIDES OF NITROGEN

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT
NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE
NONE IDENTIFIED.

=====

SECTION V - HEALTH HAZARD DATA

=====

THRESHOLD LIMIT VALUE (TLV/TWA): .050 MG/M3

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

PERMISSIBLE EXPOSURE LIMIT (PEL): NOT ESTABLISHED

TOXICITY OF COMPONENTS

INTRAPERITONEAL MOUSE LD50 FOR WATER

190 G/KG

INTRAVENOUS MOUSE LD50 FOR WATER

25 G/KG

ORAL RAT LD50 FOR COBALT

1500 MG/KG

CARCINOGENICITY: NTP: NO IARC: NO 2 LIST: NO CSHA REG: NO

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

EFFECTS OF OVEREXPOSURE

INHALATION: IRRITATION OF NOSE AND THROAT, COUGHING, DIFFICULT
 BREATHING

SKIN CONTACT: BURNS

EYE CONTACT: BURNS, IRRITATION

SKIN ABSORPTION: NONE IDENTIFIED

INGESTION: NONE IDENTIFIED

CHRONIC EFFECTS: NONE IDENTIFIED

TARGET ORGANS
NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY
NONE INDICATED

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, DO NOT INDUCE VOMITING. IF
 CONSCIOUS, GIVE WATER, MILK, OR MILK OF MAGNESIA.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE
 ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE
 OXYGEN.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF
 WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
 CLOTHING AND SHOES. WASH CLOTHING BEFORE RE-USE.

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

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

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EXTREMELY HAZARDOUS SUBSTANCE: YES CONTAINS COBALT (RQ = 1 LB, TPO = 10,000 LBS) AND NITRIC ACID (RQ = 1,000 LBS, TPO = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS NITRIC ACID (RQ = 1000 LBS)

TOXIC CHEMICALS: YES CONTAINS COBALT AND NITRIC ACID

 GENERIC CLASS: C15

TSCA INVENTORY: YES

=====

SECTION VI - REACTIVITY DATA

=====

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE DOCUMENTED

INCOMPATIBLES: NONE IDENTIFIED

DECOMPOSITION PRODUCTS: OXIDES OF NITROGEN

=====

SECTION VII - SPILL & DISPOSAL PROCEDURES

=====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH SPILL AREA WITH WATER.

J. T. BAKER NEUTRASORB(R) ACID NEUTRALIZER IS RECOMMENDED FOR SPILLS OF THIS PRODUCT.

DISPOSAL PROCEDURE

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

EPA HAZARDOUS WASTE NUMBER: D002 (CORROSIVE WASTE)

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C4884 -02 **G S 6 2 5** COBALT, 1000 PPM (0.100% W/V)
EFFECTIVE: 05/01/89

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SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

=====

EYE/SKIN PROTECTION: THIS IS A LABORATORY-USE PRODUCT FOR WHICH NO
INDUSTRIAL PROTECTIVE EQUIPMENT HAS BEEN DESIGNATED.

=====

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

=====

SAF-T-DATA* STORAGE COLOR CODE: WHITE (CORROSIVE)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN CORROSION-PROOF AREA.

=====

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

=====

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: NITRIC ACID, 40% OR LESS SOLUTION

HAZARD CLASS: CORROSIVE MATERIAL (LIQUID)

UN/NA: NA1760 REPORTABLE QUANTITY: 1000 LBS.

LABELS: CORROSIVE

REGULATORY REFERENCES: 49CFR 172.101; 173.268

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: NITRIC ACID, SOLUTION

HAZARD CLASS: 8

UN: UN2031 MARINE POLLUTANTS: NO

LABELS: CORROSIVE

REGULATORY REFERENCES: 49CFR 172.102; PART 176; IMO

I.M.O. PAGE: 8107

PACKAGING GROUP: II

AIR (I.C.A.O.)

PROPER SHIPPING NAME: NITRIC ACID, SOLUTION

HAZARD CLASS: 8

UN: UN2031

PACKAGING GROUP: II

LABELS: CORROSIVE

REGULATORY REFERENCES: 49CFR 172.101; 173.6; PART 175; ICAD/IATA

U.S. CUSTOMS HARMONIZATION NUMBER: 3822000000

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C4884 -02
EFFECTIVE: 05/01/89

COBALT, 1000 PPM (0.100% W/V)

GS625

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ISSUED: 05/16/89

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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 THIS 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 HEEDDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET. IF YOU HAVE ANY QUESTIONS, PLEASE CALL CUSTOMER SERVICE (1-800-JTBAKER) FOR ASSISTANCE.

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

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SAL 000007170

MATERIAL SAFETY DATA SHEET
THE CORTEC CORPORATION
310 CHESTER STREET
ST. PAUL, MINNESOTA 55107
PHONE: 612-224-5643 OR TOLL FREE 1-800-4-CORTEC
TELEX: 297447

EMERGENCY PHONE NO.: CHEMTREC (FOR SPILL, LEAK, FIRE, EXPOSURE
OR ACCIDENT): 1-800-424-9300 (DAY OR NIGHT)

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: Cortec VCI-347 CONCENTRATE **65620**
PRODUCT DESCRIPTION: Proprietary mixture of petroleum based
corrosion inhibitors combined with surfactants and emulsifiers.

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT NAME(S)	WEIGHT PERCENT	OCCUPATIONAL EXPOSURE LIMITS	
		TLV OR PEL	ORAL LD-50
Severely hydrotreated mineral oil	30-32	5mg/cu. meter (oil mist)	N.E.
Polyethoxylated (5) tallow alkylamines	18-20	N.E.	500mg/kg-rat
Aromatic hydrocarbons	1-2	50 ppm	N.E.
Ethylene glycol	1-2	25 ppm	N.E.

SECTION III - PHYSICAL DATA

COLOR: Brown	VAPOR PRESSURE: N.E.
PHYSICAL FORM: Viscous Liquid	VAPOR DENSITY: N.E.
% VOLATILE(weight): 6%	SPECIFIC GRAVITY: 1.01 (25 C)
BOILING RANGE: N.E.	pH: 9.0-9.5 (1% aqueous)
ODOR: Sweet odor	MELTING RANGE: N.A.
EVAPORATION RATE: Nil	WEIGHT GALLON: 8.55 lb/gal

SECTION IV - FIRE AND EXPLOSION DATA

FLAMMABILITY CLASSIFICATION: N.E.

FLASH POINT: 155 F (TCC) FLAMMABLE LIMITS: LEL: N.E. UEL: N.E.

EXTINGUISHING MEDIA: Water, carbon dioxide or other dry chemical
firefighting agents.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self
contained breathing apparatus. VCI-347 PAGE 1 OF 3

SECTION V - HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact: Immediately flush eyes with large quantities of water for at least 15 minutes. Get prompt medical attention.

Skin Contact: Pat off spillage with clean cloth. Do not rub.

Wash affected area with soap and water. Consult a physician.

Inhalation: Remove person to an uncontaminated area, administer oxygen if necessary. If breathing has stopped, administer CPR. Get immediate medical attention.

Ingestion: DO NOT INDUCE VOMITING. Dilute with milk or water. Get immediate medical attention.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: none known.

PRIMARY ROUTES OF ENTRY: eye contact, skin contact, inhalation.

Carcinogenic? OSHA: no NTP: no IARC: no

HEALTH HAZARDS (acute and chronic) / EFFECTS OF OVEREXPOSURE

- (1) Skin contact with this product can cause severe irritation.
- (2) Eye contact will cause severe irritation and possible damage unless prompt first aid measures are taken.
- (3) Inhalation of product vapors is not expected to pose a significant health hazard due to the low vapor pressure of the product. Inhalation of particle mists resulting from spraying or atomizing this product is expected to cause upper respiratory irritation and therefore should be avoided.
- (4) Ingestion of this product may cause severe irritation to the mouth, throat and stomach.

SECTION VI - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of nitrogen, carbon, sulfur, phosphorous and zinc.

INCOMPATIBILITY: Strong acids, alkalis and oxidizing agents.

CONDITIONS TO AVOID: Contact with incompatible materials.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Absorb on sweeping compound or other absorbent material.
Keep out of streams and waterways.

WASTE DISPOSAL: Incinerate or dispose of in accordance with existing Federal, State and Local environmental regulations.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: A NIOSH approved dust/mist respirator is recommended if particle mists are generated.

PROTECTIVE GLOVES: Chemical resistant rubber or plastic.

EYE PROTECTION: Safety goggles

OTHER PROTECTIVE EQUIPMENT: Eye wash station, safety shower.

SECTION IX - SPECIAL PRECAUTIONS AND STORAGE DATA

PRECAUTIONS TO BE TAKEN IN HANDLING: Avoid eye and skin contact. Avoid inhalation of particle mists.

PRECAUTIONS TO BE TAKEN IN STORING: Keep containers tightly closed. Store away from heat and open flame. "EMPTY" CONTAINER

WARNING: "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove.

"Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner in accordance with governmental regulations.

SECTION X - SHIPPING DATA

DOT SHIPPING NAME: Alkaline Corrosive Liquid n.o.s.

DOT HAZARD CLASS.: Corrosive Material T.S.C.A. STATUS: listed

DOT REQUIRED LABELS: Corrosive N.A. NUMBER: 1719

TECHNICAL SHIPPING NAME: Corrosion Inhibitor

FREIGHT CLASS BULK: Same as above LTL: 70 TL: 35 MW: 30

PREPARED BY: Mike Tarvin

APPROVED BY: Boris Miksic

TITLE: Chemist

TITLE: President

DATE PREPARED: 06/15/88

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310 CHESTER STREET
ST. PAUL, MINNESOTA 55107
PHONE: 612-224-5643 OR TOLL FREE 1-800-4-CORTEC
TELEX: 297447

G-86-21

EMERGENCY PHONE NO.: CHEMTREC (FOR SPILL, LEAK, FIRE, EXPOSURE
OR ACCIDENT): 1-800-424-9300 (DAY OR NIGHT)

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: Cortec VCI-376
PRODUCT DESCRIPTION: A proprietary waterborne corrosion resistant
coating.

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT NAME(S)	WEIGHT PERCENT	OCCUPATIONAL EXPOSURE LIMITS TLV OR PEL	ORAL LD-50
Butyl Cellosolve	5-10	25ppm *(skin) 50ppm **(skin)	.1480mg/kg-rat
Mineral Oil	5-6	5mg/cu meter (oil mist)	N.E.

* ACGIH Threshold Limit Value (TLV)

** OSHA Permissible Exposure Limit (PEL)

Carcinogenic? OSHA: no NTP: no IARC: no

SECTION III - PHYSICAL DATA

COLOR: off-white	VAPOR PRESSURE: N.E.
PHYSICAL FORM: Liquid	VAPOR DENSITY: N.E.
% VOLATILE(weight): 60-65%	SPECIFIC GRAVITY: 1.037(25 C)
BOILING RANGE: N.E.	pH: 9.0 - 9.5
ODOR: characteristic	MELTING RANGE: N.A.
EVAPORATION RATE: N.E.	WEIGHT GALLON: 8.5 lb/gal

SECTION IV - FIRE AND EXPLOSION DATA

FLAMMABILITY CLASSIFICATION: N.E.

FLASH POINT: 146 F C.CC FLAMMABLE LIMITS: LEL: N.E. UEL: N.E.

EXTINGUISHING MEDIA: Water, carbon dioxide or other dry chemical
firefighting agent.

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self
contained breathing apparatus.

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SECTION V - HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact: Flush with water for at least 15 minutes. Consult a physician.

Skin Contact: Wash area with soap and water. If irritation persists, consult a physician.

Inhalation: Remove to uncontaminated area, administer oxygen if necessary. Administer CPR if breathing has stopped. Get immediate medical attention.

Ingestion: Do not induce vomiting. Get immediate medical attention.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: none known.

PRIMARY ROUTES OF ENTRY: inhalation, skin contact, eye contact, skin absorption.

HEALTH HAZARDS (acute and chronic) / EFFECTS OF OVEREXPOSURE:

- (1) Repeated or prolonged, skin contact with this material may cause skin irritation.
- (2) Butyl cellosolve can be absorbed through intact skin, therefore direct skin contact should be avoided.
- (3) Eye contact with this material causes irritation.
- (4) Excessive inhalation of high vapor concentrations may irritate the upper respiratory tract. If the product is sprayed or atomized, inhalation of particle mists may irritate the upper respiratory tract and should be avoided.
- (5) Ingestion of this product is expected to be harmful.
- (6) Chronic effects resulting from long term overexposure to butyl cellosolve may cause hemolysis of red blood cells leading to possible liver and kidney damage.

SECTION VI - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, nitrogen and sulfur.

INCOMPATIBILITY: strong acids, alkalis and oxidizing agents.

CONDITIONS TO AVOID: contact with incompatible materials.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Absorb on sweeping compound or other absorbent material.
Keep out of streams and waterways.

WASTE DISPOSAL: Incinerate or dispose of in accordance with existing Federal, State and Local environmental regulations.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: A NIOSH approved chemical cartridge respirator to remove vapors or dust/mist respirator to remove particle mists.

PROTECTIVE GLOVES: chemical resistant rubber or plastic.

EYE PROTECTION: safety goggles

OTHER PROTECTIVE EQUIPMENT: eye wash station, safety shower

SECTION IX - SPECIAL PRECAUTIONS AND STORAGE DATA

PRECAUTIONS TO BE TAKEN IN HANDLING: Avoid skin and eye contact. Minimize breathing of vapors or particle mists.

PRECAUTIONS TO BE TAKEN IN STORING: Keep product from freezing, store at 40 F or above. Keep away from heat and open flame.

SECTION X - SHIPPING DATA

DOT SHIPPING NAME: N.A.

U.N. / N.A. NUMBER: N.A.

DOT HAZARD CLASS.: N.A.

T.S.C.A. STATUS: Listed

DOT REQUIRED LABELS: N.A.

TECHNICAL SHIPPING NAME: Paint and related material, compounds

FREIGHT CLASS BULK: Same as above LTL: 65 TL: 35 MW: 36

PREPARED BY: Mike Tarvin

APPROVED BY: Boris Miksic

TITLE: Chemist

TITLE: President

DATE PREPARED: 04/24/88

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THE CORTEC CORPORATION
310 CHESTER STREET
ST. PAUL, MINNESOTA 55107
PHONE: 612-224-5643 OR TOLL FREE 1-800-4-CORTEC
TELEX: 297447

GS622

EMERGENCY PHONE NO.: CHEMTREC (FOR SPILL, LEAK, FIRE, EXPOSURE
OR ACCIDENT): 1-800-424-9300 (DAY OR NIGHT)

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: Cortec VCI-309 Powder
PRODUCT DESCRIPTION: A proprietary blend of amine salts.

SECTION II - INGREDIENTS

INGREDIENT NAME(S)	WEIGHT PERCENT	OCCUPATIONAL EXPOSURE LIMITS	
		TLV OR PEL	ORAL LD-50
Trade Secret	----	10 mg/cu. meter (as nuisance dust)	N.E.

Carcinogenic? OSHA: no NTP: no IARC: no

SECTION III - PHYSICAL DATA

COLOR: White	VAPOR PRESSURE: .0001mmHg(20 C)
PHYSICAL FORM: Fine Powder	VAPOR DENSITY: N.E.
% VOLATILE(weight): 0%	SPECIFIC GRAVITY: N.A.
BOILING RANGE: N.E.	pH: 7.0 (1% aqueous)
ODOR: slight amine	MELTING RANGE: 167-175 C
EVAPORATION RATE: Nil	WEIGHT GALLON: N.A.

SECTION IV - FIRE AND EXPLOSION DATA

FLAMMABILITY CLASSIFICATION: N.E.

FLASH POINT:N.A. FLAMMABLE LIMITS: LEL:N.A. UEL: N.A.

EXTINGUISHING MEDIA: Water, Carbon Dioxide or other dry chemical
firefighting agents.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

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SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self
contained breathing apparatus.

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SECTION V - HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact: Flush eyes with large quantities of water for at least 15 minutes. Consult a physician.

Skin Contact: Wash affected area with soap and water. If irritation persists, consult a physician.

Inhalation: Remove person to an uncontaminated area, administer oxygen if necessary. If breathing has stopped, administer CPR. Get immediate medical attention.

Ingestion: If person is conscious, give milk or water and induce vomiting. If breathing has stopped, start CPR. Get medical attention.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: none known.

PRIMARY ROUTES OF ENTRY: Inhalation, skin contact, eye contact.

HEALTH HAZARDS (acute and chronic) / EFFECTS OF OVEREXPOSURE:

- (1) Eye contact with this product may produce irritation.
- (2) Repeated or prolonged skin contact with this product may produce mild skin irritation.
- (3) Inhalation of product vapors is not expected to pose a significant health hazard due to the low vapor pressure of the product. Excessive inhalation of dusts resulting from the use of this product may be harmful and should be avoided.
- (4) Ingestion of this product may be harmful. There are no specific data known to exist on the acute or chronic oral toxicity of the components in this product. However, the amine salts contained in this product are expected to have a low order of oral toxicity.

SECTION VI - REACTIVITY DATA

STABILITY: stable

HAZARDOUS POLYMERIZATION: will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS (under fire conditions):
oxides of carbon and nitrogen.

INCOMPATABILITY: Strong acids, alkalis and oxidizing agents.

CONDITIONS TO AVOID: Contact with incompatible materials.

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SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Sweep up.

WASTE DISPOSAL: Incinerate or dispose of in accordance with existing Federal, State and Local environmental regulations.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: A NIOSH approved dust/mist respirator is recommended.

PROTECTIVE GLOVES: Chemical Resistant Rubber or plastic.

EYE PROTECTION: Safety goggles

OTHER PROTECTIVE EQUIPMENT: Eye wash station

SECTION IX - SPECIAL PRECAUTIONS AND STORAGE DATA

PRECAUTIONS TO BE TAKEN IN HANDLING: Avoid inhalation of dusts. Avoid eye contact and prolonged or repeated skin contact. Workers should thoroughly wash hands with soap and water prior to smoking, drinking, eating or using lavatory.

PRECAUTIONS TO BE TAKEN IN STORING: Keep containers tightly closed.

SECTION X - SHIPPING DATA

DOT SHIPPING NAME: N.A.	U.N. / N.A. NUMBER: N.A.
DOT HAZARD CLASS.: N.A.	T.S.C.A. STATUS: Listed
DOT REQUIRED LABELS: N.A.	
TECHNICAL SHIPPING NAME: Amine Salts	
FREIGHT CLASS BULK:	LTL: 70 TL: 40 MW: 30

PREPARED BY: Mike Tarvin
TITLE: Chemist

APPROVED BY: Boris Miksic
TITLE: President

DATE PREPARED: 04/11/88

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THE CORTEC CORPORATION
310 CHESTER STREET
ST. PAUL, MINNESOTA 55107
PHONE: 612-224-5643 OR TOLL FREE 1-800-4-CORTEC
TELEX: 297447

GS628

EMERGENCY PHONE NO.: CHEMTREC (FOR SPILL, LEAK, FIRE, EXPOSURE
OR ACCIDENT): 1-800-424-9300 (DAY OR NIGHT)

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: Cortec VCI-369 aerosol

PRODUCT DESCRIPTION: A proprietary blend of amine carboxylates and other corrosion inhibitors in an oil carrier in aerosol form.

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT NAME(S)	WEIGHT PERCENT	OCCUPATIONAL EXPOSURE LIMITS	ORAL LD-50
		TLV OR PEL	
hydrotreated light naphthenic distillates, petroleum	20-25	5mg/cu. meter (oil mist)	N.E.
Propane	15-20	1008 ppm	N.E.
Isobutane	15-20	1008 ppm	N.E.

SECTION III - PHYSICAL DATA

COLOR: Brown	VAPOR PRESSURE: N.E.
PHYSICAL FORM: Viscous Liquid	VAPOR DENSITY: N.E.
% VOLATILE(weight): 50%	SPECIFIC GRAVITY: .95 (20 C)
BOILING RANGE: N.E.	pH: 8.0-8.5(1% aqueous)
ODOR: Petroleum	MELTING RANGE: N.A.
EVAPORATION RATE: slower than ether	WEIGHT GALLON: 7.9 lbs/gal

SECTION IV - FIRE AND EXPLOSION DATA

FLAMMABILITY CLASSIFICATION: Flammable

FLASH POINT: N.E.

FLAMMABLE LIMITS: LEL: N.E. UEL: N.E.

EXTINGUISHING MEDIA: Water, Carbon Dioxide or other Dry Chemical
firefighting agents.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Contents of aerosol cans are
under pressure. Contents are flammable.

SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self-
contained breathing apparatus.

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VCI-369 aerosol page 1 of 3

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SECTION V - HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Wash affected area with soap and water. Consult a physician if irritation persists.

Eye Contact: Flush eye(s) with large quantities of water for at least 15 minutes. Consult a physician.

Ingestions: If swallowed, DO NOT INDUCE VOMITING. Seek immediate medical attention.

Inhalation: Remove person to an uncontaminated area. Administer oxygen if necessary. Start CPR if breathing has stopped. Seek medical attention.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: none known.

CARCOGENICITY: NTP: no OSHA: no IARC: no

PRIMARY ROUTES OF ENTRY: Skin contact, eye contact, inhalation.

HEALTH HAZARDS (acute and chronic) / EFFECTS OF OVEREXPOSURE:

1. Repeated or prolonged skin contact with petroleum and related products tends to remove natural skin oils leading to irritation and dermatitis.
2. Eye contact with this product will cause irritation.
3. Inhalation of product vapors and/or aerosol mists should be avoided. Excessive inhalation may cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.
4. Ingestion of this material can cause gastrointestinal irritation. Also, aspiration of this material into the lungs can cause chemical pneumonia.

SECTION VI - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of Carbon, Nitrogen and Sulfur.

INCOMPATABILITY: Contact with strong acids, alkalies and oxidizing agents.

CONDITIONS TO AVOID: Contact with strong acids, alkalies and oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Absorb on sweeping compound or other absorbent material.
Keep petroleum out of streams and waterways.

WASTE DISPOSAL: Incinerate or dispose of in accordance with existing Federal, State and Local environmental regulations.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: Use a NIOSH approved respirator to remove vapors or particle mists when necessary.

PROTECTIVE GLOVES: Chemical resistant rubber or plastic

EYE PROTECTION: Safety goggles.

OTHER PROTECTIVE EQUIPMENT: Eye wash station, safety shower.

SECTION IX - SPECIAL PRECAUTIONS AND STORAGE DATA

PRECAUTIONS TO BE TAKEN IN HANDLING: Avoid eye and skin contact. Avoid inhalation of product vapors an/or particle mists.

PRECAUTIONS TO BE TAKEN IN STORING: Caution: Contents under pressure. Do not puncture or incinerate. Store away from heat or open flame. Store below 100 F.

SECTION X - SHIPPING DATA

DOT SHIPPING NAME: Compressed gas n.o.s. **U.N. / N.A. NUMBER:** 1954

DOT HAZARD CLASS.: Flammable gas **T.S.C.A. STATUS:** Listed

DOT REQUIRED LABELS: Flammable gas

TECHNICAL SHIPPING NAME: Petroleum Distillates/Amine Salts

FREIGHT CLASS BULK: Same as above **LTL:** 65 **TL:** 35 **MW:** 30

PREPARED BY: Mike Tarvin

APPROVED BY: Boris Miksic

TITLE: Chemist

TITLE: President

DATE PREPARED: 06/08/88

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SECTION VI CORROSIVITY AND REACTIVITY DATA

Stability: Stable Conditions to be avoided: NAIF
Polymerization: Will not occur
Incompatability: NAIF

SECTION VII STORAGE, HANDLING AND USE PROCEDURES

Normal storage and Handling: See below

Normal Use: Good housekeeping and good hygenic practices should be employed.

Steps to be taken in case of leaks or spills: Employ dust-free cleanup procedures.

Waste Disposal Method: The tearout and disposal of this product may generate dust. During tearout, observe the exposure limits outlined in Section II, and the personal protection precautions in Section VIII. Disposal shall be in accordance with Federal, State, and Local Regulations.

SECTION VIII PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE) Use NIOSH or MSHA approved respirator.

VENTILATION

LOCAL Sufficient to keep dust below TLV's.

MECHANICAL
(GENERAL)

OTHER

PROTECTIVE GLOVES Recommended

EYE PROTECTION Recommended

OTHER EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

This product contains SILICA and CALCIUM ALUMINATE CEMENT. Silica - Inhalation of this dust in the respirable size range presents a potential health hazard. Excessive inhalation will increase your risk of serious respiratory disease (Silicosis). Calcium Aluminate Cement - an alkaline material which may cause eye or skin injury.

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FOR COMPANY USE

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however RESCO makes no warranty with respect to the accuracy of the information or the

2404

Material Safety Data Sheet

May be used to comply with
 OSHA's Hazard Communication Standard,
 29 CFR 1910.1200. Standard must be
 consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration

(Non-Mandatory Form)

Form Approved

OMB No. 1218-0072

CA049



IDENTITY (As Used on Label and List) High performance
 molecular sieve

Note: Blank spaces are not permitted. If any item is not applicable, or no
 information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name LAPORTE INDUSTRIES LIMITED	Emergency Telephone Number (U.K.) 051-424-5555 Ext. E
Address (Number, Street, City, State, and ZIP Code) P.O. Box 2	Telephone Number for Information (U.K.) 051-495-2222
Moorfield Road	Date Prepared 12th May 1988
WIDNES, Cheshire, England. WA8 0JU	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
MOLECULAR SIEVE 3A, 4A, 5A, 13X				80-84
ALKALI ALUMINOSILICATES	not controlled	not controlled		
CLAY BINDER	not controlled	not controlled	10mg/m ³	16-20
(Bentonite)	controlled	controlled	UK Health	
(Fullers Earth)			and Safety	
(Sepiolite)			Executive	
Attapulgite/Polygasskite)			Recommended	
			Limit	

Section III — Physical/Chemical Characteristics N/A = not applicable

Boiling Point	-- N/A	Specific Gravity (H ₂ O = 1) bulk density	0.66-0.76
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water
 Insoluble

Appearance and Odor
 Buff coloured spheres - no odour

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) Non flammable	Flammable Limits N/A	LEL N/A	UEL N/A
--	-------------------------	------------	------------

Extinguishing Media
 Use Extinguisher to suit cause of fire

Special Fire Fighting Procedures

None

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Unusual Fire and Explosion Hazards

Heat evolved with water contact in a confined space this may generate pressure build up
 due to steam

CA049**Section V — Reactivity Data**

Stability	Unstable		Conditions to Avoid
	Stable	✓	

Incompatibility ~~Material to Avoid~~

Materials subject to catalytic decomposition e.g. Hydrogen Peroxide

Hazardous Decomposition or Byproducts

Product may become hot on contact with water

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	✓	

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	Yes	No	Yes
Health Hazards (Acute and Chronic)	Desiccant	N/A	None
Properties			

Carcinogenicity:	NTP?	IARC Monographs? Vol.42 p.159	OSHA Regulated?
Binders - Inadequate evidence for carcinogenicity to humans			
Signs and Symptoms of Exposure	Dry mouth and Nose	N/A	
Medical Conditions Generally Aggravated by Exposure	Asthma	None	None

Emergency and First Aid Procedures

Eyes and Skin - Wash with plenty of water

Ingestion - Drink plenty of water

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Collect beads and dispose of in accordance with federal, state or local regulations.

Avoid treading on beads as they represent a slip hazard

Waste Disposal Method

Dispose of in accordance with local and national regulations

Precautions to Be Taken in Handling and Storing

Store dry and away from substances subject to
catalytic decomposition

Other Precautions

None

Section VIII — Control Measures

Respiratory Protection (Specify Type)

Dust respirator if not exhaust ventilated

Ventilation	Local Exhaust	Special
	Dependant on process	None
	Mechanical (General)	Other
	Normal	None

Protective Gloves	Industrial	Eye Protection	No special requirement
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Other Protective Clothing or Equipment	Normal workwear clothing
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Work/Hygienic Practices	Wash at end of work period and before eating	SAL 000007186
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M A T E R I A L S A F E T Y D A T A S H E E T

I - G E N E R A L I N F O R M A T I O N

PRODUCT NAME HYDROGEN

68198

EMERGENCY TELEPHONE NO. 713-868-0302
MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.

TRADE NAME/SYNONYMS HYDROGEN

CHEMICAL NAME AND SYNONYMS

HYDROGEN

REVISION DATE: 08/23/89

PRODUCT ID. UN 1049 FORMULA H2

CHEMICAL FAMILY INORGANIC FLAMMABLE GAS CAS FAMILY 1333-74-0

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 896-2140

I I - H A Z A R D O U S I N G R E D I E N T S

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

0/0

TLV

HYDROGEN

100

**

** NONE ESTABLISHED

I I I - P H Y S I C A L D A T A

BOILING POINT -423.0F (-252.7C) @ 1 ATM

SPECIFIC GRAVITY (AIR = 1): 0.0695 @ 70F (21.1C) @ 1 ATM

VAPOR PRESSURE N/A

PERCENT VOLATILE BY VOLUME (O/O) N/A (GAS)

DENSITY 0.005209 LB/CU FT

@ 70 F (21.1 C) @ 1 ATM

EVAPORATION RATE N/A (GAS)

SOLUBILITY IN WATER 2.14SCC/100CC H2O @ 32 F (0 C)

MATERIAL AT NORMAL CONDITION GAS

EXPANSION RATIO (LIQUID TO GAS) N/A (GAS)

APPEARANCE AND ODOR

COLORLESS, ODORLESS, TASTELESS GAS

I V - F I R E A N D E X P L O S I O N H A Z A R D D A T A

FLASH POINT N/A

FLASH POINT (METHOD USED)

FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER 4.1

UPPER 74.2

EXTINGUISHING MEDIA

WATER, DRY CHEMICAL, CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES

EVACUATE UNNECESSARY PERSONNEL. SHUT OFF SOURCE OF HYDROGEN IF POSSIBLE. COOL SURROUNDING CONTAINERS WITH WATER SPRAY. HYDROGEN FIRES SHOULD NOT BE EXTINGUISHED UNTIL THE SUPPLY OF HYDROGEN HAS BEEN SHUT OFF AND THE SURROUNDING AREA COOLED, BECAUSE OF THE DANGER OF RE-IGNITION AND EXPLOSION. VENTILATE AREA AND REMOVE ANY POSSIBLE SOURCE OF IGNITION. DO NOT ENTER AREAS CONTAINING FLAMMABLE MIXTURES, DUE TO THE IMMEDIATE FIRE AND EXPLOSION HAZARD. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE PERSONNEL.

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HOUSTON, TX 77253

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PRODUCT NAME MATERIAL SAFETY DATA SHEET
HYDROGEN

UNUSUAL FIRE AND EXPLOSION HAZARD

HYDROGEN BURNS WITH A PALE BLUE ALMOST INVISIBLE FLAME. HYDROGEN IS LIGHTER THAN AIR AND CAN ACCUMULATE IN THE TOP OF ENCLOSED SPACES. THEREFORE, A POTENTIAL EXPLOSION HAZARD FROM RE-IGNITION EXISTS. PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD FAIL TO RELIEVE PRESSURE. HYDROGEN WILL ACT AS A SIMPLE ASPHYXIANIT IF IT DISPLACES OXYGEN.

AUTOIGNITION TEMPERATURE: 1058 F (570 C)

ELECTRICAL CLASSIFICATION: CLASS 1, GROUP B

V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	NONE ESTABLISHED
UNUSUAL CHRONIC TOXICITY	*SEE OVEREXPOSURE SECTION*
CARCINOGENICITY	NOT LISTED BY IARC, NTP, OSHA
ROUTES OF EXPOSURE	INHALATION

EFFECTS OF OVEREXPOSURE

HYDROGEN IS NONTOXIC, BUT MAY CAUSE SUFFOCATION BY DISPLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINISHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT SHOULD BE NOTED THAT BEFORE SUFFOCATION COULD OCCUR, THE LOWER FLAMMABILITY LIMIT OF HYDROGEN IN AIR WOULD BE EXCEEDED; POSSIBLY CAUSING BOTH AN OXYGEN-DEFICIENT AND AN EXPLOSIVE ATMOSPHERE. IT SHOULD ALSO BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS.

TOXICOLOGICAL PROPERTIES:

HYDROGEN IS NONTOXIC BUT IT IS AN ASPHYXIANIT IF IT DISPLACES OXYGEN IN THE AIR.

EMERGENCY AND FIRST AID PROCEDURES

PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION.

SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE WORKERS.

VI - REACTIVITY DATA

STABILITY STABLE
CONDITIONS TO AVOID
NONE.
INCOMPATABILITY (MATERIALS TO AVOID)

SAL 000007188

PRODUCT NAME MATERIAL SAFETY DATA SHEET **GS198**
HYDROGEN

HYDROGEN WILL REACT VIGOROUSLY OR EXPLOSIVELY WITH MANY
OXIDIZING AGENTS. HYDROGEN CAN INTERACT WITH SOME METALS,
SUCH AS HARDENED STEELS, TO CAUSE EMBRITTLEMENT.

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

V I I - S P I L L O R L E A K P R O C E D U R E S

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

EVACUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA.
ELIMINATE ANY POSSIBLE SOURCES OF IGNITION AND VENTILATE
AREA. IF POSSIBLE MOVE CYLINDERS TO AN ISOLATED OUTDOOR
AREA. SHUT OFF SOURCE OF HYDROGEN, IF POSSIBLE. IF LEAKING
FROM CONTAINER OR VALVE, CONTACT THE CLOSEST BIG THREE
INDUSTRIES LOCATION, OR YOUR SUPPLIER.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES.
RETURN TO YOUR SUPPLIER FOR DISPOSAL.

V I I I - S P E C I A L P R O T E C T I V E I N F O R M A T I O N

RESPIRATORY PROTECTION (SPECIFY TYPE)

USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE
AIR LINE WITH MASK IN OXYGEN-DEFICIENT ATMOSPHERES.
RESPIRATORS WILL NOT FUNCTION.

VENTILATION

SEE NOTES

PROTECTIVE GLOVES

N/A

EYE PROTECTION

SAFETY GLASSES ARE RECOMMENDED WHEN
HANDLING HIGH PRESSURE CYLINDERS.

OTHER PROTECTIVE EQUIPMENT

SEE NOTES

***** SECTION NOTES *****

PROVIDE EXPLOSION-PROOF SYSTEM ADEQUATE TO ENSURE HYDROGEN
DOES NOT REACH ITS LEL OF 4.1 %.

