

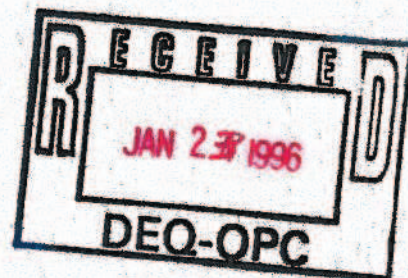
APPLICATION FOR TITLE V AIR OPERATING PERMIT APPENDIX C - VOLUME II MATERIAL SAFETY DATA SHEETS

PREPARED FOR:

 **HERCULES**

CHEMICAL SPECIALTIES

**HATTIESBURG, MISSISSIPPI
FORREST COUNTY**



JANUARY 1996

PREPARED BY:

Eco-Systems, Inc.
Environmental Engineers and Scientists



**2675 RIVER RIDGE ROAD
JACKSON, MISSISSIPPI 39216
PHONE (601) 366-0663**

8-11-8-

Material Safety Data Sheet

Use used to comply with
Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List)
IRON FREE LIQUID ALUMINUM SULFATE

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
FOOD PROCESSING GRADE

Manufacturer's Name
HOLLAND COMPANY, INC.
Address (Number, Street, City, State, and ZIP Code)
13 HOWLAND AVENUE
DANVERS, MASSACHUSETTS 01220

Emergency Telephone Number
413-743-1292
Telephone Number for Information
413-743-1292
Date Prepared
APRIL 1986
Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
<u>Al₂(SO₄)₃ in water solution -</u>	<u>NA</u>	<u>2mg(Al)/cu m in air</u>	<u>NA</u>	

UN ID NO 10043-01-3

Hazardous substances designation when discharged into Navigable Waters -
Category (P) harmful amount 18000 pounds

Section III — Other Names:

Papermakers Alum
Filter Alum
Liquid Alum

Classification: Corrosive material

UN ID No. UN 1760

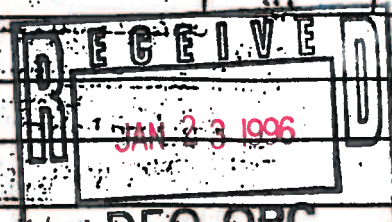
Section III — Physical/Chemical Characteristics

Boiling Point	<u>214°D</u>	Specific Gravity (H ₂ O = 1)	<u>1.33</u>
Pressure (mm Hg)	<u>NA</u>	Melting Point	<u>4° F</u>
Density (lb/l - 1)	<u>NA</u>	Evaporation Rate (Butyl Acetate = 1)	<u>NA</u>
Vol in Water	<u>100%</u>		

Appearance and Odor
Clear, green/amber liquid; negligible odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
<u>Not flammable</u>	<u>NA</u>		
Freezing Point			
<u>NA</u>			



Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	Aluminum sulfate precipitates alkalis and lowers pH in aqueous solutions

Stability (Materials to Avoid) Those which are sensitive to lowered pH
 Hazardous Decomposition or Byproducts As under Section IV (fire & explosion hazards)

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	NA

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? ☒ Skin? ☒ Ingestion? ☒
 Health Hazards (Acute and Chronic) Mist may cause irritation May cause irritation
 Ingestion—may cause irritation or burn digestive tract
 LD 50 (mouse): 980 mg (Al)/kg — Recorded human fatal dose of 30 grams
 Gosselin, RE, et al — "Clinical Toxicology of Commercial Products"
 Baltimore, Williams & Williams, 1976
 Carcinogenicity: N/A See NIOSH See NIOSH OSHA Regulated? NA

Signs and Symptoms of Exposure NA

Medical Conditions Generally Aggravated by Exposure NA

First Aid Procedures
 Eyes: Flush with water; skin: Flush with water; Ingestion: give large quantities of water or milk and induce vomiting; in all cases get medical attention if discomfort persists.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
 Flush small spills with water, dike & neutralize large spills with alkalies such as lime, soda ash, caustic soda (be alert to carbon dioxide generation from first two alkalies)

Waste Disposal Method
 As above-compatible with current waste treatment technology RCRA status of unused material if discarded—not a "Hazardous waste"

Precautions to Be Taken in Handling and Storing
 Do not expose to prolonged or continuous contact

Other Precautions NA

Section VIII — Control Measures

Respiratory Protection (Specify Type) None required

Local Exhaust	None required	Special	None required
Mechanical (General)	None required	Other	Conc in air TLV: 2mg(Al)/cu m (ACGIH)

 Protective Gloves: Rubber or equivalent Eye Protection: Goggles
 Other Protective Clothing or Equipment: None
 Other Protective Measures: NA

DELTA CENTRIFUGAL CORPORATION
and
TEXAS STAINLESS AND HEAT TREATING CORPORATION

MATERIAL SAFETY DATA SHEET

for centrifugally cast products

in compliance with OSHA Standard 29CFR 1910.1200

SECTION I - NAME AND PRODUCT
DELTA CENTRIFUGAL CORPORATION
3402 Center Street
Post Office Box 1043
Temple, Tx 76503-1043
817-773-9055

TEXAS STAINLESS AND HEAT TREATING CORPORATION
3402 Center Street
Post Office Box 882
Temple, Tx 76503-0882
817-773-0831

This data sheet covers iron base alloys including the following alloys:

ACI alloy designations(Grade):

CF-8	CG-12	CF-20	CF-8M	CF-8C	CF-16Fa	CH-20
CH-10	CK-20	CE-30	CA-15	CA-15M	CB-30	CC-50
CA-40	CF-3	CF-3M	CG-8M	CN-7M	CN-7MS	CA-6NM
CD-4MCu	CA-6M	CB7Cu-1	CB7Cu-2	CG-6MMN	CF-10MC	CF-10SMnN
HC	HD	HE	HF	HH	HI	HK
HK-30	HK-40	HL	HN	HP	HT	HT-30

AISI alloy designations:

302	303	304	304L	304N	305	308
309	310	310s	316	316L	316N	317
317L	321	329	330	347	384	405
409	410	414	416	420	420F	429
430	430F	431	434	436	440A	440B
440C	442	446	501	502	1018	

NI-RESISTS and Ductile NI-RESISTS alloys:

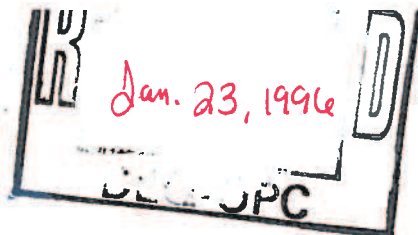
Type 1	Type 1b	Type 2	Type 2b	Type 3	Type 4	Type 5
Type D-2	Type D-2B					

Other Ferrous alloys:

WCB	C5	C12	F5	F6	F9	INCOLOY 800
DUPLEX	CD-Jr.	INVAR 36	NI HARD	U40	B4 MN STEEL	
U150	FERR 255	15-17Cr	JESS 700	HAWK 216	904L	

NFPA HAZARD RATING: HEALTH HAZARD - 0, FIRE HAZARD - 0,
REACTIVITY HAZARD - 0

ANSI CAUTION: WELDING, CUTTING OR GRINDING ON THIS CASTING MAY
GENERATE IRRITATING AND/OR TOXIC DUST AND/OR FUMES



MSDS-001 REV 0 11/21/85

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	SYMBOL	CAS NUMBER	PERCENT BY WEIGHT	TLV*	PEL*
ALUMINUM	Al	7429-90-5	0-0.60	10	N/E
CARBON	C	7440-44-0	.01-3.00	N/E	N/E
CHROMIUM	Cr	7440-47-3	0-32.00	0.5	1.0
CHROMIUM (IV)				0.05	N/E
COBALT	Co	7440-48-4	0-8.00	0.05	0.1
COLUMBIUM	Cb		0-1.50	N/E	N/E
COPPER (AS FUME)	Cu	7440-50-8	0-4.00	0.2	0.1
COPPER (AS DUST)				1.0	1.0
IRON (AS FUME)	Fe	7439-89-6	BALANCE	5.0	10
MAGNESIUM	Mg		0-.08		
MANGANESE (AS FUME)	Mn	7439-96-5	0-12.50	1.0	5.0+
MANGANESE (AS DUST)				5.0+	5.0+
MOLYBDENUM	Mo	7439-98-7	0-5.00	10	15
NICKEL	Ni	7440-02-0	0-37.00	1.0	1.0
NITROGEN	N	7727-37-9	0-.50	N/E	N/E
PHOSPHORUS	P	7723-14-0	0-.60	0.1	0.1
SILICON	Si	7440-21-3	.50-4.50	10	15
SULFUR	S	7704-34-9	0-.40	N/E	N/E
TANTALUM	Ta	7440-25-7	0-1.5	5	5
TITANIUM	Ti	7440-32-6	0-.60	N/E	N/E
VANADIUM (AS FUME)	V	1314-62-1	0-1.5	0.05	0.1
VANADIUM (AS DUST)				0.05	0.5

* values given in milligrams per cubic meter

+ indicates ceiling limit. These values should not be exceeded, even for a short time. All others are 8 hour time-weighted average concentrations.

Percent by weight values are given for the complete range of iron base alloys manufactured and sold as listed in section I. The actual composition of each casting is listed on the certification accompanying each shipment and invoice.

SECTION III PHYSICAL DATA

Boiling point(Fe): 5430 deg F Melting point: 2400 - 3000 deg F
Vapor pressure: N/A Specific gravity: 7.72 - 9.21
Vapor density: N/A Solubility in water: insoluble
Appearance and odor: silver-gray, metallic, no odor
N/A - NOT APPLICABLE

SECTION IV - FIRE AND EXPLOSION DATA

Castings will not burn or explode in their solid form. Dust and powder generated by cutting and grinding should be disposed of at regular intervals as there is a moderate fire and explosive hazard in some alloys when exposed to heat, flame, electric current or spark in the presence of sufficient oxygen. Sand, dolomite, graphite powder and sodium chloride are all adequate extinguishing media.

SECTION V - HEALTH HAZARD DATA

Castings in their solid form present two types of health hazards. The first would be an allergic reaction caused by prolonged contact to the casting in its solid form or dust form. In the

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event of such an irritation, blow loose dust or chips free, wash thoroughly and avoid future contact as much as possible. Seek medical advice if condition persists.

The second hazard would occur if contact is made with a casting with sufficient force to cause physical deformation of the person with whom it comes in contact. Care should be taken to avoid such dangerous situations. In the event of serious injury, control bleeding, administer CPR, keep the victim warm, and call a paramedic as deemed needed. If broken bones are suspect, do not move the victim.

Dust and fumes generated by cutting, grinding, machining and welding should be controlled to avoid exceeding the TLV and PEL levels for each element contained in each casting. Methods of controlling exposure include: adequate ventilation, dust masks, dust collection systems and respirators. Good health practices after contacting casting dust include washing hands before eating or using the restroom. For those leaving for the day, showering soon after work is advisable.

Exposure over the specified limits to certain elements have been known to cause certain conditions. Following is a partial list of these conditions by element.

IRON. Iron oxide can be generated by flame cutting, welding, or arc gouging of a casting. Over a long period of time, siderosis or iron pigmentation of the lungs may develop. This will be visible on a chest x-ray but should cause little or no disability.

NICKEL. Nickel has been shown to cause cancer in laboratory animals. The potential of nickel to cause cancer in humans has not been determined.

MANGANESE. Overexposure to manganese dust and fumes may cause metal fume fever with flu-like symptoms. Chronic overexposure can cause manganese poisoning. Early symptoms include headache, apathy, sleepiness, and weakness or cramps in the legs. Continued overexposure can affect the central nervous system, ultimately leading to emotional disturbances, gait and balance difficulties, and paralysis.

CHROMIUM. Chromium is classified as a human carcinogen in its water insoluble hexavalent form (see chromium(IV) in section II.) Chromium(IV) is present in welding fume but is less than 4% of the total chromium present. Overexposure is unlikely if adequate weld fume control is used.

FIRST AID:

Eye contact: Flush with running water to remove particulate. Get medical attention.

Skin contact: Brush off excess dust. Wash area well with soap and water.

Inhalation: Remove to fresh air. Get medical attention.

Ingestion: Seek medical help if large quantities of material have been ingested.

SECTION VI - REACTIVITY DATA

Material may be incompatible with certain acids, bases and oxidizers. Molten scrap may react violently with water. For additional information, user should consult data sheets on individual components.

SECTION VII - SPILL PROCEDURES

If large centrifugal casting is rolling in your direction, get out of the way. Large quantities of dust should be removed by vacuuming or wet sweeping to prevent heavy concentrations of airborne dust. Clean-up personnel should wear respirators and protective clothing.

Scrap metal can be reclaimed for reuse. Follow Federal, State and local regulations regarding disposal.

SECTION VIII - SPECIAL PROTECTION INFORMATION

When welding, cutting or grinding on castings, use general and local exhaust ventilation to keep airborne concentrations of dust or fumes below the TLV. If ventilation is not sufficient, then employees should wear MSHA or NIOSH approved respirators for protection against dust or fumes. Full protective clothing should be worn by workers exposed to heavy concentrations of dust, and showering should be required before changing into street clothes. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

Approved safety glasses or goggles should be worn when working with dusty material. Safety eyewash stations should be provided in close proximity to work areas.

Ear plugs or ear muffs should be worn where noise levels reach or exceed 90 dB.

Food should not be consumed in the work area.

Employees involved in handling castings should wear safety shoes equipped with steel toes and metatarsals.

Gloves should be worn when handling castings with sharp edges, machine chips as well as cutting or grinding dust.

SECTION IX - SPECIAL PRECAUTIONS

Use good housekeeping practices to prevent accumulations of dust and to keep airborne dust concentrations at a minimum. Avoid breathing dust or fumes.

Store material away from incompatible materials and keep dust away from sources of ignition.

Large centrifugal castings should not be stored on inclines without adequate blocking.

INFORMATION PRESENTED HEREIN HAS BEEN COMPILED FROM SOURCES CONSIDERED TO BE RELIABLE AND IS ACCURATE AND RELIABLE TO THE BEST OF OUR KNOWLEDGE AND BELIEF BUT IS NOT GUARANTEED TO BE SO.

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

NEUPHOR* 635

MSDS No.: 285 8013 0100-01

Supersedes MSDS No.: MD 262 (PMC D-527) Date: 05/01/87

I. PRODUCT IDENTIFICATION

NEUPHOR* 635 Anionic emulsion size

HMIS RATINGS:(1)

Health hazard:	0	Minimal
Flammability hazard:	0	Minimal
Reactivity hazard:	0	Minimal

APPEARANCE AND ODOR: White liquid; sweet odor

*Registered Trademark of Hercules Incorporated.

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II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29CFR1910.1200 dated November 25, 1983, this product should NOT be considered a health hazard.

FOOTNOTES

(1)Explanation of acronyms:

HMIS = Hazardous Materials Identification System rating for the product as it is supplied.

N/A = Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide for itself what safety measures are necessary to safely use this product, either alone or in combination with other products.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F)

SOLUBILITY IN WATER: Dispersible

VAPOR PRESSURE AT 20 C: 17 mm Hg

SPECIFIC GRAVITY: 1.04

VAPOR DENSITY: Lighter than air

pH: 5.5 - 6.5

VOLATILE (VOL.),%: 65

EVAPORATION RATE: Same as water

FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Nonflammable

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon can be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution which will not support combustion. If heated to decomposition, it may generate (evolve) carbon monoxide, carbon dioxide, nitrogen oxides, or hydrogen chloride. Under some fire conditions, small amounts of ammonia and hydrogen cyanide may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause mild redness and itching.

SKIN: Prolonged or repeated contact may cause skin irritation.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This material contains a rosin derivative, Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this resin after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to rosin or its derivatives.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

None of the components of this product are listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS: None known.

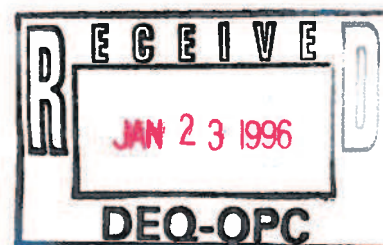
REPORTED ANIMAL EFFECTS: None known.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Dike large spills and pump to salvage container. Wash down small spills to a sewer leading to a wastewater treatment facility.
Scrub residue with water and strong detergent.

Continued...



VI. SPILL PROCEDURES & WASTE DISPOSAL

...Continued

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, state, and federal regulations is an acceptable alternative. Supplemental fuel may be required.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Wash thoroughly after handling, and before eating, drinking, or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS: Store at room temperature.

ENGINEERING CONTROLS: Provide adequate ventilation.

MATERIAL SAFETY DATA SHEET

10/18/91
PAGE: 01 of 07

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCAT* 627
Cationic emulsion size
MSDS No.: 285 7011 0800-02
Date: 10/11/91

Supersedes MSDS #: 285 7011 0800-01

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE EYE IRRITATION.

HERCAT* 627
Cationic emulsion size

HMIS RATINGS: (1)

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CASRN: Mixture

CHEMICAL AND COMMON NAME: Cationic dispersion of rosin

APPEARANCE AND ODOR: Creamy white liquid; tall oil odor

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES	%	RECOMMENDED AIRBORNE LEVELS (1)	
		1989-1990 OSHA TWA	TLV-TWA
HERCAT* 627	100	Not established	
Aluminum Sulfate	< 30	2 mg/m ³ (as Al)	2 mg/m ³ (as Al)

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstract Substance Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F)

SOLUBILITY IN WATER: Dispersible

VAPOR PRESSURE AT 20 C: Similar to water

SPECIFIC GRAVITY: Not determined

VAPOR DENSITY: Lighter than air

pH: 2.2 - 2.8

VOLATILE (VOL.),%: 65

EVAPORATION RATE: Similar to water

FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Non-flammable

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS:

Stable. Store at room temperature, as cool as possible but above 4 C (40 F).