GS198

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HOUSTON, TX 77253

PAGE 4

PRODUCT NAME MATERIAL SAFETY DATA SHEET
HYDROGEN

LOCAL EXHAUST: YES
MECHANICAL: YES, EXPLOSION PROOF

SAFETY SHOES WHEN HANDLING CYLINDERS. EXPLOSION PROOF LIGHTING AND WIRING IN AREAS WHERE HYDROGEN IS STORED OR USED.

I X - S P E C I A L P R E C A U T I O N S

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

STORE AND USE WITH ADEQUATE VENTILATION. DO NOT STORE WITHIN 20 FEET OF OXYGEN OR ANY OTHER OXIDIZER. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, ROLL, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. POST "NO SMOKING OR OPEN FLAMES" SIGNS IN THE STORAGE AND USE AREAS. THERE SHOULD BE NO SOURCES OF IGNITION. ALL ELECTRICAL EQUIPMENT SHOULD BE EXPLOSION PROOF IN THE STORAGE AND USE AREAS. STORAGE AREAS MUST MEET NATIONAL ELECTRIC CODES FOR CLASS 1 HAZARDOUS AREAS. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C).

U.O.T. LABELING

FLAMMABLE GAS - RED LABEL

VALVE CONNECTION

350

OTHER PRECAUTIONS

DO NOT "CRACK" HYDROGEN CYLINDER VALVE BEFORE CONNECTING IT, SINCE SELF-IGNITION MAY OCCUR. HYDROGEN IS THE LIGHTEST GAS KNOWN AND MAY COLLECT IN THE TOP OF BUILDINGS WITHOUT PROPER VENTILATION. HYDROGEN DIFFUSES RAPIDLY THROUGH POROUS MATERIALS AND MANY JOINTS AND FITTINGS. IT MAY LEAK OUT OF A SYSTEM WHICH IS GA-TIGHT FOR AIR OR OTHER GASES. LEAK CHECK SYSTEM WITH SOAPY WATER, NEVER WITH A FLAME.

NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER. REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER OWNER IS A VIOLATION OF FEDERAL LAW (49 CFR).

MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT HYDROGEN CAN BE FOUND IN THE FOLLOWING PAMPHLETS PUBLISHED BY:

**THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341**

**G-5.3: "COMMODITY SPECIFICATION FOR HYDROGEN"
P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS"
P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-DEFICIENT ATMOSPHERES"
SB-2: "OXYGEN-DEFICIENT ATMOSPHERES"**

IN ADDITION, YOU MAY ALSO REFER TO NFPA PAMPHLETS 50-A AND

SAL 000007190

M A T E R I A L S A F E T Y D A T A S H E E T **GS198**
PRODUCT NAME HYDROGEN

51 "OXYGEN FUEL GAS SYSTEMS FOR WELDING AND CUTTING".

• NFPA RATINGS:

HEALTH: 0
FLAMMABILITY: 4
REACTIVITY: 0

• HMIS RATINGS:

HEALTH: 0
FLAMMABILITY: 4
REACTIVITY: 0

• CERCLA RATINGS:

HEALTH: 0
FIRE: 3
REACTIVITY: 0
PERSISTENCE: 3

• LISTED IN TSCA INVENTORY: YES

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION, INVESTIGATION, IN COMPLIANCE WITH HAZARD COMMUNICATION STANDARD 29 CFR 1900.1200. BIG THREE INDUSTRIES, INC. PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED.

R. T. VANDERBILT COMPANY, INC.
Industrial Minerals and Chemicals
30 Winfield Street
Norwalk, CT 06855
(203) 853-1400 TWX 710-468-2940

* MATERIAL *
* SAFETY *
* DATA SHEET *

Customer Infol
12580060228

39835

Page 1 of 4

CONOCO INC.
REFINERY WAREHOUSE
OLD SPANISH TRAIL
WESTLAKE

LA 70669

GS652

Date: 01/29/90

Revised: 09/28/88

Supersedes: 01/29/86

I. PRODUCT IDENTIFICATION

G00055

Trade Name: THERMAX* (All Grades)

Chemical Name: Carbon black, CAS Reg. No. 1333-86-4

Synonyms: Carbon, N-991 Black, N-990 Black, N-908 Black, N-907 Black

Hazardous Ingredients/OSHA: Carbon black

Hazard: Irritant

Carcinogenic Ingredients/OSHA/NTP/IARC: None

II. WARNING STATEMENTS

WARNING! Harmful if inhaled. May cause irritation.

III. PHYSICAL AND CHEMICAL DATA

Appearance and Odor: Dark grey powder or pellets, no odor

Density, at 25 deg C, Mg/cu m: 1.80

Solubility in Water: Negligible

Percent Volatiles by Volume: Negligible

pH: 9.5 for 100 g/L dilution

(* - Registered in U.S. Patent and Trademark Office) SAL 000007192

IV. FIRE PROTECTION

Flash Point (deg C/deg F): N/A

Extinguishing Media: Carbon dioxide, foam

Special Firefighting Procedure: None

Unusual Fire Hazard: None

V. REACTIVITY DATA

Thermal Stability: Stable

Materials to Avoid: Strong oxidizers such as chlorates, bromates, nitrates, liquid oxygen.

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products: None

VI. HEALTH HAZARD DATA

Exposure Limits:

OSHA 3.5 mg/cu m/8 hr. TWA
ACGIH 3.5 mg/cu m/8 hr. TWA

Effects of Overexposure:

Particulate dust irritant to upper respiratory tract, eyes and skin. May cause drying of nasal passages.

SAL 000007193

VII. PHYSIOLOGICAL EFFECTS SUMMARY

Slight to moderate skin and eye irritation (reversible) has been reported in dusty environments. Reports of reduced lung capacity due to prolonged exposure to excessive dust level areas do not exist. Damage, however, appears non-neoplastic/non-fibrotic/non-malignant in nature. In effect, there is little well-demonstrated health hazard to humans from exposure to product.

Medical Conditions Generally Aggravated By Exposure: Unknown.

VIII. PRECAUTIONS FOR SAFE HANDLING

Avoid inhalation of dust concentrations exceeding standards.

SAL 000007194

IX. PROTECTION AND CONTROL MEASURES

Protective Equipment: If dusty conditions exist, use chemical goggles and skin protection.

Respiratory Protection: Air-purifying particle respirator (quarter or half mask) if engineering controls are insufficient to maintain safe dust levels.

Ventilation: Local exhaust recommended (100-200 fpm capture velocity).

X. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush with water.

Skin Contact: Wash with soap and water.

Inhalation: Expose to fresh air, but no acute respiratory reaction is expected.

XI. SPILL AND DISPOSAL PROCEDURES

Spill or Leakage Procedure: Contain spills. Minimize dust generation into air. Deposit and store in closed containers.

Waste Disposal: Dispose as per applicable state and local regulations.

For Additional Information Contact:

Environmental Affairs
R. T. VANDERBILT CO., INC.
30 Winfield Street
P.O. Box 5150
Norwalk, CT 06856
Tel. No.: (203) 853-1400

SAL 000007195

DOC NO. 1180

JAR 2 & REC

I.C. NO. 13450, 13500, 13550,
13600, 14200, 14250, 14300,
14350, 14450, 14455, 14500,
14510, 14550

REVISION NO. 1
MATERIAL SAFETY DATA SHEET
Anderson Laboratories, Inc.

5901 Fitzhugh Avenue
Fort Worth, Texas 76119

Telephone 817-457-4474 EMERGENCY TEL. 800-424-9300 (CHENTREC)

CS 651

File 3/30/87

The materials listed in this Data Sheet are classified in accordance with the definitions set forth in 29CFR Part 1910.1200

PRODUCT NAME: BUFFER, pH 7 CONCENTRATE

BUFFER SOLUTION, pH 7.2, For Giemsa Stain
BUFFER SOLUTION, pH 6.4, Giordano
BUFFER SOLUTION, pH 6.8, French, Modified
BUFFER SOLUTION, pH 5.58 +/- 0.02 at 25 deg. C
BUFFER SOLUTION, REFERENCE STANDARD, pH 6.00 +/- 0.02 at 25 deg. C
BUFFER SOLUTION, pH 6.47 +/- 0.02 at 25 deg. C
BUFFER SOLUTION, pH 6.86 +/- 0.02 at 25 deg. C
BUFFER SOLUTION, Reference, pH 7.00 +/- 0.01 at 25 deg. C
BUFFER SOLUTION COLOR CODED pH 7.00 +/- 0.01 at 25 deg. C
BUFFER SOLUTION, pH 7.38 +/- 0.01 at 25 deg. C
BUFFER SOLUTION, pH 7.60 +/- 0.02
BUFFER SOLUTION, pH 8.00 +/- 0.02 AT 25 deg. C

CHEMICAL FAMILY: Phosphate

DOT SHIPPING NAME: N/R

HAZARD CLASS N/R

DOT I.D. NO.: N/R

HMS DESIGNATION:

HEALTH 1

FLAMMABILITY 0

REACTIVITY 0

PERSONAL PROTECTION

glasses

HAZARD MATERIALS IDENTIFICATION SYSTEM

4 - Severe Hazard

3 - Serious Hazard

2 - Moderate Hazard

1 - Slight Hazard

0 - Minimal Hazard

COMPONENTS 1% OR GREATER

Contains carcinogenic compounds 0.1% or greater Yes ☒ No ☐

Chemical	CAS. NO.	X	NTP/IARC	Exposure Limits
			Carcinogen	TLV STEL PEL
			List	
Sodium Phosphate, di basic	17858-77-4	<1 MAX	NO	N/A N/A N/A
Potassium Phosphate, mono basic	17776-77-0	<1 MAX	NO	N/A N/A N/A
WATER	17732-18-5	MATRIX	NO	N/A N/A N/A

PERTINENT PHYSICAL DATA:

Boiling Point N/A Vapor pressure N/A mm Hg at N/A deg. C.

Melting Point N/A

Evaporation Rate: Faster Slower than ether. ☒ Not applicable.

Specific Gravity: Heavier Lighter than water. ☒ Not applicable.

Vapor Density: Heavier Lighter than air. ☒ Not applicable.

Appearance and odor: Colorless and odorless liquid

SAL 000007196

CS651

1. FIRE AND EXPLOSION DATA:

Flammability Classification: _____ DOT, _____ Flash Pt. _____ X _____ Not applicable.
Extinguishing Media: _____ Foam, _____ Alcohol Foam, _____ Dry Chemical _____ Water Fog: _____ X _____ Not applicable.
(Usual Fire and Explosion Hazards: None

HEALTH HAZARD DATA:

Effects of over-exposure: May cause eye irritation.

Toxicity Data: NOT KNOWN FOR THIS PRODUCT

Target Organs: Skin and eyes.

Primary Routes of Entry: _____ X _____ Dermal, _____ Inhalation, _____ Ingestion

Emergency and First Aid Procedures: If splashed in eyes flush with water for at least 15 minutes.

2. REACTIVITY:

Stability: _____ Unstable, _____ X _____ Stable

Hazardous Polymerization: _____ May occur, _____ X _____ will not occur.

Hazardous Decomposition Products: NONE

Conditions to avoid: NONE

Incompatibility (Materials to avoid) NONE

3. SPILL AND LEAK PROCEDURES:

Flush spill area with copious amounts of water.

4.1. SAFE HANDLING AND USE INFORMATION

Respiratory Protection: Not applicable

VENTILATION: Not applicable.

Protective Gloves _____ Yes _____ X _____ No Eye Protection _____ X _____ Yes _____ No (Glasses _____ X _____ Goggles _____)

Aprons _____ Lab Coat _____

4.2. SPECIAL PRECAUTIONS:

TOXICOLOGICAL PROPERTIES UNKNOWN. Minimize inhalation and contact with skin and eyes.

Do not get in eyes.

Avoid skin contact.

DISCLAIMER OF LIABILITY

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SAL 000007197



chemists helping chemists in research & industry

aldrich chemical co.

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Telex: 28 843 Aldrich MI
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G 8 6 5 0

ATTN: SAFETY DIRECTOR
CONOCO INC
REFINERY WAREHOUSE
PO BOX 37
OLD SPANISH TRAIL
WESTLAKE LA 70669

DATE: 03/08/90
CUST#: 923153
PO#: 316-LPA 256781

M A T E R I A L S A F E T Y D A T A S H E E T

P A G E 1

IDENTIFICATION

PRODUCT #: 20561-3 NAME: ALIQUAT 336
CAS #: 5137-55-3
MF: C25H54CLN

NONYMS

ALIQUAT 336 * ALIQUAT 336N * ALIQUAT 336-PTC *
METHYLTRICAPRYLAMMONIUM CHLORIDE * METHYLTRIOCTYLAMMONIUM CHLORIDE *
1-OCTANAMINIUM, N-METHYL-N,N-DIOCTYL-, CHLORIDE (9CI) *
TRICAPRYLMETHYLAMMONIUM CHLORIDE * TRICAPRYLYLMETHYLAMMONIUM CHLORIDE
* TRIOCTYLMETHYLAMMONIUM CHLORIDE *

TOXICITY HAZARDS

FLS NO: BR8575000

AMMONIUM, METHYLTRIOCTYL-, CHLORIDE

TOXICITY DATA

AL-RAT LD50: 223 MG/KG
IR-RAT LD50: 6600 UG/KG
ORL-MUS LD50: 280 MG/KG
IPR-MUS LD50: 3300 UG/KG

AEHA** 33-3-68/71
AEHA** 33-3-68/71
AEHA** 33-3-68/71
AEHA** 33-3-68/71

TESTS, STANDARDS, AND REGULATIONS

NOES 1983: HZD X7902; NIS 2; TNF 10; NOS 2; TNE 10; TFE 7
EPA TSCA CHEMICAL INVENTORY, 1986

TARGET ORGAN DATA

BEHAVIORAL (MUSCLE WEAKNESS)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY DEPRESSION)
GASTROINTESTINAL (HYPERMOTILITY, DIARRHEA)

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS)
DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

HEALTH HAZARD DATA

ACUTE EFFECTS

HARMFUL IF SWALLOWED.
CAUSES SEVERE EYE IRRITATION.
CAUSES SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.

FIRST AID

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
CLOTHING AND SHOES.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

CONTINUED ON NEXT PAGE

SAL 000007198

Belgium/Holland
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M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 2

CUST#: 923153
PO#: 316-LPA 256781

PRODUCT #: 20561-3
CAS #: 5137-55-3
MF: C25H54CLN

NAME: ALIQUAT 336

PHYSICAL DATA

SPECIFIC GRAVITY: 1.018
APPEARANCE AND ODOR:
VISCOUS YELLOW LIQUID

FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT: 5230
EXTINGUISHING MEDIA:
CARBON DIOXIDE
DRY CHEMICAL POWDER
WATER SPRAY
SPECIAL FIREFIGHTING PROCEDURES:
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO
PREVENT CONTACT WITH SKIN AND EYES.
USUAL FIRE AND EXPLOSIONS HAZARDS:
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

REACTIVITY DATA

INCOMPATIBLE WITH:
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
HYDROGEN CHLORIDE GAS

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
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.
WASTE DISPOSAL METHOD:
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A
CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT
GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
SAFETY SHOWER AND EYE BATHS.
USE ONLY IN A CHEMICAL FUME HOOD.
DO NOT BREATHE DUST.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.

CONTINUED ON NEXT PAGE

SAL 000007199

Belgium/Holland
Aldrich Chemie
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B-1030 Brussels/Bruxelles
Telephone: 514747

France
Aldrich-Chemie S.A./L
27, Fosse des Treilles
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Telex: 890078 Aldrich F
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I-20127 Milano
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Japan
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Telex: 714838 Aldrich D
FAX: 0732967123/236



chemists helping chemists in research & industry

aldrich chemical co.

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G S 6 5 0

M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 3

CUST#: 923153
PO#: 316-LPA 256781

PRODUCT #: 20561-3
CAS #: 5137-55-3
MF: C25H54CLN

NAME: ALIQUAT 336

--- PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE ---

AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
TOXIC.
IRRITANT.
KEEP TIGHTLY CLOSED.
HYGROSCOPIC.
STORE IN A COOL DRY PLACE.

----- ADDITIONAL PRECAUTIONS AND COMMENTS -----

ADDITIONAL INFORMATION
TRICAPRYLYLMETHYLAMMONIUM CHLORIDE ALIQUAT IS A REGISTERED TRADEMARK
OF HENKEL CORPORATION.

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE
EXHAUSTIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD
RESPONSIBLE 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.

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SAL 000007200

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D-7824 Steinheim
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Telex 714838 Aldi D
FAX 0732987139/239



Conoco Inc.

Purchase Requisition

Page

of

Shaded Areas
for Purchasing
Dept. Use Only

RQ Loc

316

Requisition No.

256781

A

CD

e. Information

Priority

RLOC

Department

Ship

Date Req'd at Dest.

Order

Previous P.O.

REB

Refining

Via

NORMAL

ALDRICH CHEMICAL

P. O. BOX 355

MILWAUKEE, WI 53201

Ship To

Conoco Inc.
Refinery Warehouse
Old Spanish Trail
P.O. Box 37
Westlake, LA 70669

Tagging Instructions

F.O.B. Point

Freight Terms

Carrier

Project ID

Clauses

Payment Terms

AFE Reporting

ttn:

MAILED 800-558-9160

equisitioner

Date

Distribution Charge

RACHELLE 318-491-5406 2/21/90

7411-3-0-149-03-13

Tax Status

Special Instructions

Exempt

0%

Item Date Control Equip. Init. Stat. Time Time Unit Date

56781

2/21/90

S149

SH

9

MAIL

NRO

7411-3-0-149-03-13

Item Stock No.

Description

Item

Quantity

Units of

Price

Qty. Issued

20, 561-3 Aliquat 336 (11kg)

1

2

bottles

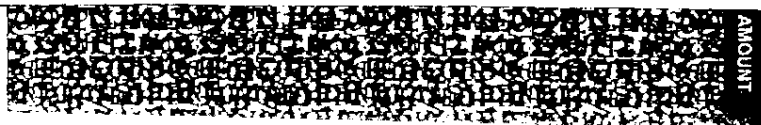
APPROVED: R COWDEN

MAILED ORDER TO ALDRICH CHEMICAL

SAL 000007201

Operating Dept.

Approval - Purchasing Dept.



QUESTED

FILED 2044

CENTURY PAPERS INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
TEL. NO. 713/928-5171

MANUFACTURER:
S.C. JOHNSON & SON, INC.
RACINE, WI 53403-5011
TEL. NO. 414/631-2777
EMERGENCY TEL. NO. 414/631-2000

G S 6 4 5

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF PRODUCT

SHEET NO. 0547

PRODUCT NAME: COMPLETE FOR FLOORS

ISSUE DATE: DECEMBER 12, 1989

PRODUCT CODE: 14650-032

ITEM NO. 420-1604, 420-1612, 420-1647

NATIONAL ITEM#: 2244XX

SECTION 2. INGREDIENTS

CAS NUMBER

WEIGHT %

EXPOSURE LIMIT

MODIFIED ACRYLIC POLYMER

107-21-1

10-20

NE
50 PPM ACGIH
TLV-TWA

*ETHYLENE GLYCOL

*DIETHYLENE GLYCOL
MONOETHYL ETHER

111-90-0

1-3

30 PPM SUPPLIER
RECOMMENDED

AMMONIUM HYDROXIDE

1336-21-6

1-3

25 PPM (ACGIH
TLV-TWA);
50 PPM (OSHA PEL)
AS AMMONIA

WATER

80-90

NA

*THESE MATERIALS ARE SUBJECT TO THE REPORTING REQUIREMENTS UNDER THE
SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III,
SECTION 313 AND CFR PART 372.

NA = NOT APPLICABLE; ND = NOT DETERMINED; NSR = NO SPECIAL REQUIREMENT

SECTION 3. PHYSICAL DATA

BOILING POINT (F): ABOVE 200

SPECIFIC GRAVITY (WATER=1): 1.03

VAPOR PRESSURE (MM HG.): NA

PERCENT VOLATILE (BY VOLUME): NA

VAPOR DENSITY (AIR=1): NA

EVAPORATION RATE (BUTYL ACETATE=1): ND

SOLUBILITY IN WATER: COMPLETE

PH RANGE: 9.2 - 9.6

FREEZING POINT (F): ND

APPEARANCE/ODOR: OPAQUE, TAN LIQUID WITH MILD WAX OR AMMONIACAL ODOR

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (F)(TEST METHOD): NA

FLAMMABLE LIMITS: NA

EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES: NORMAL FIRE FIGHTING PROCEDURES MAY
BE USED.

UNUSUAL FIRE & EXPLOSION HAZARDS: NO SPECIAL HAZARDS KNOWN

SECTION 5. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: NONE KNOWN

INCOMPATIBILITY - MATERIALS TO AVOID: NONE KNOWN

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN EXPOSED TO FIRE, PRODUCES NORMAL
PRODUCTS OF COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL RESPONSE: DO NOT LET SPILLED OR LEAKING MATERIAL ENTER
WATERCOURSE. CONTAINS AMMONIA AND ZINC. MAY BE TOXIC TO AQUATIC
LIFE. ABSORB WITH OIL-DRI OR SIMILAR INERT MATERIAL. SWEEP OR
SCRAPE UP AND CONTAINERIZE.

WASTE DISPOSAL: NO SPECIAL METHOD. OBSERVE ALL APPLICABLE FEDERAL/STATE
REGULATIONS AND LOCAL ORDINANCES REGARDING DISPOSAL OF NON-HAZARDOUS
MATERIALS. WASTE FROM NORMAL PRODUCT USE MAY BE SEWERED TO A
PUBLIC-OWNED TREATMENT WORKS (POTW) IN COMPLIANCE WITH APPLICABLE
FEDERAL, STATE, AND LOCAL PRETREATMENT REQUIREMENTS.

SAL 000007202

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: COMPLETE FOR FLOORS
PRODUCT NO. 420-1604, 420-1612, 420-1647

GS645

PAGE 2

SECTION 7. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: NA

SIGNS AND SYMPTOMS: NA

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

FIRST AID PROCEDURES: NA

SECTION 9. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER NORMAL USE
CONDITIONS.

VENTILATION: NSR

PROTECTION GLOVES: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

EYE PROTECTION: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

OTHER PROTECTIVE MEASURES: USE GOOD PERSONAL HYGIENE PRACTICES.

SECTION 10. ADDITIONAL INFORMATION AND PRECAUTIONS

PRECAUTIONARY LABELING: NA

HANDLING AND STORAGE CONDITIONS: STORE IN A COOL, DRY PLACE WITH
ADEQUATE VENTILATION. KEEP FROM FREEZING.

HMIS RATINGS: HEALTH 0, FLAMMABILITY 0, REACTIVITY 0

PREPARED BY: ROBERT B. O'BREIN
CHEMICAL INFO. ADMINISTRATOR

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SAL 000007203

CENTURY PAPERS INC.
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MANUFACTURER:
S.C. JOHNSON & SON, INC.
RACINE, WI 53403-5011
TEL. NO. 414/631-2777
EMERGENCY TEL. NO. 414/631-2000

68646

MATERIAL SAFETY DATA SHEET

ITEM NO. 409-0802

SECTION 1. IDENTIFICATION OF PRODUCT

SHEET NO. 0576

PRODUCT NAME: LEMON SHINE-UP
(PRESSURIZED)
PRODUCT CODE: 14440-017-018

PRODUCT NO. 409-0802
ISSUE DATE: DECEMBER 12, 1989
NATIONAL ITEM#: 3234XX

SECTION 2. INGREDIENTS

CAS NUMBER

WEIGHT %

EXPOSURE LIMIT

ISOPARAFFINIC HYDROCARBON
SOLVENT

64742-48-9

10-20

400 PPM (SUPPLIER
RECOMMENDED)

PROPANE, ISOBUTANE, N-BUTANE

74-98-6,
75-28-5,
106-97-8

10-20

1000 PPM (OSHA
PEL)(PROPANE)
800 PPM (ACGIH
TLV-TWA)(N-BUTANE)

SILICONE FLUID

63148-62-9

1-3

ND

WATER

70-80

NA

NA = NOT APPLICABLE; ND = NOT DETERMINED; NSR = NO SPECIAL REQUIREMENTS

SECTION 3. PHYSICAL DATA

BOILING POINT (F): NA

SPECIFIC GRAVITY (WATER=1): 0.9

VAPOR PRESSURE (MM HG.): ND

PERCENT VOLATILE (BY VOLUME): NA

VAPOR DENSITY (AIR=1): ND

EVAPORATION RATE (BUTYL ACETATE=1): NA

SOLUBILITY IN WATER: NEGLIGIBLE

PH RANGE: NA

FREEZING POINT: NA

APPEARANCE/ODOR: DISPENSED AS CREAMY SPRAY WITH LEMON ODOR.

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (F) (METHOD USED): UNDER 20 (TCC) (PROPELLANT)

FLAMMABLE LIMITS: ND

EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES: NORMAL FIRE FIGHTING PROCEDURES MAY BE
USED. FIGHT FIRE FROM MAXIMUM DISTANCE OR PROTECTED AREA. COOL
AND USE CAUTION WHEN APPROACHING OR HANDLING FIRE-EXPOSED CONTAINERS.

UNUSUAL FIRE & EXPLOSION HAZARDS: CONTAINER MAY BURST IN HEAT OF FIRE.

SECTION 5. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: NONE KNOWN

INCOMPATIBILITY - MATERIALS TO AVOID: NONE KNOWN

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN EXPOSED TO FIRE, PRODUCES NORMAL
PRODUCTS OF COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL RESPONSE: ELIMINATE ALL IGNITION SOURCES. ABSORB WITH OIL-DRI OR
SIMILAR INERT MATERIAL. SWEEP OR SCRAPE UP AND CONTAINERIZE.

WASTE DISPOSAL: DISPOSE OF AEROSOL CAN BY WRAPPING AND PLACING IN TRASH.
DO NOT PUNCTURE OR BURN CONTAINER. DISPOSE OF SPILLED RESIDUES AND
MULTIPLE UNITS IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND
LOCAL ORDINANCES.

SAL 000007204

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: LEMON SHINE-UP (PRESSURIZED)
PRODUCT NO. 409-0802

GS646

PAGE 2

SECTION 7. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: EYE CONTACT
SIGNS AND SYMPTOMS: DIRECT CONTACT OF PRODUCT WITH EYES CAN CAUSE IRRITATION.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

FIRST AID PROCEDURES: FLUSH EYES WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS, SEEK MEDICAL AID.

SECTION 9. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

VENTILATION: GENERAL ROOM VENTILATION ADEQUATE.

PROTECTION GLOVES: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

EYE PROTECTION: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

OTHER PROTECTIVE MEASURES: USE GOOD PERSONAL HYGIENE PRACTICES.

SECTION 10. ADDITIONAL INFORMATION AND PRECAUTIONS

PRECAUTIONARY LABELING: CAUTION: DO NOT USE NEAR FIRE, FLAME OR PILOT LIGHT. DO NOT SET ON STOVE OR RADIATOR OR KEEP WHERE TEMPERATURE EXCEEDS 120 F AS CONTAINER MAY BURST. DO NOT PUNCTURE OR THROW IN FIRE. KEEP OUT OF REACH OF CHILDREN. NEVER USE ON FLOORS OR SURFACES THAT ARE WALKED ON AS THE PRODUCT'S INGREDIENTS COULD MAKE THEM SLIPPERY. AVOID OVERSPRAY.

HANDLING AND STORAGE CONDITIONS: STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP FROM FREEZING. DO NOT PRESSURIZE, CUT, HEAT, WELD OR EXPOSE CONTAINER TO FLAME; EXPLOSION COULD OCCUR.

HMS RATINGS: HEALTH 1, FLAMMABILITY 4, REACTIVITY 0

PREPARED BY: ROBERT B. O'BRIEN
CHEMICAL INFO. ADM.

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SAL 000007205

CENTURY PAPERS INC.
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HOUSTON, TX 77023
PHONE NO. 713/ 928-5171

MANUFACTURER:
G S 6 4 7 CARROLL COMPANY
2900 WEST KINGSLEY RD.
GARLAND, TX 75041

EMERGENCY TELEPHONE NO. (214) 278-1304

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 0311

PRODUCT NAME: MR. JON 2 BOWL CLEANER

PRODUCT CODE: 454
ITEM NO. 408-0475, 408-0483

ISSUE DATE: DECEMBER 12, 1989

SECTION 2- HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES: %
HYDROCHLORIC ACID 25 %

SECTION 3- PHYSICAL DATA

SPECIFIC GRAVITY(H2O=1): 1.139 SOLUBILITY IN WATER: COMPLETE

APPEARANCE AND ODOR: BROWN LIQUID, PUNGENT

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

UNUSUAL FIRE AND EXPLOSION HAZARDS: PRODUCT ACTS WITH METALS TO PRODUCE
FLAMMABLE HYDROGEN.

SECTION 5- HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: UNDETERMINED

EFFECTS OF OVEREXPOSURE: SKIN & EYE- CAN CAUSE SEVERE BURNS. INGESTION-
-HARMFUL OR FATAL IF SWALLOWED. INHALATION- CONTAINS CORROSIVE FUMES.
-HARMFUL IF INHALED.

EMERGENCY AND FIRST AID PROCEDURES: SKIN- WASH WITH SOAP AND WATER. EYE-
-FLUSH IMMEDIATELY WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL
ATTENTION. INGESTION- IF SWALLOWED. GIVE LARGE AMOUNT OF MILK OR WATER
TO DRINK. GET MEDICAL ATTENTION IMMEDIATELY. INHALATION- MOVE TO FRESH-
AIR.

SECTION 6- REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: AVOID CONTACT WITH GASES AND CHLORINE BLEACHES.

SECTION 7- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

FLOOD AREA WITH WATER AND MOP UP.

SECTION 8- SPECIAL PROTECTION INFORMATION

VENTILATION: RECOMMENDED PROTECTIVE GLOVES: RECOMMENDED

EYE PROTECTION: GOGGLES, IF SPLASH MAY OCCUR.

SECTION 9- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP CONTAINER TIGHTLY
CLOSED TO AVOID ESCAPE OF CORROSIVE FUMES.

SAL 000007206

CENTURY PAPERS, INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
PHONE NO. 713-928-5171

MANUFACTURER:
UNITED STATES PUMICE CO. **6-8-48**
20219 BAHAMA STREET
CHATSWORTH, CA. 91311
EMERGENCY PHONE NO. 818-828-0300

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 1347

PRODUCT NAME: PUMICE SCOURING BARS

PRODUCT NO. 408-1005

ISSUE DATE: DECEMBER 12, 1989

SECTION 2- HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS:

PUMICE (VOLCANIC GLASS)
THERE IS NO FREE CRYSTALLINE SILICA PRESENT

SECTION 3- PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N/A

VAPOR PRESSURE: N/A

VAPOR DENSITY: N/A

SOLUBILITY IN WATER: NOT SOLUBLE

SPECIFIC GRAVITY: N/A

MELTING POINT: 2390 F.

EVAPORATION RATE: N/A

APPEARANCE AND ODOR: ODORLESS SOLID

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NA

FLAMMABLE LIMITS: LEL: NA UEL: NA

EXTINGUISHING MEDIA: N/A

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION 5- REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: NONE

INCOMPATIBILITY: NONE

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: NONE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: NONE

SECTION 6- HEALTH HAZARD DATA

ROUTES OF ENTRY: INHALATION, INGESTION

HEALTH HAZARDS (ACUTE AND CHRONIC):

DRY SAWING OR GRINDING MAY RESULT IN THE RELEASE OF DUST PARTICLES
WHICH, ACUTE, MAY CAUSE IRRITATION OF EYES, NOSE OR THROAT AND CHRONIC
MAY RESULT IN LUNG DISEASE (SILICOSIS) IF EXPOSED FOR PROLONGED TIME.

CARCINOGENICITY: NTP: NO IARC MONOGRAPHS: NO OSHA REGULATED: NO

SIGNS AND SYMPTOMS OF EXPOSURE:

IRRITATION OF EYES, NOSE OR THROAT OR SHORTNESS OF BREATH.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

PRE EXISTING LUNG DISEASE SUCH AS EMPHYSEMA OR ASTHMA.

EMERGENCY AND FIRST AID PROCEDURES:

IRRIGATE EYES GENEROUSLY WITH CLEAN WATER FOR 15 MINUTES, IF
IRRITATION PERSISTS, CALL A PHYSICIAN.

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: PUMICE SCOURING BARS
PRODUCT NO. 408-1005

PAGE 2

GS648

SECTION 7- PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN HANDLING AND STORING:
NONE

OTHER PRECAUTIONS:

WEAR NIOSH APPROVED RESPIRATOR AND TIGHT FITTING GOGGLES WHEN
SAWING OR GRINDING, OR SAW & GRIND WHEN WET

SECTION 8- CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE):
NIOSH APPROVED PARTICULATE RESPIRATOR

VENTILATION: MECHANICAL: IN CONFINED AREA

PROTECTIVE GLOVES: WHEN REQUIRED

EYE PROTECTION: TIGHT FITTING GOGGLES

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: NONE

WORK/HYGIENIC PRACTICES: N/A

CENTURY PAPERS INC.
902 GULF FREEWAY
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PHONE NO. 713/928-5171

MANUFACTURER:
SORB-ALL CO.
2200 NANCE
HOUSTON, TEXAS 77226
EMERGENCY PHONE NO. 713/223-4575

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 1306

PRODUCT NAME: SWEEP EZ

ITEM NO. 401-0019

68649

ISSUE DATE: DECEMBER 12, 1989

SECTION 2- HAZARDOUS INGREDIENTS

PRESERVATIVES AND SOLVENTS: %: TLV (UNITS)

DUPONT ORGANIC OIL RED B LIQUID .4%

PINE SANDUST 60%

MINERAL OIL 40%

ALLOYS AND METALLIC COATINGS: %: TLV(UNITS)

BASE METAL: N/A

METALLIC COATINGS: N/A

ALLOYS: N/A

FILLER METAL PLUS COATING OR CORE FLUX: N/A

OTHERS: N/A

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES:

N/A

SECTION 3- PHYSICAL DATA

BOILING POINT (F.):
VAPOR PRESSURE (MM HG.):

SPECIFIC GRAVITY (H2O=1):
PERCENT VOLATILE BY VOLUME:

SOLUBILITY IN WATER:

APPEARANCE AND ODOR: RED

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): OPEN CUP 360 F.

EXTINGUISHING MEDIA:

WATER SPRAY, CHEMICAL FOAM. DRY CHEMICAL, CO2.

SPECIAL FIRE FIGHTING PROCEDURES:

EVACUATE PERSONNEL

UNUSUAL FIRE AND EXPLOSION HAZARDS:

SECTION 5- HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: NONE FOUND

EFFECTS OF OVEREXPOSURE: NONE

EMERGENCY FIRST AID PROCEDURES:

NONE

SAL 000007209

SECTION 6- REACTIVITY DATA

STABILITY: STABLE

INCOMPATIBILITY (MATERIALS TO AVOID): UNKNOWN

MATERIAL SAFETY DATA SHEET
TRADE NAME: SWEEP EZ
ITEM NO. 401-0019

PAGE 2

GS649

SECTION 6- REACTIVITY DATA

CONTINUED.....

HAZARDOUS DECOMPOSITION PRODUCTS:

N/A

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION 7- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SWEEP UP AND DISPOSE IN TRASH BIN.

WASTE DISPOSAL METHOD: COMMON LANDFILL.

SECTION 8- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE):

VENTILATION: LOCAL EXHAUST, MECHANICAL (GENERAL).

PROTECTIVE GLOVES: NOT REQUIRED EYE PROTECTION: WEAR SAFETY GLASSES.

OTHER PROTECTIVE EQUIPMENT: NONE

SECTION 9- SPECIAL PRECAUTIONS

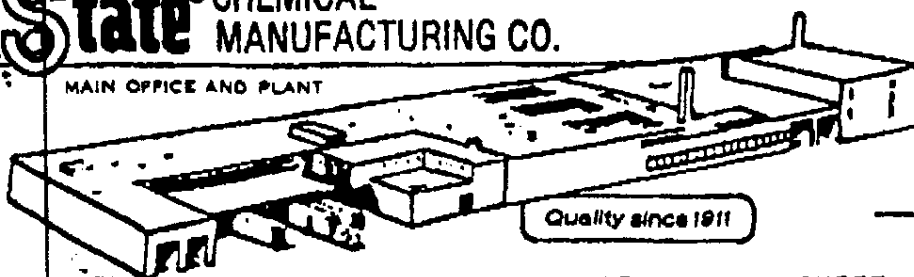
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
DO NOT STORE NEAR OPEN FLAME.

OTHER PRECAUTIONS:

SAL 000007210

The **State**® CHEMICAL
MANUFACTURING CO.

MAIN OFFICE AND PLANT



3100 HAMILTON AVENUE
CLEVELAND, OHIO 44114
TELEPHONE: (216) 861-7114

MATERIAL SAFETY DATA SHEET

SECTION I -- IDENTIFICATION

GS619

PRODUCT NAME: Sta Patch

PRODUCT TYPE: a formulated road patching compound

DOT SHIPPING NAME: Not Hazardous according to DOT definitions

DOT HAZARD CLASS: Not Applicable (N/A)

DOT ID NO.: N/A

DOT LABEL: N/A

SECTION II -- HAZARDOUS MATERIALS

MATERIALS

WEIGHT PERCENT

TLV(units)

This product does not contain any ingredients considered hazardous according to Federal and State Worker Right-to-Know laws.

SECTION III -- PHYSICAL DATA

BOILING POINT: over 400

SPECIFIC GRAVITY (WATER = 1): N/A

% VOLATILE BY WT.: < 2

WT. PER GALLON: 13 to 14

SOLUBILITY IN WATER: Negligible pH: N/A

APPEARANCE AND ODOR: a black solid road patch with an asphaltic binder

SECTION IV -- FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (METHOD USED): None to 200°F

EXTINGUISHING MEDIA: ABC Fire Extinguisher

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SAL 000007211

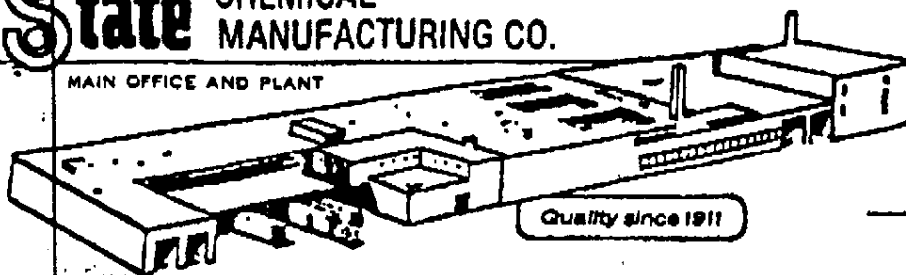
DISTRIBUTION CENTERS NATIONWIDE: 2001 SPRING GROVE AVE., CINCINNATI, OHIO 45225...513/579-0800 426 SOUTH 27TH ST., RENTON, WA 98056...206/226-8643
170 JAMES ALDREDGE BLVD., ATLANTA, GA 30336...404/691-8211 820 FRANCISCO ST., TORRANCE, CA 90563...213/638-8786 1226 TANEY ST., N. KANSAS CITY, MO 64116...816/842-0609
21 INDUSTRIAL DR., CLIFFWOOD BEACH, N.J. 07735...201/583-8600 65 INFANTRY STATION, BOX 20474 RIO PIEDRAS, PUERTO RICO 00929 7776 N.W. 86TH ST., MIAMI, FL 33166...305/582-7529

October, 1985

Page 1 of 3

The State[®] CHEMICAL MANUFACTURING CO.

MAIN OFFICE AND PLANT



3100 HAMILTON AVENUE
CLEVELAND, OHIO 44114
TELEPHONE: (216) 661-7114

GS619

PRODUCT NAME: Sta Patch

SECTION V -- HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE: None expected. Mild eye irritation could occur in cases of direct contact.

FIRST AID PROCEDURES

IF SWALLOWED: Treat symptomatically. This material would be very difficult to ingest.

IF INHALED: N/A.

IF IN EYES: Flush eyes immediately with plenty of cool water for at least 15 minutes. If irritation continues get medical advice.

IF ON SKIN: Wash with soap and water.

SECTION VI -- REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: Contact with petroleum solvent. Contact with acids.

INCOMPATIBILITY (Materials to avoid): None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Pick up with shovel. Clear residue with small amount of solvent cleaner.

WASTE DISPOSAL METHOD: Follow all Federal, State and Local regulations regarding waste disposal. If material is over two years old dispose of as nonhazardous waste.

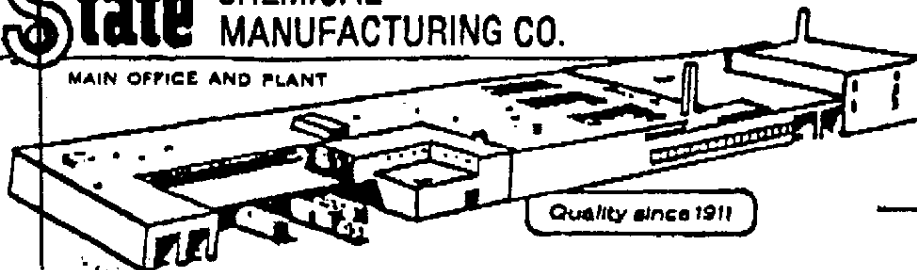
DISTRIBUTION CENTERS NATIONWIDE: 3901 SPRING GROVE AVE., CINCINNATI, OHIO 45225...513/679-0800 438 SOUTH 7TH ST., RENTON, WA 98055...206/228-8541
170 JAMES ALDRIDGE BLVD., ATLANTA, GA 30336...404/581-8211 820 FRANCISCO ST., TORRANCE, CA 90502...213/638-8788 1228 TANEY ST., N. KANSAS CITY, MO 64116...816/842-0553
21 INDUSTRIAL DR., CLIFFWOOD BEACH, N.J. 07738...201/543-6800 85 INFANTRY STATION, BOX 29474 RIO PIEDRAS, PUERTO RICO 00929 7775 N.W. 86TH ST., MIAMI, FL 33166...305/582-7422

October, 1985

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SAL 000007212

The **State**® CHEMICAL
MANUFACTURING CO.

MAIN OFFICE AND PLANT



3100 HAMILTON AVENUE
CLEVELAND, OHIO 44114
TELEPHONE: (216) 861-7114

PRODUCT NAME: Sta Patch

G.S. 619

SECTION VIII -- SPECIAL PROTECTION INFORMATION

Eye protection and protective gloves are recommended anytime you work with any concentrated industrial strength cleaning products.

RESPIRATORY PROTECTION: N/A

VENTILATION: If used Inside--ventilate area.

PROTECTIVE GLOVES: optional EYE PROTECTION: optional

OTHER PROTECTIVE EQUIPMENT: None

SECTION IX -- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Store in a cool, dry place in original labeled container.
Do not reuse empty container for any purpose.
Store indoors during winter.
Keep container covered when not in use.

OTHER PRECAUTIONS:

Read and follow all label directions and precautions before using the product.

These products are intended for industrial use only.

FOR INDUSTRIAL USE ONLY.

KEEP OUT OF THE REACH OF CHILDREN.

While we believe that the data contained herein is factual and the opinions expressed are those of qualified experts, the data are not to be taken as a warranty or representation for which the company 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 applicable Federal, State, and Local laws and regulations.

DISTRIBUTION CENTERS NATIONWIDE: 2601 SPRING GROVE AVE., CINCINNATI, OHIO 45226...813/579-0800 426 SOUTH 7TH ST., RENTON, WA 98058...206/226-8643
170 JAMES ALPHEGE BLVD., ATLANTA, GA 30338...404/861-8211 920 FRANCISCO ST., TORRANCE, CA 90502...213/638-8785 1228 TANEY ST., N. KANSAS CITY, MO 64116...816/842-0063
21 INDUSTRIAL DR., CLIFFWOOD BEACH, N.J. 07735...201/563-8400 65 INFANTRY STATION, BOX 29474 RIO PIEDRAS, PUERTO RICO 00929 7775 N.W. 64TH ST., MIAMI, FL 33166...305/992-7829

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PAGE 3 of 3

MAR-8-90 THU 14:01

M A T E R I A L S A F E T Y D A T A S H E E T
EM SCIENCE
A DIVISION OF EM INDUSTRIES
111 WOODCREST
CHERRY HILL, N.J. 08034-0395

PREPARATION DATE: OCT 27, '87

INFORMATION PHONE NUMBER.:
(609) 354-9200
CHEMTREC EMERGENCY NUMBER:
1-800-424-9300

|
| NFPA HAZARD RATINGS
|

| HEALTH: 2 FLAMMABILITY: 3
| REACTIVITY : 1 SPECIAL HAZARDS.: N/A

SECTION I - GENERAL INFORMATION

GS618

CATALOG NUMBER(S): MX0819 MX0826
CHEMICAL NAME.....: METHYL TERT-BUTYL ETHER
TRADE NAME.....: TERT-BUTYL METHYL ETHER
C.A.S. NUMBER.....: 1634-04-4
CHEMICAL FAMILY...: ALIPHATIC ETHER
FORMULA.....: CH₃CC(CH₃)₃
MOLECULAR WEIGHT.: 88.14
DOT SHIPPING NAME: N/A
DOT NUMBER.....: N/A

SECTION II - HAZARDOUS INGREDIENTS

-NONE OTHER THAN SPECIFIED PRODUCT

SECTION III- PHYSICAL DATA

BOILING POINT (C 760 MM HG)..: 55C
MELTING POINT (C).....: -110C
SPECIFIC GRAVITY(H₂O = 1).....: 0.740
VAPOR PRESSURE..(MM HG).....: 245 25C
PERCENT VOLATILE BY VOL (%)..: 99+
VAPOR DENSITY (AIR=1).....: N/A
EVAPORATION RATE (BUAC=1).....: N/A
SOLUBILITY IN WATER (%).....: 4.6
APPEARANCE AND ODOR.....: COLORLESS LIQUID

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT (F).....: -18F •
FLAMMABLE LIMITS LEL %.: 1.65
FLAMMABLE LIMITS UEL %.: 8.4
EXTINGUISHING MEDIA.....:
"ALCOHOL" FOAM, CO₂, DRY CHEMICAL
FIRE FIGHTING PROC.....:

MSDS-MX0819

PAGE # : 01

SAL 000007214

WEAR SELF-CONTAINED BREATHING APPARATUS.

GS618

FIRE & EXPL. HAZARDS...:

-EXPOSURE TO AIR MAY RESULT IN FORMATION OF EXPLOSIVE **

SECTION V - HEALTH HAZARD DATA (ACUTE AND CHRONIC)

ACGIH TLV/OSHA PEL (TWA).....:

& PEL: NONE ESTABLISHED

TOXICITY DATA.....:

-ORL-RAT LD50: 4 ML/KG

SYMPTOMS OF EXPOSURE

-VAPOR IRRITATING-CAN BE HARMFUL TO CENTRAL NERVOUS SYSTEM

CAUSES EYE IRRITATION

MAY CAUSE SKIN IRRITATION

ORAL TOXICITY LOW

MEDICAL COND. AGGRAVATED BY EXP: DATA NOT AVAILABLE.

ROUTES OF ENTRY.....: INHALATION, INGESTION OR SKIN CONTACT.

CARCINOGENICITY.....: SEE COMMENTS, SECTION X; IF NO INFORM-

ATION APPEARS, THE MATERIAL IS NOT LISTED AS A CANCER CAUSING AGENT.

EMERGENCY FIRST AID.....:

GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE

SKIN: WASH THOROUGHLY WITH SOAP AND WATER

EYES: IMMEDIATELY FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES

INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF

BREATHING HAS STOPPED

INGESTION: DO NOT INDUCE VOMITING; GET IMMEDIATE MEDICAL ATTENTION

SECTION VI - REACTIVITY DATA

STABILITY.....: YES

CONDITIONS TO AVOID

-CONTACT WITH HEAT, SPARKS OR FLAME

EXPOSURE TO AIR

MATERIALS TO AVOID.....: () WATER () ACIDS

() BASES () CORROSIVES (X) OXIDIZERS

() OTHER (SPECIFY)-N/A

HAZARDOUS POLYMERIZATION.: DATA NOT AVAILABLE.

HAZARDOUS DECOMPOSITION.: -COX

SECTION VII - ENVIRONMENTAL PROTECTION PROCEDURES

SPILL RESPONSE:

-REMOVE ALL IGNITION SOURCES; DIKE SPILL, TAKE UP AND CONTAINERIZE
FOR PROPER DISPOSAL

WASTE DISPOSAL: TO BE PERFORMED IN COMPLIANCE WITH ALL CURRENT LOCAL,
STATE AND FEDERAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION, RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, EYE PROTECTION:

-MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED FUME
HOOD OR WITH ADEQUATE VENTILATION

PROTECTIVE GLOVES (NITRILE, PVA, VITON OR EQUIVALENT) SHOULD BE WORN

MSDS-MXC819 PAGE # : 02

SAL 000007215

TO PREVENT SKIN CONTACT
SAFETY GLASSES WITH SIDE SHIELDS MUST BE WORN AT ALL TIMES

SECTION IX - SPECIAL PROTECTION INFORMATION
HANDLING & STORAGE

GS618

-KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE
STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS
AVOID PROLONGED STORAGE
CHECK PEROXIDE CONTENT BEFORE HEATING MATERIAL
DO NOT ALLOW TO EVAPORATE TO NEAR DRYNESS
DO NOT BREATHE VAPOR
DO NOT GET IN EYES, ON SKIN OR ON CLOTHING
DO NOT TAKE INTERNALLY
ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT
WORK/HYGIENIC PRACTICES: WASH THOROUGHLY AFTER HANDLING. DO NOT TAKE
INTERNALLY. EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

SECTION X - OTHER INFORMATION
COMMENTS.....:

-* (ABEL-PENSKY)
** PEROXIDES

REV. 1/87

N/A
REVISION HISTORY.....: 10/01/84, N/A
OCT 27, '87

N/A = NOT AVAILABLE:

MSDS-MXC819

PAGE # : 03

SAL 000007216

MATERIAL SAFETY DATA SHEET

POB: 316-LPA-256782
HACH ORDER#: 657817

256782

MSDS DATE: 12/28/88
CHANGE NO.: 7557For Assistance, Contact:
Regulatory Affairs Dept.
PO Box 987 Ames, IA 50010HACH COMPANY
PO BOX 907
AMES, IA 50010Emergency Telephone #
Rocky Mountain Poison Ctr.
(303) 623-5716

I. PRODUCT IDENTIFICATION

CATALOG NO.: 738
CAS NO.: 5995-86-8
FORMULA: C7H6O5 H2O
PRODUCT NAME: Gallic Acid Monohydrate
CHEMICAL NAME: 3,4,5-Trihydroxybenzoic Acid
CHEMICAL FAMILY: Organic Acids

II. INGREDIENTS

Gallic Acid Monohydrate
PCT: >97 CAS NO.: 5995-86-8 SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: May cause irritationImpurities
PCT: <3 CAS NO.: NA SARA: NOT LISTED
TLV: Not established PEL: Not established
HAZARD: Toxicity unknown; may cause irritation

III. PHYSICAL DATA

STATE: solid APPEARANCE: White or light yellow ODOR: None
SOLUBILITY IN: WATER: Slightly soluble ACID: Not determined
OTHER: Alcohol, glycerol, acetone BOILING POINT: NA
MELTING PT.: 251C decomp. SPEC GRAVITY: 1.694 pH: of 5% soln. = 2.8
VAPOR PRESSURE: Not applicable VAPOR DENSITY (air=1): NA
EVAPORATION RATE: NA METAL CORROSIVITY - ALUMINUM: 0.0111 in/yr
STEEL: ND STABILITY: Stable
STORAGE PRECAUTIONS: Store tightly closed and protected from light.

IV. FIRE, EXPLOSION HAZARD AND REACTIVITY DATA

FLASH PT.: Not applicable METHOD: NA
FLAMMABILITY LIMITS - LOWER: NA UPPER: NA
SUSCEPTIBILITY TO SPONTANEOUS HEATING: None
SHOCK SENSITIVITY: None AUTOIGNITION PT.: ND
EXTINGUISHING MEDIA: water, carbon dioxide, or dry chemical
FIRE/EXPLOSION HAZARDS: May emit acrid smoke and fumes
HAZARDOUS DECOMP. PRODUCTS: Acrid smoke and fumes
OXIDIZER: No NFPA Codes: Health: 1 Flammability: 1 Reactivity: 0
CONDITIONS TO AVOID: Exposure to heat, flames, light; contact with
oxidizers, alkali hydroxides and carbonates, ammonia, lead acetates,
silver salts

V. HEALTH HAZARD DATA

THIS PRODUCT MAY BE: irritating to eyes, skin and respiratory tract.
ACUTE TOXICITY: Moderately toxic
ROUTES OF EXPOSURE: Ingestion, inhalation, contact
TARGET ORGANS: Not determined
CHRONIC TOXICITY: Not determined
ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Not determined
CARCINOGEN, MUTAGEN, TERATOGEN DATA: Not applicable
ROUTES OF EXPOSURE: Not applicable
TARGET ORGANS: Not applicable
OVEREXPOSURE: May cause irritation. If swallowed, may cause nausea and
diarrhea.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None reported

VI. PRECAUTIONARY MEASURES

Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Do not breathe chemicals.
PROTECTIVE EQUIPMENT: adequate ventilation, safety glasses, disposable
gloves

VII. FIRST AID

EYE AND SKIN CONTACT: Immediately flush eyes with water for 15 minutes.
physician. Wash skin with soap and plenty of water.
INGESTION: Give large quantities of water or milk. Call physician
immediately.
INHALATION: Remove to fresh air.

VIII. SPILL AND DISPOSAL PROCEDURES

IN CASE OF SPILL OR RELEASE: Cover contaminated surfaces with soda ash or
sodium bicarbonate. Mix and add water if necessary. Use litmus paper
make sure pH of slurry is neutral or add neutralizer until mixture stops
bubbling. Scoop up the slurry and wash the neutral waste down the drain
with excess water. Wash the site with soda ash solution.
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

IX. TRANSPORTATION DATA

D.O.T. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: Not applicable ID: NAI.C.A.O. PROPER SHIPPING NAME: Not Currently Regulated
HAZARD CLASS: NA ID: NA GROUP: NA

X. REFERENCES

- 1) TLV's Threshold Limit Values and Biological Exposure Indices for 198
1989. American Conference of Governmental Industrial Hygienists, 198
- 2) 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor)
- 3) Sax, Merck, Chemical Dictionary
- 4) Gosselin, R.E. et al. Clinical Toxicology of Commercial Products, 5th
Ed. Baltimore: The Williams and Wilkins Co., 1984.
- 5) Sax, W. Irving. Dangerous Properties of Industrial Materials, 6th E
New York: Van Nostrand Reinhold Co. 1984.
- 6) Technical Judgment
- 7) The Merck Index, 10th Ed. Rahway, New Jersey: Merck and Co., Inc.,
1983
- 8) Vendor information.
- 9) NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86.
Cincinnati: U. S. Department of Health and Human Services, April, 1

SPECIAL NOTE: This product is Analytical Grade.

SAL 000007217

SHEA021230

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

A7440 -04 ARSENIC, 1000 PPM (0.100% w/v)
EFFECTIVE: 05/01/89

PAGE: 1
ISSUED: 05/16/89

J.T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

GS617

=====

SECTION I - PRODUCT IDENTIFICATION

=====

PRODUCT NAME: ARSENIC, 1000 PPM (0.100% w/v)
COMMON SYNONYMS: N/A
CHEMICAL FAMILY: ATOMIC ABSORPTION STANDARDS
FORMULA: AS2O3 IN HCL
FORMULA WT.: 74.90
CAS NO.: N/A
NIOOSH/RTECS NO.: CG3325000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 6919

=====

PRECAUTIONARY LABELING

=====

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	4	EXTREME (CANCER CAUSING)
FLAMMABILITY	-	0	NONE
REACTIVITY	-	2	MODERATE
CONTACT	-	2	MODERATE

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

U.S. PRECAUTIONARY LABELING

POISON DANGER

CAUSES IRRITATION. HARMFUL IF INHALED. MAY BE FATAL IF SWALLOWED. CAUTION:
CONTAINS INORGANIC ARSENIC, CANCER HAZARD.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE VAPOR. KEEP IN
TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER
HANDLING. IN CASE OF SPILL, NEUTRALIZE WITH SODA ASH OR LIME AND PLACE IN DRY
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: WHITE (CORROSIVE)

CONTINUED ON PAGE: 2

SAL 000007218

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
G S 6 1 7 MATERIAL SAFETY DATA SHEET
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

A7440 -04 ARSENIC, 1000 PPM (0.100% W/V)
EFFECTIVE: 05/01/89

PAGE: 2
ISSUED: 05/16/89

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SECTION II - COMPONENTS

=====

COMPONENT	CAS NO.	WEIGHT %	CSHA/PEL	ACGIH/TLV
ARSENIC TRIOXIDE	1327-53-3	<1	N/E	N/E
HYDROCHLORIC ACID	7647-01-0	1-2	5 PPM	5 PPM
WATER	7732-18-5	97-98	N/E	N/E

=====

SECTION III - PHYSICAL DATA

=====

BOILING POINT: N/A	VAPOR PRESSURE (MMHG): N/A
MELTING POINT: N/A	VAPOR DENSITY (AIR=1): N/A
SPECIFIC GRAVITY: N/A (H2O=1)	EVAPORATION RATE: N/A

SOLUBILITY(H2O): COMPLETE (100%)	% VOLATILES BY VOLUME: -99 (21 C)
----------------------------------	--------------------------------------

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A	PHYSICAL STATE: LIQUID
------------------------------	------------------------

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: CLEAR, COLORLESS LIQUID. ODORLESS.

=====

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

=====

FLASH POINT (CLOSED CUP): N/A	NFPA 704M RATING: 3-0-0
-------------------------------	-------------------------

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS: UPPER - N/A	LOWER - N/A
-------------------------------	-------------

FIRE EXTINGUISHING MEDIA

USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

CONTINUED ON PAGE: 3

SAL 000007219

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

A7440 -04
EFFECTIVE: 05/01/89

ARSENIC. 1000 PPM (0.100% w/v)

GS617

PAGE: 3

ISSUED: 05/16/89

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

=====

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

REACTS WITH MOST METALS TO PRODUCE HYDROGEN GAS, WHICH CAN FORM AN EXPLOSIVE MIXTURE WITH AIR.

TOXIC GASES PRODUCED

HYDROGEN CHLORIDE, HYDROGEN

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT

NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE

NONE IDENTIFIED.

=====

SECTION V - HEALTH HAZARD DATA

=====

THRESHOLD LIMIT VALUE (TLV/TWA): 7 MG/M3 (5 PPM)

TLV (CEILING) IS FOR HYDROGEN CHLORIDE.

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

PERMISSIBLE EXPOSURE LIMIT (PEL): 7 MG/M3 (5 PPM)

PEL (CEILING) IS FOR HYDROGEN CHLORIDE.

TOXICITY OF COMPONENTS

ORAL RAT LD50 FOR ARSENIC TRIOXIDE	15.1 MG/KG
ORAL MOUSE LD50 FOR ARSENIC TRIOXIDE	39.4 MG/KG
INTRAPERITONEAL MOUSE LD50 FOR HYDROCHLORIC ACID	40 MG/KG
ORAL RABBIT LD50 FOR HYDROCHLORIC ACID	900 MG/KG
INHALATION-1HR RAT LC50 FOR HYDROCHLORIC ACID	3124 PPM
INTRAPERITONEAL MOUSE LD50 FOR WATER	190 G/KG
INTRAVENOUS MOUSE LD50 FOR WATER	25 G/KG

CONTINUED ON PAGE: 4

SAL 000007220

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8602

A7440 -04 **GS617** ARSENIC, 1000 PPM (0.100% W/V)
EFFECTIVE: 05/01/89

PAGE: 4
ISSUED: 05/16/89

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

CARCINOGENICITY: NTP: YES IARC: YES Z LIST: YES CSHA REG: YES

CARCINOGENICITY

THIS PRODUCT CONTAINS ARSENIC, WHICH IS LISTED AS A NTP HUMAN CARCINOGEN
AND AN IARC HUMAN CARCINOGEN (GROUP 1).

REPRODUCTIVE EFFECTS

NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: IRRITATION OF MUCOUS MEMBRANES, SEVERE IRRITATION OR
BURNS OF RESPIRATORY SYSTEM, PULMONARY EDEMA, LUNG
INFLAMMATION

SKIN CONTACT: IRRITATION, BURNS

EYE CONTACT: IRRITATION, BURNS

SKIN ABSORPTION: NONE IDENTIFIED

INGESTION: IS HARMFUL AND MAY BE FATAL. NAUSEA, VOMITING, PARALYSIS,
SEVERE BURNS TO MOUTH, THROAT, AND STOMACH

CHRONIC EFFECTS: NONE IDENTIFIED

TARGET ORGANS

LIVER, KIDNEYS, EYES, SKIN, RESPIRATORY SYSTEM, LUNGS, LYMPHATIC SYSTEM

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY

INHALATION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, GIVE LARGE
AMOUNT OF MILK, MILK OF MAGNESIA, OR WHITES OF EGGS BEATEN
WITH WATER. INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE
OXYGEN.

CONTINUED ON PAGE: 5

SAL 000007221

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8602

A7440 -04
EFFECTIVE: 05/01/89

ARSENIC, 1000 PPM (0.100% W/V)

G S 6 1 7 PAGE: 5
ISSUED: 05/16/89

=====

SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE RE-USE.

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: YES CONTAINS ARSENIUS OXIDE (RC = 5,000 LBS, TPQ = 100/10,000 LBS) AND HYDROGEN CHLORIDE (RC = 1 LB, TPQ = 500 LBS)

CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS ARSENIUS OXIDE (RC = 5000 LBS) AND HYDROCHLORIC ACID (RC = 5000 LBS)

TOXIC CHEMICALS: YES CONTAINS ARSENIC AND HYDROCHLORIC ACID
GENERIC CLASS: C15

TSCA INVENTORY: YES

STATE LISTS: FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, THE STATE REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

=====

SECTION VI - REACTIVITY DATA

=====

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT

INCOMPATIBLES: SODIUM, ALUMINUM, ALKALIES, CARBONATES, STRONG BASES, STRONG OXIDIZING AGENTS, CHEMICALLY ACTIVE METALS, MOST COMMON METALS, SULFURIC ACID, CHLOROSULFONIC ACID

DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE, HYDROGEN, CHLORINE

CONTINUED ON PAGE: 6

SAL 000007222

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8602

A7440 -04 **GS617** ARSENIC, 1000 PPM (0.100% W/V)
EFFECTIVE: 05/01/89

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SECTION VII - SPILL & DISPOSAL PROCEDURES

=====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
STOP LEAK IF YOU CAN DO SO WITHOUT RISK. VENTILATE AREA. NEUTRALIZE
SPILL WITH SODA ASH OR LIME. WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL
INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA
WITH WATER.

J. T. BAKER NEUTRASORB(R) OR TEAM* "LOW NA+" ACID NEUTRALIZERS ARE RECOMMENDED
FOR SPILLS OF THIS PRODUCT.

DISPOSAL PROCEDURE

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

EPA HAZARDOUS WASTE NUMBER: P012 (ACUTE HAZARDOUS WASTE)

=====

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

=====

EYE/SKIN PROTECTION: THIS IS A LABORATORY-USE PRODUCT FOR WHICH NO
INDUSTRIAL PROTECTIVE EQUIPMENT HAS BEEN DESIGNATED.

=====

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

=====

SAF-T-DATA* STORAGE COLOR CODE: WHITE (CORROSIVE)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN CORROSION-PROOF AREA. ISOLATE
FROM INCOMPATIBLE MATERIALS.

=====

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

=====

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: HYDROCHLORIC ACID, SOLUTION

HAZARD CLASS: CORROSIVE MATERIAL (LIQUID)

UN/NA: UN1789 REPORTABLE QUANTITY: 5000 LBS.

HAZEL: CORROSIVE

CONTINUED ON PAGE: 7

SAL 000007223

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

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EFFECTIVE: 05/01/89

ARSENIC, 1000 PPM (0.100% W/V)

GS617 PAGE: 7
ISSUED: 05/16/89

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SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION (CONTINUED)

=====

REGULATORY REFERENCES: 49CFR 172.101; 173.263

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: HYDROCHLORIC ACID, SOLUTION, MIXTURE
HAZARD CLASS: 8 I.M.O. PAGE: 8102
UN: UN1789 MARINE POLLUTANTS: YES PACKAGING GROUP: II
LABELS: CORROSIVE
REGULATORY REFERENCES: 49CFR 172.102; PART 176; IMO

AIR (I.C.A.O.)

PROPER SHIPPING NAME: HYDROCHLORIC ACID, SOLUTION, MIXTURE
HAZARD CLASS: 8
UN: UN1789 PACKAGING GROUP: II
LABELS: CORROSIVE
REGULATORY REFERENCES: 49CFR 172.101; 173.6; PART 175; ICAO/IATA

U.S. CUSTOMS HARMONIZATION NUMBER: 3822000000

=====

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. SEC.) 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.

CONTINUED ON PAGE: 8

SAL 000007224

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
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24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

A7440 -04 **GS617** ARSENIC, 1000 PPM (0.100% w/v)
EFFECTIVE: 05/01/89

PAGE: 8
ISSUED: 05/16/89

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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 HEEDDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED
GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY
REVISE THIS MATERIAL SAFETY DATA SHEET. IF YOU HAVE ANY QUESTIONS,
PLEASE CALL CUSTOMER SERVICE (1-800-JTBAKER) FOR ASSISTANCE.

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* TRADEMARKS OF J.T.BAKER INC.

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

-- LAST PAGE --

SAL 000007225



Chubb National
Foam, Inc.

G S 6 1 5

MSDSPLUS

AOW Plus page 1 of 3

150 Gordon Drive
Lionville, PA 19353
Phone: 215 363-1400
FAX: 215 524-9073

MATERIAL SAFETY DATA SHEET

Section I

Manufacturer's Name and Address:
Chubb National Foam, Inc.
150 Gordon Drive
Lionville, PA 19353

Emergency Telephone No.:
(215) 363-1400

Product Name: National AER-O-WATER Plus
Chemical Name and Synonyms: Surface Active Agents & Fluorinated
Surfactants - Aqueous Film Forming Foam
AFFF

Section II Hazardous Ingredients

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

CAS #	Chemical Name	Percent by Weight	TLV-TWA
107-21-1	Ethylene Glycol	15 max.	50 ppm-ceiling limit (vapor)

Section III Physical Data of Product

Specific Gravity (H2O=1) : 1.03
pH: 8
Solubility in Water: 100%
Appearance and Odor: Straw Yellow Liquid - Mild Pleasant Odor

SAL 000007226

GS615

MATERIAL SAFETY DATA SHEET

AOW Plus page 2 of 3

Section IV Fire and Explosion Hazard

Flash Point: None (Cleveland Open Cup)

Section V Health Hazard Data

Primary Routes of Entry: Ingestion, Skin and Eye contact.

Effect of Acute Overexposure and First Aid:

Aer-O-Water Plus has been tested for acute toxicology to mammals and found to be essentially non-toxic and non-irritating to the skin. However, ingestion may cause diarrhea and repeated skin contact will remove the oils from the skin and cause dryness. Wash with water, if exposed, and apply hand cream. **WARNING:** contact with the eyes should be avoided as Aer-O-Water Plus is a primary eye irritant and if left untreated could cause permanent eye damage. Flush with water and seek immediate medical attention.

Section VI Reactivity Data

Stability: Stable

Hazardous Polymerization: Will not occur

SAL 000007227

CS615

MSDSPLUS

AOW Plus page 3 of 3

Section VII Spill or Leak Procedures
(Including Waste Disposal Method)

Concentrate: Flush with water to dilution of 10,000:1 (0.01%).
Direct diluted material to holding pond or, if
regulations permit, to Waste Treatment Plant.

Foam: Flush with water to dilution of 300:1. Direct diluted
material to holding pond or, if regulations permit, to
Waste Treatment Plant.

Section VIII Special Protection Information
Eye wash facilities recommended.

Section IX Special Precautions
Avoid ingestion, inhalation and skin absorption.