INCOMPATIBILITY WITH: Strong alkalies or anionic materials

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution which will not support combustion. If heated to decomposition, it may evolve carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids, hydrogen cyanide, nitrogen oxides or ammonia also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE EYE IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Redness, pain, tearing
SKIN: None expected (See below: MEDICAL CONDITIONS GENERALLY
RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE).
INHALATION: Inhaling vapor or mist may cause respiratory irritation.
INGESTION: None known.

EMERGENCY & FIRST-AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
This material contains a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this resin after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to rosin or its derivatives.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

HERCAT* 627: The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

HERCAT* 627: None known.

V. HEALTH HAZARD DATA

REPORTED HUMAN EFFECTS:...Continued

ALUMINUM SULFATE: Ingestion of concentrated solutions has produced gingival necrosis and hemorrhagic gastroenteritis. These effects may be accompanied by incoordination, clonic contractions, and evidence of nephritis.

REPORTED ANIMAL EFFECTS:

HERCAT* 627: None known.

ALUMINUM SULFATE: The acute oral LD50 (rats) for hydrated aluminum sulfate is 2,812 mg/kg (or 228 mg/kg as Al), while that reported for mice for the anhydrous material is 6,207 mg/kg (or 980 mg/kg as Al). The acute dermal LD50 (rabbit) is greater than 21.4 g/kg. Rabbit skin irritation was mild (0.47/8), and the acute eye irritation was moderate and was confined to the conjunctival membranes. In a 28-day feeding study at 10,000 ppm in the diet (hydrated material), rats showed no grossly observable signs of intoxication. At autopsy, a mild incidence of enlarged and/or cystic kidneys were noted at all dietary levels, including 3,160 ppm and 1,000 ppm.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, state, and federal regulations is an acceptable alternative. Supplemental fuel may be required.

When the drum is empty, rinse it with plenty of water before discarding.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Wash thoroughly after handling, and before eating, drinking or smoking.

Avoid breathing mist.

Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses

Impervious gloves

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Keep containers closed.

Strong alkalies or anionic materials will cause emulsion to separate. Do not store near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	HERCAT* 627	N/A	100
1	Aluminum Sulfate	10043-01-3	30.0 max.

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-2, NPH	N/A
1	N/A	N/A	HC-1, NPH	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

HERCAT* 627 contains aluminum sulfate which is a "Hazardous Substance" listed in 40 CFR 302.4 which has a "Reportable Quantity" of 5,000 lbs.

D. RCRA INFORMATION

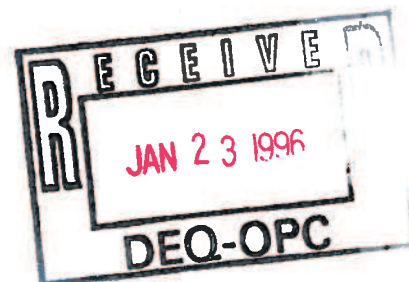
Normal variations in this product may cause its pH to be below 2.5. In those cases the product exhibits the characteristic of CORROSIVITY as defined in hazardous waste regulations 40 CFR 261 Subpart C and disposal of unused product must comply with hazardous waste regulations.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None

Continued...



VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

MATERIAL SAFETY DATA SHEET

Rec
10/18/91
PAGE: 01 of 07

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

Hi-pHase* G
Cationic dispersed size
MSDS No.: 285 7011 0501-04

Supersedes MSDS #: 285 7011 0501-03

Date: 10/11/91

I. PRODUCT IDENTIFICATION

CAUTION MAY CAUSE EYE IRRITATION.

Hi-pHase* G Cationic dispersed size

HMIS RATINGS: (1)

CASRN: Mixture

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL & COMMON NAME: Cationic dispersion of rosin

APPEARANCE AND ODOR: Creamy white liquid; tall oil odor

Master File
Do Not Remove
This Copy

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:	%	RECOMMENDED AIRBORNE LEVELS (1) 1989-1990	
		OSHA TWA	TLV-TWA
Hi-pHase* G	100	Not established	
Aluminum Sulfate	< 5	2 mg/m3 (as Al)	2 mg/m3 (as Al)

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstract Substance Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F)	SOLUBILITY IN WATER: Dispersible
VAPOR PRESSURE @ 20 C: Similar to water	SPECIFIC GRAVITY: Not determined
VAPOR DENSITY: Lighter than air	pH: 2.2 - 3.2
VOLATILE (VOL.),%: 65	EVAPORATION RATE: Similar to water
FREEZING POINT: -8 C (15 F)	

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Non-flammable

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS:

Stable. Store at room temperature, as cool as possible but above 4 C (40 F).

INCOMPATIBILITY WITH: Strong alkalis or anionic materials

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution which will not support combustion. If heated to decomposition, it may evolve carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE EYE IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Redness, pain, tearing
SKIN: None expected (See below: MEDICAL CONDITIONS GENERALLY
RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE).
INHALATION: Inhaling vapor or mist may cause respiratory irritation.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This material contains a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this resin after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to rosin or its derivatives.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

Hi-pHase* G: The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

Hi-pHase* G: None known.

Continued...

V. HEALTH HAZARD DATA

REPORTED HUMAN EFFECTS:...Continued

ALUMINUM SULFATE: Ingestion of concentrated solutions has produced gingival necrosis and hemorrhagic gastroenteritis. These effects may be accompanied by incoordination, clonic contractions, and evidence of nephritis.

REPORTED ANIMAL EFFECTS:

Hi-pHase* G: None known.

ALUMINUM SULFATE: The acute oral LD50 (rats) for hydrated aluminum sulfate is 2,812 mg/kg (or 228 mg/kg as Al), while that reported for mice for the anhydrous material is 6,207 mg/kg (or 980 mg/kg as Al). The acute dermal LD50 (rabbit) is greater than 21.4 g/kg. Rabbit skin irritation was mild (0.47/8), and the acute eye irritation was moderate and was confined to the conjunctival membranes. In a 28-day feeding study at 10,000 ppm in the diet (hydrated material), rats showed no grossly observable signs of intoxication. At autopsy, a mild incidence of enlarged and/or cystic kidneys were noted at all dietary levels, including 3,160 ppm and 1,000 ppm.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. As an alternative, incineration should be in accordance with local, state, and federal regulations. Supplemental fuel may be required.

When the drum is empty, rinse it with plenty of water before discarding.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid breathing mist.

Do not allow eye or skin contact.

Wash thoroughly after handling, and before eating, drinking or smoking.

Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses

Impervious gloves

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Keep containers closed.

Strong alkalies or anionic materials will cause emulsion to separate. Do not store near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P 1	Hi-pHase* G Aluminum Sulfate	N/A 10043-01-3	100 5.0 max.

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC 313 TOXIC CHEMICAL (YES, NO)
P 1	N/A N/A	N/A N/A	HC-1, HC-2, NPH HC-1, NPH	N/A NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

Hi-pHase* G contains aluminum sulfate which is a "Hazardous Substance" listed in 40 CFR 302.4 which has a "Reportable Quantity" of 5,000 lbs.

D. RCRA INFORMATION

Normal variations in this product may cause its pH to be below 2.5. In those cases the product exhibits the characteristic of CORROSIVITY as defined in hazardous waste regulations 40 CFR 261 Subpart C and disposal of unused product must comply with hazardous waste regulations.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None

Continued...

VIII: ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355, Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

new → *1 cc 200*
no sig change *MSDS*

MONSANTO PRODUCT NAME

SCRIPSET® 720 RESIN

**MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167
EMERGENCY PHONE NO.
(CALL COLLECT)
314-694-1000**

PRODUCT IDENTIFICATION

Chemical Name: 2-Butenedioic acid (Z)-, polymer with (Z)-4-amino-4-oxo-2-butenic acid and ethenylbenzene, ammonium salt;

Synonym: Styrene-maleic anhydride polymer, ammonium salt

CAS No.: 68171-59-5

Contains: Styrene, CAS No. 100-42-5, <0.05%

TSCA Inventory: All components of this product appear on the Inventory of Chemical Substances published by the U.S. Environmental Protection Agency (EPA) under the authority of the Toxic Substances Control Act (TSCA)

DOT Proper Shipping Name: Not Applicable

DOT Hazard Class/I.D. No.: Not Applicable

DOT Label: Not Applicable

U.S. Surface Freight Classification: Rail: Plastics, Synthetic, N.O.I., Liquid
Truck: Plastics, Liquid N.O.I.B.N.

**Reportable Quantity (RQ) Under
DOT (49 CFR) and CERCLA Regulations:** Not Applicable

SARA Hazard Notification

**Hazard Categories under criteria of
SARA Title III rules (40 CFR Part 370):** None as furnished. May release ammonia under conditions of use.

Section 313 Hazardous Chemical(s): None as furnished. May release ammonia (CAS No. 7664-41-7) under conditions of use.

Hazardous Chemical(s) under OSHA Hazard Communication Standard: None as furnished.

May release ammonia (CAS No. 7664-41-7) under conditions of use.

PRECAUTIONARY MEASURES AND FIRST AID

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND REMOVAL OF THE MATERIAL FROM EYES, SKIN AND CLOTHING.

OCCUPATIONAL CONTROL PROCEDURES:

Eye Protection: Although SCRIPSET® 720 resin does not cause significant eye irritation or eye toxicity requiring special protection, good industrial practice should be used to avoid eye contact.

OCCUPATIONAL CONTROL PROCEDURES (continued)

Skin Protection: Although SCRIPSET 720 resin does not present a significant skin concern, skin contamination should be minimized as good industrial practice. Wearing of protective gloves is recommended. Wash hands and contaminated skin after handling.

Respiratory Protection: Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure is excessive (see below). Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134.

Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust system.

Airborne Exposure Limits:

Product: SCRIPSET 720 (ammonium salt) resin wt. % 25

OSHA PEL: None Established

ACGIH TLV: None Established

Under conditions of use this resin may release ammonia.

Ammonia:

OSHA PEL/Short-term Exposure Limit: 35 ppm
ACGIH TLV/8-hour time-weighted average: 25 ppm
Short-term exposure limit: 35 ppm

FIRE PROTECTION INFORMATION

Flash Point: >200°F

Method: Pensky-Martens, Closed Cup

Extinguishing Media: Water spray, alcohol foam, dry chemical, carbon dioxide or any Class B extinguishing agent.

Special Firefighting Procedures: Firefighters and others who may be exposed to products of combustion (see "Hazardous Decomposition Products" below) should wear full protective clothing and self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.

Unusual Fire and Explosion Hazards: None known.

REACTIVITY DATA

Materials To Avoid: None

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, ammonia.

Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of SCRIPSET 720 resin and development of Precautionary Measures and Occupational Control Procedures recommended in this document.

Effects of Exposure

Skin contact and inhalation are expected to be the primary routes of occupational exposure to SCRIPSET 720 resin. Occupational exposure to this material has not been reported to cause any significant adverse human health effects. On the basis of available information SCRIPSET 720 resin is not expected to produce any significant adverse human health effects when recommended safety precautions are followed.

Toxicological Data

Data from Monsanto studies are given below.

Single-dose (acute) animal studies indicate:

Oral - Practically Nontoxic (Rat LD50 - >15,800 mg/kg)
Dermal - Practically Nontoxic (Rabbit LD50 - >7,940 mg/kg)
Eye Irritation - Slightly Irritating (Rabbit, 1.2/110.0, 24-hr. exposure)
Skin Irritation - Practically Nonirritating (Rabbit, 0.5/8.0, 24-hr. exposure)

Additional Information

SCRIPSET 720 resin is an alkaline ammoniated styrene-maleic anhydride resin solution. Under conditions of use, this resin may release ammonia which is an eye, skin and respiratory tract irritant. A Threshold Limit Value (TLV) has been established by the American Conference of Governmental Industrial Hygienists (ACGIH) for ammonia. For further information on this material, please refer to the current edition of the Documentation of Threshold Limit Values and Biological Exposure Indices.

PHYSICAL DATA

Appearance: Tan liquid
Odor: Slightly ammonia
Solubility in Water: 100%
Boiling Point: >100°C
Density: 9.0 lbs./gal.
Specific Gravity (H₂O = 1): 1.08
Percent Solids: 25
Viscosity: 250 - 2,500 cps
pH: 7.5 - 9.5

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

SPILL, LEAK & DISPOSAL INFORMATION

Waste Disposal: SCRIPSET 720 resin is not a "hazardous waste" as that term is defined in the Resource Conservation and Recovery Act (RCRA), 40 CFR 261, "Identification and Listing of Hazardous Waste". Waste product should be solidified with absorbent material and disposed of in a sanitary landfill licensed to receive non-hazardous industrial waste. Disposal should be in accordance with all applicable local, state, and federal laws and regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

Spill or Leakage Procedures: In case of spill or leak, apply sawdust or sweeping compound to soak up. For large spills, use balling methods into containers. May be flushed to sewer or settling ponds if local regulations permit.

ADDITIONAL COMMENTS

Material is freeze thaw stable.

ENVIRONMENTAL EFFECTS

Environmental Toxicity Information:

96-hr LC50 Rainbow trout: 560 mg/l, Practically Nontoxic
96-hr LC50 Bluegill sunfish: 1,000 mg/l, Practically Nontoxic
48-hr EC50 Daphnia magna: 1,000 mg/l, Practically Nontoxic

DATE: 6/29/92

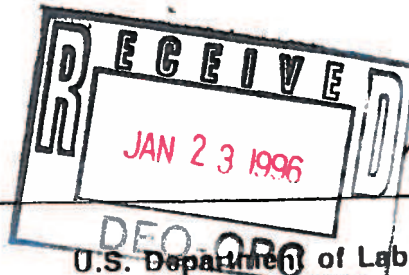
SUPERSEDES: 4/15/91

MSDS NUMBER S00010659

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

Product Safety Coordinator
Resins Division
The Chemical Group
Monsanto Company
(314) 694-6661

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, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.



5/4/94

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

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List)
FUMARIC ACID (Technical.)

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 Bartek Ingredients Inc.,	Emergency Telephone Number 905-662-8830
Address (Number, Street, City, State, and ZIP Code) 421 Seaman Street	Telephone Number for Information 905-662-3292
Stoney Creek, Ontario L8E 3J4	Date Prepared March 4, 1994
Canada	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Fumaric acid	CAS Registry 110-17-8	NA9126	Generally recognized as safe	

Empirical Formula - $C_4H_4O_4$

Chemical Name - **Fumaric Acid, Trans - Butenedioic Acid**
Trans-1, 2-Ethylene Dicarboxylic

Note: Fumaric dust and aqueous solutions may irritate skin, eyes and mucous membranes.

Oral LD₅₀ : 10700mg/kg. rat

Dermal: LD₅₀: 20000mg/kg. rabbit

Eye Irritation: rabbit - mild, FSHA 15.6

Section III — Physical/Chemical Characteristics

Boiling Point will lose H₂O upon heating	Specific Gravity (H ₂ O = 1)	Fumaric Acid	1.635
Decomposes above 150°C	not applicable		
Vapor Pressure (mm Hg.)	not applicable	Melting Point Fumaric Acid	286°C
Vapor Density (AIR = 1)	not applicable	Evaporation Rate (Butyl Acetate = 1)	Ø

Solubility in Water **0.61 gms in 100 gm water at 20°C**

Appearance and Odor **White/to Off White Fine Crystals, slight odour, has acid taste**

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) (Cleveland open cup) 282 °C	Flammable Limits gm/litre	LEL 0.130	UEL unknown
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Extinguishing Media
Water, carbon dioxide, dry chemical

Special Fire Fighting Procedures
Wear self-contained breathing apparatus

approved by NIOSH

Unusual Fire and Explosion Hazards
None known

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	x	Temperature over 80 °C

Incompatibility (Materials to Avoid) Strong oxidants, strong bases, alkali metals, amines, carbonates

Hazardous Decomposition or Byproducts Maleic Acid, Maleic Anhydride

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	x	Temperature over 80°C

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? Yes

Health Hazards (Acute and Chronic)

Not known to be a health hazard. Avoid contact. Dust and aqueous solutions may cause lachrymation and irritation of the eyes. It will also irritate skin and mucous membranes

Carcinogenicity: Not known NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure Irritation of eyes, mucous membranes and skin

Medical Conditions Generally Aggravated by Exposure Not known

Emergency and First Aid Procedures

Take person from affected area; wash with large volumes of water; flush eyes with clean water for 15 minutes. If irritation persists see a doctor.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Sweep up with broom or vacuum. In case of acid solution, neutralize with soda ash or sodium bicarbonate, mix and scoop up slurry, wash residual with water.

Waste Disposal Method Dispose of in accordance with local, state and federal government regulations.

Precautions to Be Taken in Handling and Storing

Store in a cool and dry place. Keep containers sealed to avoid contamination and spillage.

Other Precautions

Do not store together with strong oxidants, strong bases, amines, carbonates, alkali metals.

Section VIII — Control Measures

Respiratory Protection (Specify Type) NIOSH/U.S. Bureau of Mines approved dust mask.

Ventilation	Local Exhaust	as required	Special	Well-grounded explosion-proof
	Mechanical (General)	Good dust control	Other	Avoid dust build-up

Protective Gloves Should be worn Eye Protection Chemical goggles should be worn

Other Protective Clothing or Equipment as required

Work/Hygienic Practices Normal washing up after work and change of clothes

The information herein is given in good faith, but no warranty, express or implied is made. Consult Bartek Ingredients Inc. for further information

MATERIAL SAFETY DATA SHEET

HERCULES® GUM ROSIN

HERCULES INCORPORATED
Hercules Plaza
Wilmington, Delaware, 19894
Phone Number: (302) 594-5000 (all hours)

MSDS No.: 852 3991 0600-1

Date: 05/15/87
Page: 1 of 3

I. PRODUCT IDENTIFICATION

CAUTION! MAY FORM FLAMMABLE DUST-AIR MIXTURES.