Date: October 26, 1989

SAL 000007228



GS614

150 Gordon Drive, Lionville, PA 19353 • Phone 215 363-1400 • Telex 685-1058 • FAX (215) 524-9073

MSDSXL3

XL-3 page 1 of 3

MATERIAL SAFETY DATA SHEET

Section I

Manufacturer's Name and Address:
National Foam System, Inc.
150 Gordon Drive
Lionville, PA 19353

Emergency Telephone No.:
(215) 363-1400

Product Name: National AER-O-FOAM XL-3
Chemical Name and Synonyms: Protein Hydrolysate

Section II Hazardous Ingredients

<u>Common Name</u>	<u>Chemical Name</u>	<u>% Conc.</u>	<u>TLV</u>
Ethylene Glycol	1,2-Ethanediol	10 max.	50 ppm ceiling limit (vapor)
Hexylene Glycol	2-Methyl-2,4 Pentanediol	10 max.	25 ppm ceiling limit

Section III Physical Data of Product

Specific Gravity ($H_2O=1$) : 1.16
Solubility in Water: 100%
Appearance and Odor: Dark Brown Liquid - Organic Odor

Section IV Fire and Explosion Hazard
Flash Point: None (Cleveland Open Cup)

SAL 000007229

G S 6 1 4

MATERIAL SAFETY DATA SHEET

XL-3 page 2 of 3

Section V Health Hazard Data

This product contains materials which, in their pure form, may cause the following effects upon overexposure:

Ethylene Glycol - may cause eye and skin irritation on contact, nose and throat irritation on inhalation of vapors and digestive tract irritation, nervous system depression, visual disturbances, kidney damage, convulsions and coma on ingestion. Animal studies of large doses showed liver and kidney damage and birth defects.

Hexylene Glycol - may cause eye and skin irritation and nervous system depression. Large amounts may cause nose and throat irritation on inhalation of vapors and digestive tract irritation on ingestion.

Effects of Over-exposure: Internal consumption may cause diarrhea.
Removes oils from skin.

Emergency and First Aid Procedures: Flush skin with water for 15 minutes. Flush eyes with water for 15 minutes. Apply hand cream to restore oil to skin.

Section VI Reactivity Data

Stability: Stable

Hazardous Polymerization: Will not occur

SAL 000007230

MATERIAL SAFETY DATA SHEET**XL-3 page 3 of 3****Section VII Spill or Leak Procedures
(Including Waste Disposal Method)**

Concentrate: Flush with water to dilution of 1,000:1 (0.1%).
Direct diluted material to holding pond or, if
regulations permit, to Waste Treatment Plant.

Foam: Flush with water to dilution of 30:1. Direct diluted
material to holding pond or, if regulations permit, to
Waste Treatment Plant. Product is biodegradeable at
1% or lower concentrations.

Section VIII Special Protection Information
Eye wash facilities recommended.**Section IX Special Precautions**
Avoid ingestion, inhalation and skin absorption.

Date: October 1, 1987

TRIETHYLENE GLYCOL

REVISION OF: 01-24-90

*** OFFICE REQUEST ***

ORDER NO:
PROD NO: 04765000VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1544 (408) 435-8700

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800)424-9300

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: TRIETHYLENE GLYCOL
COMMON NAMES/SYNONYMS:
TRIETHYLENE GLYCOL; TEGCAS NO.: 112-27-6
VW&R CODE: P1233FORMULA: C6 H14 O4
HAZARD RATING (NFPA 325H)DATE ISSUED: 08/89
SUPERCEDES: 08/87HEALTH: 1
FIRE: 1
REACTIVITY: 0
SPECIAL: NONEHAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	%	EXPOSURE LIMITS, PPM			HAZARD
		OSHA PEL	ACGIH TLV	OTHER LIMIT	
TRIETHYLENE GLYCOL	>99	NONE	NONE	NONE	NONE

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: 546	VAPOR PRESSURE, MM HG/20 DEG C: NIL
MELTING POINT, DEG F: N/A	VAPOR DENSITY (AIR=1): 3.2
SPECIFIC GRAVITY (WATER=1): 1.1	WATER SOLUBILITY, %: 100
APPEARANCE AND ODOR:	EVAPORATION RATE (BUTYL ACETATE=1): <1
COLORLESS LIQUID; MILD ODOR	

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

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INVOICE:

SAL 000007232

TRIETHYLENE GLYCOL

REVISION OF: 01-24-90

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: LIQUID AND MIST MAY IRRITATE THE EYES.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR REPEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS. A SINGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN THE ABSORPTION OF HARMFUL AMOUNTS. MAY CAUSE A MORE SEVERE RESPONSE IF THE SKIN IS ABRASSED. SKIN SENSITIZATION TESTING IN 25 HUMAN VOLUNTEERS DID NOT FIND ANY SENSITIZATION TO OCCUR.

SWALLOWED: SWALLOWING LARGE QUANTITIES MAY CAUSE NAUSEA AND VOMITING AND MAY CAUSE INJURY. THE TRIETHYLENE GLYCOL PRODUCED BY SOME MANUFACTURERS MAY CONTAIN SMALL AMOUNTS OF DIETHYLENE GLYCOL, IN WHICH CASE SWALLOWING MAY PRODUCE CNS DEPRESSION AND KIDNEY DAMAGE, WHICH MAY BE FATAL, AND LIVER DAMAGE.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: PRE-EXISTING EYE, SKIN, AND RESPIRATORY DISORDERS OR IMPAIRED LIVER AND KIDNEY FUNCTION.

-----TOXICITY DATA-----

ORAL: RAT LD50 = 17 G/KG; HUMAN L0LD = 5000 MG/KG

DERMAL: NO DATA FOUND

INHALATION: NO DATA FOUND

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: GENERAL ROOM VENTILATION.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE MISTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR WITH PARTICULATE FILTERS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, AND GLOVES.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

TRIETHYLENE GLYCOL

REVISION OF: 01-24-90

FLASH POINT, DEG F: 350

FLAMMABLE LIMITS IN AIR, %

METHOD USED: FMCC

LOWER: 0.9 UPPER: 9.2

EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE

POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: EXCESSIVE HEAT. WILL IGNITE IN AIR AT 700 DEG F.

MATERIALS TO AVOID: OXIDIZERS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE OR CARBON DIOXIDE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR PARTICULATES MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR Wipe UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOILS. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

-----NOTICE-----

VAN WATERS & ROGERS INC. ("VWR") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE

TRIETHYLENE GLYCOL

REVISION OF: 01-24-90

MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

-----REVISION-----
08/87: CORRECTED NFPA REFERENCE. EXPANDED HAZARDS OF EYE AND SKIN CONTACT AND SWALLOWING. EXPANDED AGGRAVATED MEDICAL CONDITIONS. REVISED PERSONAL PROTECTION, SPILL AND LEAK PROCEDURES AND HANDLING ADVICE.

08/89: CHANGED: HEADING AND CONTACT INFORMATION.

**** E N D O F M S D S ****

PROD: 04765000 16:55:31 26 FEB 1990 CUST:

INVOICE:

(006447-0382P -E0016293-5907)

DATE OF ISSUE
01/11/90SUPERSEDES
08/01/88

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS

N/A

TRADE NAME & SYNONYMS

TRILL

CHEMICAL FAMILY

SULFURIC ACID DRAIN OPENER

FORMULA

X<--MIXTURE

MANUFACTURERS NAME:

NATIONAL CHEMSEARCH DIV. OF NCH CORP.

ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)

BOX 152170

IRVING, TEXAS 75015

PREPARED BY:

KELLY SEALS/T.S.CHEMIST

PRODUCT CODE NUMBER

5907

EMERGENCY TELEPHONE NUMBER

214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
SULFURIC ACID	CORROSIVE	1MG/M3	1MG/M3	7664-93-9

SECTION IIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE SECRET REGISTRY # 409363-5118P

SECTION III - PHYSICAL DATA

TRILL

(CONTINUED)

SECTION III - PHYSICAL DATA

PAGE : 02

BOILING PT. (FAHRENHEIT)	625.00	SPEC GRAVITY (H2O=1)	1.835
VAPOR PRESSURE (MM HG)	0.00	COLOR	DARK BROWN
VAPOR DENSITY (AIR=1)	0.00	ODOR	ACIDIC
PH @ 100%	10% < 1	CLARITY	UNIFORMLY OPAQUE
PERCENT VOLATILE BY VOLUME (%)	0.00	EVAPORATION RATE (BU AC = 1)	0.00
SOLUBILITY IN WATER	COMPLETE		
VISCOSITY	NON-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
NON-FLAMT.C.C.		N/A	N/A
EXTINGUISHING MEDIA "ALCOHOL"	DRY	WATER	
X<--FOAM	X<--CO2	X<--CHEMICAL	X<--SPRAY
			X<--OTHER

SPECIAL FIRE FIGHTING PROCEDURES
USE NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS WHERE THIS MATERIAL IS INVOLVED IN A FIRE.

UNUSUAL FIRE & EXPLOSION HAZARDS
WHERE SULFURIC ACID IS INVOLVED IN A FIRE, DO NOT USE WATER SPRAY AS THIS CAN RESULT IN A POSSIBLE VIOLENT REACTION. SEE SECTION VII.

NFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
3<--HEALTH 0<--FLAMMABILITY 1<--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)

A DILUTE SOLUTION IS AN IRRITANT TO SKIN AND MUCCOUS MEMBRANES DUE TO

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CS394

(CONTINUED)

TRILL

SECTION V - HEALTH HAZARD DATA

PAGE : 03

ITS ACIDITY AND MAY CAUSE IRREPARABLE CORNEAL DAMAGE AND BLINDNESS AS WELL AS SCARRING OF THE EYELIDS. A CONCENTRATED SOLUTION CAUSES BURNING AND CHARRING OF THE SKIN WHICH IS EVEN MORE RAPIDLY INJURIOUS TO MUCOUS MEMBRANES AND EXCEEDINGLY DANGEROUS TO THE EYES. INGESTION CAUSES SERIOUS BURNS OF THE MOUTH OR PERFORATION OF THE ESOPHAGUS OR STOMACH.

- CHRONIC - (LONG TERM EXPOSURE)
NONE OTHER THAN THOSE SECONDARY TO TISSUE DESTRUCTION

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION X<-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION:
OBJECT IS TO SEEK MEDICAL ATTENTION IMMEDIATELY. GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED, ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES HOLDING EYELIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. FOLLOW WITH A 1% SOLUTION OF BAKING SODA IN WATER. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
WIPE ACID OFF GENTLY. FLUSH OFF SKIN WITH PLenty OF WATER. FOLLOW WITH AN APPLICATION OF A PASTE OF BAKING SODA OR MAGNESIA. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. DRINK A TEASPOON OR MORE OF MAGNESIUM, CHALK, WHITING OR SMALL PIECES OF SOAP MOISTENED WITH WATER OR MILK. SEE A PHYSICIAN AT ONCE.

NOTES TO PHYSICIAN :

N/A

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC	<--YES	NTP	<--YES	OSHA	<--YES	ACGIH	<--YES	OTHER	<--YES
	X<--NO		X<--NO		X<--NO		X<--NO		X<--NO

SULFURIC ACID
EYE - RABBIT 1,300 MG SEV 4.
UNK - MAN. LD50: 135 MG/KG 4.
ORAL - RAT LD50: 2140 MG/KG 4.
INHALATION - GUINEA PIG LC50: 8 MG/M3 4.

TRILL

SECTION VII - REACTIVITY DATA

PAGE : 04

STABILITY	X<--STABLE	<--UNSTABLE	CONDITIONS TO AVOID
	N/A		

INCOMPATIBILITY (MATERIALS TO AVOID)
WATER, SOLVENTS, STRONG OXIDIZERS, COMBUSTIBLE MATERIALS, ALKALIS, METALS, CHLORATES.

HAZARDOUS DECOMPOSITION PRODUCTS
HYDROGEN EVOLUTION IN CLOSED METAL CONTAINERS. WHEN HEATED TO DECOMPOSITION, CAN EMIT TOXIC FUMES OF NITROGEN OXIDES.

HAZARDOUS	WILL NOT OCCUR	MAY OCCUR	CONDITIONS TO AVOID
	X<--		

POLYMERIZATION: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS. FOLLOW OSHA REGULATIONS FOR RESPIRATOR USE (SEE 29 CFR 1910.34). GAS-TIGHT GOGGLES, COVERALLS AND RUBBER BOOTS, GLOVES AND APRON. ADD NON-COMBUSTIBLE DRY ABSORBENT SHOVEL (SWEEP UP). PLACE IN AN APPROVED DOT CONTAINER AND SEAL. WASH RESIDUE WITH LARGE AMOUNTS OF WATER. WASH CONTAMINATED CLOTHING.

WASTE DISPOSAL METHOD
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS CONCERNING HEALTH AND POLLUTION. VIA APPROVED CHEMICAL WASTE DISPOSAL METHOD, IF REGULATIONS PERMIT. DISPOSE OF CLEAN UP DEBRIS, CONTAMINATED MATERIAL AND RESIDUES.

NEUTRALIZING AGENT
ADD SLOWLY TO A SOLUTION OF SODA ASH AND SLAKED LIME WITH STIRRING; FLUSH TO DRAIN WITH LARGE VOLUMES OF WATER.

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
GOOD INDUSTRIAL HYGIENE PRACTICE DICTATES THAT THE WORK AREA SHOULD BE ISOLATED AND CONTAINED AND PROVIDED WITH ADEQUATE LOCAL EXHAUST VENTILATION OR OTHER CONTROLS TO MAINTAIN THE AIR CONCENTRATION OF SULFURIC ACID BELOW 1 MG/M3 AS REQUIRED BY OSHA.

RESPIRATORY PROTECTION
NIOSH HAS CONCLUDED THAT ADHERENCE TO THE PRESENT FEDERAL STANDARD OF 1 MG/M3 OF AIR, IN CONJUNCTION WITH A STRONG PROGRAM OF WORK PRACTICES, WILL PROTECT THE WORKER FROM SULFURIC ACID EXPOSURE FOR UP TO 10 HOUR WORKDAY, 40 HOUR WORK WEEK OVER A WORKING LIFETIME. THE IDLH LEVEL IS 80 MG/M3. RECOMMENDED RESPIRATOR SELECTION, FOR EXPOSURES:
<= 50MG/M3-GMAGHIEP/HIEPF/SAP/SCBAF
<= 50MG/M3-GMAGHIEP/HIEPF/SAP/SCBAF

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(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

PROTECTIVE GLOVES
RUBBER GLOVES SHOULD BE WORN.

EYE PROTECTION
FACE SHIELD SHOULD BE WORN.

OTHER PROTECTION
COVERALLS. RUBBER APRON AND SAFETY BOOTS.

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
120 F. <--MAX 32 F. <--MIN	X			

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
STORE IN ORIGINAL CONTAINER. DO NOT GET IN EYES.
ON SKIN OR ON CLOTHING. DO NOT TAKE INTERNALLY.
AVOID BREATHING MIST OR FUMES. PROTECT AGAINST
PHYSICAL DAMAGE AND WATER. SEPARATE CARBIDES,
CHLORATES, FULMINATES, NITRATES, PICRATES,
POWDERED METALS AND COMBUSTIBLE MATERIALS.

OTHER PRECAUTIONS
STORE IN A COOL DRY PLACE. FOLLOW LABEL
DIRECTIONS. KEEP OUT OF REACH OF CHILDREN.
NOTE: WATER ON SULFURIC ACID WILL CAUSE
SPATTERING, FUMING AND EVOLUTION OF HEAT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
SULFURIC ACID	7664-93-9	UE

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF
319 OF TITLE 171 OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF
1986 AND 40 CFR PART 372.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

TRILL

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

PAGE : 06

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)

SHIPPING NAME

HAZARD CLASS	ID NUMBER	REPORT QTY
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LABELS	LIMITED QTY
--------	-------------

UNIT CONTAINER

DDT SPS CONTAINER	NET EXPLOSIVE WT.
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AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, 1978.
2. HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS,
2ND EDITION, MARSHALL SITTIG, 1985.
3. NIOSH REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, 1982.
4. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION,
N. IRVING SAK.
5. VENDOR'S MATERIAL SAFETY DATA SHEETS.

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 THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL 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.

SAL 000007238



Material Safety Data Sheet

GULPTENE 10

Page 1 of 6

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

The Chevron MSDSs have been reformatted and expanded to provide you with useful hazard warnings and health evaluations and to facilitate your compliance with local, State and Federal regulations.

1. PRODUCT IDENTIFICATION

GULPTENE 10

DANGER: - HARMFUL OR FATAL IF SWALLOWED
- COMBUSTIBLE

SYNONYM: GULF Decene-1 (C10)

PRODUCT INFORMATION: (713)754-4260

Revision Number: 4

Revision Date: 10/05/89

MSDS Number: PE0018

NDA - No Data Available

NA - Not Applicable

Prepared According to the OSHA Hazard Communication
Standard (29 CFR 1910.1200) by the Chevron Environmental
Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

SAL 000007239

X-005051 (06-89)

2. FIRST AID

EYE CONTACT:

No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.

SKIN CONTACT:

No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

INHALATION:

If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.

INGESTION:

If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital. Note to Physician: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:

This substance is not expected to cause prolonged or significant eye irritation.

SKIN IRRITATION:

Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material.

DERMAL TOXICITY:

If absorbed through the skin, this substance is considered practically non-toxic to internal organs.

RESPIRATORY/INHALATION:

If inhaled, this substance is considered practically non-toxic to internal organs. This substance may be irritating if inhaled. Signs and symptoms of respiratory tract irritation may include, but may not be limited to, one or more of the following: nasal discharge, sore throat, coughing, bronchitis, pulmonary edema and difficulty in breathing.

INGESTION:

If swallowed, this substance is considered practically non-toxic to internal organs. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:

No special eye protection is usually necessary.

SKIN PROTECTION:

No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended.

VENTILATION:

No special ventilation is usually necessary. However, if operating conditions create high airborne concentrations of this material, special ventilation may be needed.

5. FIRE PROTECTION

FLASH POINT: (PM) 120F (53C)

AUTOIGNITION: NDA

FLAMMABILITY: 1 - 5%

EXTINGUISHING MEDIA:

CO2, dry chemical, foam and water fog.

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0; Special NDA;

HMIS RATINGS: Health 1; 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. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire document.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA.

STABILITY:

This material is considered chemically and thermally stable.

Revision Number: 4

Revision Date: 10/05/89

MSDS Number: PE0018

NDA - No Data Available

NA - Not Applicable

SAL 000007241

X-DOS021 (01-89)

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

INCOMPATIBILITY:

May react with strong acids or 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.

CAUTION! Do not use pressure to empty drum or explosion may result.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.

APPEARANCE: Clear, colorless liquid.

BOILING POINT: 170C (338F)

MELTING POINT: NA

EVAPORATION: NDA

SPECIFIC GRAVITY: 0.75 @ 15.6/15.6C

VAPOR PRESSURE: 1.6mm Hg @ 75F

PERCENT VOLATILE (VOLUME %): NDA

VAPOR DENSITY (AIR=1): 4.84

VISCOSITY: NDA

POUR POINT: NA

FREEZING POINT: -66C (-86.8F)

8. SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).

SPILL/LEAK PRECAUTIONS:

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 % GULFTENE 10

CONTAINING

< 2.0 % DECANE-N
CAS124185

< 95.0 % DECENE-N-1
CAS872059

< 3.0 % OLEFINS-BRANCHED

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company

PEL - Permissible Exposure Limit
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: NDA
DOT HAZARD CLASS: NDA
DOT IDENTIFICATION NUMBER: NDA

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects; NO
2. Delayed (Chronic) Health Effects; NO
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.

DECANE 10.

REGULATORY LISTS:

01=SARA 313	02=MASS RTK	03=NTP Carcinogen
04=CA Prop. 65	05=MI 406	06=IARC Group 1

Revision Number: 4 Revision Date: 10/05/89 MSDS Number: PE0018
NDA - No Data Available NA - Not Applicable

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X-005001 001-89

07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:

The Draize Eye Irritation Score (range, 0-110) in rabbits is 0.7.

SKIN IRRITATION:

The Draize Skin Primary Irritation Score (range 0-8) for a 24-hour exposure (rabbits) is 0.9.

DERMAL TOXICITY:

The dermal LD50 in rabbits is greater than 10g/kg.

RESPIRATORY/INHALATION:

The 1-hour inhalation LC50 in rats is > 320 ppm (0.03%).

INGESTION:

The oral LD50 in rats is greater than 10g/kg.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:

All available data is expressed elsewhere in this document.

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.

(006447-0382P -EOO16293-5053

) DATE OF ISSUE
09/11/89SUPERSEDES
09/01/89

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS
N/ATRADE NAME & SYNONYMS
BRILLIANCE AEROSOLCHEMICAL FAMILY
AEROSOL GLASS CLEANERFORMULA
X<-MIXTUREMANUFACTURERS NAME:
NATIONAL CHEMSEARCH DIV. OF NCH CORP.ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)
BOX 152170
IRVING, TEXAS 75015PREPARED BY:
KEVIN UHL/T.S. CHEMISTPRODUCT CODE NUMBER
5053EMERGENCY TELEPHONE NUMBER
214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL
COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED
AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
ISOPROPANOL	COMBUST.	400PPM	400PPM	67-63-0
ISOBUTANE	FLAM	N/E	N/E	75-28-5

SECTION III - PHYSICAL DATA

BOILING PT. (FAHRENHEIT)	180	SPEC GRAVITY (H2O=1)	0.97
VAPOR PRESSURE (MM HG)	131	COLOR	WHITE

BRILLIANCE AEROSOL

(CONTINUED)

SECTION III - PHYSICAL DATA

PAGE : 02

VAPOR DENSITY (AIR=1)	2.0	ODOR	ALCOHOL ODOR
PH @ 100%	8	CLARITY	OPAQUE EMULSION
PERCENT VOLATILE BY VOLUME (%)	97	EVAPORATION RATE (BU AC = 1)	0.50
SOLUBILITY IN WATER	COMPLETE		
VISCOSITY	NON-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	185 F 185 C	FLAMMABLE LIMITS % BY VOLUME IN AIR	LEL	UEL
EXTINGUISHING MEDIA	"ALCOHOL" X<-<-FOAM	X<-<-CC2	2.0	12.0
		DRY X<-<-CHEMICAL	WATER X<-<-SPRAY	OTHER X<-<-OTHER

SPECIAL FIRE FIGHTING PROCEDURES
USE WATER SPRAY TO COOL EXPOSED CONTAINERS. WEAR NIOSH/MSHA APPROVED
RESPIRATORY PROTECTION WHEN FIGHTING FIRES IN CONFINED AREAS TO PREVENT
EXPOSURE TO ACRID SMOKE AND HAZARDOUS DECOMPOSITION PRODUCTS.

UNUSUAL FIRE & EXPLOSION HAZARDS
AEROSOL CONTAINERS MAY BURST WHEN EXPOSED TO ELEVATED TEMPERATURES FOR
EXTENDED PERIODS.

LEVEL 1 AEROSOL (NFPA 308)

NFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
1<-HEALTH 3<-FLAMMABILITY 0<-REACTIVITY <-SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

EFFECTS OF OVEREXPOSURE

ACUTE - (SHORT TERM EXPOSURE)
ACUTE EXPOSURE TO LOW CONCENTRATIONS OF THIS MIXTURE MAY RESULT IN MILD
IRRITATION TO EYE OR SKIN TISSUE.
CHRONIC - (LONG TERM EXPOSURE)
PROLONGED CONTACT CAN CAUSE APPRECIABLE IRRITATION TO EYES LEADING TO

CORNEAL OPACITY IN REPEATED SEVERE EXPOSURES. INGESTION OR INHALATION OF LARGE QUANTITIES OF THE VAPOR MAY CAUSE FLUSHING, HEADACHE, DIZZINESS, MENTAL DEPRESSION, NAUSEA, VOMITING, NARCOSIS, ANESTHESIA AND COMA.

TARGET ORGANS: CONTACT-EYES, SKIN
INGESTION-CENTRAL NERVOUS SYSTEM, LIVER

PRIMARY ROUTE OF ENTRY: X-- INHALATION <-- INGESTION <-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

REMOVE PERSON FROM AREA TO FRESH AIR. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

EYE CONTACT:
OBJECT IS TO SEEK MEDICAL ATTENTION IMMEDIATELY. IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES HOLDING EYELIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
IF OVEREXPOSED: WASH WITH PLENTY OF SOAP AND WATER. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. IF AVAILABLE, GIVE SEVERAL GLASSES OF CITRUS JUICE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: DERMATITIS, CONDITIONS OF THE LIVER

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC	<--YES	NTP	<--YES	OSHA	<--YES	ACGIH	<--YES	OTHER	<--YES
	X--NO		X--NO		X--NO		X--NO		X--NO

ISOPROPANOL
EYE-HMN - 20 PPM 2.
ORAL-HMN - TOLD = 15.710 MG/KG:CNS 2.
ORAL-HMN LDLC = 8600MG/KG 2.
INH-HMN TOLD = 400 PPM 2.

SECTION VII - REACTIVITY DATA

STABILITY	X--STABLE	<--UNSTABLE	CONDITIONS TO AVOID
			KEEP AWAY FROM HEAT, SPARKS, HOT SURFACES AND OPEN FLAMES.

BRILLIANCE AEROSOL

(CONTINUED)

SECTION VII - REACTIVITY DATA

PAGE : 04

INCOMPATIBILITY (MATERIALS TO AVOID)
STRONG OXIDIZERS, SUCH AS SODIUM OR CALCIUM HYPOCHLORITES, LIQUID OXYGEN, BROMIDES.

HAZARDOUS DECOMPOSITION PRODUCTS
OXIDES OF CARBON AND ACRID SMOKE.

HAZARDOUS	WILL NOT X <--OCCUR	MAY <--OCCUR	CONDITIONS TO AVOID
POLYMERIZATION	N/A		

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
SMALL SPILL: TAKE UP WITH ABSORBANT MATERIAL & PLACE IN NON-LEAKING CONTAINERS SEALED TIGHT FOR PROPER DISPOSAL. LARGE SPILL: AEROSOL 50
LARGE SPILL IS UNLIKELY. FLOOD CONTAMINATED AREA WITH A DETERGENT AND WATER AND FLUSH TO SEWER.

WASTE DISPOSAL METHOD
WRAP EMPTY CONTAINER IN SEVERAL LAYERS OF NEWSPAPER AND PUT IN TRASH. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS CONCERNING HEALTH, POLLUTION.

NEUTRALIZING AGENT

LARGE AMOUNTS OF WATER WILL NEUTRALIZE.

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
TYPICAL USE OF THIS PRODUCT DOES NOT REQUIRE SPECIAL VENTILATION. LOCAL EXHAUST IS SUFFICIENT.

RESPIRATORY PROTECTION
TYPICAL USE OF THIS PRODUCT DOES NOT REQUIRE THE USE OF A RESPIRATOR. IF MISTING, USE A NIOSH APPROVED MASK FOR SPRAY MIST.

PROTECTIVE GLOVES
TYPICAL USE OF THIS PRODUCT DOES NOT REQUIRE GLOVES. FOR CONTINUOUS CONTACT USE RUBBER GLOVES.

EYE PROTECTION
GOGGLES ARE SUGGESTED IF METHOD OF APPLICATION PRESENTS POSSIBLE EYE CONTACT.

SAL 000007246

(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

GS441

OTHER PROTECTION
N/A

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
120 F. <--MAX 32 F. <--MIN	X			X

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
KEEP AT MODERATE TEMPERATURES.

OTHER PRECAUTIONS
KEEP OUT OF REACH OF CHILDREN. READ
ENTIRE LABEL BEFORE USING PRODUCT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
---------------	---------------	---------------

N/A

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.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

APPLICABLE REGULATIONS	---	---	---	---
<--49 CFR <--IMCO	<--TARIFF 6 D	<--IATA	<--MILITARY AIR (AFR 71-4)	

SHIPPING NAME

HAZARD CLASS	ID NUMBER	REPORT QTY
--------------	-----------	------------

LABELS	LIMITED QTY
--------	-------------

BRILLIANCE AEROSOL

(CONTINUED)

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

PAGE : 06

UNIT CONTAINER

DOT SPS CONTAINER	NET EXPLOSIVE WT.
-------------------	-------------------

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. THRESHOLD LIMIT VALUE FOR CHEMICAL SUBSTANCES IN THE WORK
ENVIRONMENT 2ND EDITION, ACGIH, 1985.
2. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION,
N. IRVING SAX.

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 THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL 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.

SAL 000007247

P1166001

MATERIAL SAFETY DATA SHEET

PG 1

MINERAL OIL 95T

OF:01-24-90

SHIP TO:

45000382
CONOCO INC
REFINING
P O BOX 37
WESTLAKE

LA 70669

ORDER NO: 460533886
PROD NO: 04411095VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1564 (408) 435-8700

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800)424-9300

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: MINERAL OIL, TECHNICAL
COMMON NAMES/SYNONYMS: SONTEX; PAROL; DRAKEOIL;
PENETECK; ARCOPRIME (TM)CAS NO.: 8042-47-5
VW&R CODE: P1166001FORMULA: UNDEFINED
HAZARD RATING (MANUFACTURER)
HEALTH: 0
FIRE: 1
REACTIVITY: 0
SPECIAL: NONEDATE ISSUED: 08/89
SUPERCEDES: 10/87
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, PPM			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
MINERAL OIL	8042-47-5	>99	NONE	NONE	NONE	NONE

(TM) TRADEMARK OF ARCO PETROLEUM PRODUCTS COMPANY

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: 520-609 VAPOR PRESSURE, MM HG/20 DEG C: <1
MELTING POINT, DEG F: N/D VAPOR DENSITY (AIR=1): >1
SPECIFIC GRAVITY (WATER=1): 0.829-0.868 WATER SOLUBILITY, %: IN-
SOLUBLE
APPEARANCE AND ODOR: CLEAR EVAPORATION RATE (ETHYL ETHER=1): <1
FLUID, ODORLESS OR SLIGHT PETROLEUM ODOR

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT
BREATHING. GET IMMEDIATE MEDICAL ATTENTION.IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING
WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.
GET IMMEDIATE MEDICAL ATTENTION.IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND
WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET

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MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER OR MILK. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT, INHALATION.

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: NONE CURRENTLY KNOWN.

SKIN CONTACT: NONE CURRENTLY KNOWN.

SWALLOWED: NONE CURRENTLY KNOWN.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

ORAL: RATS LD50 = 5 G/KG

DERMAL: RABBIT LD50 = 2 G/KG

INHALATION: NO DATA FOUND

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: GENERAL ROOM VENTILATION.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE VAPORS OR MISTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIER-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES AND FULL FACESHIELD UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: 310-350

METHOD USED: CUC

FLAMMABLE LIMITS IN AIR, %

LOWER: N/D UPPER: N/D

EXTINGUISHING MEDIA: USE DRY CHEMICAL, CO2, OR ALCOHOL FOAM. DO NOT USE WATER TO FIGHT FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

MINERAL OIL 95T

REVISION OF:01-24-90

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE
CONDITIONS TO AVOID: NONE

POLYMERIZATION: WILL NOT OCCUR

MATERIALS TO AVOID: OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE OR CARBON DIOXIDE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR Wipe UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOILS. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME OR OXIDIZERS.

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

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P1166001 **CS504** MATERIAL SAFETY DATA SHEET

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MINERAL OIL 95T

REVISION OF: 01-24-90

PROCESS:

-----REVISION-----

02709: CHANGED HEADING AND CONTACT INFORMATION.

**** E N D O F F S D S ****

PROD: 04411095 12:51:25 22 FEB 1990 CUST: 45000832 INVOICE: 460538136

SAL 000007251

BETZ INDUSTRIAL
4636 SOMERTON ROAD, TREVOSE, PA. 19047

BETZ MATERIAL SAFETY DATA SHEET

24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

CS 825

PRODUCT : FLOWPRO 1502

EFFECTIVE DATE 05-18-89
PRINTED: 2/27/90
REV: SEC.3

PRODUCT APPLICATION : DUST CONTROL AGENT.

---SECTION 1-----HAZARDOUS INGREDIENTS-----

FORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC
PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE
STED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE
AND CHRONIC HAZARDS OF THIS FORMULATION.

SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE***CAS#64742-52-5;
POTENTIAL SKIN IRRITANT; PEL: 5MG/M3(OIL MIST); TLV: 5MG/M3(OIL MIST).

---SECTION 2-----TYPICAL PHYSICAL DATA-----

H: 50% EXTRACT (APPROX.) 5.7	ODOR: MILD
L.P.T.(DEG.F): 362 P-M(CC)	SP.GR.(70F)OR DENSITY: 0.893
APOR PRESSURE(mmHG): <10	VAPOR DENSITY(AIR=1): >1
ISC cps70F: 314	%SOLUBILITY(WATER): 0
VAP.RATE: <1 ETHER=1	APPEARANCE: AMBER
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): -5

---SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
OUT-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

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MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

CS525

PRODUCT: FLOWPRO 1502

EFFECTIVE DATE 05-18-89

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

CUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

SLIGHTLY IRRITATING TO THE SKIN.MAY CAUSE DERMATITIS.

CUTE EYE EFFECTS ***

SLIGHTLY IRRITATING TO THE EYES

CUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS,GASES,MISTS AND/OR AEROSOLS MAY CAUSE IRRITATION TO UPPER
RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED EXPOSURES MAY CAUSE DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

EXCESSIVE DERMAL EXPOSURE CAUSES DEFATTING AND DRYING OF SKIN;EXCESSIVE
INHALATION OF VAPORS CAUSES DIZZINESS,HEADACHE AND NAUSEA.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF
SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A
PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE
FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF
STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB
ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE
CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL,
SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD
SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY
SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A
PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING
APPARATUS(FULL FACE-PIECE TYPE).

DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

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MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

GS525

SUBJECT: FLOWPRO 1502

EFFECTIVE DATE 05-18-89

SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

NEOPRENE GLOVES

WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE IN COOL VENTILATED LOCATION. STORE AWAY FROM OXIDIZERS

HAZARD HANDLING INSTRUCTIONS***

IMMEDIATELY REMOVE CONTAMINATED CLOTHING, WASH BEFORE REUSE

NORMAL CHEMICAL HANDLING

MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD

AROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

...TREAT AS OIL SPILL

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE

IDENTIFICATION NUMBER IS: NOT APPLICABLE

...DOT HAZARD CLASSIFICATION: NOT APPLICABLE

...DOT SHIPPING DESIGNATION IS: NOT APPLICABLE

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...A/HMIS: HEALTH - 1; FIRE - 1; REACTIVITY - 0; SPECIAL - NONE; PE - B



United Catalysts Inc.
Girdler and CCI Catalysts

Post Office Box 32370
Louisville, Kentucky 40232

Telephone 502-634-7200
Telex 204190, 204239
Facsimile 502-637-3732

MATERIAL SAFETY DATA SHEET
N-239

SECTION I PRODUCT IDENTIFICATION

Trade Name and Synonyms: N-239

Chemical Family: Inorganic

Formula: $\text{Al}_2\text{O}_3 + \text{CoO} + \text{La}_2\text{O}_3 + \text{MoO}_3$

SECTION II HAZARDOUS INGREDIENTS

Hazardous Components in the Solid Mixture

<u>COMPONENT</u>	<u>CAS No.</u>	<u>%</u>	<u>OSHA/PEL</u>	<u>ACGIH/TLV</u>
Aluminum oxide	1344-28-1	80-90	10.0 mg/m ³	10.0 mg/m ³
Cobalt oxide	1304-96-6	1-5	0.05 mg/m ³	0.05 mg/m ³
Lanthanum oxide	1312-81-8	1-5	*NIA	*NIA
Molybdenum trioxide	1313-27-5	10-15	10.0 mg/m ³	10.0 mg/m ³

SECTION III PHYSICAL DATA

Appearance and Odor: Blue extrusions. No odor.

Melting Point: Greater than 800°C, greater than 1450°F.

Solubility in Water: Insoluble.

Bulk Density: 37 lbs./cu. ft.

Percent Volatile by Weight at 1000°F: Less than 5%.

SECTION IV FIRE EXPLOSION DATA

Fire and Explosion Hazard

Negligible fire and explosion hazard when exposed to heat or flame by reaction with incompatible substances.

SAL 000007255



Girdler and CCI Catalysts

CA 047

CA 047

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MATERIAL SAFETY DATA SHEET
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Flash Point
Nonflammable.

Firefighting Media
Dry chemical, water spray, or foam.
For larger fires, use water spray fog or foam.

Firefighting
Nonflammable solids, liquids or gases: Cool containers that are exposed to flames with water from the side until well after fire is out. For massive fire in enclosed area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of the tank due to fire.

SECTION V HEALTH HAZARD DATA

Health hazards may arise from inhalation, ingestion, and/or contact with the skin and/or eyes.

Alumina particles deposited in the eye may cause necrosis of the cornea. Ingestion may cause stomach and intestinal distress. Salts of alumina may cause dermatoses, eczema, conjunctivitis, and irritation of the mucous membranes of the upper respiratory tract. Prolonged inhalation of alumina dust may result in pneumoconiosis. Lung damage (Shaver's Disease) may result from inhalation of finely divided aluminum oxide particles; it is complicated by silica and oxides of iron in the inhaled air.

Excessive inhalation of cobalt may cause irritation of the respiratory tract; asthma-like symptoms with cough, dyspnea, chest tightness and wheezing; lung damage; and pneumoconiosis. Ingestion may produce nausea and vomiting, diarrhea, and sensation of hotness. Chronic ingestion may cause blood abnormalities (polycythemia), increased clotting time, hyperplasia of the bone marrow and thyroid gland, cardiomyopathy, and damage to the pancreas in sensitive individuals. prolonged or repeated contact with the skin, in the absence of proper hygienic practices may result in dryness, irritation and/or an allergic dermatitis. Contact with the eye may cause redness, irritation, and/or conjunctivitis.

Research data on cobalt and cobalt compounds based on animal injection studies indicates that cobalt may be a possible carcinogen.

SAL 000007256



MATERIAL SAFETY DATA SHEET
N-239

CA 047

Prolonged excessive inhalation of lanthanum may result in pneumonitis or granuloma of the lung. Lanthanum may cause delayed blood clotting, leading to hemorrhages. Overexposure may lead to hemoglobinemia. Symptoms of exposure are chills, fever, headache, muscle pains, abdominal cramps, nausea, malaise, and hemobloginurea. Skin contact, in the absence of proper hygienic practices, may result in irritation and skin granulomas. Eye contact may cause irritation and/or conjunctivitis.

Molybdenum trioxide may cause irritation of the eyes and mucous membranes. Prolonged, excessive inhalation may affect the liver, kidneys, and red blood cells; cause hypothyroidism; and/or produce molybdenum-induced gout. Ingestion of excessive amounts may produce signs of copper deficiency.

First Aid (Inhalation)

Remove to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. Get medical attention immediately.

First Aid (Ingestion)

If large amounts have been ingested, give emetics to cause vomiting. Stomach siphon may be applied as well. Milk and fatty acids should be avoided. Get medical attention immediately.

First Aid (Eyes)

Wash eyes immediately and carefully for 30 minutes with running water, lifting upper and lower eyelids occasionally. Get prompt medical attention.

First Aid (Skin)

To avoid repeated or prolonged contact with this chemical, use good hygienic practices. Wash with soap and a large amount of water. Get medical attention if irritation or inflammation develops.

SECTION VI REACTIVITY DATA

Reactivity

Is stable under normal temperatures and pressures in sealed containers. Hazardous polymerization will not occur. Molybdenum trioxide may emit toxic fumes when heated to decomposition.

SAL 000007257



United Catalysts Inc.
Girdler and CCI Catalysts

Post Office Box 32370
Louisville, Kentucky 40232

Telephone 502-634-7200
Telex 204190, 204239
Facsimile 502-637-3732

CA047

MATERIAL SAFETY DATA SHEET
N-239

SECTION VII SPILL OR LEAK PROCEDURES

Notify safety personnel of spills or leaks. Clean-up personnel need protection against inhalation of dusts or fumes. Eye protection is required. Vacuuming and/or wet methods of cleanup are preferred. Place in appropriate containers for disposal, keeping airborne particulates at a minimum.

Disposal

Consult applicable local, state, and federal regulations to select the method of disposal. Recover metal components by reprocessing whenever possible.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection

Provide a NIOSH/MSHA jointly approved respirator in the absence of proper environmental control. Contact your safety equipment supplier for proper mask type.

Ventilation

Provide general and/or local exhaust ventilation to keep exposures below the TLV. Ventilation used must be designed to prevent spots of dust accumulation or recycling of dusts.

Protective Clothing

Wear protective clothing, including long sleeves and gloves, to prevent repeated or prolonged skin contact.

Eye Protection

Chemical splash goggles designed in compliance with OSHA regulations are recommended. Consult your safety equipment supplier.

SECTION IX REGULATORY INFORMATION

This product contains substances which appear on lists of the indicated act or agency.

XX American Conference of Governmental Industrial Hygienists
(ACGIH) Threshold Limit Values for Chemical Substances in
the Work Environment

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CA 047

- California Proposition 65
- Clean Air Act 40 CFR 61
- Clean Water Act 40 CFR 116
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) 40 CFR 302
- International Agency for Research on Cancer (IARC) Monographs on the Evaluation of Carcinogenic Risks to Humans Volumes 1-42.
- NTP Annual Report on Carcinogens
- XX Occupational Safety and Health Administration (OSHA) 29 CFR 1910
- Resource Conservation and Recovery Act (RCRA) 40 CFR 261 Subpart C
- XX Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III Section 313 40 CFR 372
- XX Toxic Substances Control Act (TSCA) 40 CFR 700

SECTION X BIBLIOGRAPHY

Clinical Toxicology of Commercial Products, Fifth Edition, Gosselin, Smith, Hodge, Williams and Wilkins, Baltimore, 1984.

Dangerous Properties of Industrial Materials, Sax, N. Irving, ed., Van Nostrand Reinhold Company, New York, 7th Edition, 1989.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs, Volumes 1-42, Lyon: World Health Organization, International Agency for Research on Cancer, 1987.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Silica and Some Silicates, Volume 42, Lyon, World Health Organization, International Agency for Research on Cancer, 1987.

Kentucky Occupational Safety and Health Standards for General Industry, 29 CFR Part 910 as adopted by 803 KAR 2:020 with Amendments as of July 31, 1986, Promulgated by Occupational Safety and Health Administration, U.S. Department of Labor, Kentucky Occupational Safety and Health Program, Kentucky Labor Cabinet, Commerce Clearing House, Inc., Chicago 1986.

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Girdler and CCI Catalysts

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Facsimile 502-637-3732

CA047

MATERIAL SAFETY DATA SHEET
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Occupational Diseases, A Guide to their Recognition, U. S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, NIOSH, Revised Edition, June 1977.

Patty's Industrial Hygiene and Toxicology, Clayton, G.D., Clayton, F.E., eds., John Wiley and Sons, New York, 3rd Edition, Volume 2, A-C, 1981.

TLVs^R Threshold Limit Values and Biological Exposure Indices for 1988-1989, American Conference of Governmental Industrial Hygienists, Cincinnati, OH, 1988.

MSDS's from Suppliers of Raw Materials.

SECTION XI

The information presented herein is believed to be accurate but is not warranted. Recipients are advised to confirm in advance that the information is current and applicable to meet their circumstances.

* No Information Available

Doc. #615

SAL 000007260

SODIUM HYPOCHLORITE LIQUICHLOR 12.5

REVISION OF: 12-12-89

0380

SHIP TO:

45000382
CONOCO INC
REFINING
P O BOX 37
WESTLAKE

LA 70669

ORDER NO: 451500017
PROD NO: 04367186VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1564 (408) 435-8700

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800)424-9300

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: SODIUM HYPOCHLORITE CAS NO.: MIXTURE
COMMON NAMES/SYNONYMS: LIQUID BLEACH, VW&R CODE: P1147
LIQUICHLOR; HYPOCHLOROUS ACID; SODIUM SALT; SODA BLEACHFORMULA: NA O CL
HAZARD RATING (NFPA 704 CRITERIA)
HEALTH: 2
FIRE: 0
REACTIVITY: 2
SPECIAL: OXYDATE ISSUED: 09/89
SUPERCEDES: 08/89
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, MG/M3			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
SODIUM HYPOCHLORITE	7681-52-9	7-16	NONE	NONE	NONE	CORROSIVE; OXIDIZER
SODIUM CHLORIDE	7647-14-5	5-13	NONE	NONE	NONE	NONE
SODIUM HYDROXIDE	1310-73-2	0.05-0.9	2	2	NONE	CORROSIVE; TOXIC
WATER	7732-18-5	BALANCE	NONE	NONE	NONE	NONE

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: VAPOR PRESSURE, MM HG/125 DEG F: 100
DECOMPOSES AT 125
MELTING POINT, DEG F: 9.4-10.4 VAPOR DENSITY (AIR=1): 0.9
SPECIFIC GRAVITY (WATER=1): 1.1-1.3 WATER SOLUBILITY, %: 100
APPEARANCE AND ODOR: LIGHT EVAPORATION RATE (BUTYL ACETATE=1): AS
YELLOW TO GREEN CLEAR LIQUID; WATER
CHLORINE ODOR.

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

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SAL 000007261

SODIUM HYPOCHLORITE LIQUICHLOR 12.5

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IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES. LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH LOTS OF RUNNING WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER OR MILK. OR MILK OF MAGNESIA. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE BAKING SODA OR ACID ANTIDOTES. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT, INHALATION.

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: INHALATION OF FUMES OR MISTS CAUSES RESPIRATORY TRACT IRRITATION AND IRRITATION OF MUCOUS MEMBRANES. IF SODIUM HYPOCHLORITE IS MIXED WITH AMMONIA OR OTHER CHEMICALS, EVOLUTION OF CHLORINE OR HYPOCHLOROUS ACID RESULTS. THESE GASES CAN PRODUCE PULMONARY EDEMA.

EYE CONTACT: LIQUID AND MISTS MAY SEVERELY IRRITATE OR DAMAGINFLAMMATION.

SWALLOWED: MISTS AND LIQUID ARE EXTREMELY CORROS MEMBRANES AND STOMACH. SWALL THE TISSUES. CAUSOMINAL PAIN, NAUSEA, VOMITING, CIRCULATORY COLLAPSE, CONFUSION, DELERIUM, COMA, AND COLLAPSE. SWALLOWING LARGE QUANTITIES CAN CAUSE DEATH.

CHRONIC EFFECTS OF EXPOSURE: IRRITATION EFFECTS INCREASE WITH STRENGTH OF SOLUTION AND TIME OF EXPOSURE. PROLONGED OR REPEATED EXPOSURE CAN LEAD TO CONSTANT IRRITATION OF EYES AND THROAT. PROLONGED OR REPEATED CONTACT MAY CAUSE DERMITITIS AND SENSITIZATION.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

ORAL: FOR 5% SOLUTION RAT LD50 = 13 G/KG
FOR 12.5% SOLUTION RAT LD50 = 5 G/KG

DERMAL: RAT LD50 >3.0 G/KG

INHALATION: NO DATA AVAILABLE

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THE VAPOR OR MIST CONCENTRATION AT THE POINT OF USE. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CART-RIDGE RESPIRATOR EQUIPPED FOR ACID GASES/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES AND FULL FACESHIELD UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT

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SODIUM HYPOCHLORITE LIQUICHLOR 12.5

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CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, RUBBER BOOTS, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NOT FLAMMABLE
METHOD USED: N/A

FLAMMABLE MITS IN AIR, %
LOWER: N/A UPSURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: CONTAINERS OF THIS MATERIAL CAN EXPLODE UNDER FIRE CONDITIONS. OXYGEN MAY BE LIBERATED UPON CONTACT WITH CERTAIN METALS. TOXIC FUMES ARE LIBERATED BY CONTACT WITH ACIDS OR HEAT. HIGHLY EXOTHERMIC REACTIONS WITH ORGANIC MATERIALS AND OXIDIZABLE MATERIALS MAY CAUSE FIRES.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
STABILITY DECREASES WITH CONCENTRATION, HEAT, LIGHT EXPOSURE, DECREASE IN PH AND CONTAMINATION WITH HEAVY METALS SUCH AS NICKEL, COBALT, COPPER AND IRON.

CONDITIONS TO AVOID: EXCESSIVE HEAT, EXPOSURE TO LIGHT, EXCESS ALKALINITY, AND CONTAMINATION OF ANY KIND.

MATERIALS TO AVOID: ETHER, AMMONIA ACIDS, REDUCING AGENTS, OXIDIZABLE MATERIALS, COMBUSTIBLE MATERIALS SUCH AS WOOD, CLOTH OR ORGANIC MATERIALS, HEAVY METALS SUCH AS IRON AND COPPER AND THEIR ALLOYS, AND DIRT. ALSO MAGNESIUM, ALUMINUM, TIN, OR MANGANESE.

HAZARDOUS DECOMPOSITION PRODUCTS: HOCL, CHLORINE, HCL, NAOL, SODIUM CHLORATE, AND OXYGEN WHICH DEPEND ON PH, TEMPERATURE AND TIME.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR ALKALI-RESISTANT SLICKER SUIT AND COMPLETE PROTECTIVE EQUIPMENT INCLUDING RUBBER GLOVES, RUBBER BOOTS, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED WITH ACID GASES/MISTS FILTERS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND CAREFULLY NEUTRALIZE WITH DILUTE HYDROCHLORIC ACID. KEEP NON-NEUTRALIZED MATERIAL OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL. THIS PRODUCT IS VERY TOXIC TO AQUATIC LIFE. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED

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SODIUM HYPOCHLORITE LIQUICHLOR 12.5

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PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. STORE IN ORIGINAL CONTAINERS ONLY AT TEMPERATURES BELOW 85 DEG. F. DO NOT STORE NEAR ACIDS, OXIDIZABLE MATERIALS, OR ORGANICS. DO NOT STORE ON WOODEN FLOORS, PALLETS, OR NEAR WOOD OF ANY KIND. REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL. DO NOT MIX THIS PRODUCT WITH OTHER CLEANING AGENTS THAT MAY LIBERATE CHLORINE GAS VAPORS (I.E. ACIDIC AGENTS). THIS PRODUCT DEGRADES WITH AGE; USE IT WITHIN ONE MONTH OF RECEIPT. IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.

-----FOR ADDITIONAL INFORMATION-----

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

-----NOTICE-----

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-----REVISION-----

12/89: REVISED SYNONYM

**** E N D O F M S D S ****

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SAL 000007264

CENTURY PAPERS INC.
1902 GULF FREEWAY
HOUSTON, TEXAS 77023
TEL. NO. 713/928-5171

MANUFACTURER:
S.C. JOHNSON & SON, INC.
RACINE, WI 53403-5011
TEL. NO. 414/631-2777
EMERGENCY TEL. NO. 414/631-2000

MATERIAL SAFETY DATA SHEET

CS599

SECTION 1. IDENTIFICATION OF PRODUCT

SHEET NO. 0534

PRODUCT NAME: G P FORWARD CLEANER

ISSUE DATE: DECEMBER 12, 1989

PRODUCT CODE: 14520-006

NATIONAL ITEM#: 2131XX

ITEM NO. 406-1471, 406-1489, 406-1497.

SECTION 2. INGREDIENTS

CAS NUMBER

WEIGHT %

EXPOSURE LIMIT

SODIUM HYDROXIDE

1310-73-2

1-3

2 MG/M3 (CEILING)
(ACGIH TLV-TWA)
(OSHA PEL)

SODIUM SILICATE

1344-09-8

3-6

NA

NONYLPHENOL POLYETHYLENE

26027-38-3

1-4

NA

GLYCOL ETHER

WATER

80-90

NA

NA-NOT APPLICABLE; NSR-NO SPECIAL REQUIREMENT; ND-NOT DETERMINED

SECTION 3. PHYSICAL DATA

BOILING POINT (F): ABOVE 200

SPECIFIC GRAVITY (WATER=1): 1.0

VAPOR PRESSURE (MM HG.): NA

PERCENT VOLATILE (BY VOLUME): NA

VAPOR DENSITY (AIR=1): NA

EVAPORATION RATE (BUTYL ACETATE=1): ND

SOLUBILITY IN WATER: COMPLETE

PH RANGE: 12.5 MIN. (UNDILUTED)

FREEZING POINT (F): ND

APPEARANCE/ODOR: CLEAR, GREEN LIQUID.

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (F) (TEST METHOD): NA

FLAMMABLE LIMITS: NA

EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES: NORMAL FIRE FIGHTING PROCEDURES MAY BE USED. COOL AND USE CAUTION WHEN APPROACHING OR HANDLING FIRE-EXPOSED CONTAINERS.

UNUSUAL FIRE & EXPLOSION HAZARDS: CORROSIVE MATERIAL (SEE SECTIONS 5, 9). CONTAINER MAY BURST IN HEAT OF FIRE.

SECTION 5. REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: NONE KNOWN

INCOMPATIBILITY-MATERIALS TO AVOID: STRONG ACIDS (E.G., MURIATIC ACID).

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN EXPOSED TO FIRE, PRODUCES NORMAL PRODUCTS OF COMBUSTION.

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL RESPONSE: ABSORB WITH OIL-DRI OR SIMILAR INERT MATERIAL. SWEEP OR SCRAPE UP AND CONTAINERIZE. RINSE AFFECTED AREA THOROUGHLY WITH WATER. WEAR/USE APPROPRIATE PROTECTIVE EQUIPMENT.

WASTE DISPOSAL: FOR UNDILUTED PRODUCT: DISPOSAL IS REGULATED UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT AS A CORROSIVE WASTE.

DISPOSAL OF REGULATED QUANTITIES SHOULD BE BY NEUTRALIZATION AT A PERMITTED FACILITY IN ACCORDANCE WITH ALL FEDERAL/STATE REGULATIONS AND LOCAL ORDINANCES REGARDING DISPOSAL OF CORROSIVE WASTES. WASTE FROM NORMAL PRODUCT USE MAY BE SEWERED TO A PUBLIC-OWNED TREATMENT WORKS (POTW) IN COMPLIANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL PRETREATMENT REQUIREMENTS.

SAL 000007265

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: G.P. FORWARD CLEANER
PRODUCT NO. 406-1471, 406-1489, 406-1497

PAGE 2

G S 5 9 9

SECTION 7. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: SKIN CONTACT

SIGNS AND SYMPTOMS: DIRECT CONTACT OF PRODUCT WITH EYES CAN CAUSE IRRITATION. PROLONGED OR REPEATED CONTACT OF UNDILUTED PRODUCT WITH SKIN MAY CAUSE IRRITATION. IF TAKEN INTERNALLY, PRODUCT MAY CAUSE CORROSIVE DAMAGE TO MOUTH, THROAT OR STOMACH.

SECTION 8. EMERGENCY AND FIRST AID PROCEDURES

FIRST AID PROCEDURES: FLUSH EYES WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS, SEEK MEDICAL AID. WASH SKIN WITH PLENTY OF WATER. IF IRRITATION PERSISTS, SEEK MEDICAL AID. IF PRODUCT IS SWALLOWED, DRINK LARGE AMOUNTS OF WATER OR MILK AND SEEK MEDICAL AID.

SECTION 9. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER NORMAL USE CONDITIONS.

VENTILATION: NSR

PROTECTION GLOVES: ANY IMPERVIOUS MATERIAL.

EYE PROTECTION: FOR UNDILUTED PRODUCT: CHEMICAL WORKERS SPLASH-PROOF GOGGLES.

OTHER PROTECTIVE MEASURES: USE GOOD PERSONAL HYGIENE PRACTICES. LAUNDER CONTAMINATED EQUIPMENT BEFORE REUSE.

SECTION 10. ADDITIONAL INFORMATION AND PRECAUTIONS

PRECAUTIONARY LABELING: CAUTION: EYE IRRITANT. FOR INDUSTRIAL USE ONLY. DO NOT GET IN EYES.

HANDLING AND STORAGE CONDITIONS: KEEP OUT OF REACH OF CHILDREN. STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP FROM FREEZING. WASH THOROUGHLY AFTER HANDLING. PRODUCT RESIDUE MAY REMAIN ON/IN EMPTY CONTAINERS. ALL PRECAUTIONS FOR HANDLING THE PRODUCT MUST BE USED IN HANDLING THE EMPTY CONTAINER AND RESIDUE.

ADDITIONAL INFORMATION: NA

HMS RATINGS: HEALTH 3, FLAMMABILITY 0, REACTIVITY 0

PREPARED BY: ROBERT B. O'RIEN
CHEMICAL INFO. ADMIN.

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH. NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE. ANY USE OF THESE DATA AND INFORMATION MUST BE DETERMINED BY THE USER TO BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

SAL 000007266

M A T E R I A L S A F E T Y D A T A S H E E T

I - G E N E R A L I N F O R M A T I O N

PRODUCT NAME OXYGEN

GS271

EMERGENCY TELEPHONE NO. 713-868-0302

MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.

TRADE NAME/SYNONYMS OXYGEN; OXYGEN USP; AVIATORS BREATHING OXYGEN (ABO)

CHEMICAL NAME AND SYNONYMS

OXYGEN

REVISION DATE: 09/05/89

PRODUCT ID. UN 1072 FORMULA O2

CHEMICAL FAMILY OXIDIZER

CAS NUMBER 7782-44-7

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 396-2140

I I - H A Z A R D O U S I N G R E D I E N T S

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

040 TLV

OXYGEN

100 **

** NONE ESTABLISHED

I I I - P H Y S I C A L D A T A

BOILING POINT -297.3F (-183.0C) @ 1 ATM

SPECIFIC GRAVITY (AIR = 1): 1.1049 @ 70F (21.1C) @ 1 ATM

VAPOR PRESSURE N/A

PERCENT VOLATILE BY VOLUME (O/O) N/A (GAS)

DENSITY 0.08279 LB/CU FT

@ 70 F (21.1 C) @ 1 ATM

EVAPORATION RATE N/A (GAS)

SOLUBILITY IN WATER 4.89SCC/100CC H2O @ 32 F (0 C)

MATERIAL AT NORMAL CONDITION GAS

EXPANSION RATIO (LIQUID TO GAS) N/A (GAS)

APPEARANCE AND ODOR

COLORLESS, ODORLESS, TASTELESS GAS

I V - F I R E A N D E X P L O S I O N H A Z A R D D A T A

FLASH POINT N/A

FLASH POINT (METHOD USED)

FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER N/A

UPPER N/A

EXTINGUISHING MEDIA

MATERIAL IS NONFLAMMABLE. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES

THOUGH NOT FLAMMABLE ITSELF, OXYGEN VIGOROUSLY ACCELERATES COMBUSTION. IF POSSIBLE, SHUT OFF OXYGEN GAS AND REMOVE CYLINDERS FROM FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE BUILD UP.

SAL 000007267

UNUSUAL FIRE AND EXPLOSION HAZARD

MATERIALS WHICH DO NOT BURN IN AIR MAY BURN IN AN OXYGEN-ENRICHED ATMOSPHERE WHERE THE OXYGEN CONTENT EXCEEDS 21%. OXYGEN MAY FORM EXPLOSIVE COMPOUNDS WHEN EXPOSED TO COMBUSTIBLE MATERIALS OR OIL, GREASE, AND OTHER HYDROCARBON MATERIALS. PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD FAIL TO

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P. O. BOX 3047
HOUSTON, TX 77253

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MATERIAL SAFETY DATA SHEET
PRODUCT NAME OXYGEN

RELIEVE PRESSURE.

V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	NONE ESTABLISHED
UNUSUAL CHRONIC TOXICITY	*SEE OVEREXPOSURE SECTION*
CARCINOGENICITY	NOT LISTED BY IARC, NTP, OSHA
ROUTES OF EXPOSURE	INHALATION
EFFECTS OF OVEREXPOSURE	

BREATHING 80% OR MORE OXYGEN AT ATMOSPHERIC PRESSURE FOR MORE THAN A FEW HOURS MAY CAUSE NASAL STUFFINESS, COUGH, SORE THROAT, CHEST PAIN AND BREATHING DIFFICULTY. BREATHING OXYGEN AT HIGHER PRESSURE INCREASES THE LIKELIHOOD OF ADVERSE EFFECTS WITHIN A SHORTER TIME PERIOD. EXPOSURE TO OXYGEN AT HIGHER PRESSURES FOR PROLONGED PERIODS HAS BEEN FOUND TO AFFECT VISION, NEUROMUSCULAR COORDINATION AND ATTENTIVE POWERS.

TOXICOLOGICAL PROPERTIES:

AT NORMAL CONCENTRATION AND PRESSURE, OXYGEN POSES NO TOXICITY HAZARDS. HOWEVER, AT ELEVATED CONCENTRATIONS AND PRESSURES, OXYGEN MAY CAUSE ADVERSE EFFECTS (SEE ABOVE).

EMERGENCY AND FIRST AID PROCEDURES

REDUCE OXYGEN PRESSURES TO 1 ATM AND/OR MOVE VICTIM INTO FRESH AIR.

RESCUE PERSONNEL SHOULD BE AWARE OF EXTREME FIRE HAZARDS ASSOCIATED WITH OXYGEN-ENRICHED ATMOSPHERES.

VI - REACTIVITY DATA

STABILITY STABLE

CONDITIONS TO AVOID

NONE.

INCOMPATABILITY (MATERIALS TO AVOID)

OXYGEN REACTS EXPLOSIVELY WITH ETHERS, ALCOHOLS, AND HYDROCARBON MATERIALS. KEEP OXYGEN CONTAINERS FREE OF OIL AND/OR GREASE.

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

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VII - SPILL OR LEAK PROCEDURES

BIG THREE INDUSTRIES, INC.
P. O. BOX 3047
HOUSTON, TX 77253

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M A T E R I A L S A F E T Y D A T A S H E E T**PRODUCT NAME OXYGEN****STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

EVACUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA. SHUT OFF SOURCE OF OXYGEN IF POSSIBLE. VENTILATE AREA TO PREVENT OXYGEN-ENRICHED ATMOSPHERE. REMOVE SOURCES OF HEAT OR IGNITION. IF LEAKING FROM CONTAINER OR VALVE, CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION, OR YOUR SUPPLIER.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, SECURE THE CYLINDER AND SHUT DOWN SLOWLY TO THE ATMOSPHERE IN A WELL-VENTILATED AREA OR OUTDOORS.

V I I I - S P E C I A L P R O T E C T I V E I N F O R M A T I O N**RESPIRATORY PROTECTION (SPECIFY TYPE)**

NONE.

VENTILATION

NATURAL OR MECHANICAL WHERE GAS IS PRESENT -- *SEE NOTES*

PROTECTIVE GLOVES

IF USED, MUST BE CLEAN AND GREASE FREE

EYE PROTECTION

SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING HIGH PRESSURE CYLINDERS.

OTHER PROTECTIVE EQUIPMENT

SAFETY SHOES WHEN HANDLING CYLINDERS.

******* SECTION NOTES *******

LOCAL EXHAUST: SUFFICIENT TO PREVENT OXYGEN-ENRICHED ATMOSPHERES OF OVER 21% OXYGEN.

I X - S P E C I A L P R E C A U T I O N S**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

STORE AND USE WITH ADEQUATE VENTILATION. OXYGEN IS HEAVIER THAN AIR AND LEAKING GAS COULD ACCUMULATE IN LOW AREAS OR CONFINED SPACES CAUSING AN OXYGEN-ENRICHED ATMOSPHERE. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, ROLL, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C). DO NOT STORE OXYGEN CLOSER THAN 20 FEET FROM FLAMMABLE OR COMBUSTIBLE MATERIALS. KEEP CYLINDERS FREE FROM OIL AND GREASE.

D.O.T. LABELING

OXIDIZER -- YELLOW LABEL

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BIG THREE INDUSTRIES, INC.

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HOUSTON, TX 77253

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MATERIAL SAFETY DATA SHEET
PRODUCT NAME OXYGEN

CGA 540 OR CGA 870 (PIN INDEXED)

OTHER PRECAUTIONS

ALL GAUGES, VALVES, REGULATORS, PIPING AND EQUIPMENT TO BE USED IN OXYGEN SERVICE MUST BE CLEANED FOR OXYGEN SERVICE IN ACCORDANCE WITH CGA PAMPHLET G-4.1. OXYGEN IS NOT TO BE USED AS A SUBSTITUTE FOR COMPRESSED AIR. NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER. REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER OWNER IS A VIOLATION OF FEDERAL LAW (49 CFR).

• DOT PLACARD: OXIDIZER

• DOT PROPER SHIPPING NAME: OXYGEN

• MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT OXYGEN CAN BE FOUND IN THE FOLLOWING PAMPHLETS PUBLISHED BY:

• THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341

G-4.3: "COMMODITY SPECIFICATION FOR OXYGEN"

G-4: "OXYGEN"

G-4.1: "CLEANING EQUIPMENT FOR OXYGEN SERVICE"

P-1: "SAFE CLEANING OF COMPRESSED GASES IN CONTAINERS"

P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-DEFICIENT ATMOSPHERES"

✓ SB-8: "USE OF OXY-FUEL GAS WELDING AND CUTTING APPARATUS"

AV-8: "CHARACTERISTICS AND SAFE HANDLING OF CRYOGENIC LIQUID AND GASEOUS OXYGEN"

• NFPA RATINGS:

HEALTH:	0
FLAMMABILITY:	0
REACTIVITY:	0

• HMIS RATINGS:

HEALTH:	0
FLAMMABILITY:	0
REACTIVITY:	0

• CERCLA RATINGS:

HEALTH:	0
FIRE:	0
REACTIVITY:	0
PERSISTENCE:	3

• LISTED IN TSCA INVENTORY: YES

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION. CONSIDERATION, INVESTIGATION, IN COMPLIANCE WITH HAZARD COMMUNICATION STANDARD CFR 1900.1200. BIG THREE INDUSTRIES, INC. PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED.

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MATERIAL SAFETY DATA SHEET

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PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.A

REVISION DATE: 11/29/89
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

SECTION 1 PRODUCT IDENTIFICATION

PRODUCT: PET1300

TRADE NAME: PETROTEC

LABEL: 002
000
000

(IF HAZARDOUS PER D.O.T. CFR TITLE 49)

SHIPPING NAME: Flammable Liquid, N.O.S.

HAZARD CLASS: Flammable Liquid

ID#: UN1993

CHEMICAL DESCRIPTION

POLYAMINE-ARYL QUATERNARY IN ISOPROPANOL AND WATER.

SECTION 2 HAZARDOUS INGREDIENTS

CAS NUMBER	MATERIAL	%	EXPOSURE LIMITS
**	Polyamine-aryl quaternary	30-60	Not Established
00067-63-0	Isopropanol	10-30	ACGIH TLV: 400ppm TWA OSHA PEL: 400ppm TWA ACGIH STEL: 500 ppm

**Specific chemical identity is being withheld for
confidential business purposes.

SECTION 3 PHYSICAL DATA

SPECIFIC GRAVITY(H₂O = 1.0@60 F): 1.055
VAPOR PRESSURE: Not Established

VOLATILITY: Significant
SOL. IN WATER: Soluble

APPEARANCE AND ODOR: Amber liquid. Alcohol odor.

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 80 F

FLAMMABLE LIMITS: Not Established

FLASH METHOD:

SFCC ASTM D-3828

EXTINGUISHING MEDIA:

Use water spray or fog, alcohol-type foam, dry chemical
or CO₂.

CONTINUED ON PAGE: 2

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MATERIAL SAFETY DATA SHEET

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***CONTINUATION OF PET1300 ***

FIRE FIGHTING PROCEDURES:

Use a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode. Flammable. Cool fire-exposed containers using water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Flammable liquid, vapors of which can form an ignitable mixture with air. Vapors can flow along surfaces to distant ignition sources and flash back.

SECTION 3 HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION:

Exposure to elevated vapor concentrations may result in eye, nose and respiratory irritation. Prolonged contact may cause drowsiness, dizziness and, in extreme cases, narcosis. Inhalation of mists or exposure to very high vapor concentrations may cause extreme eye, nose and respiratory irritation, and may result in lung damage. Prolonged over-exposure may result in chemical pneumonitis and systemic effects.

SKIN AND EYE CONTACT:

May cause mild to moderate skin irritation and dermatitis on prolonged contact. Contact with eyes may cause moderate irritation and mild but reversible eye injury. Systemic effects resulting from repeated or prolonged skin absorption may include kidney and liver injury as well as other organ damage.

EYE IRR. SCORE: 2 (0=None, 4=Severe)

SKIN IRR SCORE: 1 (0=None, 4=Severe)

DERMAL LD50: >2.0 g/kg(Rab.)

INGESTION:

Harmful if swallowed. May cause headache, gastrointestinal disturbances, dizziness, and nausea. May result in irritation or burns of mouth and digestive tract.

ORAL LD50: 0.9 g/kg (Rat)

EMERGENCY AND FIRST AID PROCEDURES:

If contacted, wash skin immediately with soap and water. Remove contaminated clothing and wash before reuse. If irritation or burns develop, consult a physician. If in eyes, irrigate with flowing water immediately and continuously for fifteen minutes. Consult a physician.