HERCULES® *Resin, Gum*
GUM ROSIN

HMIS†	Rating
Health hazard:	0 Minimal
Flammability hazard:	1 Slight
Reactivity hazard:	0 Minimal

Appearance and odor: Amber solid; terpene-rosin odor

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29.CFR 1910.1200 dated November 25, 1983, this product should NOT be considered a hazardous material.

If this material is used in a manner that could generate particulates (dust), Hercules recommends that the resin dust be treated as a nuisance particulate according to the American Conference of Governmental Industrial Hygienists (ACGIH).

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling point:	318°C (604°F)	Solubility in water:	Negligible
Vapor pressure @ 317°C:	100 mm Hg	Specific gravity:	1.07
Vapor density:	N/A	pH:	N/A
% volatile (vol.):	Negligible @ 20°C	Evaporation rate:	N/A
Softening point:	82°C (180°F)		

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

CAUTION! MAY FORM FLAMMABLE DUST-AIR MIXTURES.

Flash point: 204°C (400°F) COC

Flammable limits: N/A

Autoignition temperature: Not determined.

Continued...

†HMIS = Hazardous Materials Identification System rating for the product as it is supplied.
N/A = Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide for itself what safety measures are necessary to safely use this product, either alone or in combination with other products.

V. HEALTH HAZARD DATA

...Continued

Reported Animal Effects:

Oral LD₅₀, rats - 7.6 g/kg
Oral LD₅₀, mice - 4.6 g/kg
Oral LD₅₀, guinea pig - 4.1 kg/kg
Dermal LD₅₀, rabbits - > 2.5 g/kg.

In two-year dietary feeding studies with rats and dogs at dietary levels up to 1.0%, the animals exhibited an increase in liver weights. Hematology, urinalysis and clinical chemistry parameters were within normal limits. Microscopic examination of the tissues, including the liver, did not reveal any changes that could be related to the test diet.

VI. SPILL & LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

Waste Disposal Method: Incineration of combustible waste material in a permitted facility in accordance with local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility equipped with leachate collection is a suitable alternative.

This product is not listed in federal hazardous waste regulations 40 CFR 261.33 paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261 Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

VII. APPLICABLE CONTROL MEASURES

- Appropriate hygienic practices:** Avoid contact with eyes, skin, and clothing.
Avoid breathing dust.
Wash thoroughly after handling, and before eating, drinking or smoking.
- Personal protective equipment:** Safety glasses
Impervious gloves
Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits.
Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.
Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.
- Work practices:** Eyewash fountains and safety showers should be easily accessible.
- Handling and storage precautions:** Keep away from sparks and open flame.
Avoid accumulating dust. Avoid suspending dust in air.
- Engineering controls:** Adequate ventilation should be provided to keep dust concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.
- Protective measures during repair & maintenance:** Eliminate ignition sources.
Keep area clean. Product will burn.

MATERIAL SAFETY DATA SHEET

PAGE: 01 of 08

HERCULES INCORPORATED

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

PAMITE* TALL OIL ROSIN (All grades)

MSDS No.: 676 4401 0100-03

Supersedes MSDS No.: 676 4401 0100-02

Date: 08/24/90

I. PRODUCT IDENTIFICATION

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

PAMITE* TALL OIL ROSIN (All grades)

HMIS RATINGS:(1)

Health hazard:	0	Minimal
Flammability hazard:	1	Slight
Reactivity hazard:	0	Minimal

APPEARANCE AND ODOR: Amber-colored solid; typical rosin odor

* Registered Trademark of Hercules Incorporated.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

N/A: Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

1. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

Note: The ingredients in this product are not listed in 29 CFR 1910, Subpart Z, nor do they appear in "Threshold Limit Values for Chemical Substances in the Work Environment Adopted by ACGIH" for 1989-90.

If this product is used in a manner that could generate particulates (dust), Hercules recommends that the dust be treated as a NUISANCE PARTICULATE (Particulates Not Otherwise Classified) as defined by the American Conference of Governmental Industrial Hygienists (ACGIH) or (Particulates not otherwise Regulated) as defined by OSHA.

RECOMMENDED AIRBORNE LEVELS
1989-1990

OSHA TWA TLV-TWA

Particulates not
Otherwise classified/regulated

15mg/m3 total 10mg/m3
5mg/m3 respirable fraction

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: N/A

SOLUBILITY IN WATER: Negligible

VAPOR PRESSURE AT 20 C: Negligible

SPECIFIC GRAVITY: 1.06

VAPOR DENSITY: N/A

pH: N/A

VOLATILE (VOL.), %: Negligible at 20 C

EVAPORATION RATE: Slower than butyl acetate

SOFTENING POINT: 81 C (178 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

FLASH POINT: 216 C (420 F) COC

FLAMMABLE LIMITS: Not determined.

AUTOIGNITION TEMPERATURE: Not determined.

Continued...

V. HEALTH HAZARD DATA

...Continued

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This product contains rosin or a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals after repeated or prolonged skin contact. Hercules Incorporated is unaware of any allergic skin reactions caused by industrial exposure to this product or similar materials. A thorough search of Hercules medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

Repeated exposure to smoke or fumes of decomposition products of rosin or rosin derivatives heated to high temperatures may produce an asthmatic reaction (respiratory sensitization) in sensitive individuals.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are not listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

See above- MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE. A similar resin was tested in a repeated insult human patch test. No signs of skin irritation or sensitization were noted in the study.

REPORTED ANIMAL EFFECTS

Acute studies: Peroral rat LD50 = 7.6 g/kg
Peroral mouse LD50 = 4.6 g/kg
Peroral guinea pig LD50 = 4.6 g/kg
Percutaneous rabbit LD50 Greater than 2.5 g/kg

90-Day rat feeding study: Increased liver weight at 1%, reduced food consumption at 1% and 0.2%, no effects at .05%.

2-year rat feeding study: Very mild growth depression at 1%, no effects at 0.2%.

2-year dog feeding study: No adverse effects at 1%, the highest dosage fed.

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May form flammable dust-air mixtures.

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None expected.

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Dust may cause irritation by mechanical abrasion. Smoke or fumes from decomposition of rosin products heated to high temperatures may cause eye irritation, with redness, tearing and discomfort.

SKIN: See below: MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE

INHALATION: Breathing smoke or fumes from decomposition of rosin products heated to high temperatures may produce breathing discomfort, coughing and sore throat.

INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water. MOLTEN RESINS: If molten material comes in contact with the skin, cool under a running stream of water. Do NOT attempt to remove the resin from the skin. Removal could result in severe tissue damage. Get medical attention.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen the material.

Continued...

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

WASTE DISPOSAL METHOD:

Incineration of combustible waste material in a permitted facility in accordance with local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility is a suitable alternative.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Avoid breathing dust.

Wash thoroughly after handling, and before eating, drinking or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses

Impervious gloves

Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

For small packages, the following warning applies:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapors may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute.

Continued...

VII. APPLICABLE CONTROL MEASURES

HANDLING AND STORAGE PRECAUTIONS...Continued

For large bags (1,000 lbs. or greater), the following warning applies:
WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment and the bag. In addition, when emptying where flammable vapors may be present, blanket vessel with an inert gas. ATTENTION! A GROUNDING CABLE MUST BE ATTACHED TO THE BAG GROUND CONNECTION!

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep dust concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate ignition sources.

Keep area clean. Product will burn.

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following Environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	PAMITE* TALL OIL ROSIN	N/A	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	NHH, HC-3 (dust)	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

ATTENTION:

Addressee below

MATERIAL SAFETY DATA SHEET (MSDS)

It is our intent to comply with the OSHA FEDERAL HAZARD
COMMUNICATION STANDARD. (29CFR 1910.1200)

The enclosed MSDS is the most recently published version
sent either at your request or as a result of a sampling.
The address below was either supplied with your request
or sample, or was extracted from our corporate records.

Thank you for your interest in our products.

HERCULES INCORPORATED

REF MSDS NBRS:

676 4401 0100 03

CUSTOMER ID NUMBER:

S HEGWOOD

HERCULES INCORPORATED
HATTIESBURG PLANT
HATTIESBURG PLANT MS 39401

DATE SENT: 09/24/90

10/101

PRODUCT SAFETY DATA SHEET

PAGE: 01 OF 05

HERCULES INCORPORATED
HERCULES PLAZA
WILMINGTON, DE 19894
PHONE #: (302) 594-5000 (24 HRS)

PAMITE* 3327

MSDS NO.: 811 3011 0200-02

HERSEDES MSDS NO.: 811 3011 0200-01

DATE: 10/27/89

PRODUCT IDENTIFICATION

WARNING: STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

PAMITE* 3327 SYNTHETIC RESIN

HMIS RATINGS: (1)

HEALTH HAZARD:	0	MINIMAL
FLAMMABILITY HAZARD:	1	SLIGHT
REACTIVITY HAZARD:	0	MINIMAL

CHEMICAL & COMMON NAME: MODIFIED ROSIN

COLOR AND ODOR: AMBER SOLID; ROSIN ODOR

REGISTERED TRADEMARK OF HERCULES INCORPORATED.

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HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

ALL INGREDIENTS IN THIS PRODUCT ARE NOT LISTED IN 29 CFR 1910, PART 2, NOR DO THEY APPEAR IN "THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES IN THE WORK ENVIRONMENT ADOPTED BY ACGIH" FOR 1989-90.

THESE MATERIALS ARE USED IN A MANNER THAT COULD GENERATE PARTICULATES (DUST), HERCULES RECOMMENDS THAT THE RESIN DUST BE TREATED AS A NUISANCE PARTICULATE ACCORDING TO THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH).

NOTES

EXPLANATION OF ACRONYMS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING FOR PRODUCT AS SUPPLIED.
NOT APPLICABLE

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT. THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS

 I. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

FLASHING POINT: N/A	SOLUBILITY IN WATER: NEGLIGIBLE
VAPOR PRESSURE AT 20 C: NEGLIGIBLE	SPECIFIC GRAVITY: HEAVIER THAN WATER
VAPOR DENSITY: HEAVIER THAN AIR	PH: N/A
FLATILITY (VOL.),%: N/A	EVAPORATION RATE: SLOWER THAN BUTYL ACETATE
FREEZING POINT: 100 C (212 F)	

 . FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
 MAY FORM FLAMMABLE DUST-AIR MIXTURES.
 (FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

BOILING POINT: ABOVE 149 C (300 F)

FLAMMABLE LIMITS: NOT DETERMINED.

IGNITION TEMPERATURE: NOT DETERMINED.

EXTINGUISHING MEDIA: WATER SPRAY, DRY CHEMICAL, FOAM, CARBON DIOXIDE, OR HALON

SPECIAL FIREFIGHTING PROCEDURES: USE SELF-CONTAINED BREATHING APPARATUS.

USUAL FIRE AND EXPLOSION HAZARDS: MAY FORM FLAMMABLE DUST-AIR MIXTURES.

STABILITY CONSIDERATIONS: STABLE

COMPATIBILITY WITH: NONE

HAZARDOUS DECOMPOSITION PRODUCTS: NONE

HAZARDOUS PRODUCTS OF COMBUSTION:
 CARBON MONOXIDE, CARBON DIOXIDE AND SMOKE. DEPENDING ON CONDITIONS, SOME ALIPHATIC ALDEHYDES AND CARBOXYLIC ACIDS ALSO MAY BE FORMED.

ADDITIONAL POLYMERIZATION: WILL NOT OCCUR.

HEALTH HAZARD DATA

NS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: DUST MAY CAUSE IRRITATION BY MECHANICAL ABRASION.
SKIN: PROLONGED AND REPEATED CONTACT MAY CAUSE A SKIN SENSITIZATION REACTION IN SUSCEPTIBLE INDIVIDUALS (SEE BELOW: MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE).
INHALATION: NONE KNOWN. NONE EXPECTED.
INGESTION: NONE KNOWN.

EMERGENCY & FIRST AID PROCEDURES:

EYES: IN CASE OF CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF LOW-PRESSURE WATER FOR AT LEAST 15 MINUTES. REMOVE ANY CONTACT LENSES TO ENSURE THOROUGH FLUSHING. CALL A PHYSICIAN.

SKIN: WASH WITH SOAP AND RUNNING WATER. MOLTEN RESINS: IF MOLTEN MATERIAL COMES IN CONTACT WITH THE SKIN, COOL UNDER A RUNNING STREAM OF WATER. DO NOT ATTEMPT TO REMOVE THE RESIN FROM THE SKIN. REMOVAL COULD RESULT IN SEVERE TISSUE DAMAGE. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN: MATERIAL SHOULD NOT BE FORCIBLY PULLED FROM THE SKIN. MINERAL OIL MAY BE USED TO LOOSEN THE MATERIAL.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
THIS PRODUCT CONTAINS ROSIN OR A ROSIN DERIVATIVE. ROSIN AND SOME OF ITS DERIVATIVES HAVE BEEN REPORTED TO CAUSE AN ALLERGIC SKIN REACTION (SENSITIZATION) IN SUSCEPTIBLE INDIVIDUALS UNDER CERTAIN NON-INDUSTRIAL EXPOSURE CONDITIONS OF REPEATED AND PROLONGED SKIN CONTACT. INDIVIDUALS SENSITIZED TO ROSIN DERIVATIVES MAY ALSO REACT TO THIS PRODUCT AFTER SKIN CONTACT. HERCULES IS UNAWARE OF ANY ALLERGIC SKIN REACTIONS CAUSED BY INDUSTRIAL EXPOSURE TO THIS PRODUCT OR SIMILAR MATERIALS. A THOROUGH SEARCH OF HERCULES MEDICAL RECORDS HAS DISCLOSED NO CASE OF SKIN SENSITIZATION TO ROSIN OR ITS DERIVATIVES FROM INDUSTRIAL EXPOSURE IN OUR WORKERS. NONE HAVE BEEN REPORTED BY OUR CUSTOMERS.

PRIMARY ROUTES OF ENTRY: EYES, SKIN

CANCER INFORMATION:

THE COMPONENTS OF THIS PRODUCT ARE NOT LISTED AS CARCINOGENS BY THE NATIONAL TOXICOLOGY PROGRAM (NTP). THEY ARE NOT REGULATED AS CARCINOGENS BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND HAVE NOT BEEN EVALUATED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC).

SPILL PROCEDURES & WASTE DISPOSAL

ILL PROCEDURES:

IF MATERIAL IS NOT CONTAMINATED, SCOOP INTO CLEAN CONTAINERS FOR USE. IF CONTAMINATED, SCOOP INTO CONTAINERS FOR DISPOSAL.

STE DISPOSAL METHOD:

INCINERATION OF WASTE MATERIAL IN A PERMITTED FACILITY IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS IS THE RECOMMENDED DISPOSAL METHOD. LANDFILLING IN A LICENSED FACILITY IS A SUITABLE ALTERNATIVE.

THIS PRODUCT IS NOT LISTED IN FEDERAL HAZARDOUS WASTE REGULATION 40 CFR 261.33, PARAGRAPH (E) OR (F) - I.E., CHEMICAL PRODUCTS THAT ARE CONSIDERED HAZARDOUS IF THEY BECOME WASTES. IT DOES NOT EXHIBIT ANY OF THE HAZARDOUS CHARACTERISTICS LISTED IN 40 CFR 261, SUBPART C. STATE OR LOCAL HAZARDOUS WASTE REGULATIONS MAY APPLY IF THEY ARE DIFFERENT FROM THE FEDERAL REGULATION.

I. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

DO NOT ALLOW EYE OR SKIN CONTACT.

AVOID BREATHING DUST.

WASH THOROUGHLY AFTER HANDLING, AND BEFORE EATING, DRINKING OR SMOKING.

PERSONAL PROTECTIVE EQUIPMENT:

IMPERVIOUS GLOVES

SAFETY GLASSES

APPROPRIATE RESPIRATORY PROTECTION IS REQUIRED WHEN EXPOSURE TO AN AIRBORNE CONTAMINANT IS LIKELY TO EXCEED ACCEPTABLE LIMITS. RESPIRATORS SHOULD BE SELECTED AND USED IN ACCORDANCE WITH OSHA, SUBPART I (29 CFR 1910.134) AND MANUFACTURER'S RECOMMENDATIONS.

PERSONNEL EXPOSED TO HOT MOLTEN MATERIAL SHOULD WEAR PROTECTIVE CLOTHING THAT PROVIDES PROTECTION FROM THERMAL BURNS. FULL FACE SHIELD, LINED RAIN SUIT (OR OTHER HEAT RESISTANT MATERIAL), AND LINED IMPERVIOUS GLOVES ARE RECOMMENDED.

WORK PRACTICES:

EYEWASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE EASILY ACCESSIBLE.

CONTINUED...

APPLICABLE CONTROL MEASURES

CONTINUED

HANDLING AND STORAGE PRECAUTIONS:

FOR SMALL PACKAGES, THE FOLLOWING WARNING APPLIES:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. AVOID IGNITION SOURCES SUCH AS SPARKS AND FLAME. GROUND ALL EQUIPMENT. IN ADDITION, WHEN EMPTYING BAGS WHERE FLAMMABLE VAPORS MAY BE PRESENT, BLANKET VESSEL WITH INERT GAS, GROUND OPERATOR, AND POUR MATERIAL SLOWLY INTO CONDUCTIVE, GROUNDED CHUTE.