CONTINUED ON PAGE: 3

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MATERIAL SAFETY DATA SHEET

***CONTINUATION OF FBT1300 ***

If ingested, DO NOT induce vomiting. If conscious, drink promptly large quantities of water. Call a physician immediately. NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock and convulsion may be necessary. If inhaled, remove to fresh air. Administer oxygen if necessary. Consult a physician if symptoms persist or exposure was severe.

SECTION 6 REACTIVITY DATA

STABILITY:

Stable under normal conditions of storage and use.

INCOMPATIBILITY:

Small spill - Dilute with water and absorb on paper, cloth or other material.

Large spill - Dike to prevent entering any sewer or waterway. Transfer liquid to a holding container. Flush residues to sewer. Use personal protective equipment as necessary.

HAZARDOUS DECOMPOSITION PRODUCTS:

Oxides of nitrogen. HCl.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 7 SPILL AND LEAK PROCEDURES

IF MATERIAL IS SPILLED OR RELEASED:

Small spill - Absorb on paper, cloth or other material.

Large spill - Dike to prevent entering any sewer or waterway. Transfer liquid to a holding container. Cover residue with dirt, or suitable chemical adsorbent. Use personal protective equipment as necessary.

DISPOSAL METHOD:

Place chemical residues and contaminated adsorbent materials into a suitable waste container and take to an approved waste disposal site. Dispose of all residues in accordance with applicable waste management regulations.

DECONTAMINATION PROCEDURES:

Not appropriate.

CONTINUED ON PAGE: 4

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MATERIAL SAFETY DATA SHEET

PAGE 4

***CONTINUATION OF PET1300 ***

SECTION 8 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

When concentrations exceed the exposure limits specified, use of a NIOSH-approved organic vapor cartridge respirator with full facepiece is recommended. Where the protection factor of the respirator may be exceeded, use of a self-contained breathing unit may be necessary.

VENTILATION:

General ventilation should be provided to maintain ambient concentrations below nuisance levels. Local ventilation of emission sources may be necessary to maintain ambient concentrations below recommended exposure limits.

PROTECTIVE CLOTHING:

Chemical-resistant gloves and chemical goggles, face shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

SECTION 9 SPECIAL PRECAUTIONS

Flammable liquid. Avoid heat, sparks and open flames. Avoid breathing of vapors and contact with eyes, skin or clothing. Keep container closed when not in use. Hazardous product residue may remain in emptied container. Do not reuse empty containers without commercial cleaning or reconditioning.

Although the information and recommendations set forth herein are believed to be correct as of the date hereof, Petrolite makes no representations to the accuracy of such information and recommendations. It is the user's responsibility to determine the suitability and completeness of such information and recommendation for its own particular use. Petrolite shall not be responsible for any direct, indirect, incidental or consequential damages of whatsoever nature resulting from the publication, use of or reliance upon such information and recommendations.

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PETROLITE

ENVIRONMENTAL DATA SHEET GS 276

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PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.A.

REVISION DATE: 03/23/90
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

PET1300

SARA TITLE III, SECTION 313

This notification is incorporated into the Material Safety Data Sheet (MSDS) for the Petrolite product named above. When physically attached to the MSDS, this notification must not be detached from the MSDS. Any copying and redistribution of the MSDS to which this notification is attached must include copying and redistribution of this notification.

This Petrolite product contains no toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 in excess of the applicable de minimis concentration.

SAL 000007275

BIG THREE INDUSTRIES, INC.

P. O. BOX 3047
HOUSTON, TX 77253

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MATERIAL SAFETY DATA SHEET

I - GENERAL INFORMATION

PRODUCT NAME NITROGEN

EMERGENCY TELEPHONE NO. 713-868-0302

MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.

TRADE NAME/SYNONYMS NITROGEN; NITROGEN NF

CHEMICAL NAME AND SYNONYMS

NITROGEN

REVISION DATE: 08/24/89

PRODUCT ID. UN 1066 FORMULA N2

CHEMICAL FAMILY INERT GAS

CAS NUMBER 7727-37-9

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 896-2140

II - HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

0/0

TLV

NITROGEN

100

**

** NONE ESTABLISHED

III - PHYSICAL DATA

BOILING POINT -320.4F (-195.9C) @ 1 ATM

SPECIFIC GRAVITY (AIR = 1): 0.967 @ 70 F (21.1C) @ 1 ATM

VAPOR PRESSURE N/A

PERCENT VOLATILE BY VOLUME (0/0) N/A (GAS)

DENSITY 0.07245 LB/CU FT

@ 70 F (21.1 C) @ 1 ATM

EVAPORATION RATE N/A (GAS)

SOLUBILITY IN WATER 2.33SCC/100CC H2O @ 32 F (0 C)

MATERIAL AT NORMAL CONDITION GAS

EXPANSION RATIO (LIQUID TO GAS) N/A (GAS)

APPEARANCE AND ODOR

COLORLESS, ODORLESS, TASTELESS GAS

IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A

FLASH POINT (METHOD USED)

FLAMMABILITY LIMITS IN AIR (0/0 BY VOL) LOWER N/A

UPPER N/A

EXTINGUISHING MEDIA

MATERIAL IS NONFLAMMABLE. NITROGEN NEITHER BURNS NOR SUPPORTS COMBUSTION. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES

NONE. NITROGEN WILL ACT AS A SIMPLE ASPHYXIAN IF IT DISPLACES OXYGEN. IF POSSIBLE, REMOVE NITROGEN CYLINDERS FROM FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE BUILDUP. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE WORKERS.

USUAL FIRE AND EXPLOSION HAZARD

SAL 000007276

PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD FAIL TO RELIEVE PRESSURE.

AUTOIGNITION TEMPERATURE: N/A

BIG THREE INDUSTRIES, INC.

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HOUSTON, TX 77257

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MATERIAL SAFETY DATA SHEET
PRODUCT NAME NITROGEN

ELECTRICAL CLASSIFICATION: NONHAZARDOUS

V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE NONE ESTABLISHED
UNUSUAL CHRONIC TOXICITY *SEE OVEREXPOSURE SECTION*
CARCINOGENICITY NOT LISTED BY IARC, NTP, OSHA
ROUTES OF EXPOSURE INHALATION
EFFECTS OF OVEREXPOSURE

NITROGEN IS NONTOXIC, BUT MAY CAUSE SUFFOCATION BY DIS-
PLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT
ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINI-
SHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT
SHOULD BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY
OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS.

TOXICOLOGICAL PROPERTIES:

NITROGEN IS A SIMPLE ASPHYXIAN.

EMERGENCY AND FIRST AID PROCEDURES

PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO
FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTI-
FICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER
OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION.

*SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RES-
CUE WORKERS.

VI - REACTIVITY DATA

STABILITY STABLE

CONDITIONS TO AVOID

NONE.

INCOMPATIBILITY (MATERIALS TO AVOID)

NONE.

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

SAL 000007277

VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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H A T E R I A L S A F E T Y D A T A S H E E T

PRODUCT NAME NITROGEN

EVAQUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA. SHUT OFF SOURCE OF NITROGEN IF POSSIBLE. VENTILATE ENCLOSED AREAS OR REMOVE CYLINDERS TO AN OUTDOOR LOCATION TO PREVENT FORMATION OF OXYGEN-DEFICIENT ATMOSPHERES. IF LEAKING FROM CONTAINER OR VALVE, CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION, OR YOUR SUPPLIER.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, SECURE CYLINDER AND VENT LOCALLY TO THE ATMOSPHERE IN A WELL-VENTILATED AREA OR OUTDOORS.

RESPIRATORY PROTECTION (SPECIFY TYPE)

USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK IN OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.

VENTILATION

SEE NOTES

TECTIVE GLOVES

N/A

PROTECTION

SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING HIGH PRESSURE CYLINDERS.

OTHER PROTECTIVE EQUIPMENT

SAFETY SHOES WHEN HANDLING CYLINDERS.

***** SECTION NOTES *****

ACQUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5 % (OXYGEN-DEFICIENT ATMOSPHERE).

LOCAL EXHAUST: YES
MECHANICAL: YES

I X - S P E C I A L P R E C A U T I O N S

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING SAL 000007278

STORE AND USE WITH ADEQUATE VENTILATION. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, KICK, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C).

0.1. LABELING

NONFLAMMABLE GAS - GREEN LABEL

VALVE CONNECTION

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HOUSTON, TX 77253

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MATERIAL SAFETY DATA SHEET

PRODUCT NAME NITROGEN

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OTHER PRECAUTIONS

NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER.
REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER
OWNER IS A VIOLATION OF FEDERAL LAW (49 CFR).

DOT PLACARD: UNFLAMMABLE GAS

DOT PROPER SHIPPING NAME: NITROGEN; OR NITROGEN, COMPRESSED

MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT NITROGEN CAN BE FOUND IN THE
FOLLOWING PAMPHLETS PUBLISHED BY:

THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341

- G-10.1: "COMMODITY SPECIFICATION FOR NITROGEN"
P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS"
P-9: "THE INERT GASES ARGON, NITROGEN, AND HELIUM"
P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-
DEFICIENT ATMOSPHERES"
S8-2: "OXYGEN DEFICIENT ATMOSPHERES"

NFPA RATINGS:

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

HMIS RATINGS:

HEALTH: 0
FLAMMAB: 0
REACTIV: 0

CERCLA RATINGS:

HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 3

LISTED IN TSCA INVENTORY: YES

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29 CFR 1900.1200. BIG THREE INDUSTRIES, INC. PROVIDES NO WARRANTIES, EITHER
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HOUSTON, TX 77253

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M A T E R I A L S A F E T Y D A T A S H E E T

I - G E N E R A L I N F O R M A T I O N

PRODUCT NAME NITROGEN

EMERGENCY TELEPHONE NO. 713-868-0302
MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.
TRADE NAME/SYNONYMS NITROGEN; NITROGEN NF
CHEMICAL NAME AND SYNONYMS
NITROGENREVISION DATE: 08/24/89 PRODUCT ID. UN 1066 FORMULA N2
CHEMICAL FAMILY INERT GAS CAS NUMBER 7727-37-9

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 896-2140

I I - H A Z A R D O U S I N G R E D I E N T S

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

0/0 TLV

NITROGEN
** NONE ESTABLISHED

100 **

I I I - P H Y S I C A L D A T A

BOILING POINT -320.4 F (-195.8 C) @ 1 ATM
SPECIFIC GRAVITY (AIR = 1): 0.967 @ 70 F (21.1 C) @ 1 ATM
VAPOR PRESSURE N/A
PERCENT VOLATILE BY VOLUME (O/O) N/A (GAS)
DENSITY 0.07245 LB/CU FT
@ 70 F (21.1 C) @ 1 ATM
EVAPORATION RATE N/A (GAS)
SOLUBILITY IN WATER 2.33 SCC/100 CC H2O @ 32 F (0 C)
MATERIAL AT NORMAL CONDITION GAS
EXPANSION RATIO (LIQUID TO GAS) N/A (GAS)

APPEARANCE AND ODOR

COLORLESS, ODORLESS, TASTELESS GAS

I V - F I R E A N D E X P L O S I O N H A Z A R D D A T A

FLASH POINT N/A
FLASH POINT (METHOD USED)
FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER N/A UPPER N/A

EXTINGUISHING MEDIA

MATERIAL IS NONFLAMMABLE. NITROGEN NEITHER BURNS NOR SUP-
PORTS COMBUSTION. USE EXTINGUISHING MEDIA APPROPRIATE FOR
SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES

SAL 000007280

NONE. NITROGEN WILL ACT AS A SIMPLE ASPHYXIANIT IF IT DIS-
PLACES OXYGEN. IF POSSIBLE, REMOVE NITROGEN CYLINDERS FROM
FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE
BUILDUP. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED
FOR RESCUE WORKERS.

USUAL FIRE AND EXPLOSION HAZARD

PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE
IF PRESSURE RELIEF DEVICES SHOULD FAIL TO RELIEVE PRESSURE.

BIG THREE INDUSTRIES, INC.

P. O. BOX 3047
HOUSTON, TX 77252

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MATERIAL SAFETY DATA SHEET
PRODUCT NAME NITROGEN

ELECTRICAL CLASSIFICATION: NONHAZARDOUS

V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE NONE ESTABLISHED
USUAL CHRONIC TOXICITY *SEE OVEREXPOSURE SECTION*
ARCINOGENICITY NOT LISTED BY IARC, NTP, OSHA
ROUTES OF EXPOSURE INHALATION
EFFECTS OF OVEREXPOSURE

NITROGEN IS NONTOXIC, BUT MAY CAUSE SUFFOCATION BY DIS-
PLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT
ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINI-
SHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT
SHOULD BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY
OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS.

TOXICOLOGICAL PROPERTIES:

NITROGEN IS A SIMPLE ASPHYXIAN.

EMERGENCY AND FIRST AID PROCEDURES

PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO
FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTI-
FICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER
OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION.

SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RES-
CUE WORKERS.

VI - REACTIVITY DATA

STABILITY STABLE

CONDITIONS TO AVOID

NONE.

INCOMPATIBILITY (MATERIALS TO AVOID)

NONE.

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

SAL 000007281

VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

BIG THREE INDUSTRIES, INC.
P.O. BOX 3042
HOUSTON, TX 77253

GS264

MATERIAL SAFETY DATA SHEET

PRODUCT NAME NITROGEN

EVACUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA. SHUT OFF SOURCE OF NITROGEN IF POSSIBLE. VENTILATE ENCLOSED AREAS OR REMOVE CYLINDERS TO AN OUTDOOR LOCATION TO PREVENT FORMATION OF OXYGEN-DEFICIENT ATMOSPHERES. IF LEAKING FROM CONTAINER OR VALVE, CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION, OR YOUR SUPPLIER.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, SECURE CYLINDER AND VENT ONLY TO THE ATMOSPHERE IN A WELL-VENTILATED AREA OR OUTDOORS.

VIII - SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK IN OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.

VENTILATION

SEE NOTES

PROTECTIVE GLOVES

N/A

PROTECTION

SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING HIGH PRESSURE CYLINDERS.

OTHER PROTECTIVE EQUIPMENT

SAFETY SHOES WHEN HANDLING CYLINDERS.

***** SECTION NOTES *****

ACCUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5 % (OXYGEN-DEFICIENT ATMOSPHERE).

LOCAL EXHAUST: YES
MECHANICAL: YES

IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

STORE AND USE WITH ADEQUATE VENTILATION. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, ROLL, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDERS MOVEMENT. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C).

9.1. LABELING

NONFLAMMABLE GAS - GREEN LABEL

VALVE CONNECTION

DIG THREE INDUSTRIES, INC.
P.O. BOX 3047
HOUSTON, TX 77253

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GS264**MATERIAL SAFETY DATA SHEET**

PRODUCT NAME NITROGEN

530

OTHER PRECAUTIONS

NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER.
REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER
OWNER IS A VIOLATION OF FEDERAL LAW (49 CFR).

DOT PLACARD: NONFLAMMABLE GAS

DOT PROPER SHIPPING NAME: NITROGEN; OR NITROGEN, COMPRESSED

MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT NITROGEN CAN BE FOUND IN THE
FOLLOWING PAMPHLETS PUBLISHED BY:

THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341

- G-10.1: "COMMODITY SPECIFICATION FOR NITROGEN"
- P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS"
- P-9: "THE INERT GASES ARGON, NITROGEN, AND HELIUM"
- P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-
DEFICIENT ATMOSPHERES"
- SB-2: "OXYGEN DEFICIENT ATMOSPHERES"

NFPA RATINGS:

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

HMIS RATINGS:

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

CERCLA RATINGS:

HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 3

LISTED IN TSCA INVENTORY: YES

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HOUSTON, TX 77253

PAGE 1

GS264

M A T E R I A L S A F E T Y D A T A S H E E T

I - G E N E R A L I N F O R M A T I O N

PRODUCT NAME NITROGEN

EMERGENCY TELEPHONE NO. 713-868-0302

MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.

TRADE NAME/SYNONYMS NITROGEN; NITROGEN NF

CHEMICAL NAME AND SYNONYMS

NITROGEN

REVISION DATE: 08/24/89

PRODUCT ID. UN 1066 FORMULA N2

CHEMICAL FAMILY INERT GAS

CAS NUMBER 7727-37-9

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 896-2140

I I - H A Z A R D O U S I N G R E D I E N T S

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

0/0 TLV

NITROGEN

100 **

** NONE ESTABLISHED

I I I - P H Y S I C A L D A T A

BOILING POINT -320.4F (-195.8C) @ 1 ATM

SPECIFIC GRAVITY (AIR = 1): 0.967 @ 70 F (21.1C) @ 1 ATM

VAPOR PRESSURE N/A

PERCENT VOLATILE BY VOLUME (O/O) N/A (GAS)

DENSITY 0.07245 LB/CU FT

@ 70 F (21.1 C) @ 1 ATM

EVAPORATION RATE N/A (GAS)

SOLUBILITY IN WATER 2.33SCC/100CC H2O @ 32 F (0 C)

MATERIAL AT NORMAL CONDITION GAS

EXPANSION RATIO (LIQUID TO GAS) N/A (GAS)

APPEARANCE AND ODOR

COLORLESS, ODORLESS, TASTELESS GAS

I V - F I R E A N D E X P L O S I O N H A Z A R D D A T A

FLASH POINT N/A

FLASH POINT (METHOD USED)

FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER N/A

UPPER N/A

EXTINGUISHING MEDIA

MATERIAL IS NONFLAMMABLE. NITROGEN NEITHER BURNS NOR SUPPORTS COMBUSTION. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES

SAL 000007284

NONE. NITROGEN WILL ACT AS A SIMPLE ASPHYXIAN IF IT DISPLACES OXYGEN. IF POSSIBLE, REMOVE NITROGEN CYLINDERS FROM FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE BUILDUP. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE WORKERS.

USUAL FIRE AND EXPLOSION HAZARD

PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD FAIL TO RELIEVE PRESSURE.

AUTOIGNITION TEMPERATURE: N/A

BIG THREE INDUSTRIES, INC.

P. O. BOX 3047
HOUSTON, TX 77252

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GS264MATERIAL SAFETY DATA SHEET
PRODUCT NAME NITROGEN

ELECTRICAL CLASSIFICATION: NONHAZARDOUS

V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE NONE ESTABLISHED
UNUSUAL CHRONIC TOXICITY *SEE OVEREXPOSURE SECTION*
CARCINOGENICITY NOT LISTED BY IARC, NTP, OSHA
ROUTES OF EXPOSURE INHALATION
EFFECTS OF OVEREXPOSURE

NITROGEN IS NONTOXIC, BUT MAY CAUSE SUFFOCATION BY DIS-
PLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT
ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINI-
SHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT
SHOULD BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY
OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS.

TOXICOLOGICAL PROPERTIES:

NITROGEN IS A SIMPLE ASPHYXIAN.

EMERGENCY AND FIRST AID PROCEDURES

PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO
FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTI-
FICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER
OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION.

SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RES-
CUE WORKERS.

VI - REACTIVITY DATA

STABILITY STABLE
CONDITIONS TO AVOID

NONE.

INCOMPATABILITY (MATERIALS TO AVOID)

NONE.

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

SAL 000007285

VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

BIG THREE INDUSTRIES, INC.
P. O. BOX 3847
HOUSTON, TX 77253

PAGE 3

GS264**M A T E R I A L S A F E T Y D A T A S H E E T**

PRODUCT NAME NITROGEN

EVACUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA. SHUT OFF SOURCE OF NITROGEN IF POSSIBLE. VENTILATE ENCLOSED AREAS OR REMOVE CYLINDERS TO AN OUTDOOR LOCATION TO PREVENT FORMATION OF OXYGEN-DEFICIENT ATMOSPHERES. IF LEAKING FROM CONTAINER OR VALVE, CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION, OR YOUR SUPPLIER.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, SECURE CYLINDER AND VENT SLOWLY TO THE ATMOSPHERE IN A WELL-VENTILATED AREA OR OUTDOORS.

V I I I - S P E C I A L P R O T E C T I V E I N F O R M A T I O N**RESPIRATORY PROTECTION (SPECIFY TYPE)**

USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK IN OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.

VENTILATION

SEE NOTES

PROTECTIVE GLOVES

N/A

EYE PROTECTION

SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING HIGH PRESSURE CYLINDERS.

OTHER PROTECTIVE EQUIPMENT

SAFETY SHOES WHEN HANDLING CYLINDERS.

******* SECTION NOTES *******

ADEQUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5 % (OXYGEN-DEFICIENT ATMOSPHERE).

LOCAL EXHAUST: YES
MECHANICAL: YES

I X - S P E C I A L P R E C A U T I O N S**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

STORE AND USE WITH ADEQUATE VENTILATION. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, ROLL, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C).

DOT LABELING

NONFLAMMABLE GAS - GREEN LABEL

VALVE CONNECTION

SAL 000007286

BIG THREE INDUSTRIES, INC.
P. O. BOX 3047
HOUSTON, TX 77253

PAGE 6

GS264**MATERIAL SAFETY DATA SHEET**

PRODUCT NAME NITROGEN

580

OTHER PRECAUTIONS

NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER.
REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER
OWNER IS A VIOLATION OF FEDERAL LAW (49 CFR).

DOT PLACARD: UNFLAMMABLE GAS

DOT PROPER SHIPPING NAME: NITROGEN; OR NITROGEN, COMPRESSED

MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT NITROGEN CAN BE FOUND IN THE
FOLLOWING PAMPHLETS PUBLISHED BY:

THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341

G-10.1: "COMMODITY SPECIFICATION FOR NITROGEN"

P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS"

P-9: "THE INERT GASES ARGON, NITROGEN, AND HELIUM"

P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-
DEFICIENT ATMOSPHERES"

S8-2: "OXYGEN DEFICIENT ATMOSPHERES"

NFPA RATINGS:

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

HMS RATINGS:

HEALTH: 0
FLAMMAB: 0
REACTIV: 0

CERCLA RATINGS:

HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 3

LISTED IN TSCA INVENTORY: YES

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION,
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HOUSTON, TX 77253

GS264

M A T E R I A L S A F E T Y D A T A S H E E T

I - G E N E R A L I N F O R M A T I O N

PRODUCT NAME NITROGEN, REFRIGERATED LIQUID

EMERGENCY TELEPHONE NO. 713-868-0302

MANUFACTURERS NAME BIG THREE INDUSTRIES, INC.

TRADE NAME/SYNONYMS LIQUID NITROGEN (LIN)

CHEMICAL NAME AND SYNONYMS

NITROGEN, REFRIGERATED LIQUID

REVISION DATE: 08/24/89

PRODUCT ID. UN 1977 FORMULA N2

CHEMICAL FAMILY INERT GAS

CAS NUMBER 7727-37-9

***** SECTION NOTES *****

MSDS INFORMATION NUMBER: (713) 896-2140

II - H A Z A R D O U S I N G R E D I E N T S

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

O/O

TLV

NITROGEN

100

**

** NONE ESTABLISHED

III - P H Y S I C A L D A T A

BOILING POINT -320.4F (-195.3C) @ 1 ATM

SPECIFIC GRAVITY (H2O = 1): 0.8093 @ BOILING PT. @ 1 ATM

VAPOR PRESSURE N/A

PERCENT VOLATILE BY VOLUME (O/O) N/A

DENSITY 50.49 LB/CU FT @ BOILING PT. @ 1 ATM

EVAPORATION RATE N/A

SOLUBILITY IN WATER N/A

MATERIAL AT NORMAL CONDITION LIQUID

EXPANSION RATIO (LIQUID TO GAS) 1:696.5

APPEARANCE AND ODOR

COLORLESS, ODORLESS GAS

IV - F I R E A N D E X P L O S I O N H A Z A R D D A T A

FLASH POINT N/A

FLASH POINT (METHOD USED)

FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER N/A

UPPER N/A

EXTINGUISHING MEDIA

MATERIAL IS NONFLAMMABLE. NITROGEN NEITHER BURNS NOR SUPPORTS COMBUSTION. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES

NONE. NITROGEN WILL ACT AS A SIMPLE ASPHYXIAN IT IT DISPLACES OXYGEN. LIQUID NITROGEN WHEN SPILLED WILL VAPORIZE RAPIDLY CAUSING A VAPOR CLOUD THAT WILL CREATE AN OXYGEN-DEFICIENT ATMOSPHERE. EVACUATE THE AREA OF THIS VAPOR CLOUD UNLESS WEARING SELF-CONTAINED BREATHING APPARATUS.

U UAL FIRE AND EXPLOSION HAZARD

SAL 000007288

CONTACT WITH "COLD" LIQUID OR GASEOUS NITROGEN MAY CAUSE FROSTBITE. VISIBILITY MAY BE OBSCURED IN THIS "VAPOR CLOUD".

AUTOIGNITION TEMPERATURE: N/A

GS264

BIG THREE INDUSTRIES, INC.
P. O. BOX 3047
HOUSTON, TX 77253MATERIAL SAFETY DATA SHEET
PRODUCT NAME NITROGEN, REFRIGERATED LIQUID

ELECTRICAL CLASSIFICATION: NONHAZARDOUS

V - HEALTH HAZARD DATA

RESHOLD LIMIT VALUE NONE ESTABLISHED
USUAL CHRONIC TOXICITY *SEE OVEREXPOSURE SECTION*
RCINOGENICITY NOT LISTED BY IARC, NTP, OSHA
UTES OF EXPOSURE INHALATION, EYE/SKIN CONTACT
FFECTS OF OVEREXPOSURE

NITROGEN IS NONTOXIC, BUT MAY CAUSE SUFFOCATION BY DIS-
PLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT
ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINI-
SHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT
SHOULD BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY
OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS. PRO-
LONGED BREATHING OF VERY COLD ATMOSPHERES CAN CAUSE LUNG
DAMAGE AND HYPOTHERMIA. FROZEN TISSUES, CAUSED BY FROSTBITE
ARE PAINLESS AND APPEAR WAXY WITH A POSSIBLE YELLOW COLOR.
THEY WILL BECOME SWOLLEN, PAINFUL, AND PRONE TO INFECTION
WHEN THAWED.

TOXICOLOGICAL PROPERTIES:

NITROGEN IS A SIMPLE ASPHYXIANT.

CONTACT WITH COLD LIQUID OR PIPING MAY CAUSE COLD CONTACT
BURNS, "FROSTBITE".

EMERGENCY AND FIRST AID PROCEDURES

PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO
FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTI-
FICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER
OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION.

SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RES-
CUE WORKERS.

IF CONTACT WITH CRYOGENIC LIQUID NITROGEN HAS CAUSED FROST-
BITE, DO NOT RUB THE AFFECTED AREA, AS TISSUE DAMAGE MAY
OCCUR. FLUSH THE AFFECTED AREAS WITH WARM WATER. DO NOT
USE HOT WATER. OBTAIN PROMPT MEDICAL ATTENTION.

VI - REACTIVITY DATA

STABILITY STABLE

CONDITIONS TO AVOID

NONE.

INCOMPATABILITY (MATERIALS TO AVOID)

NONE.

SAL 000007289

HAZARDOUS DECOMPOSITION PRODUCTS

NONE.

BIG THREE INDUSTRIES, INC.
P. O. BOX 3047
HOUSTON, TX 77253

GS264

MATERIAL SAFETY DATA SHEET
NAME NITROGEN, REFRIGERATED LIQUID

HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS TO AVOID

NONE.

VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

EVACUATE ALL UNNECESSARY PERSONNEL FROM VAPOR CLOUD AREA WHERE AN OXYGEN-DEFICIENT ATMOSPHERE IS PROBABLE. SHUT OFF NITROGEN SOURCE IF POSSIBLE. AVOID CONTACT WITH LIQUID NITROGEN OR ITS COLD BOIL-OFF GAS. TO INCREASE RATE OF EVAPORATION SPRAY WITH LARGE AMOUNTS OF WATER FROM UPWIND. IF LEAKING FROM CONTAINER OR CONNECTION, CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION, OR YOUR SUPPLIER. SELF-CONTAINED BREATHING APPARATUS WILL BE REQUIRED IN OXYGEN-DEFICIENT AREAS SUCH AS NITROGEN VAPOR CLOUDS.

WASTE DISPOSAL METHOD

DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, ALLOW LIQUID NITROGEN TO EVAPORATE IN A WELL-VENTILATED OUTDOOR LOCATION.

VIII - SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK IN OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.

VENTILATION

SEE NOTES

PROTECTIVE GLOVES

LOOSE-FITTING THERMAL INSULATED/LEATHER

EYE PROTECTION

FULL FACE SHIELD AND SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING N2 LIQUID

OTHER PROTECTIVE EQUIPMENT

LONG SLEEVE SHIRT FOR LIQUID HANDLING.
SAFETY SHOES IF HANDLING CYLINDERS.

***** SECTION NOTES *****

ADEQUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5 % (OXYGEN-DEFICIENT ATMOSPHERE).

LOCAL EXHAUST: YES
MECHANICAL: YES

SAL 000007290

IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

GS264**MATERIAL SAFETY DATA SHEET**
PRODUCT NAME NITROGEN, REFRIGERATED LIQUID

STORE AND USE WITH ADEQUATE VENTILATION. CONTAINERS SHOULD BE STORED UPRIGHT AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CONTAINERS FROM PHYSICAL DAMAGE. DO NOT DRAG, ROLL, SLIDE, OR DROP. USE A SUITABLE HAND TRUCK FOR CONTAINER MOVEMENT. LIQUID CONTAINERS (I.E.: 4L CYLINDERS) WILL VENT NITROGEN IF INTERNAL PRESSURE BUILDS UP, SO THESE CONTAINERS SHOULD BE STORED IN WELL-VENTILATED AREAS.

DOT LABELING

NONFLAMMABLE LIQUID - GREEN LABEL

VALVE CONNECTION

295 FOR LIQUID, 580 FOR GAS

OTHER PRECAUTIONS

LIQUID NITROGEN EXPANDS AT A RATIO OF 696.5 TO 1, AND IF TRAPPED IN A CONTAINER OR PIPE, IT WILL PRODUCE ENORMOUS PRESSURES WHICH WILL RUPTURE THE CONTAINER. ANY AREA WHERE LIQUID NITROGEN COULD BE TRAPPED MUST BE PROTECTED BY A PRESSURE RELIEF DEVICE. PIPING MUST BE DESIGNED FOR EXTREME COLD. MANY MATERIALS, SUCH AS CARBON STEEL, WILL BECOME BRITTLE AND MAY FRACTURE WHEN EXTREMELY COLD. DO NOT TOUCH COLD PIPING AS FROSTBITE MAY OCCUR.

DOT PLACARD: NONFLAMMABLE LIQUID

DOT PROPER SHIPPING NAME: NITROGEN, REFRIGERATED LIQUID

MISCELLANEOUS INFORMATION:

FURTHER INFORMATION ABOUT LIQUID NITROGEN CAN BE FOUND IN THE FOLLOWING PAMPHLETS PUBLISHED BY:

THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202
(703) 979-4341

- G-10.1: "COMMODITY SPECIFICATION FOR NITROGEN"
- P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS"
- P-9: "THE INERT GASES ARGON, NITROGEN, AND HELIUM"
- P-12: "SAFE HANDLING OF CRYOGENIC LIQUID"
- P-14: "ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-DEFICIENT ATMOSPHERES"
- SB-2: "OXYGEN-DEFICIENT ATMOSPHERES"
- AV-5: "SAFE HANDLING OF LIQUEFIED NITROGEN & ARGON"

NFPA RATINGS:

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

HMIS RATINGS:

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

CERCLA RATINGS:

HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 3

SAL 000007291

LISTED IN TSCA INVENTORY: YES

FROM LK CHARLES 141

BIG THREE INDUSTRIES, INC.
P. O. BOX 3047
HOUSTON, TX 77253

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CS264

MATERIAL SAFETY DATA SHEET
PRODUCT NAME NITROGEN, REFRIGERATED LIQUID

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION,
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SAL 000007292

MAIL TO:

45000382
CONOCO INC
REFINING
P O BOX 37
WESTLAKE

LA 70669

ORDER NO: 451500111
PROD NO: 04310054

VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1564 (408) 435-8700

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800)424-9300

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: HYDROCHLORIC ACID
COMMON NAMES/SYNONYMS: HYDROCHLORIC
ACID; MURIATIC ACID; HYDROCHLORIC ACID 10 BE;
HYDROCHLORIC ACID 9%

CAS NO.: 7647-01-0
VW&R CODE: P1125

FORMULA: H CL
HAZARD RATING (NFPA 49)
HEALTH: 3
FIRE: 0
REACTIVITY: 0
SPECIAL: NONE

DATE ISSUED: 03/90
SUPERCEDES: 02/90
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, PPM			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
HYDROCHLORIC ACID	7647-01-0M	9-37	5	5	NONE	CORROSIVE
WATER	7732-18-5	BALANCE	NONE	NONE	NONE	NONE

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: 150 - 230 VAPOR PRESSURE, MM HG/20 DEG C: 30
AT 77 DEG F
MELTING POINT, DEG F: N/A VAPOR DENSITY (AIR=1): N/A
SPECIFIC GRAVITY (WATER=1): A=1.14; B=1.16; C=1.18; D=1.07 WATER SOLUBILITY, %:
APPEARANCE AND ODOR: CLEAR, EVAPORATION RATE (BUTYL ACETATE=1): N/A
COLORLESS TO PALE YELLOW WITH PUNGENT, IRRITATING ODOR.

(A=18 DEG BE HYDROCHLORIC ACID; B=20 DEG BE HYDROCHLORIC ACID;
C=22 DEG BE HYDROCHLORIC ACID; D=10 DEG BE HYDROCHLORIC ACID)

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT
BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

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IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 30 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH LOTS OF RUNNING WATER FOR 30 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT, INHALATION.

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: VAPORS AND MISTS ARE EXTREMELY CORROSIVE TO THE NOSE, THROAT, AND MUCOUS MEMBRANES. BRONCHITIS, PULMONARY EDEMA, AND CHEMICAL PNEUMONITIS MAY OCCUR. IRRITATION, COUGHING, CHEST PAIN, AND DIFFICULTY IN BREATHING MAY OCCUR WITH BRIEF EXPOSURE WHILE PROLONGED EXPOSURE MAY RESULT IN MORE SEVERE IRRITATION AND TISSUE DAMAGE. BREATHING HIGH CONCENTRATIONS MAY RESULT IN DEATH.

EYE CONTACT: VAPORS, LIQUID, AND MISTS ARE EXTREMELY CORROSIVE TO THE EYES. BRIEF CONTACT OF THE VAPORS WILL BE SEVERELY IRRITATING. BRIEF CONTACT OF THE LIQUID OR MISTS WILL SEVERELY DAMAGE THE EYES AND PROLONGED CONTACT MAY CAUSE PERMANENT EYE INJURY WHICH MAY BE FOLLOWED BY BLINDNESS.

SKIN CONTACT: VAPORS, MISTS, AND LIQUID ARE EXTREMELY CORROSIVE TO THE SKIN. VAPORS WILL SEVERELY IRRITATE THE SKIN AND LIQUID AND MISTS WILL SEVERELY BURN THE SKIN. PROLONGED LIQUID CONTACT WILL BURN OR DESTROY SURROUNDING TISSUE AND DEATH MAY ACCOMPANY BURNS WHICH EXTEND OVER LARGE PORTIONS OF THE BODY.

SWALLOWED: VAPORS, MISTS, AND LIQUID ARE EXTREMELY CORROSIVE TO THE MOUTH AND THROAT. SWALLOWING THE LIQUID BURNS THE TISSUES, CAUSES SEVERE ABDOMINAL PAIN, NAUSEA, VOMITING, AND COLLAPSE. SWALLOWING LARGE QUANTITIES CAN CAUSE DEATH.

CHRONIC EFFECTS OF EXPOSURE: MAY RESULT IN AREAS OF DESTRUCTION OF SKIN TISSUE OR PRIMARY IRRITANT DERMATITIS. SIMILARLY, INHALATION OF VAPORS OR MISTS MAY CAUSE VARYING DEGREES OF DAMAGE TO THE AFFECTED TISSUES AND ALSO INCREASING SUSCEPTIBILITY TO RESPIRATORY ILLNESS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

ORAL: RABBIT LD50 = 900 MG/KG

DERMAL: NO DATA FOUND

INHALATION: RAT LC50 = 3,124 PPM/1HR

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE

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-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL.

RESPIRATORY PROTECTION: WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THE VAPOR OR MIST CONCENTRATION AT THE POINT OF USE. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ACID GASES/MISTS, A SELF-CONTAINED

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BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES AND FULL FACESHIELD UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: ACID-RESISTANT SLICKER SUIT WITH RUBBER APRON, RUBBER BOOTS WITH PANTS OUTSIDE, AND RUBBER GLOVES WITH GAUNTLETS.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NONE

FLAMMABLE LIMITS IN AIR, %

METHOD USED: N/A

LOWER: N/A UPPER: N/A

EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTINGUISH ALL NEARBY SOURCES OF IGNITION SINCE FLAMMABLE HYDROGEN GAS WILL BE LIBERATED FROM CONTACT WITH SOME METALS.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE
CONDITIONS TO AVOID: NONE

POLYMERIZATION: WILL NOT OCCUR

MATERIALS TO AVOID: ALKALIS, OXIDIZING OR REDUCING MATERIALS, CYANIDES, SULFIDES, OR COMBUSTIBLE MATERIALS. KEEP AWAY FROM FORMALDEHYDE SINCE THERE ARE REPORTS THAT BIS-CHLOROMETHYL ETHER, A POTENTIAL CARCINOGEN, MAY BE FORMED. ALSO KEEP AWAY FROM AMINES, VINYL ACETATE, PROPYLENE OXIDE, BETA-PROPIOLACTONE, AND METAL OXIDES.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE HYDROGEN CHLORIDE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR ACID-RESISTANT SLICKER SUIT AND COMPLETE PROTECTIVE EQUIPMENT INCLUDING RUBBER GLOVES, RUBBER BOOTS, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ACID GASES MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND CAREFULLY NEUTRALIZE WITH SODA ASH OR LIME. IF SODA ASH IS USED, PROVIDE ADEQUATE VENTILATION TO DISSIPATE THE CARBON DIOXIDE GAS. KEEP NON-NEUTRALIZED MATERIAL OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

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STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

-----OTHER REGULATORY INFORMATION-----

THE COMPONENTS OF THIS PRODUCT ARE ON THE TSCA INVENTORY OF CHEMICAL SUBSTANCES.

DO NOT DETACH THIS SECTION FROM THE MSDS AND BE SURE TO INCLUDE THIS SECTION WHEN COPYING THE MSDS.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL(S) 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:

NAME	CAS NO.	% WT.
HYDROCHLORIC ACID	7647-01-0	9-37

UNDER MASSACHUSETTES RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCE AND EXTRA-ORDINARILY HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRES REPORTING ARE:

EXTRAORDINARILY HAZARDOUS SUBSTANCES CHEMICAL	CAS NO.	CONCENTRATION (=> 0.0001%)
HYDROCHLORIC ACID	7647-01-0	9-37

UNDER THE PENNSYLVANIA RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCES AND SPECIAL HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRE REPORTING ARE:

HAZARDOUS SUBSTANCES CHEMICAL	CAS NO.	CONCENTRATION (=> 1%)
HYDROCHLORIC ACID	7647-01-0	9-37

CALIFORNIA SCAGMD: NONE

-----NOTICE-----

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ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

-----REVISION-----

03/90: ADDED SYNONYM

SAL 000007296

PROD: 04310054 02:19:47 21 MAR 1990 CUST: 45000382 INVOICE: 451500111

P1125

MATERIAL SAFETY DATA SHEET

GS192

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REVISED % COMPOSITION IN INGREDIENT AND OTHER REGULATORY
INFORMATION

**** END OF MSDS ****

PROD: 04310054 02:19:47 21 MAR 1990 CUST: 45000382 INVOICE: 451500111

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Material Safety Data Sheet Description and Explanation of Terms

Emergency Telephone Number **6 S 5 8 2**
Medical (708) 920-1510 (24 hours)

General

The Material Safety Data Sheet (MSDS) has, over the years, become the major media for transmitting health and safety information on chemical products. It is therefore natural that it has been included in the new OSHA Hazard Communication Standard (29CFR 1910.1200) as the key document along with the container label to provide hazard information to employees and employers.

These new OSHA regulations require chemical manufacturers to evaluate each chemical produced to determine if it is hazardous. The definition of "hazardous" has been expanded from the usual "flammable, corrosive, oxidizer, explosive, toxic or highly toxic agents, carcinogen, etc." to include combustibles as well as irritants. Consequently, many products that had not previously been classified as "hazardous" now fall into this classification under OSHA.

The new regulations require chemical manufacturers and importers to prepare and distribute an MSDS for all hazardous chemicals and that each container of hazardous chemical leaving the workplace be labeled. In addition, the chemical manufacturer is to provide a copy of the MSDS to the purchaser at the time of shipment or before.

Nalco has established a computerized program to send MSDS's to each purchaser upon receipt of a first order after November 25, 1985. The MSDS will automatically be sent to the attention of the purchasing agent at the "ship to address." A revised MSDS will also be sent to that same address when a change has been made to the MSDS.

MSDS's will also continue to be available through your Nalco Sales Representative or upon request to Nalco.

The Nalco MSDS complies with all of the requirements of the OSHA regulation. In addition, it provides you with all of the important information regarding the safe handling of our products, recommended protection measures, toxicological data, and the status of our products under various federal and state environmental and safety regulations. In short, we have put all of this information into one document for your convenience and easy use.

Nalco, as part of our overall commitment to product safety, is providing MSDS's on all of our chemical products regardless of whether the product is hazardous or not. The OSHA regulations require an MSDS to be prepared only for certain hazardous chemicals.

This MSDS section description and explanation of terms is designed to assist your interpretation of the MSDS so that you may receive full value from the document.

Section 1 — Product Identification

This section identifies the Nalco product by Trade Name or Product Number. This is the same trade name or product number that will appear on the product container allowing you to match up the product label with the MSDS.

Nalco also provides a generic chemical description of all major ingredients, both hazardous and non-hazardous. This is designed to give your health and safety personnel information on the class of chemistry(s) in our product without compromising the proprietary nature of the formulation.

The third part of this section is the National Fire Protection Association (NFPA) 704M rating designation. This popular rating system is used to give you a quick summary of the hazards of the product regarding health, flammability, reactivity and other hazards. Based on NFPA definition, an organic product will always have a flammability rating of at least (1) with inorganics having a rating of (0).

Section 2 — Hazardous Ingredients

We have evaluated our formulations for hazardous properties and identify those chemical ingredients which we believe cause or contribute to the hazard. As required by OSHA, these substances are identified if they are present in quantities greater than 1%, or in the case of carcinogens, greater than 0.1%, or if our hazard evaluation determines a hazard exists at lower concentrations. The hazardous ingredients are identified by specific chemical name and their CAS number (the Chemical Abstract Service number for that specific chemical).

To assist your industrial hygiene and safety personnel, Nalco identifies general or relative concentration ranges into which the exact percentage of the hazardous ingredient falls. This should enable your safety professional to evaluate the need for air sampling, employee monitoring, or other protective measures. Since most of our product formulations are proprietary, exact percentages will be given only when there are no trade secret concerns.

In a few cases where disclosure of specific chemical name and CAS number of a hazardous ingredient would release trade secrets, we have identified the chemical as "proprietary" as permitted by the OSHA regulation. In the event of an injury or accident, procedures are established to communicate the specific identity to health professionals who may have need for this information. In all

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cases, the hazard information and safe handling recommendations are provided.

Section 3 — Precautionary Label Information

The drum or product container is labeled showing product identity, health and safety precautions as well as other information on handling and use of the product. That portion of the label which covers health and safety precautions is included in this section of the MSDS. In this way, you can easily refer to what is shown on the drum label without actually seeing the container.

Empty drums or containers may contain residual product and should be treated in accordance with the label requirement unless the empty container has been properly reconditioned. By EPA Standards (RCRA - 40CFR 261.7), a container is considered to be "empty" when it contains: 1) no more than 1 inch (2.5 centimeters) of product, or 2) no more than 3% by weight of the total capacity of the container if the container is less than or equal to 110 gallons in size or 3) no more than 0.3% by weight if the container is greater than 110 gallons in size. Empty drums that formerly contained chemicals listed in 40CFR 261.33 (c) must be triple rinsed using a solvent capable of removing the commercial chemical to qualify as "empty." Quantities of chemical greater than those indicated above which remain in the container are considered "wastes" when disposing of the container and appropriate RCRA regulations will apply.

Section 4 — First Aid Information

This section is designed to provide first aid information for the typical routes of exposure. The recommendations should be followed in all cases. If exposure causes unexpected or delayed effects, or severe reaction or injury, you should immediately consult a physician. Nalco ALERT, our medical emergency system (312/920-1510) should be called by the attending physician or others. Nalco ALERT operates 24 hours/day, seven days/week and is staffed by trained professionals.

Section 5 — Health Effects Information

This section describes the nature of the hazardous effect resulting from exposure if no first aid or improper first aid is given. The primary routes of exposure such as eye, skin, inhalation or ingestion are listed along with the effects that could occur from acute (single) exposure and chronic (repeated) exposure. The most likely exposure for our products would be due to unsafe practices which result in skin or eye contact from splashes during handling or feeding of the product.

Section 6 — Toxicology Information

Our health hazard evaluation for a product is based upon one or more of the following:

1. Results of toxicological tests conducted on a product,

2. Toxicological test results for a product ingredient(s),

3. Use of test results on a similar formulation or product and,

4. Use of information obtained in the open literature or supplier information for an ingredient(s).

In this Section, we present summaries of results of such toxicity tests. Explanations of results are given as needed. In most cases, results are those from acute, single exposure tests conducted with laboratory animals. As such, it should be remembered that the test procedures are quite stringent so that direct extrapolation of results to comparable human exposure must be viewed in that context.

The types of acute animal tests which are routinely conducted include oral, dermal and inhalation lethality studies and eye and skin irritancy studies. The lethality studies involve administration of the chemical to groups of test animals at various graded dose levels and recording mortality as one end point. The mortality-dose response allows for the calculation of the LD₅₀ or LC₅₀ by appropriate statistical methods. The LD₅₀ is that dose (amount) of chemical usually expressed in grams or milligrams per kilogram of animal body weight (g/kg or mg/kg) which would produce death in one half of a group of animals administered the chemical. The LC₅₀ is equivalent to LD₅₀ except it uses concentration rather than dose and is expressed as parts per million (ppm), milligrams per liter (mg/l) or milligrams per cubic meter of air (mg/M³). Oral and dermal tests use LD₅₀ while inhalation tests use LC₅₀. In both cases the smaller the value the more "toxic" the chemical.

Eye and skin irritancy tests utilize weighted numerical scores to assess degree of injury or irritation. In many instances, such numerical scores are also given descriptive ratings such as mildly or severely irritating. Most grading systems are modeled after those described by Draize, *et al* (referred to in the Bibliography, Section 17) in their original eye and skin irritation test procedures.

Results of skin sensitization tests conducted primarily on animals are presented. Human data is given if available. Generally, these test results will be for one or more chemicals in a formulation rather than the formulation itself.

When available and applicable, results of tests conducted to assess hazards other than lethality, will be provided in this Section under — "other toxicity results" and "chronic studies." These types of tests include life-time cancer studies, reproduction tests, and tests designed to uncover birth defects (teratology studies). These tests are usually conducted on individual chemical(s) rather than on formulated products.

Other short-term bioassays for changes to genetic cells are run with bacterial and other cells. While these tests identify genetic changes in tissue, the usefulness of the information as a prediction of a similar effect to humans

continues to be a scientific uncertainty. If this data is available, it will be provided in this section.

Since OSHA has broadened the criteria for acute health hazards and since the numerical rating is not uniformly accepted by all governmental agencies and scientific bodies, we are including OSHA's definitions below:

Highly toxic substance is one having:

1. An oral LD₅₀ of 50 mg/kg or less.
2. A dermal LD₅₀ of 200 mg/kg or less.
3. An inhalation LC₅₀ of 200 ppm or less of gas or vapor, or 2 mg/l or less of mist, fume or dust.

A toxic substance is one having:

1. An oral LD₅₀ between 50 and 500 mg/kg.
2. A dermal LD₅₀ between 200 and 1000 mg/kg.
3. An inhalation LC₅₀ between 200 ppm, 2,000 ppm of gas or vapors, or between 2 and 20 mg/l of mist, fume or dust.

A corrosive substance is one which causes third degree burns and scar tissue from 4-hour skin contact to rabbits.

A skin irritant is one which causes redness and swelling which does not persist and results in a numerical score of 5 out of 8 in greater than 50% of the animals tested.

An eye irritant — under 1910.1200 an eye irritant is one which at a minimum results in a grade 2 redness and/or swelling of the conjunctiva in at least 4 of 6 test animals when tested by the methods described in 16CFR 1500.42 or other appropriate techniques. The maximum attainable score using the Draize procedure is 110 (80 for cornea, 10 for iris, and 20 for conjunctiva).

Use of a finite irritation index to assess a chemical's potential as an eye irritant, i.e. x/110 cannot always be made because of inconsistencies between OSHA's definition and the standard Draize scoring technique. In some instances, an index as low as 2.7/110 is sufficient to warrant the eye irritation hazard statement while in other instances an index of 6/110 would not. In cases of conflict such as this we will point them out on the MSDS.

This rating system tends to classify many substances as irritants which would not be so classified under other regulations.

Section 7 — Physical and Chemical Properties

To assess the physical hazards of our products, we perform appropriate tests using procedures recommended by the American Society for Testing and Materials (ASTM). Their procedure number is identified accordingly. The tests vary depending on the physical form and chemical nature of the product. These physical or chemical test results are one of the factors reviewed in determining the need for or type of subsequent toxicological testing. The results are also used to identify hazardous physical proper-

ties which require labeling according to the Department of Transportation (DOT) regulations or for waste classification for disposal under the Resource Conservation and Recovery Act (RCRA).

Section 8 — Fire and Explosion Information

If the product exhibits flammable characteristics, information is provided on the recommended method for fighting fire. Unusual fire or explosion hazards are also given. OSHA 29CFR 1910.1200 and the Department of Transportation (DOT) consider products with flash points of less than 100 degrees Fahrenheit (F) as flammable materials. Chemicals with flash points between 100 degrees F and 200 degrees F are classified as combustible. On the other hand, the Resource Conservation and Recovery Act (RCRA) — 40CFR 261 subpart C and D define those chemicals with flash points of 140 degrees F and below as ignitable.

Section 9 — Reactivity Information

The potential for our products to aggressively react with other commonly found chemicals or to decompose represents a special hazard. Information is provided on possible interaction with other chemicals as well as reaction of our products on commonly encountered materials of construction used for chemical and feeding handling systems.

Section 10 — Personal Protective Equipment

Handling chemicals such as attaching feed pumps or transferring chemicals from one container to another constitutes the most likely exposure to operating personnel.

Recommendations are provided to protect personnel handling product spills, the type of ventilation needed, and the protective equipment (respirator, gloves, goggles, etc.) that should be used. This is one of the most important sections of the MSDS and the overall hazard communication program and should be well understood and put in practice by operating personnel.

Section 11 — Spill and Disposal Information

The disposal of wastes generated at a facility is one of the biggest problems facing industry. This section provides information on how to handle and clean up product spills and guidance for proper disposal should our product be considered a "waste" intended for disposal.

Section 12 — Environmental Information

This section provides information useful for assessing environmental impact of products or product constituents. When available and where applicable, information on partition coefficients, Biochemical Oxygen Demand (BOD), and Chemical Oxygen Demand (COD) is presented.

Results of acute aquatic bioassays are presented. These bioassays, usually conducted on rainbow trout and bluegill sunfish are useful in assessing potential for adverse effects on aquatic vertebrates. Results are usually expressed as 96-hour LC₅₀ values in milligrams per liter water (mg/l) or parts per million (ppm). The LC₅₀ is the concentration which is lethal to 50% of a group of fish exposed for the time period indicated. It is synonymous with the term TL₅₀ (the concentration which would result in the survival of 50% of a given test group). In many instances, 24 and 48 hours LC₅₀ values are given. When applicable, a 96-hour, no-observed effect concentration is presented based upon lack of adverse effects and mortality.

While we know of no published list which ascribes a descriptive rating to LC₅₀ values, listed below are ratings we use as internal guidelines:

96-Hour LC ₅₀	Rating
<1.0 ppm	Extremely toxic
>1.0<5.0	Highly toxic
>5<10.0	Toxic
>10<100	Moderately toxic
>100<1000	Slightly toxic
>1000	Essentially non-toxic

Section 13 — Transportation Information

All hazardous chemicals are subject to regulation by the Department of Transportation (DOT). Section 13 identifies the DOT proper shipping name and hazard class for the product, if any. This name will appear on all shipping documents. Many times the name will reflect the hazard and not necessarily the exact chemical name identified in Section 2. DOT hazard classifications are not always in agreement with those of OSHA.

Section 14 — Regulatory Information

Today chemical products are regulated from the time they are manufactured, during use, should any environmental release occur, and when the material is finally ready for disposal. Section 14 provides information on the status of our products under the various federal and state regulations that may govern its manufacture, use or disposal. Specifically, under the OSHA Hazard Communication Rule 29CFR 1910.1200, the reason for classifying the product as being hazardous is provided. A "hazardous classification" is triggered by such things as 1) being combustible (flash point 100–200 degrees F), 2) being flammable (flash point less than 100 degrees F), 3) being a skin or an eye irritant, 4) presenting chronic health hazards such as liver damage, nerve damage, etc., 5) listed on the National Toxicology Program (NTP) Annual Report on Carcinogens or found to be a potential carcinogen by the International Agency for Research on Cancer (IARC), 6) or OSHA having an established workplace exposure limit or recommended limits. Threshold Limit Value (TLV) can be

established by either OSHA [OSHA uses the term Permissible Exposure Limit (PEL)], the American Conference of Governmental Industrial Hygienists (ACGIH) or by the chemical manufacturer.

Three categories of TLV's are recognized: 1) the Threshold Limit Value-Time Weighted Average (TLV-TWA) — the time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed day after day, without adverse effect, 2) Threshold Limit Value-Short Term Exposure Limit (TLV-STEL) — the concentration to which workers can be exposed continuously for a short period of time without suffering from a) irritation, b) chronic or irreversible tissue damage, or c) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. A STEL is defined as a 15-minute time-weighted average exposure which should not be exceeded at any time during a workday even if the 8-hour time-weighted average is within the TLV and 4) Threshold Limit Value-Ceiling (TLV-C) — the concentration that should not be exceeded during any part of the working exposure.

We frequently receive questions on the status of our products under other federal environmental laws. For this reason, when applicable, we are providing information on product status under major laws.

1. **OSHA Hazard Communication 29CFR 1910.1200** — These regulations have been discussed previously in this document.
2. **Other OSHA Regulations** — OSHA has established specific regulations for various chemicals. If these regulations apply to our products, the regulation and its applicability is identified.
3. **CERCLA/Superfund 40CFR 117.302** — This Law requires the reporting of spills of certain chemicals when the quantity spilled exceeds certain specified amounts. If Nalco's product contains one of the specified chemicals, the quantity of Nalco product, which must be spilled before the notification requirement is "triggered," is calculated and the chemical is identified.
4. **Toxic Substances Control Act (TSCA)** — Only substances that are included on the TSCA 8(b) Inventory list, have been exempted, or have been cleared through a TSCA premanufacturing notification (PMN) can be legally manufactured and used in the U.S.A. As other sections of TSCA are implemented, other regulations may apply and will be addressed.

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5. *If our product requires registration or governmental clearances* for use in intended applications (examples, pesticides under FIFRA, food additives under FDA, drinking water additives, fuel additives under EPA, use in meat and poultry plants under USDA) the status under the appropriate law is indicated.
6. *Resource Conservation and Recovery Act (RCRA)* — Our products as sold are not wastes and therefore not covered by this Act. However, should someone decide to declare them a waste and discard them, then they must be evaluated to determine how RCRA might cover the waste. This information is provided on our products should they become "a waste." Please refer to comments in Section 3 of this document regarding empty containers.
7. *The Federal Clean Air and Water Acts 40CFR 60 and 61 and 40CFR 401.15 and 116* contain sections which specifically list chemicals for which these regulations apply. If Nalco products contain as ingredients any of the chemicals listed under these sections, they will be identified. This will allow assessment of their impact, if any, on discharge or emission permits.

We also get similar questions regarding the status of our products under state regulations. State laws are becoming more common and it is difficult to cover all the specifics of each state law in this limited space. However, many states (such as Michigan) list those materials which they consider hazardous or use criteria for listing chemicals. Examples of these criteria are the established TLV's by OSHA or ACGIH or the presence of the chemical on a list such as the National Toxicology Program (NTP) Annual Report or International Agency for Research on Cancer (IARC) list for suspect carcinogens. We are identifying those chemicals for which there is an established TLV or that appear on the NTP or IARC lists.

Section 15 — Additional Information

There may be additional information available than what is covered in other sections affecting health, safety and regulation of our product. Section 15 provides space to present this additional information.

Section 16 — User's Responsibility

This section is designed to serve as a reminder that the information provided is of use only if it is transmitted to the persons who handle the product or work in locations where hazardous chemicals are used or stored. The information is developed based on recommended uses for our products. Other applications may warrant additional review.

Section 17 — Bibliography

In addition to this MSDS section description, we may find it of value to know the source material used in evaluating our products other than specific toxicity tests or physical/chemical tests we may have performed. The references below along with this document serve as a brief description of the hazard determination procedure we use in evaluating our products.

Typical Bibliographic Sources Used

- Annual Report on Carcinogens*, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.
- Casarett and Doull's Toxicology, The Basic Science of Poisons*, Doull, J., Klaassen, C. D., and Amdur, M. O., eds., Macmillan Publishing Company, Inc., N.Y., 2nd edition, 1980.
- Chemical Hazards of the Workplace*, Proctor, N. H., and Hughes, J. P., eds., J. P. Lipincott Company, N.Y., 1981.
- Dangerous Properties of Industrial Materials*, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.
- IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man*, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.
- Patty's Industrial Hygiene and Toxicology*, Clayton, G. D., Clayton, F. E., eds., John Wiley and Sons, N.Y., 3rd edition, Vol 2 A-C, 1981.
- Registry of Toxic Effects of Chemical Substances*, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol 1-3, OH, 1984.
- Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).
- Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes*, American Conference of Governmental Industrial Hygienists, OH.



SAL 000007303

G S 3 3 3

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87792

Page: 1

PRODUCT NAME: TRIETHYLENE GLYCOL - TECHNICAL

Effective Date: 08/29/89 Date Printed: 01/26/90

MSDS:000271

1. INGREDIENTS: (% w/w, unless otherwise noted)

Triethylene glycol

CAS# 000112-27-6

99%

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: 545.9F; 286C

VAP PRESS: < 1.0 mmHg @ 20C

VAP DENSITY: 5.18

SOL. IN WATER: Completely miscible

SP. GRAVITY: 1.1 @ 25/25C

APPEARANCE: Colorless liquid.

ODOR: Mild odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 350F; 177C

METHOD USED: PMCC

FLAMMABLE LIMITS

LFL: 0.9%

UFL: 9.2%

EXTINGUISHING MEDIA: Water fog, alcohol resistant foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Wear positive pressure self-contained

(Continued on Page 2)

(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company

SAL 000007304

SHEA013347

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87792

Page: 2

PRODUCT NAME: TRIETHYLENE GLYCOL - TECHNICAL

Effective Date: 08/29/89 Date Printed: 01/26/90

MSDS:000271

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Will ignite in air at 700F.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Oxidizing material.

HAZARDOUS DECOMPOSITION PRODUCTS: Burning produces normal products of combustion, including carbon monoxide, carbon dioxide, and water.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Small spills: Soak up with absorbent material and collect for disposal. Large spills: dike to prevent contamination of waterways, then pump into suitable containers for disposal.

DISPOSAL METHOD: Burn in an approved incinerator in accordance with all local, state, and federal laws and regulations.

6. HEALTH HAZARD DATA:

EYE: Essentially nonirritating to eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. May cause more severe response if skin is abraded (scratched or cut).

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful

(Continued on Page 3)

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MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87792

Page: 3

PRODUCT NAME: TRIETHYLENE GLYCOL - TECHNICAL

Effective Date: 08/29/89 Date Printed: 01/26/90

MSDS:000271

6. HEALTH HAZARD DATA: (CONTINUED)

amounts. The dermal LD50 has not been determined.

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is 16,800-22,060 mg/kg.

INHALATION: No adverse effects are anticipated from inhalation.

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any significant adverse effects. Did not cause cancer in long-term animal studies. Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus. In animal studies, has been shown not to interfere with reproduction.

7. FIRST AID:

EYES: Irrigate immediately with water for at least five minutes.

SKIN: Wash off in flowing water or shower.

INGESTION: Induce vomiting if large amounts are ingested.
Consult medical personnel.

INHALATION: Remove to fresh air if effects occur. Call a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care.
Treatment based on judgment of the physician in response to the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE: AIHA WEEL is 10 mg/m³ for polyethylene glycols.

VENTILATION: Provide general and/or local exhaust ventilation to

(Continued on Page 4)

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MATERIAL SAFETY DATA SHEET

GS 333

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87792

Page: 4

PRODUCT NAME: TRIETHYLENE GLYCOL - TECHNICAL

Effective Date: 08/29/89 Date Printed: 01/26/90

MSDS:000271

8. HANDLING PRECAUTIONS: (CONTINUED)

control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. In misty atmospheres, use an approved mist respirator.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron or full-body suit will depend on operation. If hands are cut or scratched, use impervious gloves even for brief exposures.

EYE PROTECTION: Use safety glasses.

9. ADDITIONAL INFORMATION:

REGULATORY 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

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Practice reasonable care to avoid exposure.

Trace quantities of ethylene oxide (EO) may be present in this product. While these trace quantities could accumulate in headspace areas of storage and transport vessels, they are not

(Continued on Page 5)

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* An Operating Unit of The Dow Chemical Company

SAL 000007307

M A T E R I A L S A F E T Y D A T A S H E E T

CS333

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87792

Page: 5

PRODUCT NAME: TRIETHYLENE GLYCOL - TECHNICAL

Effective Date: 08/29/89 Date Printed: 01/26/90

MSDS:000271

9. ADDITIONAL INFORMATION: (CONTINUED)

expected to create a condition which will result in EO concentrations greater than 0.5 ppm (8 hour TWA) in the breathing zone of the workplace for appropriate applications. OSHA has established a permissible exposure limit of 1.0 ppm 8 hr TWA for EO. (Code of Federal Regulations Part 1910.1047 of Title 29).

MSDS STATUS: Revised Sections 6 and 8.

(R) Indicates a Trademark of The Dow Chemical Company
The Information Herein Is Given In Good Faith, But No Warranty,
Express Or Implied, Is Made. Consult The Dow Chemical Company
For Further Information.

* An Operating Unit of The Dow Chemical Company

SAL 000007308

COASTAL CHEMICAL COMPANY, INC.
P.O. BOX 820
ABBEVILLE, LA 70511-0820

65333

CONOCO, INC.
ATTN: SAFETY DIRECTOR
P O BOX 4000
ATTN: PURCHASING DEPT
PONCA CITY, OK. 74603

2/23/90

RE OUR INV. # 37099

DEAR CUSTOMER:

THE ATTACHED MATERIAL SAFETY DATA SHEET FOR THE PRODUCT OUR RECORDS INDICATE THAT YOU HAVE PURCHASED OR MAY PURCHASE FROM COASTAL CHEMICAL COMPANY, INC. HAS BEEN CAREFULLY PREPARED IN AN EFFORT TO MEET THE WORKERS' RIGHT-TO-KNOW LAWS AND TO PROVIDE INFORMATION NECESSARY TO YOUR EMPLOYEE SAFETY TRAINING PROGRAM. PLEASE REVIEW ALL OF THE INFORMATION ON THIS SHEET WITH ALL INDIVIDUALS THAT WILL FORESEEABLY COME INTO CONTACT WITH THIS PRODUCT. IT SHOULD BE RECOGNIZED THAT PERSONS AT OTHER LOCATIONS WHO MAY COME INTO CONTACT WITH THIS PRODUCT HAVE THE 'RIGHT-TO-KNOW'. THEREFORE, IT IS VERY IMPORTANT THAT THIS INFORMATION REACH ALL INDIVIDUALS WHO WILL DIRECTLY OR INDIRECTLY COME INTO CONTACT WITH THIS PRODUCT, INCLUDING YOUR CUSTOMERS.

IT IS COASTAL CHEMICAL CO., INC.'S POLICY TO CONSTANTLY REVIEW ITS LABELS FOR COMPLETENESS AND COMPLIANCE WITH VARIOUS LAWS, ORDINANCES, RULES AND REGULATIONS. IF YOU REPACKAGE THIS PRODUCT, YOU MUST PASS THIS INFORMATION ON TO YOUR CUSTOMERS AND THEIR EMPLOYEES. IF THE PRODUCT IS COMBUSTIBLE OR FLAMMABLE, SPECIAL WARNING LABELS MUST BE AFFIXED TO THE CONTAINERS. YOU SHOULD ALSO ADVISE YOUR CUSTOMERS AND THEIR EMPLOYEES OF THE POTENTIAL HAZARDS OF THE EMPTY CONTAINERS. 'EMPTY' CONTAINERS ARE THOSE THAT CONTAINED PRODUCT AND HAVE NOT BEEN PROFESSIONALLY CLEANED AND RECONDITIONED. 'EMPTY' CONTAINERS SHOULD NOT BE USED FOR ANY PURPOSE SINCE THEY MAY CONTAIN EXPLOSIVE VAPORS. ALL CONTAINERS, INCLUDING EMPTY OR PARTIALLY EMPTY CONTAINERS, SHOULD BE STORED IN A SECURE AREA AWAY FROM ALL HEAT, SPARK, FLAME, OR OTHER IGNITABLE SOURCE.

IF YOU ARE NOT THE PERSON RESPONSIBLE FOR THE SAFE HANDLING OF THIS PRODUCT, PLEASE FORWARD THIS INFORMATION TO THE APPROPRIATE INDIVIDUAL.

THANKING YOU FOR YOUR BUSINESS, WE REMAIN SINCERELY,

JIM DOYLE, PRESIDENT

PRODUCT: TPIETHYLENE GLYCOL

SAL 000007309



GS 449

MATERIAL SAFETY DATA SHEET

97367 (4-85)

MSDS NUMBER ▶

7,150-9

PAGE 1

24 HOUR EMERGENCY ASSISTANCE			GENERAL MSDS ASSISTANCE		
SHELL: 713-473-9461 CHEMTREC: 800-424-9300			SHELL: 713-241-4819		
ACUTE HEALTH + 1	FIRE 2	REACTIVITY 0	HAZARD RATING	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4	BE SAFE READ OUR PRODUCT SAFETY INFORMATION ...AND PASS IT ON (PRODUCT LIABILITY LAW REQUIRES IT)
*For acute and chronic health effects refer to the discussion in Section III					

SECTION I	NAME
PRODUCT ▶	NEODENE(R) 12 ALPHA OLEFIN
CHEMICAL NAME ▶	DODECENE-1
CHEMICAL FAMILY ▶	LINEAR ALPHA OLEFIN
SHELL CODE ▶	31921

SECTION II-A

PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	NEODENE 12 ALPHA OLEFIN	MIXTURE	100
1	C10 AND BELOW	872-05-9	<2
2	C12	112-41-4	97
3	C14 AND ABOVE	64743-02-8	<2

SECTION II-B

ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NONE ESTABLISHED		

SECTION III

HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT

BASED ON ESSENTIALLY SIMILAR PRODUCT TESTING, PRODUCT IS MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT

BASED ON ESSENTIALLY SIMILAR PRODUCT TESTING, PRODUCT IS SLIGHTLY IRRITATING TO THE SKIN. PROLONGED OR REPEATED LIQUID CONTACT CAN RESULT IN DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION

THIS PRODUCT IS PRESUMED TO HAVE A LOW ORDER OF ACUTE INHALATION TOXICITY.

INGESTION

BASED ON ESSENTIALLY SIMILAR PRODUCT TESTING, PRODUCT IS SLIGHTLY TOXIC, BUT INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS.