FOR LARGE BAGS (1,000 LBS. OR GREATER), THE FOLLOWING WARNING APPLIES:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. AVOID IGNITION SOURCES SUCH AS SPARKS AND FLAME. GROUND ALL EQUIPMENT AND THE BAG. IN ADDITION, WHEN EMPTYING WHERE FLAMMABLE VAPORS MAY BE PRESENT, BLANKET VESSEL WITH AN INERT GAS. ATTENTION! A GROUNDING CABLE MUST BE ATTACHED TO THE BAG GROUND CONNECTION!

FLAKED FORMS ARE PRONE TO GRADUAL OXIDATION. CONTROL INVENTORY. USE OLDEST MATERIAL FIRST.

AVOID ACCUMULATING DUST. AVOID SUSPENDING DUST IN AIR.

WORKING CONTROLS:

ADEQUATE VENTILATION SHOULD BE PROVIDED TO KEEP DUST CONCENTRATIONS BELOW ACCEPTABLE EXPOSURE LIMITS. DISCHARGE FROM THE VENTILATION SYSTEM SHOULD COMPLY WITH APPLICABLE AIR POLLUTION CONTROL REGULATIONS.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

ELIMINATE SOURCES OF IGNITION.

HERCULES INCORPORATED
Hercules Plaza
Wilmington, Del, 19894
Phone #: (302) 594-5000 (24 hrs)

HERCON* 70 Sizing emulsion

MSDS No.: 181 6114 0600-03

Supersedes MSDS No.: 181 6114 0600-02

Date: 09/18/92

I. PRODUCT IDENTIFICATION

HERCON* 70 Sizing emulsion

HMIS RATINGS: (1)

CASRN: Mixture

Health hazard: 0 Minimal
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL AND COMMON NAME: Ketene dimer emulsion

APPEARANCE AND ODOR: White, low viscosity liquid; little or no odor

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a health hazard.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

-SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 99-100 C (210-212 F)

SOLUBILITY IN WATER: Miscible

VAPOR PRESSURE AT 20 C: Similar to water

SPECIFIC GRAVITY: 1.0

VAPOR DENSITY: Similar to water

pH: 3.0-5.0

VOLATILE (VOL.),%: 88

EVAPORATION RATE: Similar to water

FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Nonflammable - Water emulsion

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, or carbon dioxide may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: Alkalies and amines

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This material is an aqueous emulsion and will not support combustion. If treated to decomposition, it may produce carbon monoxide, carbon dioxide and smoke.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: None known.
SKIN: None known.
INHALATION: None known.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

No adverse health effects are expected from exposure to HERCON* 70.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

None known.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

None of the components of this product are listed as carcinogens by NTP (National Toxicology Program). They are not regulated as carcinogens by OSHA (Occupational Safety & Health Administration) and have not been evaluated by IARC (International Agency for Research on Cancer).

REPORTED HUMAN EFFECTS:

HERCON* 70: A patch test with human volunteers showed that this material was not irritating and did not cause skin sensitization.

REPORTED ANIMAL EFFECTS:

HERCON* 70: Acute Oral LD50, rats - greater than 40 g/kg
Rabbit eye irritation study - non-irritating
Rabbit skin irritation study - non-irritating

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration in accordance with local, state, and federal regulations is an acceptable alternative. Supplemental fuel will be required.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.



VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

- Avoid breathing vapor.
- Avoid contact with eyes, skin, and clothing.
- Wash thoroughly after handling, and before eating, drinking or smoking.
- Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

- Safety glasses
- Appropriate protective clothing

WORK PRACTICES:

- Eyewash fountains and safety showers should be easily accessible.
- Handle in areas with adequate ventilation. Use a respirator in accordance with OSHA Subpart I (29 CFR 1910.134), if vapor levels are excessive.

HANDLING AND STORAGE PRECAUTIONS:

- Avoid freezing. Store at lowest possible temperature between 4-35 C (40-95 F), in order to preserve product stability.
- This product may react with alkalies and should not be stored near such materials.

ENGINEERING CONTROLS:

- Provide adequate ventilation.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

- Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.
-

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	HERCON* 70 Sizing emulsion	Mixture	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	NHH, NPH	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements
"Hazard Categories"

HC-1 Immediate (acute) health hazard
HC-2 Delayed (chronic) health hazard
HC-3 Fire hazard
HC-4 Sudden release of pressure hazard
HC-5 Reactive hazard
NHH Not a health hazard
NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

R
MATERIAL SAFETY DATA SHEET

PAGE: 01 of 07

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCON* 75 Sizing emulsion

MSDS No.: 181 6114 0800-04

Supersedes MSDS No.: 181 6114 0800-03

Date: 08/13/93

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE MILD TEMPORARY SKIN AND EYE IRRITATION.

HERCON* 75 Sizing emulsion

HMIS RATINGS: (1)

CASRN: Mixture

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL AND COMMON NAME: Cationic emulsion of alkyl ketene dimer

APPEARANCE AND ODOR: White liquid; odorless

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a hazardous material. Although Hercules believes this product may be a mild eye and skin irritant, the irritancy is not great enough to be classed as hazardous under the Hazard Communication Standard.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstract Substance Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000; March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE MILD TEMPORARY SKIN AND EYE IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause mild eye irritation (redness, swelling).
SKIN: Prolonged or repeated contact may cause skin irritation (redness, itching).
INHALATION: Inhaling mist may cause respiratory irritation.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

PRIMARY ROUTES OF EXPOSURE/ENTRY: Eyes, skin, inhalation

CANCER INFORMATION:

HERCON* 75: This product primarily contains a mixture of two active components. The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are NOT regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have NOT been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

No toxicity studies in humans have been carried out with this product.

HERCON* 75: COMPONENT A was neither irritating nor sensitizing when applied undiluted to the skin of 200 volunteers.

Continued...

VII. APPLICABLE CONTROL MEASURES

...Continued

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Store as cool as possible, but above 4 C (40 F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.

This product may react with alkalies or amines and should not be stored near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Section 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.



ISSUE DATE: 03/04/94
SUPERSEDES: 181 6115 0700 REV.: 01
08/27/93

Incorporated
Plaza
Wilmington, DE 19894-0001
302) 594-5000 (24 hrs)

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME: HERCON® 79 sizing emulsion

APPEARANCE: liquid

HMIS RATINGS

COLOR: white

Health hazard: 1 SLIGHT

ODOR: mild

Flammability hazard: 0 MINIMAL

CASRN: Mixture

Reactivity hazard: 0 MINIMAL

CHEMICAL DESCRIPTION: alkyl ketene dimer emulsion

SECTION 2: HAZARDOUS COMPONENT INFORMATION

This product is not a health hazard according to the OSHA Hazard Communication Standard 29CFR1910.1200. The hazards identified for this product are based on pH.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: CAUTION!

Prolonged or repeated contact may cause skin irritation.
May cause mild, temporary eye irritation.

Refer to Section 5 for Hazardous Combustion Products, and Section 10 for Hazardous Decomposition/Hazardous Polymerization Products.

SECTION 4: FIRST AID PROCEDURES

EYES:

Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Remove contact lenses. Get immediate medical attention.

SKIN:

Wash thoroughly with soap and water.

INGESTION:

No adverse health effects are expected from accidental ingestion of small amounts of this product.

SECTION 5: FIRE HAZARDS

FIGHTING PROCEDURES:

This material is an aqueous suspension and will not support combustion.

EXTINGUISHING MEDIA:

Water spray, dry chemical, foam, carbon dioxide or halon may be used on fires involving this product.

CONDITIONS TO AVOID:

None known.

HAZARDOUS COMBUSTION PRODUCTS:

If heated to decomposition, the following substances may be formed: carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, hydrogen cyanide and ammonia.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Flush with excess water to a wastewater treatment system.
For large spills, dike to contain and pump into drums for use or disposal.

In case of accidental spill or release, refer to Section 8, Personal Protective Equipment and General Hygiene Practices.

SECTION 7: HANDLING AND STORAGE

GENERAL MEASURES:

There are no unusual hazards associated with handling of this product.

Store at temperatures above freezing and below 90°F.

MATERIALS OR CONDITIONS TO AVOID:

Avoid storing product near incompatible materials. See Section 10.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling, and before eating, drinking or smoking.

RECOMMENDED EXPOSURE LIMITS:

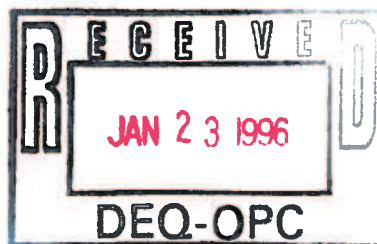
This product is not considered to present an inhalation health hazard under reasonably anticipated conditions of use.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses
Impervious gloves

WORK PRACTICES AND ENGINEERING CONTROLS:

Eyewash fountains and safety showers should be easily accessible.



PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping, or vessels before beginning maintenance or repairs.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

pH:	2.5-4.0	
Solids, %:	15-16	
Solubility in Water:	miscible with water	
Specific Gravity:	similar to water	
Vapor Pressure:	similar to water	
Evaporation Rate:	similar to water	
Boiling Point:	210-212 ° F	99-100 ° C
Freezing Point:	32 ° F	0 ° C

SECTION 10: STABILITY AND REACTIVITY

GENERAL STABILITY CONSIDERATIONS:

Stable under recommended handling and storage conditions.

COMPATIBLE MATERIALS:

Incompatible with: alcohols, alkalis and amines

HAZARDOUS DECOMPOSITION PRODUCTS:

None anticipated under normal or recommended handling and storage conditions.

HAZARDOUS POLYMERIZATION:

Not anticipated under normal or recommended handling and storage conditions.

SECTION 11: TOXICOLOGICAL INFORMATION

REPORTED HUMAN EFFECTS:

PRODUCT/SIMILAR PRODUCT - A patch test with human volunteers showed that this material was not irritating and did not cause skin sensitization.

REPORTED ANIMAL EFFECTS:

PRODUCT/SIMILAR PRODUCT - Acute oral LD50, rats: > 40 g/kg; rabbit eye irritation study: nonirritating; rabbit skin irritation study: nonirritating.

CARCINOGENICITY INFORMATION:

Not listed as a carcinogen by NTP; Not regulated as a carcinogen by OSHA; and Not evaluated by IARC.

SECTION 12: ECOLOGICAL INFORMATION

OTOXICITY:

No ecological studies have been carried out on this product.

SECTION 13: DISPOSAL CONSIDERATIONS

STE DISPOSAL METHOD:

Incineration in accordance with applicable regulations is the recommended disposal method. Supplemental fuel may be required. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system.

SECTION 14: TRANSPORTATION INFORMATION

For information regarding transportation of this product, please contact Hercules Transportation at (302) 594-7356.

SECTION 15: REGULATORY INFORMATION

CHEMICAL INVENTORIES:

U. S. TSCA Status: Included on TSCA inventory.

SARA TITLE III

Sections 302 and 304:

This product is not an Extremely Hazardous Substance subject to reporting under 40CFR355.

Sections 311 and 312:

HC-1: Acute health hazard
NPH: Not a physical hazard

Section 313:

This product does not contain any chemicals subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act and 40CFR372.

CERCLA

This product does not contain any chemicals subject to reporting as a CERCLA Hazardous Substance under 40CFR302.4.

RCRA

This product is not a hazardous waste as listed in 40CFR261.33. It does not exhibit any of the hazardous characteristics listed in 40CFR261, Subpart C.

SECTION 16: OTHER INFORMATION

LIST OF ACRONYMS:

ACGIH: American Conference of Governmental Industrial Hygienists
AICS: Australian Inventory of Chemical Substances
AIHA WEEL: American Industrial Hygienists Association - Workplace Environmental Exposure Level
C: Ceiling
CASRN: Chemical Abstracts Service Registry Number
CERCLA: Comprehensive Emergency Response, Compensation and Liability Act
DSL: Domestic Substances List (Canadian)
EINECS: European Inventory of Existing Commercial Chemical Substances
HMIS: Hazardous Materials Identification System
IARC: International Agency for Research on Cancer
MITI: Ministry of International Trade and Industry (Japanese)
N/A: Not Applicable
NDSL: Non-domestic Substances List (Canadian)
NOR: Not Otherwise Regulated

APPENDIX 1

HERCULES TRAINING PROGRAM

Employees who will be working with asbestos will be trained prior to working with asbestos.

Training consists of fit-testing employees with 1/2 face piece respirators. This ensures a proper fit which provides adequate protection. They are then given a copy of the procedure for review and discussion.

After all questions are answered a video tape training program, "Asbestos: Small Scale, Short Duration Activities (Part I)" by International Training Systems - Marlinton, NJ, is shown. This video tape requires approximately forty (40) minutes to view. After viewing the tape employees are encouraged to ask any other questions which they may have.

For practice, the training program also consists a session using non-asbestos insulation in "mock" glove bag removals.

0323S:10/dc

OSHA: Occupational Safety and Health Administration
PEL: OSHA Permissible Exposure Limit
RCRA: Resource Conservation and Recovery Act
RQ: Reportable Quantity
SARA: Superfund Amendment Reauthorization Act
Short-Term Exposure Limit
Threshold Limit Values (registered trademark of ACGIH)
T: Threshold Planning Quantity
TSCA: Toxic Substances Control Act
TWA: Time Weighted Average

The information and recommendations contained in this Material Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with our products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

Mobil

MSDBS FOR THE FOLLOWING PRODUCTS ARE ENCLOSED:

793125 MOBILWAX 145

G WAX

CHANGE OF ADDRESS FORM

ACCOUNT NO: 1268788

TO CHANGE THE ADDRESS FOR MAILINGS OF MATERIAL SAFETY DATA BULLETINS,
PLEASE COMPLETE THIS FORM AND RETURN TO:

MOBIL OIL CORPORATION
LUBE PRODUCT MANAGEMENT
3225 GALLOWES ROAD
FAIRFAX, VIRGINIA 22037

CURRENT ADDRESS

HERCULES RUBBER COMPANY
PO DRAWER 1937

HATTIESBURG MS 39401

CORRECTED ADDRESS

NAME _____

TITLE _____

COMPANY _____

STREET _____
ADDRESS _____

CITY _____ STATE _____ ZIP _____

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

REVISED:09/21/90

***** I. PRODUCT IDENTIFICATION *****
MOBILWAX 145

SUPPLIER:

MOBIL OIL CORP.

HEALTH EMERGENCY TELEPHONE:

(609) 737-4411

CHEMICAL NAMES AND SYNONYMS:

PETROLEUM HYDROCARBONS

TRANSPORT EMERGENCY TELEPHONE:

(800) 424-9300 (CHEMTREC)

USE OR DESCRIPTION:

WAX COATING

PRODUCT TECHNICAL INFORMATION:

(800) 662-4525

***** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: WHITE SOLID

ODOR: MILD

PH: NA

VISCOSITY AT 100 F, SUS: NA

AT 40 C, CS: NA

VISCOSITY AT 210 F, SUS: 44.0

AT 100 C, CS: 4.0

FLASH POINT F(C): 400(204) (ASTM D-92)

MELTING POINT F(C): 142(61)

POUR POINT F(C): NA

BOILING POINT F(C): > 600(316)

RELATIVE DENSITY, 15/4 C: 0.91

SOLUBILITY IN WATER: NEGLIGIBLE

VAPOR PRESSURE-MM HG 20C: < .1

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER INFORMATION, CONTACT YOUR LOCAL MARKETING OFFICE.

***** III. POTENTIALLY HAZARDOUS INGREDIENTS *****

NONE

SEE SECTIONS XII AND XIII FOR REGULATORY AND FURTHER COMPOSITIONAL DATA.

SOURCES: A=ACGIH-TLV. A*=SUGGESTED-TLV. M=MOBIL, O=OSHA, S=SUPPLIER

NOTE: LIMITS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

***** IV. HEALTH HAZARD DATA *****

--- INCLUDES AGGRAVATED MEDICAL CONDITIONS, IF ESTABLISHED ---
EFFECTS OF OVEREXPOSURE: NOT EXPECTED TO BE A PROBLEM.

***** V. EMERGENCY AND FIRST AID PROCEDURES *****

--- FOR PRIMARY ROUTES OF ENTRY ---

EYE CONTACT: FLUSH WITH WATER.

SKIN CONTACT: IF BURNED BY CONTACT WITH HOT MATERIAL, COOL MOLTEN
MATERIAL ADHERING TO SKIN AS QUICKLY AS POSSIBLE WITH WATER, AND
SEE A PHYSICIAN FOR REMOVAL OF ADHERING MATERIAL AND TREATMENT OF
BURN. WASH CONTACT AREAS WITH SOAP AND WATER.

INHALATION: NOT EXPECTED TO BE A PROBLEM.

INGESTION: NOT EXPECTED TO BE A PROBLEM WHEN INGESTED. IF
UNCOMFORTABLE SEEK MEDICAL ASSISTANCE.

***** VI. FIRE AND EXPLOSION HAZARD DATA *****

FLASH POINT F(C): 400(204) (ASTM D-92)
 FLAMMABLE LIMITS. LEL: .6 UEL: 7.0
 EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.
 SPECIAL FIRE FIGHTING PROCEDURES: WATER OR FOAM MAY CAUSE FROTHING.
 USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. WATER SPRAY MAY BE
 USED TO FLUSH SPILLS AWAY FROM EXPOSURE. FOR FIRES IN ENCLOSED
 AREAS, FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS.
 PREVENT RUNOFF FROM FIRE CONTROL OR DILUTION FROM ENTERING STREAMS
 OR DRINKING WATER SUPPLY.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.
 NFPA HAZARD ID: HEALTH: 0, FLAMMABILITY: 1, REACTIVITY: 0

***** VII. REACTIVITY DATA *****

STABILITY (THERMAL, LIGHT, ETC.): STABLE
 CONDITIONS TO AVOID: EXTREME HEAT.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS
 HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE.
 HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

***** VIII. SPILL OR LEAK PROCEDURE *****

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE
 AUTHORITIES. U. S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE
 REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING
 INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE
 NUMBER (800) 424-8802.
 PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: IF LIQUID DIKE TO
 CONTAIN, ALLOW TO COOL. SHOVEL UP AND DISPOSE OF AT AN APPROPRIATE
 WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS
 AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.
 WASTE MANAGEMENT: PRODUCT IS SUITABLE FOR BURNING IN AN ENCLOSED,
 CONTROLLED BURNER FOR FUEL VALUE OR DISPOSAL BY SUPERVISED
 INCINERATION. SUCH BURNING MAY BE LIMITED PURSUANT TO THE RESOURCE
 CONSERVATION AND RECOVERY ACT. IN ADDITION, THE PRODUCT IS
 SUITABLE FOR PROCESSING BY AN APPROVED RECYCLING FACILITY OR CAN BE
 DISPOSED OF AT ANY GOVERNMENT APPROVED WASTE DISPOSAL FACILITY.
 USE OF THESE METHODS IS SUBJECT TO USER COMPLIANCE WITH APPLICABLE
 LAWS AND REGULATIONS AND CONSIDERATION OF PRODUCT CHARACTERISTICS
 AT TIME OF DISPOSAL.

***** IX. SPECIAL PROTECTION INFORMATION *****

EYE PROTECTION: NORMAL INDUSTRIAL EYE PROTECTION PRACTICES SHOULD BE
 EMPLOYED.
 SKIN PROTECTION: GLOVES AS REQUIRED TO HANDLE HOT MATERIALS.
 RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY
 CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.
 VENTILATION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE
 AND WITH ADEQUATE VENTILATION.

***** X. SPECIAL PRECAUTIONS *****

NO SPECIAL PRECAUTIONS REQUIRED.

***** XI. TOXICOLOGICAL DATA *****

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): LD50: > 15 G/KG NONTXIC (ESTIMATED) ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

DERMAL TOXICITY (RABBITS): LD50: > 5 G/KG NONTXIC (ESTIMATED) ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

INHALATION TOXICITY (RATS): NOT APPLICABLE ---HARMFUL CONCENTRATIONS OF MISTS AND/OR VAPORS ARE UNLIKELY TO BE ENCOUNTERED THROUGH ANY CUSTOMARY OR REASONABLY FORESEEABLE HANDLING, USE, OR MISUSE OF THIS PRODUCT.

EYE IRRITATION (RABBITS): EXPECTED TO BE NON-IRRITATING. ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

SKIN IRRITATION (RABBITS): EXPECTED TO BE NON-IRRITATING. ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

***** XII. REGULATORY INFORMATION *****
GOVERNMENTAL INVENTORY STATUS: ALL COMPONENTS REGISTERED IN ACCORDANCE
WITH TSCA.

DOT:

SHIPPING NAME: NOT APPLICABLE

HAZARD CLASS: NOT APPLICABLE

US OSHA HAZARD COMMUNICATION STANDARD: PRODUCT ASSESSED IN ACCORDANCE
WITH OSHA 29 CFR 1910.1200 AND DETERMINED NOT TO BE HAZARDOUS.
COMPONENTS OF THIS PRODUCT MEET FDA REGULATIONS: 175.105 176.170
176.180 178.3710 172.886

RCRA INFORMATION: THE UNUSED PRODUCT, IN OUR OPINION, IS NOT
SPECIFICALLY LISTED BY THE EPA AS A HAZARDOUS WASTE (40 CFR,
PART 261D); DOES NOT EXHIBIT THE HAZARDOUS CHARACTERISTICS OF
IGNITABILITY, CORROSIVITY, OR REACTIVITY, AND IS NOT FORMULATED
WITH THE CONTAMINANTS LISTED IN THE TOXICITY CHARACTERISTIC (TC)
RULE AS DETERMINED BY THE TOXICITY CHARACTERISTIC LEACHING
PROCEDURE (TCLP). HOWEVER, USED PRODUCT MAY BE REGULATED.

THIS PRODUCT HAS BEEN USDA APPROVED UNDER THE FOLLOWING CATEGORY: P1 -
COMPOUNDS REQUIRING SPECIAL AUTHORIZATION LETTER

U.S. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III:
THIS PRODUCT CONTAINS NO "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (302) REPORTABLE HAZARD CATEGORIES: NONE

THIS PRODUCT CONTAINS NO CHEMICALS REPORTABLE UNDER
SARA (313) TOXIC RELEASE PROGRAM.

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME CAS NUMBER LIST CITATIONS

*** NO REPORTABLE INGREDIENTS ***

--- KEY TO LIST CITATIONS ---

1 = OSHA Z, 2 = ACGIH, 3 = IARC, 4 = NTP, 5 = NCI,
6 = EPA CARC, 7 = NFPA 49, 8 = NFPA 325M, 9 = DOT HMT, 10 = CA RTK,
11 = IL RTK, 12 = MA RTK, 13 = MN RTK, 14 = NJ RTK, 15 = MI 293,
16 = FL RTK, 17 = PA RTK, 18 = CA P65.

--- NTP, IARC, AND OSHA INCLUDE CARCINOGENIC LISTINGS ---

NOTE: MOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

***** XIII. INGREDIENTS *****

INGREDIENT DESCRIPTION	PERCENT	CAS NUMBER
CONTAINS THE FOLLOWING BASE OILS:	> 95.00	
- PARAFFIN WAXES (PETROLEUM). HYDROTREATED		64742-51-4

***** APPENDIX *****
FOR MOBIL USE ONLY: (FILL NO: MTW338A001) MCN: . MHC: 0* 0* NA 0* 0*.
MPPEC: . PPEC: A. US86-523 APPROVE 05/10/90

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT
WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR
PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT
ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL
WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF
MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE
USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A
RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING
LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING
PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.

PREPARED BY: MOBIL OIL CORPORATION

ENVIRONMENTAL HEALTH AND SAFETY DEPARTMENT, PRINCETON, NJ

FOR FURTHER INFORMATION, CONTACT:

MOBIL OIL CORPORATION, PRODUCT FORMULATION AND QUALITY CONTROL
3225 GALLOWES ROAD, FAIRFAX, VA 22037 (800) 227-0707 X3265

ARIZONA CHEMICAL CO.
P.O. BOX 1147
OAKDALE, LOUISIANA 71463-1147

HERCULES INC.
HATTIESBURG, MS. 39401

ATTN: QUALITY CONTROL

DATE----- 10/03/90

PRODUCT----- TALL OIL ROSIN
(35-240)

SHIPPED VIA ----- UTLX-650192

CUSTOMER'S REF.-----042880483 REL 23

ARIZONA'S ORDER NUMBER----- 16001174

BATCH (LOT) NUMBER----- 1875

ACID VALUE----- 170.1

% ROSIN ACIDS----- 88.3

% FATTY ACID----- 3.2

GRADE----- WW 1/4

BALL & RING, S. P.----- 73.8

YOURS TRULY

J. G. Stephenson
J.G. STEPHENSON
QUALITY CONTROL
LAB TECHNICIAN



EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

SLACK WAX 200

DATE ISSUED: 06/01/89
SUPERSEDES DATE: 10/14/88

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
SLACK WAX 200

N wax

PRODUCT CODE
493650 - 03650

CHEMICAL NAME
Petroleum Wax

CAS NUMBER
64742-61-6

PRODUCT APPEARANCE AND ODOR
Crystalline slack wax, light colored
Bland petroleum odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS

Slack wax, petroleum

CAS NO. OF
COMPONENTS

64742-61-6

APPROXIMATE
CONCENTRATION

100%

See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health Flammability Reactivity

1 1 0

BASIS

Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT

5 mg/m³ for oil mist or 2 mg/m³ for wax fumes in air; 6 mg/m³ STEL

BASIS

OSHA Regulation 29 CFR 1910.1000
Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If hot product is splashed into eyes, flush immediately with clear water and contact physician immediately.

SKIN

Immediately contact a physician for treatment of thermal burns. In case of skin contact with product under other conditions, wash thoroughly with soap and water. Removal of product from skin may be aided by use of waterless handcleaner.

INHALATION

If overcome by fumes, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)

190°C (374°F)

ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE

Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health Flammability Reactivity

0

1

0

BASIS

Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS

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

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9%

Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, 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 and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

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

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Prolonged or repeated skin contact may cause skin irritation.
Exposure to hot product may cause thermal burns.

NATURE OF HAZARD AND TOXICITY INFORMATION

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

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

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None Recognized

F. PHYSICAL DATA

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

BOILING RANGE

IBP Greater than 302°C (575°F)

VAPOR PRESSURE

Less than 0.01 mm Hg @ 20°C

SPECIFIC GRAVITY (15.6 C/15.6 C)

0.82

VAPOR DENSITY (AIR = 1)

Greater than 5

MOLECULAR WEIGHT

Not determined

PERCENT VOLATILE BY VOLUME

Negligible from open container
in 4 hours @ 38°C (100°F)

pH

Essentially neutral

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)

(n-BUTYL ACETATE = 1)
Less than 0.01

POUR, CONGEALING OR MELTING POINT

52.8°C (127°F)

Melting Point by ASTM D 127

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

Negligible; less than 0.1%

VISCOSITY

4.1 cSt @ 100°C

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Recover free product. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers or watercourses. Assure conformity with applicable governmental regulations.

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

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)

No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)

No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)

No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

	Acute	Chronic	Fire	Pressure	Reactive	Not Applicable
EPA HAZARD CLASSIFICATION CODE:	Hazard	Hazard	Hazard	Hazard	Hazard	

XXX

I. PROTECTION AND PRECAUTIONS**VENTILATION**

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

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

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

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

WORK PRACTICES / ENGINEERING CONTROLS

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

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE

Minimize breathing hot fumes, vapors, and mist.

Remove wax-impregnated clothing and launder or dry-clean before re-use. Discard wax-impregnated shoes. Wash skin thoroughly with soap and water after handling.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION**TRANSPORTATION INCIDENT INFORMATION**

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER

Not applicable

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

(OSHA Hazard Warnings not applicable for this product; therefore, no OSHA warnings would appear on the label.)

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

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

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

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

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:

DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:

MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

MATERIAL SAFETY DATA SHEET

DEC 12 1990
PAGE: 01 of 08

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCULES* IP SIZE 46
Sizing emulsion

MSDS No.: 181 6112 0100-01

Supersedes MSDS No.: OR 564

Date: 11/21/90

1. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE SKIN AND EYE IRRITATION.

POSSIBLE CANCER HAZARD: HERCULES* IP SIZE 46
CONTAINS LESS THAN 1% 1,3-DICHLOROPROPANOL
(1,3-DCP).

1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER
LABORATORY STUDIES.

Risk of cancer depends on duration and level of exposure.

HERCULES* IP SIZE 46 Sizing emulsion

HMIS RATINGS: (1)

Health hazard: 1 Slight (2)
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL & COMMON NAMES: Cationic emulsion of alkyl ketene dimer

APPEARANCE AND ODOR: White liquid; odorless

(2) Indicates there may be chronic health effects present. See Section V of
MSDS.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.
AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

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II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES	%	RECOMMENDED AIRBORNE LEVELS(1)	
		OSHA TWA	TLV-TWA 1988-89
HERCULES* IP SIZE 46 Sizing emulsion	100		Not established
1,3-Dichloropropan-2-ol (1,3-DCP)	< 1		Not established (3)

- (3) 1,3-DCP is a by-product from the manufacture of HERCULES* IP SIZE 46. Although no TLV has been established, Hercules recommends that the workplace standard (TLV) of 2 ppm be applied.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 99-100 C (210-212 F) SOLUBILITY IN WATER: Completely miscible

VAPOR PRESSURE @ 20 C: Same as water SPECIFIC GRAVITY: 1.0

VAPOR DENSITY: Lighter than air pH: 4.1 - 5.5

% VOLATILE (VOL.): Negligible @ 20 C EVAPORATION RATE: Same as water

FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Noncombustible

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon may be used on fires involving this product.

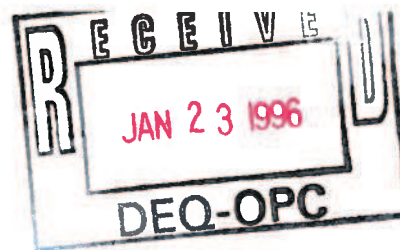
SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS:

Stable. Store as cool as possible, but above 4 C (40 F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.

Continued...



MSDS No.: 181 6112 0100-01

Date: 11/21/90

PAGE: 03 of 08

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

INCOMPATIBILITY WITH: Alkalies, amines, or alcohols

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution which will not support combustion. If heated to decomposition, it may generate (evolve) carbon monoxide, carbon dioxide, nitrogen oxides, or hydrogen chloride. Under some fire conditions, small amounts of ammonia or hydrogen cyanide may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE SKIN AND EYE IRRITATION.

POSSIBLE CANCER HAZARD: HERCULES* IP SIZE 46
CONTAINS LESS THAN 1% 1,3-DICHLOROPROPANOL
(1,3-DCP).

1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER
LABORATORY STUDIES.

Risk of cancer depends on duration and level of exposure.

SIGNS & SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause mild eye irritation.

SKIN: Prolonged contact may cause mild skin irritation.

INHALATION: Inhaling vapor or mist may cause respiratory irritation.

INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

V. HEALTH HAZARD DATA

...Continued

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

PRIMARY ROUTES OF ENTRY: Eyes, skin, inhalation

CANCER INFORMATION:

HERCULES* IP SIZE-46: This product contains a mixture of two active components. The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are NOT regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have NOT been evaluated by the International Agency for Research on Cancer (IARC).

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): A recent unpublished chronic study of 1,3-DCP administered to rats in drinking water at 80 mg/liter for a period of 104 weeks found tumors of the liver, kidney, oral epithelial/tongue, and thyroid gland. At the dose level of 27 mg/liter no test material related effects were noted.

REPORTED HUMAN EFFECTS:

HERCULES* IP SIZE 46: Repeated insult human patch tests with each of the two resins in this product have shown that neither is a skin irritant nor a sensitizer.

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): None known.

REPORTED ANIMAL EFFECTS:

HERCULES* IP SIZE 46: This product is a mixture of two resins. The acute oral LD50 for RESIN A in rats is greater than 40 g/kg and in guinea pigs is 20 g/kg. It was not an irritant to rabbit skin and caused neither irritation or sensitization in guinea pigs. Acute oral studies were not conducted with RESIN B (uncured), but it was not irritating to rabbit skin and was neither an irritant nor sensitizer to guinea pigs.

1,3 DICHLOROPROPAN-2-OL: Acute studies; Oral LD50 (rat) 110 mg/kg; Oral LD50 (mouse) 100 mg/kg; inhalation LC50 (4 hours, rat) 125 ppm, 2/6 deaths, 250 ppm (6/6 deaths); dermal LD50 (rabbits) 800 mg/kg; skin irritation (rabbit) mild; eye irritation (rabbit) severe. Liver and kidney damage was observed in acute oral and inhalation studies.

Subacute studies: In response to a TSCA test rule, a 13-week oral gavage study with 1,3-DCP was conducted with male and female rats at dose levels of 0.1, 1, 10, and 100 mg/kg body weight/day. The highest level produced decreases in body weight gain, feed consumption, and hematologic parameters, increases in clinical chemistry values and kidney and liver weight ratios. Histopathologic changes were noted in the stomach, kidney, liver, and nasal tissues in both male and female rats. Lesser effects were noted in the 10 mg dose groups; while 1 mg/day was considered a no-observed-adverse-effect level (NOAEL).

V. HEALTH HAZARD DATA

REPORTED ANIMAL EFFECTS:...Continued

Male Wistar rats were exposed orally to 1,3-DCP by gavage at daily doses of 0, 15, or 60 mg/kg for 14 days. Differences between treated and control animals were observed in the appearance of small spermatocoele or sperm granulomas in the efferent ducts and/or epididymis. These effects were seen in only a small number of animals and were not dose related. In addition, no morphological changes were noted in kidneys, testes, or vas deferens. Studies conducted by the Upjohn Co. found 1,3-DCP to have no sterilitant activity in male rats.

Chronic studies, see above: CANCER INFORMATION.

In an 8(e) submission to the EPA, a report of a two-year chronic feeding study in rats disclosed that tris (1,3-dichloropropan-2-ol) phosphate (CAS No. 13674-87-8) caused a statistically significant increase in malignant liver tumors (hepatocellular carcinomas) at 80 mg/kg/day, the highest dose studied. The significance of this study is that the product rapidly metabolized to 1,3-DCP and partial phosphate esters. Both partial esters were inactive in the Ames bacterial mutagen test in the presence of liver homogenate induction, whereas 1,3-DCP was mutagenic without activation (see below).

GENOTOXICITY:

1,3-DCP was active in the Ames salmonella bacteria test both in the presence and absence of a liver metabolizing fraction. It caused sister chromatid exchange and chromosome aberrations in Chinese hamster ovary cells in vitro and a mutation at the TK locus in the L5178Y line of mouse lymphoma cells in vitro. 1,3-DCP was active in all tests with and without activation by S-9 fraction from Aroclor* induced rat liver.

* Aroclor is a registered trademark of Monsanto Company for chlorinated biphenyl.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Flush with excess water to a wastewater treatment system.
Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, state, and federal regulations is an acceptable alternative. Supplemental fuel may be required.