SAL 000007310

SHEAR 14180

GS 449

PRODUCT NAME: NEODENE(R) 12 ALPHA OLEFIN

MSDS 7,150-B
PAGE 2

SIGNS AND SYMPTOMS

IRRITATION AS NOTED ABOVE. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS

PREEXISTING SKIN AND EYE DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

SECTION IV

OCCUPATIONAL EXPOSURE LIMITS

NO.	OSHA PEL/TWA	OSHA PEL/CEILING	ACGIH TLV/TWA	ACGIH TLV/STEL	OTHER
-----	--------------	------------------	---------------	----------------	-------

P*

*SHELL INTERNAL STANDARD - 100 PPM

SECTION V

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN.

SKIN CONTACT

REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT RESUE CLOTHING UNTIL CLEANED.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.*

NOTE TO PHYSICIAN

*IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI

SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SAL 000007311

SECTION VII

PHYSICAL DATA

BOILING POINT: 401-415
(DEG F)

SPECIFIC GRAVITY: 0.764
(H2O=1)

VAPOR PRESSURE: 0.155@75 DEG F
(MM HG)

MELTING POINT: NOT AVAILABLE
(DEG F)

SOLUBILITY: SLIGHT
(IN WATER)

VAPOR DENSITY: 5.8
(AIR=1)

PRODUCT NAME: NEODENE(R) 12 ALPHA OLEFIN

G S 4 4 9

MSDS
PAGE

7,150-9
3

EVAPORATION RATE (N-BUTYL ACETATE = 1):

APPEARANCE AND ODOR:
COLORLESS LIQUID. MILD HYDROCARBON ODOR.

SECTION VIII

FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
168 DEG F SETAFLASH

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

EXTINGUISHING MEDIA

USE WATER FOG, FOAM, DRY CHEMICAL OF CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

CAUTION. COMBUSTIBLE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS

CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION IX

REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID CONTACT WITH OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS

CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

SECTION X

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING

AVOID CONTACT WITH EYES. WEAR SAFETY GLASSES OR GOGGLES AS APPROPRIATE. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT.

ADDITIONAL PROTECTIVE MEASURES

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

SECTION XI

ENVIRONMENTAL PROTECTION

SAL 000007312

SPILL OR LEAK PROCEDURES

CAUTION. COMBUSTIBLE. SPILLED MATERIAL IS SLIPPERY. *** LARGE SPILLS *** ELIMINATE POTENTIAL SOURCES OF IGNITION. WEAR APPROPRIATE RESPIRATOR AND OTHER PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS AND SEAL TIGHTLY FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTION AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL.

G S 4 4 9

PRODUCT NAME: NEODENE(R) 12 ALPHA OLEFIN

MSDS 7,150-9
PAGE 4

SECTION XII

SPECIAL PRECAUTIONS

KEEP LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE.

WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDRER CONTAMINATED CLOTHING BEFORE REUSE.

SECTION XIII

TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
COMBUSTIBLE LIQUID

D.O.T. PROPER SHIPPING NAME:
PETROLEUM OIL, N.O.S.

OTHER REQUIREMENTS:
D.O.T. ID.# = NA 1270. GUIDE SHEET 27.

SECTION XIV

OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE EDS SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV

SPECIAL NOTES

SECTION XI - ENVIRONMENTAL PROTECTION HAS BEEN REVISED. THE INFORMATION IN THE "WASTE DISPOSAL" AND "ENVIRONMENT PROTECTION" HAS BEEN REMOVED AND INCLUDED IN THE ATTACHED ENVIRONMENTAL DATA SHEET. IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE EDS SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS. CHANGE FROM PREVIOUS REVISION: FLASH POINT CHANGE FROM 168 DEG. F PMCC TO 168 DEG. F SETAFLASH.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: JULY 14, 1989

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

J. C. WILLETT

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

SAL 000007313



G S 4 4 9

ENVIRONMENTAL DATA SHEET

EDS NUMBER ► 7,150-2

PAGE 1

57449 (9-87)

PRODUCT ► NEODENE(R) 12 ALPHA OLEFIN

PRODUCT
CODE ► 31921

SECTION I

PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	NEODENE 12 ALPHA OLEFIN	MIXTURE	100
1	C10 AND BELOW	872-05-9	<2
2	C12	112-41-4	97
3	C14 AND ABOVE	64743-02-8	<2

SECTION II

SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)
-----	----------------------	-----------------------	-----------------	----------------------	----------------------------

P

H-1, P-3

FOOTNOTES

- *1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
- *2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
- *3 = TOXIC CHEMICAL, SEC 313
- *4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C). MUST BE USED ON TOXIC RELEASE INVENTORY FORM
- *5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
 - HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
 - PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
 - P-5 = REACTIVE HAZARD

SECTION III

ENVIRONMENTAL RELEASE INFORMATION

SECTION IV

RCRA INFORMATION

PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

SAL 000007314

G S 4 4 9

PRODUCT NAME: NEODENE(R) 12 ALPHA OLEFIN

EDS 7,150-2
PAGE 2

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: FEBRUARY 05, 1990

SHELL OIL COMPANY
ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

SAL 000007315



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS582

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: TRI-ACT 1800 INHIBITOR

DESCRIPTION: An aqueous solution of amines

NFPA 704M/HMIS RATING: 3/3 HEALTH 2/2 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Cyclohexylamine	108-91-8	10-20
Ethanolamine	141-43-5	10-20
Methoxypropylamine	5332-73-0	10-20

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: Causes burns to skin and eyes. Combustible. Do not get in eyes, on skin, or on clothing. Wear goggles and face shield and rubber gloves when handling. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.

INGESTION: Do not induce vomiting. Give water. Call a physician at once.

INHALATION: Remove to fresh air. Treat symptoms. Call a physician at once.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 4 FIRST AID INFORMATION

(CONTINUED)

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

SKIN CONTACT: Corrosive to the skin, possibly resulting in third degree burns depending on the length of exposure and on the first aid action given. Can cause allergic contact dermatitis in susceptible individuals.

INGESTION: Can be harmful or fatal.

INHALATION: Can be corrosive to the mucous membranes and the lungs. Can cause an allergic reaction in susceptible individuals.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have been conducted on this product along with acute toxicity studies on the hazardous ingredient(s) in Section 2. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS):

LD₅₀ = 1267 mg/kg

95% Confidence Limit = 1,047 to 1,532 mg/kg

COMMENTS: Excessive salivation, squinting of the eyes, loss of muscular coordination, prostration and irregular breathing were observed.

ACUTE DERMAL TOXICITY (ALBINO RABBITS):



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

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SECTION 6 TOXICOLOGY INFORMATION

(CONTINUED)

LD₅₀ = Greater than 2,000 mg/kg

COMMENTS: Redness, swelling, and blanching of the skin were noted. Scab formation was due to the corrosive action of the product. However, no systemic signs of toxicity were observed.

SKIN SENSITIZATION: Cyclohexylamine can cause sensitization in susceptible individuals.

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING: Corrosive

COMMENTS: Severe redness, swelling, and blistering of the conjunctiva were observed. Opacification of the cornea was also noted. Due to the extreme corrosive action of the test material, no Draize index rating could be assigned.

OTHER TOXICITY RESULTS: Cyclohexylamine. A battery of tests including the Ames test, sister chromatid exchange, cell transformation, mouse lymphoma and rat hepatocyte/DNA repair provided inconclusive evidence of mutagenic activity.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Colorless	FORM: Liquid	ODOR: Amine
DENSITY:	8.2 lbs/gal.	
SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	0.99 @ 77 Degrees F	ASTM D-1298
pH (NEAT) =	12.6	pH (at 1%) 11.2
VISCOSITY:	5 cps @ 77 Degrees F	ASTM E-70
FREEZE POINT:	8 Degrees F	ASTM D-2983
FLASH POINT:	135 Degrees F (PMCC)	ASTM D-1177
		ASTM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: 135 Degrees F (PMCC) ASTM D-93

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 8 FIRE AND EXPLOSION INFORMATION

(CONTINUED)

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NO_x under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: N-nitrosamines, many are cancer causing agents to laboratory animals, may be formed when certain amines are mixed with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations.

Avoid contact with strong acids (eg. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) which can generate heat, splattering or boiling and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, NO_x may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent respirator is recommended.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors or mists may be released.

PROTECTIVE EQUIPMENT: Wear gloves, boots, apron and a face shield with chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.). A full slicker suit is recommended if gross exposure is possible.

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

G S 5 8 2

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

DISPOSAL: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under the Resources Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous Waste D001 & D002.

As a hazardous liquid waste, it must be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to a licensed industrial waste landfill (Hazardous Waste Treatment, Storage and Disposal facility). A hazardous liquid waste can also be incinerated in accordance with local, state, and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - CORROSIVE LIQUID, N.O.S.
CORROSIVE MATERIAL UN 1760
CONTAINS - CYCLOHEXYLAMINE

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

Cyclohexylamine - Corrosive, combustible
Ethanolamine - Corrosive, combustible
Methoxypropylamine - Corrosive, combustible

Cyclohexylamine = TWA 10 ppm, 41 mg/m³ ACGIH/TLV
Ethanolamine = TWA 3 ppm, STEL 6 ppm ACGIH/TLV
7.5 mg/m³ 15 mg/m³ ACGIH/TLV

Cyclohexylamine = TWA 10 ppm, 40 mg/m³ OSHA/PEL
Ethanolamine = TWA 3 ppm, STEL 6 ppm OSHA/PEL
8 mg/m³ 15 mg/m³ OSHA/PEL

Methoxypropylamine = TWA 10 ppm, 20 ppm (15 minute exposure) TLV
Weel Guidelines

CERCLA/SUPERFUND, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product contains cyclohexylamine, which is listed in Appendix A and B
as an Extremely Hazardous Substance. The statutory threshold planning
quantity for this substance is 10,000 pounds.

A release of 10 pounds of product will require a notification to your State
Emergency Response Commission.

You may also be required to notify the NATIONAL RESPONSE CENTER - See
CERCLA/SUPERFUND, above.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found this product to be hazardous. The product
should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
-- Delayed (chronic) health hazard
XX Fire hazard
-- Sudden release of pressure hazard
-- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local
emergency planning commission, state emergency response commission and local



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

G S 5 8 2

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does meet the criteria of a hazardous waste as defined under RCRA 40 CFR 261 (consult Section 11).

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15

(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):

None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product contains the following ingredients covered by the Clean Air Act:

Ethanolamine - Section 111

Cyclohexylamine - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:

The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Cyclohexylamine 108-91-8



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

Ethanolamine	141-43-5
Methoxypropylamine	5332-73-0
Water	7732-18-5

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.

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REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983



MATERIAL SAFETY DATA SHEET

PRODUCT TRI-ACT 1800 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 17 BIBLIOGRAPHY

(CONTINUED)

supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 04/03/90

DATE PRINTED: 04/07/90

SAL 000007324

PAGE 9 OF 9

G S 5 8 2



MATERIAL SAFETY DATA SHEET

PRODUCT

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SAL 000007325

G S 0 6 4

Betz Laboratories, Inc.
4636 Somerton Road, Trevose, Pa. 19047
Betz Material Safety Data Sheet
24 Hour Emergency Telephone (Health or Accident) 215/355-3300

REAGENT : HARDNESS INDICATOR

CODE 290

EFFECTIVE DATE 05-18-89

PRINTED: 04/06/90

REVISIONS TO SECTIONS: 3

REAGENT APPLICATION : FIELD TEST REAGENT

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC REAGENT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY OSHA REGULATIONS.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: NO DATA	ODOR: NONE
FL.PT.(DEG.F): NA	SP.GR.(70F)OR DENSITY: NA
VAPOR PRESSURE(mmHG): NA	VAPOR DENSITY(AIR=1): NA
VISC cps70F: NA	%SOLUBILITY(WATER): 100
EVAP.RATE: NA WATER=1	APPEARANCE: BLACK
PHYSICAL STATE: POWDER	FREEZE POINT(DEG.F): NA

-----SECTION 3-----REACTIVITY DATA-----

TABLE. BETZ TANK CLEAN-OUT CATEGORY 'A'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000007326
JUN 009886

MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

AGENT: HARDNESS INDICATOR

-SECTION 4-----HEALTH HAZARD EFFECTS-----
 ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
 SLIGHTLY IRRITATING TO THE SKIN
 ACUTE EYE EFFECTS ***
 MODERATELY IRRITATING TO THE EYES
 ACUTE RESPIRATORY EFFECTS ***
 DUSTS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT
 CHRONIC EFFECTS OF OVEREXPOSURE***
 NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.
 MEDICAL CONDITIONS AGGRAVATED ***
 NOT KNOWN

SYMPTOMS OF EXPOSURE ***
 MAY CAUSE EYE, SKIN, AND/OR RESPIRATORY TRACT IRRITATION.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***
 REMOVE CLOTHING. WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER
 FOR 15 MIN. IMMEDIATELY CONTACT PHYSICIAN
 EYE CONTACT***
 IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A
 PHYSICIAN FOR ADDITIONAL TREATMENT
 INHALATION EXPOSURE***
 REMOVE VICTIM FROM CONTAMINATED AREA. APPLY NECESSARY FIRST AID
 TREATMENT. IMMEDIATELY CONTACT A PHYSICIAN.
 INGESTION***
 GENERAL-DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
 SPECIFIC- DILUTE CONTENTS OF STOMACH. INDUCE VOMITING BY ONE OF THE STANDARD
 METHODS. IMMEDIATELY CONTACT A PHYSICIAN

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***
 GENERAL-VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. SWEEP
 UP AND PLACE IN WASTE DISPOSAL CONTAINER.
 SPECIFIC- FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD
 SAND/GRIT.
 DISPOSAL INSTRUCTIONS***
 GENERAL-WATER CONTAMINATED WITH THIS REAGENT MAY BE SENT TO A SANITARY
 SEWER, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A TREATMENT FACILITY OR
 DISCHARGED UNDER A NPDES PERMIT
 REAGENT (AS IS)- INCINERATE OR BURY IN APPROVED LANDFILL
 FIRE EXTINGUISHING INSTRUCTIONS***
 FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING
 APPARATUS (FULL FACE-PIECE TYPE). PROPER FIRE EXTINGUISHING MEDIA:
 DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER

MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

REAGENT: HARDNESS INDICATOR

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
 USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
 RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
 VENTILATION PROTECTION***

ADEQUATE VENTILATION
 RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT REAGENT EXPOSURE IS LIKELY,
 USE A RESPIRATOR WITH DUST/MIST FILTERS.
 RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES
 WASH OFF AFTER EACH USE. REPLACE AS NECESSARY
 RECOMMENDED EYE PROTECTION***
 AIRTIGHT CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----
 STORAGE INSTRUCTIONS***
 KEEP CONTAINER CLOSED WHEN NOT IN USE.
 KEEP DRY

HANDLING INSTRUCTIONS***
 NORMAL CHEMICAL HANDLING

 THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
 HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
 EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
 ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
 ...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
 NOT APPLICABLE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE
 IDENTIFICATION NUMBER IS: NOT APPLICABLE

...DOT HAZARD/UN#/ER GUIDE# IS: NOT APPLICABLE

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
 CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: PRODUCT IS NONHAZARDOUS UNDER SECTION 311/312

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

NFPA/HMIS : HEALTH - 1 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

GS064

Betz Industrial Division
4636 Somerton Road
Trevose, Pa. 19047

04/06/90

3143 CONOCO INC.
REFINERY WAREHOUSE
1000 SOUTH PINE
PONCA CITY

OK 74603

Attention: Plant Manager/
Safety Officer/Industrial Hygienist

Re: Material Safety Data Sheets (MSDS):
Osha Hazard Communication Standard

Dear Customer:

Thank you for your recent order of a Betz Reagent(s). The OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) requires that all manufacturers/suppliers of chemicals, send material safety data sheets (MSDS) to their customers with or prior to the receipt of those chemicals by the user. In compliance with this standard you will find enclosed, MSDS for the Betz reagent(s) you recently ordered. The standard requires that personnel who may come into contact with these products be appraised of any hazards that may be associated with these reagent(s), therefore please route this information to the correct areas within your organization.

Should you have and questions about the contents of these MSDS, please contact Hal Hersh at 215-953-2442.

Betz is fully committed to the stewardship of its many product lines and to the full disclosure of any health or environmental hazards they may contain. The protection of health and safety in the workplace and surrounding community, and the protection of the environment in which we all live and work requires dedication and team effort. Betz appreciates being part of your team and will ever strive to be equal to the trust you have placed in us.

Very Truly Yours,

F. S. Spoerle
Vice President Engineering
Betz Industrial Division

SAL 000007329



MATERIAL SAFETY DATA SHEET

EMERGENCY PHONE (504) 344-7147 **G S 1 6 8**

78.0.1

PRODUCT IDENTIFICATION

TRADE NAME: "ETHYL" MMT[™]

CHEMICAL NAME: Methylcyclopentadienyl Manganese Tricarbonyl

CHEMICAL FAMILY: Organometallic

CHEMICAL FORMULA: $C_5H_5Mn_3$

CAS NO.: 12108-13-3

SUMMARY OF HAZARDS

COMBUSTIBLE.

Toxic by inhalation, skin absorption and ingestion.

See "Chronic Effects of Overexposure".

See "Other Health Effects".

HAZARDOUS COMPONENTS

	<u>NOTE+</u>	<u>CAS NO.</u>	<u>EXPOSURE LIMIT</u>
Methylcyclopentadienyl Manganese Tricarbonyl	NL	12108-13-3	0.2 mg/M ³ (as Mn) TWA ₈ (skin) (ACGIH).

+NOTE: Carcinogenicity listing of components at concentrations greater than or equal to 0.1% indicated by:

@ = NTP; # = IARC; & = OSHA; * = Other; NL = Not Listed.

+NOTE: Carcinogenicity Listing indicated by: @=NTP; #=IARC; &=OSHA; *=Other; NL=Not Listed.

CHEMICAL & PHYSICAL PROPERTIES

APPEARANCE/ODOR: Orange liquid/pleasant herbaceous odor.

BOILING POINT: 232°C/450°F.

VAPOR PRESSURE mm Hg (@ 20°C/68°F): 0.05

SOLUBILITY IN WATER: 10 ppm (@ 20°C/68°F).

SPECIFIC GRAVITY: 1.38

SAL 000007330

SHCA 002199

FIRE & EXPLOSION HAZARDS

FLASH POINT (METHOD):	83°C/182°F (TCC).
FLAMMABLE LIMITS:	Not established.
EXTINGUISHING MEDIA:	Dry chemical, water spray (fog), foam or carbon dioxide.
HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:	Include oxides of carbon and manganese
SPECIAL FIRE FIGHTING PROCEDURES:	Do not breathe smoke or vapors.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	None known.

REACTIVITY DATA

STABILITY:	Stable.
CONDITIONS TO AVOID:	Exposure to extreme heat or open flame.
MATERIALS TO AVOID:	None known.
HAZARDOUS POLYMERIZATION:	Will not occur.

HEALTH HAZARDS

INHALATION:	Expected to be toxic.
SKIN ABSORPTION:	Expected to be toxic.
INGESTION:	Expected to be toxic.
CHRONIC EFFECTS OF OVEREXPOSURE:	A 90-day chronic inhalation study of MMT indicated that 3 mg/M³ of MMT showed detectable effects in mice. The lungs appear to be the organ most sensitive to MMT both acutely and chronically. Metabolism studies of MMT indicate it is excreted through the urine. Oxidation of the methyl group to the alcohol or acid reduces the toxicity of the compound and aids in its excretion.
OTHER HEALTH EFFECTS:	MMT may cause central nervous system stimulation.

65168

HEALTH HAZARDS - Continued

TOXICITY DATA:

ORAL LD₅₀ (rat) = 58 mg/kg.DERMAL LD₅₀ (rabbit) = 618 mg/kg.INHALATION LC₅₀ = 220-247 mg/M³/1h.EMERGENCY FIRST AID PROCEDURES

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT:

Begin immediate eye irrigation with cool water.

SKIN CONTACT:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION:

Induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Get medical attention.

EXPOSURE CONTROL INFORMATION

EXPOSURE LIMITS:

See "Hazardous Components" section.

EYE PROTECTION:

Chemical goggles.

PROTECTIVE GLOVES:

Resistant to chemical penetration.

RESPIRATORY PROTECTION:

NIOSH approved organic vapor respirator. In emergency situations, NIOSH approved self contained breathing apparatus (SCBA).

LOCAL VENTILATION:

At source of vapors.

MECHANICAL VENTILATION:

Recommended.

OTHER:

If skin contact or contamination of clothing is likely, protective clothing should be worn.

45168

TRADE NAME: "ETHYL" MMT

ENVIRONMENTAL PROTECTION

SPILLS OR LEAKS: Eliminate sources of ignition. Ventilate area. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Take up small spills with dry chemical absorbent. Large spills may be taken up with pump or vacuum and finished off with dry chemical absorbent. May require excavation of contaminated soil.

DISPOSAL METHODS: Under the CERCLA/RCRA regulations in effect December 29, 1986, this material is not regulated as a hazardous waste or material. Therefore, it may be disposed of as an industrial waste in a manner acceptable to good waste management practice and in compliance with applicable local, state and federal regulations.

MMT liquids should be used in product blending or disposed, preferably by incineration, in an approved facility. Spill residues may be disposed of in a secure chemical landfill.

STORAGE REQUIREMENT: Store in well-ventilated, cool, dry area. Close container when not in use.

ADDITIONAL PRECAUTIONS OR COMMENTS

For information on the disposal of contaminated soil, contact your local Ethyl representative. All containers and equipment that have been in contact with MMT should be decontaminated by rinsing with a solvent such as kerosene, diesel fuel or light fuel oil and followed by thorough washings with soap and water. All rinsate should be contained, recovered and disposed of as hazardous waste. If absorbent material (e.g. wood) becomes soaked with MMT, it should be removed and disposed of as hazardous waste.

REVISED: 09/22/88

SUPERCEDES: 08/06/87

MSDS prepared by: Ethyl Corporation, Health and Environment Department

FOR ADDITIONAL NON-EMERGENCY MSDS INFORMATION, CONTACT: ETHYL CORPORATION
HEALTH & ENVIRONMENT DEPARTMENT
451 FLORIDA STREET
BATON ROUGE, LA 70801
(504) 388-7717

FOR ALL OTHER NON-EMERGENCY INFORMATION, CONTACT YOUR LOCAL ETHYL SALES REPRESENTATIVE.

THIS MATERIAL SAFETY DATA SHEET CONTAINS AT LEAST THE INFORMATION REQUIRED BY THE FEDERAL OSHA HAZARD COMMUNICATION RULE, COMM 29 CFR 1910.1200 (g) (2).

SAL 000007333

GS168

TRADE NAME: ... MMT

ADDENDUM TO MSDS DATED: 1/1/89

MSDS ADDENDUM

Regulatory Information

SARA Title III, Section 313

This sheet has been prepared as a supplement to the Ethyl Corporation Material Safety Data Sheet. According to 40 CFR, Part 372, Subpart C, it must remain with the MSDS and all copies thereof. DO NOT DETACH!

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

<u>COMPONENT</u>	<u>CAS NUMBER</u>	<u>PERCENTAGE</u>
Methylcyclopentadienyl manganese tricarbonyl	12108-13-3	100

2319E

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EXPLANATION OF MATERIAL SAFETY DATA SHEET TERMINOLOGY

GS168

PRODUCT IDENTIFICATION

TRADE NAME AND SYNONYMS

The name under which the product is sold and common synonyms.

CHEMICAL NAME AND FORMULA

Chemical descriptive name and the chemical formula.

CAS NO.

Chemical Abstract Service Registry number which identifies the product.

SUMMARY OF HAZARDS

Emphasizes major hazard(s) associated with the product. Further details are provided in subsequent sections.

COMPONENTS

COMPONENT NAME

Chemical, generic, or proprietary name that identifies the product or components of a mixture. Inclusion of a component is not necessarily based on hazard criteria.

EXPOSURE LIMIT

The airborne concentration at which most workers can be exposed without any expected adverse effects. Source may be Ethyl guideline, ACGIH TLV (Threshold Limit Value), or OSHA PEL (Permissible Exposure Limit).

TYPES OF EXPOSURE LIMITS

TWA - the time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

STEL (Short-Term Exposure Limit) - 15 minute time-weighted average exposure which should not be exceeded at any time during a workday even if the 8-hour time-weighted average is within the TLV.

CEILING - the concentration that should not be exceeded during any part of the working exposure.

Peak - The maximum concentration and duration of exposure allowable above the ceiling concentration for an 8-hour shift.

ACGIH - American Conference of Governmental Industrial Hygienists.

OSHA - Occupational Safety and Health Administration.

NIOSH - National Institute of Occupational Safety and Health.

CARCINOGENICITY LISTING

Indicates whether a component is thought to be a cancer hazard based on human experience and animal data.

NTP - National Toxicology Program.

IARC - International Agency for Research on Cancer.

Other - May include preliminary data or studies not yet evaluated by the major agencies. Also includes ACGIH and NIOSH listings.

CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE/ODOR

Description of material at normal temperature and pressure that may be useful in identifying the presence of the product.

BOILING POINT

The temperature at which the vapor pressure of the liquid is equal to the pressure of the atmosphere.

MELTING POINT (FREEZING POINT)

Temperature at which a substance changes from the solid to liquid state.

VAPOR PRESSURE

The pressure exerted at any temperature by a vapor existing in equilibrium with its liquid or solid phase.

SOLUBILITY IN WATER

The amount of the product, by weight, that will dissolve in a given weight

of water at a specified temperature.

	grams/100 H ₂ O
Negligible	< 0.1
Slight	0.1 - 1.0
Moderate	1 - 10
Appreciable	< 10
Complete	Soluble in all proportions

SPECIFIC GRAVITY

Ratio of the weight of a volume of the product to the weight of an equal volume of water (liquids/solids) or air(gases).

EVAPORATION RATE

Ratio of the rate of vaporization of the product to the rate of a known material.

PERCENT VOLATILES

The percentage of the product (liquid or solid) that will evaporate at ambient temperature.

POUR POINT

The lowest temperature at which a liquid will flow when the container is inverted.

VISCOSITY

A measure of flow characteristics of a liquid, expressed in units called Centistokes (cSt).

FIRE AND EXPLOSION HAZARDS

FLASH POINT (CLOSED CUP METHOD)

Lowest temperature at which the product will give off enough vapor to ignite.

FLAMMABLE LIMITS

Range of vapor concentration (percent by volume in air) which will burn or explode in the presence of spark or flame. LEL is the lower explosive limit and UEL is the upper explosive limit.

EXTINGUISHING MEDIA

The fire fighting agents which are recommended for use.

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HAZARDOUS THERMAL DECOMPOSITION PRODUCTS
Known hazardous products resulting from heating or burning the compound.

SPECIAL FIREFIGHTING PROCEDURES

General firefighting procedures of chemical fires are not described, but special procedures are given, if required.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Hazards not covered by other sections of the MSDS pertaining to chemical reactions in the presence of heat and/or fire.

REACTIVITY DATA

STABILITY

Indicates the susceptibility of the product to dangerous decomposition.

CONDITIONS AND MATERIALS TO AVOID

Gives the conditions and materials that may cause undesirable reactions or instability of the product.

HAZARDOUS DECOMPOSITION PRODUCTS

Describes the hazardous materials produced from a chemical reaction.

HAZARDOUS POLYMERIZATION

Indicates the tendency of the product's molecules to combine in a violent reaction.

HEALTH HAZARDS

Gives the immediate effects of overexposure to the product by skin or eye contact, breathing vapors or dust, and ingestion. Common symptoms which may occur from exposure to the product are given.

CHRONIC EFFECTS

Refers to the effects that may occur after repeated or prolonged overexposure to the product.

OTHER HEALTH EFFECTS

Includes medical conditions which may be aggravated by exposure to the product.

TOXICITY

Gives numerical results from animal tests on the product. LD₅₀ or LC₅₀ is the dose level that kills half⁵⁰ of the animals tested.

EMERGENCY FIRST AID

Gives emergency and first aid instructions for treating overexposure by inhalation, ingestion, and skin and eye contact.

NOTE TO PHYSICIAN

May give any contraindicated treatment for a licensed health care professional to conduct.

EXPOSURE CONTROL INFORMATION

EYE PROTECTION

Specification of eyes or face protection beyond normal use of safety glasses.

PROTECTIVE GLOVES

Indicates the need for protective gloves when skin contact may occur.

RESPIRATORY PROTECTION

Specification of the type of respirator recommended for use during routine or emergency situations.

VENTILATION

Specification of the type (local/general) of ventilation recommended to capture contaminants or prevent the build-up of hazardous atmospheres.

OTHER

Specification of other recommended personal protective equipment based on type and degree of hazard.

ENVIRONMENTAL PROTECTION

SPILLS AND LEAKS

Indicates special precautions for clean-up of spills and leaks and preparation of chemical for disposal.

DISPOSAL METHOD

Tells the EPA classification of the product as well as the proper disposal procedure.

EPA

Environmental Protection Agency

RQ

Reportable Quantity - The amount of the product or one of its components that, when spilled, must be reported to the EPA and possibly other regulatory agencies.

RCRA - Resource Conservation and Recovery Act.

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act.

STORAGE REQUIREMENTS

Any unusual requirements or precautions for storage of the product.

ADDITIONAL PRECAUTIONS OR COMMENTS

States or re-emphasizes any special precautions or handling requirements.

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, Ethyl Corporation 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 safety and suitability for their purposes prior to use. In no event will Ethyl Corporation be responsible for damages of any nature whatsoever resulting from the use or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

GS236

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 5151 CORROSION INHIBITOR

DESCRIPTION: An aqueous solution of alkyl primary amine and alkanolamine compounds

NFPA 704M/HMIS RATING: 3/3 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER*
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX.%
Methoxypropylamine	5332-73-0	10-20
Monoethanolamine	141-43-5	40+

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: Causes burns to skin and eyes. Do not get in eyes, on skin, or on clothing. Wear goggles and face shield when handling. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.

INGESTION: Do not induce vomiting. Give water. Call a physician.

INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

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MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 4 FIRST AID INFORMATION

(CONTINUED)

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation *

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given. *

SKIN CONTACT: Corrosive to skin with possible permanent damage depending on length of exposure. Can cause allergic contact dermatitis in susceptible individuals. *

INGESTION: Can be harmful or fatal. *

INHALATION: Can be corrosive to the mucous membranes and the lungs. *

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions. *

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but toxicity studies of the ingredient(s) in Section 2 have been reviewed. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS):

Methoxypropylamine LD₅₀ = 750 mg/kgMonoethanolamine LD₅₀ = 2,100 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS):

Methoxypropylamine LD₅₀ = 2,600 mg/kgMonoethanolamine LD₅₀ = 1,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING:

6.6/8.0 Corrosive - Methoxypropylamine

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING:

104/110.0 Extremely irritating - Methoxypropylamine

SKIN SENSITIZATION: Skin sensitization expected.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 6 TOXICOLOGY INFORMATION

(CONTINUED)

OTHER TOXICITY RESULTS: Methoxypropylamine. Bacterial mutagenicity bioassay (Ames) negative.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Colorless	FORM: Liquid	ODOR: Amine
DENSITY: 8.5 lbs/gal.		
SOLUBILITY IN WATER: Completely		
SPECIFIC GRAVITY: 1.02 @ 60 Degrees F		ASTM D-1298
pH (NEAT) = 11.4		ASTM E-70
VISCOSITY: 42 SUS @ 100 Degrees F		ASTM D-2983
POUR POINT: Less than -30 Degrees F		ASTM D-97
BOILING POINT: Greater than 200 Degrees F @ 760 mm Hg		ASTM D-86
FLASH POINT: None		

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: Ammonia, CO, CO₂ may be evolved under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: N-nitrosamines, many are cancer causing agents to laboratory animals, may be formed when certain amines are mixed with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations.

FEEDING EQUIPMENT: Do not use with copper, brass, aluminum or bronze, rubber, neoprene, polyurethane, Buna-N or ethylene propylene.

Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 9 REACTIVITY INFORMATION

(CONTINUED)

Avoid contact with strong acids (eg. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) which can generate heat, splattering or boiling and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, NO_x may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent respirator is recommended.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, mists or aerosols may be released.

PROTECTIVE EQUIPMENT: Wear gloves, boots, apron and a face shield with chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.). A full slicker suit is recommended if gross exposure is possible.

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

Keep the spill away from heat, sparks, flames and welding operations. Ventilate area and evacuate employees from exposure if the airborne concentration exceeds the TLV. Refer to Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - CORROSIVE LIQUID, N.O.S.
CORROSIVE MATERIAL UN 1760
CONTAINS - ORGANIC AMINE COMPOUND

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.

Methoxypropylamine - Corrosive, sensitizer
Monoethanolamine - Corrosive

Monoethanolamine = TWA 3 ppm, STEL 6 ppm ACGIH/TLV



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

8 mg/m³, 15 mg/m³ ACGIH/TLV

Monoethanolamine = TWA 3 ppm, STEL 6 ppm OSHA/PEL
8 mg/m³, 15 mg/m³ OSHA/PEL

Methoxypropylamine = TWA 10 ppm, STEL 20 ppm
Workplace Environmental Exposure Limit (WEEL)

CERCLA/SUPERFUND, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an
Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found this product to be hazardous. The product
should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
-- Delayed (chronic) health hazard
-- Fire hazard
-- Sudden release of pressure hazard
-- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local
emergency planning commission, state emergency response commission and local
fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever
is less, of an extremely hazardous substance.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):
This product does not contain ingredients (at a level of 1% or greater) on the
List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):
The chemical ingredients in this product are on the 8(b) Inventory List
(40 CFR 710).



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
If this product becomes a waste, it does not meet the criteria of a
hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:
This product contains the following ingredients covered by the Clean Air Act:

Monoethanolamine - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be
present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical
Materials Register.

STATE RIGHT TO KNOW LAWS:

The following ingredient(s) are disclosed for compliance with State Right To
Know Laws:

Methoxypropylamine	5332-73-0
Monoethanolamine	141-43-5
Water	7732-18-5

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill
C-70. The product contains the following substance(s), from the Ingredient
Disclosure List or has been evaluated based on its toxicological properties,
to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Methoxypropylamine	5332-73-0	10-20
Monoethanolamine	141-43-5	40+

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MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE

SAL 000007344



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 5151 CORROSION INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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SECTION 17 BIBLIOGRAPHY

(CONTINUED)

WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

Information on this MSDS has changed. The changes are indicated by asterisks on the right side of only the changed sections. This is an updated MSDS as required by OSHA's Hazard Communication Rule 29 CFR 1910.1200.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 04/18/90

DATE PRINTED: 04/28/90