Refer to Section VIII for specific Federal Environmental and Regulatory

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Do not allow eye or skin contact.

Avoid breathing mist.

Wash thoroughly after handling, and before eating, drinking or smoking.

Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Store as cool as possible, but above 4 C (40 F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.

This product may react with alkalies or amines and should not be stored near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following Environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	HERCULES* IP SIZE 46 Sizing emulsion	N/A	100
I	1,3-Dichloropropan-2-ol	96-23-1	< 1

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-2, NPH	NO
I	N/A	N/A	HC-1, HC-2, NPH	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

MATERIAL SAFETY DATA SHEET

HERCULES® IP SIZE 63
Emulsion

HERCULES INCORPORATED
Hercules Plaza
Wilmington, Del, 19894
Phone Number: (302) 594-5000 (all hours)

MSDS No.: 181 6112 0200-1

Date: 12/25/87
Page: 1 of 5

Supersedes MSDS No.: PMC D-0603

I. PRODUCT IDENTIFICATION

CAUTION: MAY CAUSE EYE AND SKIN IRRITATION.
VAPORS AND MIST MAY BE HARMFUL.
CONTAINS EPICHLOROHYDRIN AND ITS HYDROLYSIS PRODUCTS.

HERCULES® IP SIZE 63 Emulsion

HMIS[†] Ratings

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

Chemical and common name: Cationic emulsion of alkylketene dimer

Appearance and odor: White low viscosity liquid; slight medicinal odor

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

Chemical & Common Names of Hazardous Ingredients	%	Recommended Air-borne levels	
		OSHA PEL*	TLV**TWA** 1987-88
Epichlorohydrin [106-89-6]	< 0.10 ⁽¹⁾	5 ppm (skin)	2 ppm ⁽²⁾ (skin)
Epichlorohydrin hydrolysis products: ⁽³⁾			
1,3-Dichloro-2-propanol [96-23-1]	< 1.0	Not established.	
3-Chloro-1,2-dihydroxypropane	< 0.2	Not established.	
Sulfuric acid [7664-93-9]		1 mg/m ³	

(1) No unreacted epichlorohydrin was found in similar products.

(2) Hercules Incorporated recommends that the workplace air standard (TLV) of 2 ppm be applied to the sum of epichlorohydrin and the two indicated primary hydrolysis products.

(3) Under alkaline conditions, the hydrolysis products of epichlorohydrin may form epichlorohydrin.

[†]HMIS = Hazardous Materials Identification System rating for the product as it is supplied.

*OSHA PEL = Occupational Safety and Health Standards Permissible Exposure Limit.

**TLV = Registered trademark of American Conference of Governmental Industrial Hygienists for Threshold Limit Values.

**TWA = Time Weighted Average

N/A = Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide for itself what safety measures are necessary to safely use this product, either alone or in combination with other products.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling point:	100°C (212°F)	Solubility in water:	Miscible
Vapor pressure @ 20°C:	Similar to water	Specific gravity:	1.03
Vapor density:	Lighter than air	pH:	2.0 ± 0.3
% volatile (vol.):	Negligible at 20°C	Evaporation rate:	Similar to water
Freezing point:	0°C (32°F)		

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

Flash point: Non-flammable - water emulsion Flammable limits: N/A

Autoignition temperature: N/A

Extinguishing media: Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon may be used on fires involving this product.

Special fire-fighting procedures: None

Unusual fire & explosion hazards: None

Stability considerations: Stable. Store at room temperature between 40 and 70°F.

Incompatibility with: Alkalies or amines

Hazardous decomposition products: None

Hazardous products of combustion: This product as sold is not combustible. However, if all the water is evaporated in a fire, the residue may be burned in the fire. In that case, the combustion products depend on fire temperature, other materials present, and air supply. They can be carbon dioxide, carbon monoxide, nitrogen oxides, and sulfur oxides. They also can include irritating aldehydes, carboxylic acids, ketones, unsaturated hydrocarbons, irritating chlorinated derivatives of these organic compounds and hydrogen chloride. Carbon monoxide and carbon dioxide will be the most prevalent.

Hazardous polymerization: Will not occur.

V. (A) HEALTH HAZARD DATA

**CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.
VAPORS AND MIST MAY BE HARMFUL.
CONTAINS EPICHLOROHYDRIN AND ITS HYDROLYSIS PRODUCTS.**

Signs & symptoms of overexposure in the workplace:

Eyes: May cause transient eye irritation (redness, itching, tearing, pain).
Skin: Prolonged or repeated contact may cause skin irritation (redness, itching, pain).
Inhalation: Mist or vapors may cause irritation of the respiratory tract (coughing, wheezing).
Ingestion: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly flush with running water. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician.

Continued...

APPLICABLE CONTROL MEASURES

- Appropriate hygienic practices:** Do not allow eye or skin contact.
Avoid breathing mist or vapor.
Wash thoroughly after handling, and before eating, drinking or smoking.
Remove contaminated clothing promptly and clean thoroughly before reuse.
- Personal protective equipment:** Impervious gloves
Chemical goggles
Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits.
Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.
Appropriate protective clothing
- Work practices:** Eyewash fountains and safety showers should be easily accessible.
- Handling and storage precautions:** Store as cool as possible, but above 4°C (40°F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.
This product may react with alkalies or amines and should not be stored near such materials.
- Engineering controls:** Adequate ventilation should be provided to keep mist or vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.
- Protective measures during repair and maintenance:** Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.
-

V. (A) HEALTH HAZARD DATA

Reported Animal Effects:...Continued

The inhalation LC50 to rats exposed for 6 hours to epichlorohydrin vapors is about 360 ppm. The no observable effect level (NOEL) was 283 ppm for 6 hours. The two-hour LC50 for mice is approximately 780 ppm. Epichlorohydrin exposure for 0.5 hours for 7,414 ppm was lethal to mice. Multiple exposure inhalation studies with several animal species have shown that epichlorohydrin causes degenerative changes in the respiratory and olfactory tissues. In some studies, significant kidney and liver effects were noted.

Reproduction studies with rats showed the epichlorohydrin exposure by the inhalation route did not affect the reproductive performance of females or cause malformation of the offspring. Studies in male rats indicate that epichlorohydrin may cause reversible sterility. Teratogenicity studies with mice and rabbits exposed to levels of epichlorohydrin that produced toxic effects confirmed that epichlorohydrin is not teratogenic.

There is limited evidence from animal studies to indicate that epichlorohydrin may be carcinogenic by the oral, inhalation and dermal routes of exposure. The evidence was sufficient for IARC to list epichlorohydrin as an animal carcinogen.

The primary hydrolysis products of epichlorohydrin appear to produce toxic effects similar to those of epichlorohydrin at about the same concentrations.

Other: Dichloropropanols - Active in the Ames test. Cause sister chromatid exchanges.

Epichlorohydrin - Mutagenic in bacteria, yeasts, fungi, molds, and animal and human cells. Also caused physical changes in chromosomes of animal cells.

V. (B) EPICHLOROHYDRIN LEVELS IN PAPER MILLS

Hercules Incorporated has conducted extensive studies on the levels of epichlorohydrin in a variety of paper mills. The amounts of epichlorohydrin and its hydrolysis products in the air, in the paper, and in the process water are either undetectable or so low that they do not present any industrial hygiene concerns. The one exception is that air above Kymene in storage tanks may contain epichlorohydrin and its hydrolysis products at levels considerably in excess of TLV limitations for epichlorohydrin. These tanks should be vented in such a way that epichlorohydrin and its hydrolysis products do not contaminate the air of the workplace and should be entered only while using an approved tank entry procedure.

Hercules Incorporated recommends that the user of this product establish a monitoring program for airborne levels of epichlorohydrin and its derived chemicals. Since epichlorohydrin and its primary hydrolysis products (1,3-dichloro-2-propanol and 3-chloro-1,2-dihydroxypropane) appear to have similar toxicological properties, it is recommended that the work standards for epichlorohydrin should be applied to the sum of the concentrations of epichlorohydrin and related compounds. If the user requires information or assistance in establishing a monitoring program, contact Hercules Incorporated for further information.

VI. SPILL PROCEDURES & WASTE DISPOSAL

Spill Procedures: Small Spills: Flush with excess water to a wastewater treatment system. Large Spills: Dike to contain and pump into drums for use or disposal.

Waste Disposal Method: This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, State, and Federal regulations is an acceptable alternative. Supplemental fuel may be required.

Normal variations in this product may cause its pH to be equal to or less than 2.0. In those cases, the product exhibits the characteristic of corrosivity as defined in hazardous waste regulations 40 CFR 261, Subpart C, and disposal of unused product must comply with the hazardous waste regulations.

This product is not listed in Federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the Federal regulation.

V. (A) HEALTH HAZARD DATA

...Continued

Medical conditions generally recognized as being aggravated by exposure: None known. Any pre-existing skin, eye, or respiratory irritation may be aggravated by overexposure to this product.

Primary Routes of Exposure/Entry: Eyes, skin, inhalation

Cancer Information:

None of the components of this product are listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

Epichlorohydrin, which may be formed in small amounts under alkaline conditions, is listed in the most recent NTP (National Toxicology Program) list of carcinogens and has been determined to be carcinogenic in animals by IARC (International Agency for Research on Cancer). Both have determined that there is sufficient evidence of carcinogenicity to experimental animals, but inadequate evidence of carcinogenicity to humans.

Reported Human Effects:

1,3-Dichloropropan-2-ol - None known.

Sulfuric Acid - Concentrated sulfuric acid has been reported to upset blood acid-base balance when swallowed. Chronic overexposure by inhalation has been reported to cause pulmonary fibrosis and emphysema.

Epichlorohydrin: Epichlorohydrin causes irritation of the respiratory tract, skin, and eyes. Symptoms of acute exposure to vapors include headache, nausea, head and chest congestion. Acute (i.e., accidental) exposure to a very high level of epichlorohydrin resulted in severe inhalation poisoning. The initial irritation of eyes and throat was followed by chronic asthmatic bronchitis and extensive degenerative changes in the liver. No other cases of liver damage from epichlorohydrin exposure have been reported. Repeated skin contact may cause skin sensitization. It has been reported that epichlorohydrin induces chromosomal changes in some occupationally exposed humans. Epidemiologic studies have not demonstrated that epichlorohydrin is a human carcinogen or causes effects on the fertility of occupationally exposed males.

None of the above toxic effects reported for concentrated sulfuric acid or pure epichlorohydrin are believed to be important for exposures to IP SIZE 63.

Reported Animal Effects:

1,3-Dichloropropan-2-ol - Chloropropanols administered by mouth have caused reversible sterility in male rats.

Sulfuric Acid - Monkeys breathing air containing 2.4 mg/m³ of sulfuric acid mist for 2 years did not show any serious effects. Under the same conditions, 4.8 mg/m³ caused severe lung damage.

Epichlorohydrin: Animal studies have shown that epichlorohydrin is well-absorbed following oral, inhalation or dermal exposure and rapidly distributed to various tissues and organs. The highest concentrations are found in the kidney, liver, pancreas, adrenal glands and spleen. Epichlorohydrin is extremely irritating to skin, nasal tissues and eyes. Acute exposure can cause systemic toxicity and regardless of the route of exposure, results in a similar sequence of symptoms. Animals exposed to high doses of epichlorohydrin exhibit central nervous system depression with death occurring due to paralysis of the respiratory system. Some of the specific symptoms that have been reported prior to death of animal exposure to epichlorohydrin are lethargy, slowed respiration, tremors, breathing difficulties and muscular coordination problems. Examination of the tissues often reveal hemorrhages of the lungs and degenerative changes in the kidney and liver.

The acute oral LD50 in rats and mice, respectively is 90 mg/kg and 240 mg/kg. The acute dermal LD50 in rabbits is approximately 1 g/kg. Several animal studies have been conducted to determine if epichlorohydrin causes an allergic skin sensitization response. The results have been conflicting.

Continued...

MATERIAL SAFETY DATA SHEET

Gum Ghatti

Hi-Tek Polymers, Inc.

8808 Bluegrass Parkway

Louisville, Kentucky 40299

Emergency Phone Numbers:

(502) 499-4040 (If no answer, (502) 499-4119)

CHEMTREC (800) 424-9300

Page 1 of 3

Date Issued: 01/28/90 Supersedes: 09/11/86

I. IDENTIFICATION & PHYSICAL DATA

Product Name: Gum Ghatti

Percent Volatile by Volume: Not Applicable

Product Class: Water Soluble Gum Exudate

Boiling Range: Not Applicable

Manufacturer's I.D. : 22863

Bulk Density: 40 +/- 5 lb/cu.ft.

D.O.T. Hazard Class: Not Regulated

Specific Gravity: >1.0

Shipping Name: Gums Natural NOIBN

Vapor Pressure at 20 C: Not Applicable

Evaporation Rate: No specific information

Solubility in Water: Forms Gel

Appearance and Odor: Pale yellow to tan free flowing powder with bland odor.

II. HAZARDOUS INGREDIENTS

	CAS #	WT. %	OSHA TWA ppm	OSHA STEL ppm	ACGIH TWA ppm	ACGIH STEL ppm
Gum Ghatti	9000-28-6	100	10 mg/m3*	---	10 mg/m3*	---

*Limits based on nuisance particulate values for total and respirable dust.

---Not established

III. FIRE & EXPLOSION DATA

Flashpoint: >200 F Setofflash

LEL: No data

Extinguishing Media:

Use carbon dioxide or dry chemical for small fires; aqueous foam or water for large fires.

Unusual Fire & Explosion Hazards:

Like all carbohydrate and most dry organic chemicals, a potential dust explosion hazard exists if the dust concentration in air is too high. Good housekeeping procedures are required to reduce this potential hazard.

Special Fire Fighting Procedures:

Wear self-contained breathing apparatus and complete personal protective equipment when entering confined areas where potential for exposure to vapors or products of combustion exists.

IV. REACTIVITY DATA

Stability: Stable

Hazardous Polymerization: Will not occur

Conditions to Avoid:

Excessive heat.

Reactions to Avoid:

No specific information available.

Hazardous Decomposition Products:

Fumes produced when heated to decomposition may include: carbon monoxide, carbon dioxide.

V. HEALTH HAZARD DATA

Effects of Overexposure:

Ingestion:

Practically nontoxic--LD50 (rat) >17.0 g/kg.

Inhalation:

No specific information available.

Dust may produce a respiratory allergenic response and/or irritation in some individuals.

Skin Absorption:

No specific information available.

Expected to be practically nontoxic.

Skin Contact:

No specific information available.

Contains materials that are essentially nonirritating, but contact may cause slight transient irritation.

Eye Contact:

No specific information available.

Contains materials that may cause eye injury which may persist for several days.

Chronic Effects of Overexposure:

No specific information available.

Emergency & First Aid Procedures:

Eye Contact:

Flush with plenty of water for at least 15 minutes and seek medical attention if irritation persists.

Skin Contact:

Remove contaminated clothing and wash contact area with soap and water for 15 minutes.

Ingestion:

If appreciable quantities are swallowed, seek medical attention.

Inhalation:

In case of exposure to a high concentration of dust, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

VI. SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled:

For wet material, dike spill and absorb with inert material and collect for disposal. Caution: wet material is slippery.

For dry powder, sweep or scoop-up and collect for disposal. Avoid creating dust clouds and breathing dust.

Waste Disposal Method:

Incinerate or dispose of in a landfill in accordance with federal, state, and local regulations. This material is not defined as a hazardous waste under current RCRA regulations.

VII. SPECIAL PROTECTION INFORMATION

Respiratory Protection:

Wear a properly fitted NIOSH/MSHA approved dust or air-line respirator whenever exposure to dust is likely and where ventilation is inadequate.

Ventilation:

Local Exhaust - Recommended when appropriate to control employee exposure.

Mechanical - Not recommended as the sole means of controlling employee exposure.

Protective Gloves: For operations where contact can occur, wear impervious gloves.

Eye Protection: Safety goggles.

Other Protective Equipment: For operations where contact can occur, a safety shower and eye wash facility should be available.

VIII. SPECIAL PRECAUTIONS

Store in a dry place. Keep container closed to avoid moisture pickup. Avoid creating dust clouds and breathing dust when handling.

IX. STATE R-T-K COMPOSITION INFORMATION

This product does not contain any STATE RIGHT-TO-KNOW chemicals.

X. SARA Title III Section 313 Information

This product does not contain any SARA Title III Section 313 chemicals.

XI. California Proposition 65 Information

This product does not contain any California Proposition 65 designated chemicals.

XII. Other Information

All components of this product are listed on the TSCA registry.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Safe Right

Required under USDL Safety and Health Regulations for Ship Repairing,
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME ITT Rayonier Inc.		EMERGENCY TELEPHONE NO. 206 532-1410
ADDRESS (Number, Street, City, State, and ZIP Code) P.O. Box 299, 23rd & Railroad Hoquiam, WA 98550		
CHEMICAL NAME AND SYNONYMS Sodium Lignosulfonate-Lignin Liquor		TRADE NAME AND SYNONYMS Raylig
CHEMICAL FAMILY Silvichemicals	FORMULA Mixture	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Unit)	ALLOYS AND METALLIC COATINGS	%	TLV (Unit)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Unit)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212+	SPECIFIC GRAVITY (H ₂ O=1)	1.25
VAPOR PRESSURE (mm Hg.)	-	PERCENT VOLATILE BY VOLUME (%)	50
VAPOR DENSITY (AIR=1)	-	EVAPORATION RATE (_____ = 1)	-
SOLUBILITY IN WATER	soluble	PH - 1% aqueous	5.5
APPEARANCE AND ODOR Brown viscous liquid with sweet odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	None	FLAMMABLE LIMITS	LeI	UeI
EXTINGUISHING MEDIA	None			
SPECIAL FIRE FIGHTING PROCEDURES	None			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

THRESHOLD LIMIT VALUE	None Known
EFFECTS OF OVEREXPOSURE	None
EMERGENCY AND FIRST AID PROCEDURES	The material is considered non-toxic and removal with water is sufficient first aid.

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to avoid)		Strong oxidizing agents	
HAZARDOUS DECOMPOSITION PRODUCTS		SO ₂	
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
Clean up the area and flush with water.	
WASTE DISPOSAL METHOD	Dispose of as a non-hazardous industrial material.

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type) If product is heated it is recommended to wear SO ₂ mask to avoid irritation.			
VENTILATION	LOCAL EXHAUST	SPECIAL	N/A
	MECHANICAL (General)	OTHER	N/A
PROTECTIVE GLOVES	None Required	EYE PROTECTION	Goggles
OTHER PROTECTIVE EQUIPMENT	None Required		

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
None except as noted in Section VI above	
OTHER PRECAUTIONS	None

Master
Do Not Remove
This Copy

Material Safety Data Sheet

Complies with OSHA'S Hazard Communication Standard 29CFR 1910.1200



Staley

STA-LOK 410 Starch

Starch, 2-hydroxy-3-trimethylammonium chloride propyl ether

CAS #56780-58-6

SECTION I - MANUFACTURER

A. E. STALEY MANUFACTURING CO.
2200 E. ELDORADO STREET
DECATUR, IL 62525

Emergency Phone Number CHEMTREC: 800-424-9300
Phone Number For Information: 8:00-4:30 M-F (217)423-4411
Date Prepared 11/1/88

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components	CAS#	OSHA PEL	ACGIH TLV	Other Limits	% Present
Nuisance Dust					
(Total Dust)		15 mg/M ³	10 mg/M ³		
(Respirable Fraction)		5 mg/M ³			

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	N/A	Specific Gravity (H ₂ O = 1):	N/A
Vapor Pressure (mmHg):	N/A	Percent, Volatile	
Vapor Density (air = 1):	N/A	By Weight (%) Moisture:	13 max.
Solubility in Water:	Negligible	Evaporation Rate (Butyl Acetate = 1):	N/A
Appearance and Odor:	Off-white powder; starch-like odor		

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flash Point (Method Used): N/A Flammable Limits: N/A LEL: UEL:

Extinguishing Media: Water spray, carbon dioxide, dry chemical extinguishers.

Special Fire Fighting Procedures: Avoid procedures which could cause a dust cloud to be formed.

Unusual Fire and Explosion Hazards: Product dust may form an explosive mixture with air. Avoid conditions which produce dust.

N/A - NOT APPLICABLE
N/F - NO INFORMATION FOUND

SECTION V - REACTIVITY DATA

Stability: Stable: X Unstable:

Conditions to Avoid: Practices which produce dust.

Incompatibility (Materials to Avoid): Oxidizing agents

Hazardous Decomposition or By-Products: Oxides of carbon

Hazardous

Polymerization: May Occur: Will Not Occur: X

Conditions to Avoid: Practices which produce dust.

SECTION VI - HEALTH HAZARD DATA

Routes of Entry: Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic): N/F

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

Teratogenicity: No Mutagenicity: No

Signs and Symptoms of Exposure: Dust may be irritating to nose and eyes.

Medical Conditions Generally Aggravated by Exposure: N/F

Emergency and First Aid Procedures: Unlikely to be necessary. Flush eyes with water.
Remove to fresh air.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING & USE

Steps To Be Taken In Case Material Is Released Or Spilled: Sweep up with explosion proof vacuum cleaner. Avoid production of dust.

Waste Disposal Method: Send to sanitary landfill or incinerate.

Precautions to be taken in handling and storing: Store away from heat source. Avoid handling procedures which produce dust.

Other Precautions: None

SECTION VIII - CONTROL MEASURES

Respiratory Protection: Dust respirator (NIOSH/MSHA #TC-21C-132) may be desirable when dumping bags.

Ventilation: Local Exhaust:
Desirable when dumping bags.

Mechanical (General):
Desirable when dumping bags.

Protective Gloves:
Not needed.

Eye Protection:
Goggles may be desirable when dumping bags.

Other Protective Clothing or Equipment: Not needed

SECTION IX - SARA TITLE III

This material is not subject to the toxic chemical reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR Part 372.

MATERIAL SAFETY DATA SHEET

AQUAPEL® 364 Alkylketene dimer

HERCULES INCORPORATED
Hercules Plaza
Wilmington, Delaware, 19894
Phone Number: (302) 594-5000 (all hours)

MSDS No.: 180 6021 0700-2

Date: 03/18/88
Page: 1 of 3

Supersedes MSDS No.: 180 6021 0700-1

I. PRODUCT IDENTIFICATION

AQUAPEL® 364 Alkylketene dimer

CAS-Number: [68390-56-7]

HMIS[†] Ratings

Health hazard:	0	Minimal
Flammability hazard:	1	Slight
Reactivity hazard:	0	Minimal

Chemical and Common Name: Fatty acid ketene dimers

Appearance and odor: Tan, waxy solid; slight solvent odor

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a hazardous material.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling point:	> 300°C (572°F)	Solubility in water:	Negligible
Vapor pressure @ 25°C:	7 mm Hg	Specific gravity:	0.95
Vapor density :	Heavier than air	pH:	N/A
% volatile (vol.):	< 1	Evaporation rate:	Slower than butyl acetate
Freezing point:	42°C (108°F)		

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

Flash point: > 204°C (400°F)

Flammable limits: N/A

Autoignition temperature: Not established.

Continued...

[†]HMIS = Hazardous Materials Identification System rating for the product as it is supplied.
N/A = Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide for itself what safety measures are necessary to safely use this product, either alone or in combination with other products.

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

Extinguishing media: Water spray, dry chemical, foam, carbon dioxide, or halon

Special fire-fighting procedures: Use self-contained breathing apparatus.

Unusual fire & explosion hazards: None

Stability considerations: Stable

Incompatibility with: Strong oxidizers

Hazardous decomposition products: None

Hazardous products of combustion: Combustion products vary depending on fire conditions and other combustibles present in the fire. The predominant products will be carbon dioxide and carbon monoxide. Under some conditions, irritating aldehydes and carboxylic acids may be formed.

Hazardous polymerization: Will not occur.

V. HEALTH HAZARD DATA

Signs & symptoms of overexposure in the workplace:

None known.

EMERGENCY & FIRST AID PROCEDURES:

None required.

Medical conditions generally recognized as being aggravated by exposure: None expected.Primary Routes of Entry: IngestionCancer Information:

Not listed as a carcinogen by NTP (National Toxicology Program); not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

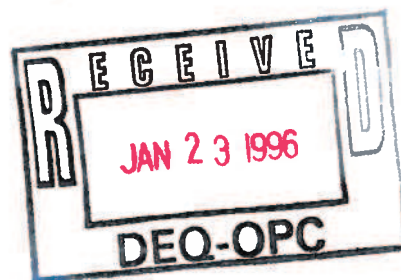
Reported Human Effects:

None known. An emulsion containing 6% fatty acid ketene dimers did not cause skin irritation or signs of skin sensitization in a human patch test.

Reported Animal Effects:AQUAPEL® 364: None known.

A closely related chemical was tested (undiluted) for toxic effects and found to have a lethal dose greater than 5 g/kg when eaten by rats, did not cause an allergic skin reaction (sensitization) in guinea pigs, did not irritate rabbit skin, was not absorbed through rabbit skin (LD50 > 2 g/kg) and caused only minimal transient eye irritation which was gone by 24 hours after dosing.

Continued...



V. HEALTH HAZARD DATA

...Continued

Reported Animal Effects:

In a 28-day repeated dermal application study with rats, a similar product was applied neat at 1 g/kg for 6 hour periods. No signs of skin irritation or other clinical signs of toxicity were noted. All hematological, biochemical and urinalysis tests were normal. Necropsy did not reveal any abnormalities. The adrenal gland weights of the treated rats were larger than the control animals. However, microscopic examination of the tissues and the adrenal glands revealed no treatment related effects.

Other:

A similar product was negative in the Ames test, and a micronuclei test with mice was negative.

VI. SPILL PROCEDURES & WASTE DISPOSAL

Spill Procedures: If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

Waste Disposal Method: Incineration of combustible waste material in a permitted facility in accordance with local, State, and Federal regulations is the recommended disposal method. Landfilling in a licensed facility equipped with leachate collection is a suitable alternative.

This product is not listed in Federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the Federal regulation.

VII. APPLICABLE CONTROL MEASURES

- | | |
|--|---|
| Appropriate hygienic practices: | Avoid contact with eyes, skin, and clothing.
Avoid breathing solvent vapors.
Wash thoroughly after handling, and before eating, drinking, or smoking.
Remove contaminated clothing promptly and clean thoroughly before reuse. |
| Personal protective equipment: | Safety glasses
Impervious gloves
Appropriate protective clothing |
| Work practices: | Eyewash fountains and safety showers should be easily accessible. |
| Handling and storage precautions: | This product may react with strong oxidizers and should not be stored near such materials.
Store under cool dry conditions to prevent agglomeration. |
| Engineering controls: | Provide adequate ventilation. |
| Protective measures during repair and maintenance: | Keep area clean. Product will burn.
Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs. |
-



S CHEMICAL CO., INC., P.O. 102, OLD BRIDGE, N.J. 08857
EMERGENCY PHONE 908-607-2700

cc. Safety
7-5-94
**MATERIAL SAFETY
DATA SHEET**

SECTION I - IDENTIFICATION

TRADE NAME Agefloc PC18HV, PC20HV, PC20VHV, PC2206, PC20		CAS NO. 26062-79-3
CHEMICAL NAME AND SYNONYMS Poly(dimethyldimethylammonium chloride)		
CHEMICAL FAMILY Quaternary ammonium homopolymer		FORMULA $(C_8H_{16}NCl)_n$

SECTION II - HAZARDOUS INGREDIENTS

COMPONENT	%	TLV-TWA
Poly(dimethyldimethylammonium chloride) (CAS 26062-79-3)	20	
Water (CAS 7732-18-5)	80	

SECTION III - PHYSICAL DATA

BOILING POINT (°C)	100	SPECIFIC GRAVITY (H ₂ O=1) @ 25°C	1.03-1.05
VAPOR PRESSURE (mm Hg)	NA	PERCENT VOLATILE BY VOLUME (%)	80
OR DENSITY (H ₂ O=1)	NA	EVAPORATION RATE	NA
SOLUBILITY IN WATER	Complete	pH	5.0-7.0
APPEARANCE AND ODOR	Straw colored liquid with characteristic odor.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 200°F	METHOD: PMCC	FLAMMABLE LIMITS	LEL NA	UEL NA
EXTINGUISHING MEDIA This product would not be expected to burn unless all water is boiled away. The remaining organics may be ignitable. Use water to cool containers and water, foam, carbon dioxide or dry chemical to fight fires.				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Self-contained breathing apparatus should be worn by fire fighting and rescue personnel.				

SECTION V - REACTIVITY DATA

STABILITY UNSTABLE <input type="checkbox"/> STABLE <input checked="" type="checkbox"/>	CONDITIONS TO AVOID Strong oxidizers (see below)
HAZARDOUS POLYMERIZATION MAY OCCUR <input type="checkbox"/> WILL NOT OCCUR <input checked="" type="checkbox"/>	CONDITIONS TO AVOID
INCOMPATIBILITY (materials to avoid) Strong oxidizers, i.e. chlorine, peroxide, nitric acid, etc.	
HAZARDOUS DECOMPOSITION PRODUCTS In the event of combustion, oxides of nitrogen and carbon may be formed.	
Hazardous decomposition products	

Hazardous decomposition products

THRESHOLD LIMIT VALUE: (TLV) - Not established

Not established

SYMPTOMS OF OVEREXPOSURE

Review of available data does not identify any symptoms from exposure. Reported or prolonged contact may cause skin or eye irritation.

PRIMARY ROUTE(S) OF ENTRY

Skin

TOXICITY INFORMATION

Acute toxicity studies have not been conducted on this product, but they have been conducted on a similar product. Results are as follows:

Acute oral toxicity (Albino Rats) LD50 - 4,699 mg/kg

Acute dermal toxicity (Albino Rabbits) LD50 - Greater than 2000 mg/kg

Skin Irritation Draize rating (Albino rabbits) - 0.04/0.0 (mildly irritating)

Eye Irritation Draize rating (Albino rabbits) - 1.0/110 (practically non-irritating).

EMERGENCY FIRST-AID PROCEDURES

SKIN: Flush with water for 15 minutes.

EYES: Flush with water for at least 15 minutes with eyelids open. Call a physician.

INGESTION: Give water. Do not induce vomiting. Consult a physician.

INHALATION: Remove to fresh air. Seek medical attention.

SECTION VII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specific type) Not normally needed, if high concentration of vapors are present, Use NIOSH approved respirator (ANSI Z89.2, 1980)

VENTILATION

General area ventilation is recommended.

PROTECTIVE GLOVES

Impervious

EYE PROTECTION

Splash-proof goggles.

OTHER PROTECTIVE EQUIPMENT

Eyebath, safety shower.

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Dike and absorb material with inert material such as earth, sawdust, vermiculite or other commercially available absorbents. Shovel into recovery or salvage drum for disposal. Large spills: contain spill and recover into salvage drums or tank truck.

WASTE DISPOSAL METHOD

This product does not meet the criteria of a hazardous waste as defined by RCRA 40 CFR 261. As a non-hazardous liquid waste the recovered product should be solidified before disposal in an approved landfill.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Protect from freezing. Freezing may cause stratification. Keep out of streams and ponds. Material is toxic to fish at high concentrations.

DATE OF ISSUE

3-22-93

SUPERSEDES

6-17-92

PREPARED BY

Peter F. Epstein

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Safety
10-15-93

ROQUETTE
Corporation

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
MATERIAL SAFETY DATA SHEET
Required under USDL Safety and Health Regulation for Ship Repairing,
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: ROQUETTE CORPORATION EMERGENCY PHONE # (800) 223-5305

ADDRESS: 1550 NORTHWESTERN AVENUE, GURNEE, IL 60031

CHEMICAL NAME AND SYNONYMS: CATIONIC STARCH

TRADE NAME AND SYNONYMS: HI-CAT[®] 115, 135, 142, 165

CHEMICAL FAMILY: MODIFIED STARCH

FORMULA: $(C_6H_{12}O_6)_n$ - CATION

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENT	%	TLV	ALLOYS AND METALLIC COATINGS	%	TLV
Pigments		E	Base Metal		E
		L			L
Catalyst	A B		Alloys		A B
	C				C
Vehicle			Metallic Coatings		I
					L
Solvents	A P		Filler Metal Plus Coating or Core Flux	P A	
Additives			Others		I
Others	H O				N O
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES					
NOT APPLICABLE					

SECTION III - PHYSICAL DATA

BOILING POINT (°F): DECOMPOSES @ 400° F

BULK DENSITY: 34 lb./ft³

VAPOR PRESSURE (mm Hg.): N/A

PERCENT, VOLATILE (Water)
BY VOLUME (%): Approx. 16-18

VAPOR DENSITY (AIR=1): N/A

EVAPORATION RATE:
(_____ = 1) N/A

SOLUBILITY IN WATER: @ 20° C - SLIGHTLY

pH OF 20% W/W SLURRY IN WATER: 2.0 - 4.5

APPEARANCE AND ODOR: WHITE TO TAN POWDER, NO SIGNIFICANT ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT ($^{\circ}$ F): N/A

FLAMMABLE LIMITS: NOT DETERMINED

EXTINGUISHING MEDIA: WATER SPRAY RECOMMENDED. CO₂, DRY CHEMICAL
PER FOLLOWING NOTE.

SPECIAL FIRE FIGHTING PROCEDURES: WHEN USING AN EXTINGUISHER ON A FIRE
INVOLVING POWDERS, AVOID CREATING A DUST CLOUD THAT MAY POSE AN EXPLOSION
HAZARD.

UNUSUAL FIRE AND EXPLOSION HAZARDS: AS WITH ALL POWDERED MATERIALS THAT CAN
BURN, AVOID SUSPENSIONS IN AIR THAT MAY POSE AN EXPLOSION HAZARD IF IGNITED.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: GENERAL ACGIH TLV-TWA FOR STARCH IS 10 mg/m³
GENERAL OSHA STANDARD FOR STARCH IS:

TWA PEL = 15 mg/m³ TOTAL PARTICULATE
TWA PEL = 5 mg/m³ RESPIRABLE PARTICULATE

PRIMARY ROUTES OF EXPOSURE: INHALATION, SKIN AND EYE CONTACT.. INGESTION
POSSIBLE BUT NOT EXPECTED IN NORMAL USE.

EFFECTS OF OVEREXPOSURE: EYES - IRRITATION AND IMPAIRED VISION (DUST), SKIN
CONTACT - CHEMICAL AND MECHANICAL INJURY (INCLUDING INJURY FROM VIGOROUS SKIN
CLEANING). INHALATION - IRRITATION OF RESPIRATORY TRACT AND INJURY TO MUCOUS
MEMBRANES. INGESTION - IRRITATION OF GASTROINTESTINAL TRACT.

EMERGENCY AND FIRST AID PROCEDURES: EYES - FLUSH WITH WATER FOR AT LEAST 15
MINUTES. SKIN - WASH WITH SOAP & WATER. INHALATION - REMOVE TO FRESH AIR.
IF IRRITATION OR RESPIRATORY SYMPTOMS DEVELOP, CONSULT MEDICAL PERSONNEL.

THIS MATERIAL IS NOT LISTED AS A CARCINOGEN BY IARC, NTP, NIOSH OR THE WEST
GERMAN MAK COMMITTEE.

SECTION VI - REACTIVITY DATA

STABILITY: STABLE UNDER NORMAL CONDITIONS.

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY (Materials to avoid): STRONG OXYDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS: COMBUSTION PRODUCTS (CARBON MONOXIDE &
CARBON DIOXIDE).

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE SPILLED MATERIAL WITH A SCOOP OR SHOVEL. TRACES OF MATERIAL MAY BE REMOVED BY FLUSHING WITH WATER TO A SEWER CONNECTED TO AN APPROPRIATE TREATMENT FACILITY.

WASTE DISPOSAL METHOD: STARCH IS BIODEGRADABLE. DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL ENVIRONMENTAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): WHERE DUST IS PRESENT, NIOSH APPROVED RESPIRATOR FOR DUSTS WITH TLV > 0.05 mg/m³.

VENTILATION

LOCAL EXHAUST: AS NEEDED TO MINIMIZE EXPOSURE.

SPECIAL: N/A

MECHANICAL: (General) N/A

OTHER: N/A

PROTECTIVE GLOVES: IMPERMEABLE GLOVES

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS. CHEMICAL GOGGLES IF DUST IS PRESENT.

OTHER PROTECTIVE EQUIPMENT: NOT NORMALLY REQUIRED.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE IN A COOL, DRY PLACE AWAY FROM STRONG OXIDIZING AGENTS.

OTHER PRECAUTIONS: HANDLE WITH CAUTION AS APPROPRIATE FOR POWDERED MATERIALS.

MATERIAL SAFETY DATA SHEET

2-18-91
PAGE: 01 of 09

HERCULES INCORPORATED

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

KYMENE* 367

Wet strength resin

MSDS No.: 595 6153 0100-05

Supersedes MSDS No.: 595 6153 0100-04

Date: 11/21/90

I. PRODUCT IDENTIFICATION

WARNING! PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION OR
SENSITIZATION (ALLERGIC SKIN REACTION).
MAY CAUSE EYE IRRITATION.
VAPOR AND MIST MAY BE IRRITATING TO MUCOUS MEMBRANES.
MAY CAUSE LIVER AND KIDNEY DAMAGE.

POSSIBLE CANCER HAZARD. KYMENE* 367 CONTAINS LESS THAN 4%
1,3-DICHLOROPROPANOL (1,3-DCP).
1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER LABORATORY
STUDIES.

Risk of cancer depends on duration and level of exposure.

KYMENE* 367 Wet strength resin

HMIS RATINGS:(1)

Health hazard: 2 Moderate (2)
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL & COMMON NAME: Water solution of cationic amine polymer -
epichlorohydrin adduct

APPEARANCE AND ODOR: Amber-colored liquid; odorless

(2) Indicates that there may be chronic health effects present. See Section V
of MSDS.

* Registered Trademark of Hercules Incorporated.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

IN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

/A: Not applicable

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:	%	RECOMMENDED AIRBORNE LEVELS(1)	
		OSHA TWA	TLV-TWA 1989-90
KYMENE* 367	100		Not established
1,3-Dichloropropan-2-ol	< 4		Not established (3)
(1,3-DCP)			

(3) 1,3-DCP is the principal by-product from the manufacture of KYMENE* 367. Although no TLV has been established, Hercules recommends that the workplace standard (TLV) of 2 ppm be applied.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F)	SOLUBILITY IN WATER: Completely miscible
VAPOR PRESSURE @ 20 C: Same as water	SPECIFIC GRAVITY: 1.07
VAPOR DENSITY: Lighter than air	pH: 2.0 - 2.5 as produced (increases with age)
% VOLATILE (VOL.): 62 (water)	EVAPORATION RATE: Same as water
FREEZING POINT: -2 C (28 F)	

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Noncombustible - Water solution

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

None required. Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, or carbon dioxide may be used on fires involving this product.

Continued...

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE & EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution that will not support combustion. If heated to decomposition, it may generate carbon monoxide, carbon dioxide, nitrogen oxides, or hydrogen chloride. Under some fire conditions, small amounts of ammonia and hydrogen cyanide may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

WARNING! PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION OR SENSITIZATION (ALLERGIC SKIN REACTION).
MAY CAUSE EYE IRRITATION.
VAPOR AND MIST MAY BE IRRITATING TO MUCOUS MEMBRANES.
MAY CAUSE LIVER AND KIDNEY DAMAGE.

POSSIBLE CANCER HAZARD. KYMENE* 367 CONTAINS LESS THAN 4% 1,3-DICHLOROPROPANOL (1,3-DCP).
1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER LABORATORY STUDIES.

Risk of cancer depends on duration and level of exposure.

SIGNS & SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause stinging and transient redness.

SKIN: Prolonged or repeated contact may cause skin irritation or sensitization (allergic skin reaction).
See below: MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.

INHALATION: Inhaling vapor or mist may cause nasal and throat irritation and coughing.

INGESTION: None known.

Continued...

V. HEALTH HAZARD DATA

...Continued

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly wash with soap and running water. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

Prolonged or repeated contact may cause skin irritation or sensitization (allergic skin reaction).

PRIMARY ROUTES OF ENTRY: Eyes, skin, inhalation

CANCER INFORMATION:

KYMENE* 367: The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are NOT regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have NOT been evaluated by the International Agency for Research on Cancer (IARC).

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): A recent unpublished chronic study of 1,3-DCP administered to rats in drinking water at 80 mg/liter for a period of 104 weeks found tumors of the liver, kidney, oral epithelial/tongue, and thyroid gland. At the dose level of 27 mg/liter no test material related effects were noted.

REPORTED HUMAN EFFECTS:

KYMENE* 367: Cured paper handsheets prepared with 1.5% Kymene* 367 (solids basis) were tested on 50 human subjects in the repeated insult patch test with no evidence of skin irritation or sensitization.

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): None known.

Continued...

V. HEALTH HAZARD DATA

...Continued

REPORTED ANIMAL EFFECTS:

KYMENE* 367: The uncured resin was tested as a 25% solids aqueous solution: Acute oral LD50 (rats) 4118 mg/kg. The cured resin was tested as a 25% solids dispersion in corn oil: Acute oral LD50 (rat) 25530 mg/kg.

A Buehler guinea pig study was conducted using Kymene* 367. Ten male Hartley albino guinea pigs were treated topically with a 25% solution of Kymene* 367 (9.5% resin solids - the highest non-irritating concentration) for the nine induction treatments. Two weeks after the last induction treatment the guinea pigs were challenged on both the original site and on a virgin test site. Forty-eight hours later the animals were challenged a second time. All challenges were made with the same concentration of Kymene* 367 as was used for the induction treatments. Positive sensitization responses were obtained on the first challenge in 4/9 animals on the original induction site and in 2/9 animals on the virgin test site. On the second challenge 6/9 animals responded on the original test site and 4/9 on the virgin test site. These results indicate Kymene* 367 may be a strong sensitizer.

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): Acute studies; Oral LD50 (rat) 110 mg/kg; Oral LD50 (mouse) 100 mg/kg; inhalation LC50 (4 hours, rat) 125 ppm, 2/6 deaths), 250 ppm (6/6 deaths); dermal LD50 (rabbits) 800 mg/kg; skin irritation (rabbit) mild; eye irritation (rabbit) severe. Liver and kidney damage was observed in acute oral and inhalation studies.

Subacute studies: In response to a TSCA test rule, a 13-week oral gavage study with 1,3-DCP was conducted with male and female rats at dose levels of 0.1, 1, 10, and 100 mg/kg body weight/day. The highest level produced decreases in body weight gain, feed consumption, and hematologic parameters, increases in clinical chemistry values and kidney and liver weight ratios. Histopathologic changes were noted in the stomach, kidney, liver, and nasal tissues in both male and female rats. Lesser effects were noted in the 10 mg dose groups; while 1 mg/day was considered a no-observed-adverse-effect level (NOAEL).

Male Wistar rats were exposed orally to 1,3-DCP by gavage at daily doses of 0, 15, or 60 mg/kg for 14 days. Differences between treated and control animals were observed in the appearance of small spermatocoele or sperm granulomas in the efferent ducts and/or epididymis. These effects were seen in only a small number of animals and were not dose related. In addition, no morphological changes were noted in kidneys, testes, or vas deferens. Studies conducted by the Upjohn Co. found 1,3-DCP to have no

V. HEALTH HAZARD DATA

REPORTED ANIMAL EFFECTS:...Continued

In an 8(e) submission to the EPA, a report of a two-year chronic feeding study in rats disclosed that Tris (1,3-dichloropropan-2-ol) phosphate (CAS No. 13674-87-8) caused a statistically significant increase in malignant liver tumors (hepatocellular carcinomas) at 80 mg/kg/day, the highest dose studied. The significance of this study is that the product rapidly metabolized to 1,3-DCP and partial phosphate esters. Both partial esters were inactive in the Ames bacterial mutagen test in the presence of liver homogenate induction, whereas 1,3-DCP was mutagenic without activation (see below).

OTHER:

Genotoxicity: 1,3-DCP was active in the Ames salmonella bacteria test both in the presence and absence of a liver metabolizing fraction. It caused sister chromatid exchange and chromosome aberrations in Chinese hamster ovary cells in vitro and a mutation at the TK locus in the L5178Y line of mouse lymphoma cells in vitro. 1,3-DCP was active in all tests with and without activation by S-9 fraction from Aroclor* induced rat liver.

ADDENDUM:

Hercules Incorporated has conducted extensive studies on the levels of epichlorohydrin hydrolysis products in a variety of paper mills when Kymene products have been used. The amounts of hydrolysis products in the air, in the paper, and in the process water are either undetectable or so low that they do not present any health concerns. The one exception is air above Kymene in storage tanks. It may contain epichlorohydrin hydrolysis products (1,3-dichloropropan-2-OL and 3-chloro-1,2-dihydroxypropane) at levels considerably in excess of suggested limitations (see next paragraph). These tanks should be vented in such a way that epichlorohydrin hydrolysis products do not contaminate the air of the workplace and should be entered only while using an approved tank entry procedure.

Hercules Incorporated recommends that the user of this product establish a monitoring program for airborne levels of epichlorohydrin hydrolysis products. It is recommended that 2 ppm be used as an 8-hour TWA for exposure to each of these products by inhalation if they are found in the tank headspace or in the workplace air. If the user requires information or assistance in establishing a monitoring program, contact Hercules

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal. Clean surrounding area with soda ash.

WASTE DISPOSAL METHOD:

Incineration should be in accordance with local, state, and federal regulations. Supplemental fuel may be required.

When the drum is empty, rinse it with plenty of water before discarding.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

- Do not allow eye or skin contact.
- Avoid breathing mist or vapors.
- Wash thoroughly after handling, and before eating, drinking or smoking.
- Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

- Safety glasses
- Impervious gloves
- Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.
- Appropriate protective clothing

WORK PRACTICES:

- Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

- Keep containers tightly closed.

ENGINEERING CONTROLS:

- Adequate ventilation should be provided to keep mist and vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

- Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following Environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	KYMENE* 367	N/A	100
	Wet strength resin		
1	1,3-Dichloropropan-2-OL	96-23-1	< 4

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-2, NPH	N/A
1	N/A	N/A	HC-1, HC-2, NPH	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. Normal variations in this product may cause its pH to be equal to or less than 2.0. In those cases, the product exhibits the characteristic of CORROSIVITY (D002) as defined in hazardous waste regulation 40 CFR 261, Subpart C, and disposal of unused product must comply with the hazardous waste regulations. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

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STEARIC ACID

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SECTION I - PRODUCT IDENTIFICATION

=====

PRODUCT NAME: STEARIC ACID
COMMON SYNONYMS: OCTADECANOIC ACID; 1-HEPTADECANECARBOXYLIC ACID
CHEMICAL FAMILY: ORGANIC ACIDS
FORMULA: C18H36O2
FORMULA WT.: 284.49
CAS NO.: 57-11-4
NIOSH/RTECS NO.: W12800000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 0340,0342

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PRECAUTIONARY LABELING

=====

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	1	SLIGHT
FLAMMABILITY	-	1	SLIGHT
REACTIVITY	-	1	SLIGHT
CONTACT	-	1	SLIGHT

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES; LAB COAT

U.S. PRECAUTIONARY LABELING

CAUTION

MAY CAUSE IRRITATION.
AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING DUST. 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: ORANGE (GENERAL STORAGE)

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SECTION II - COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
STEARIC ACID	57-11-4	90-100	N/E	N/E

SECTION III - PHYSICAL DATA

BOILING POINT: 383 C (721 F) (AT 760 MM HG)	VAPOR PRESSURE (MMHG): N/A
MELTING POINT: 69 C (156 F) (AT 760 MM HG)	VAPOR DENSITY (AIR=1): 9.8
SPECIFIC GRAVITY: 0.87 (H2O=1)	EVAPORATION RATE: N/A
SOLUBILITY(H2O): NEGLIGIBLE (<0.1%)	% VOLATILES BY VOLUME: 0 (21 C)

P N/A

ODOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: SOLID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: WHITE TO LIGHT YELLOW SOLID. TALLOW-LIKE ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): 195 C (385 F)	NFPA 704M RATING: 1-1-0
AUTOIGNITION TEMPERATURE: N/A	
FLAMMABLE LIMITS: UPPER - N/A	LOWER - N/A
FIRE EXTINGUISHING MEDIA USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. (WATER MAY BE INEFFECTIVE.)	



ADDITIONAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

=====

UNUSUAL FIRE & EXPLOSION HAZARDS
DUST MAY FORM EXPLOSIVE MIXTURE WITH AIR.

TOXIC GASES PRODUCED
CARBON MONOXIDE, CARBON DIOXIDE

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): NOT ESTABLISHED

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

MISSIBLE EXPOSURE LIMIT (PEL): NOT ESTABLISHED

TOXICITY OF COMPONENTS

INTRAVENOUS MOUSE LD50 FOR STEARIC ACID

INTRAVENOUS RAT LD50 FOR STEARIC ACID

CARCINOGENICITY: NTP: NO IARC: NO

Z LIST: NO

OSHA REG: NO

23 MG/KG

21.5 MG/KG

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: IRRITATION OF UPPER RESPIRATORY TRACT

SKIN CONTACT: NONE IDENTIFIED

EYE CONTACT: IRRITATION

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

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

INHALATION, EYE CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: IF SWALLOWED AND THE PERSON IS CONSCIOUS, IMMEDIATELY GIVE LARGE AMOUNTS OF WATER. GET MEDICAL ATTENTION.

INHALATION: IF A PERSON BREATHES IN LARGE AMOUNTS, MOVE THE EXPOSED PERSON TO FRESH AIR.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

ACUTE: NO CHRONIC: NO FLAMMABILITY: NO PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: NO

CERCLA HAZARDOUS SUBSTANCE: NO

TOXIC CHEMICALS: NO

TSCA INVENTORY: YES

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SECTION VI - REACTIVITY DATA

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION, DUSTING

INCOMPATIBLES: STRONG BASES, STRONG OXIDIZING AGENTS

DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE

SECTION VII - SPILL & DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.

DISPOSAL PROCEDURE

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

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION:

USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO
KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.

EYE/SKIN PROTECTION: SAFETY GOGGLES, RUBBER GLOVES ARE RECOMMENDED.

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. STORE IN A COOL, WELL-VENTILATED AREA AWAY FROM SOURCES OF HEAT, FLAME, OR IGNITION.

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SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

=====

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)
MARINE POLLUTANTS: NO

AIR (I.C.A.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

U.S. CUSTOMS HARMONIZATION NUMBER: 29157000005

=====

N/A = NOT APPLICABLE OR NOT AVAILABLE
N/E = NOT ESTABLISHED

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN, CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES.

EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL.

BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT 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,

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

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UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC. ⁵⁻¹¹ ^{5/5/94}

Industrial Chemicals Division

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE 11/01/93

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

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

I. IDENTIFICATION

PRODUCT NAME: TRIETHANOLAMINE, 99%

CHEMICAL NAME: Triethanolamine

CHEMICAL FAMILY: Alkanolamines

FORMULA: $(\text{HOCH}_2\text{CH}_2)_3\text{N}$

MOLECULAR WEIGHT: 149.19

SYNONYMS: Tri(2-Hydroxyethyl)Amine; TEA; TEA 99

CAS # AND NAME: 102-71-6
Ethanol, 2,2',2"-nitrilotris-

II. PHYSICAL DATA(Determined on Typical Material)

BOILING POINT, 760 mm Hg: Extrapolated
with decomposition
335.4°C (635.7°F)

SPECIFIC GRAVITY($\text{H}_2\text{O} = 1$): 1.126 at 20/20°C
Supercooled liquid

FREEZING POINT: Substance can remain liquid < this temperature (supercools)
21.6°C (70.9°F)

VAPOR PRESSURE AT 20°C: <0.001 mmHg

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EMERGENCY PHONE NUMBERS: 1-800-UCC-HELP (NUMBER AVAILABLE AT ALL TIMES) OR (304) 744-3487

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC

Industrial Chemicals Division

39 Old Ridgebury Road Danbury, CT 06810

PRODUCT NAME: TRIETHANOLAMINE, 99%

PAGE 2

EVAPORATION RATE (Butyl Acetate = 1): <0.01

VAPOR DENSITY (AIR = 1): 5

SOLUBILITY IN WATER by wt: 100% at 20 °C

APPEARANCE: Transparent colorless to pale amber

ODOR: Mild ammoniacal

PHYSICAL STATE: Liquid above freezing point
Solid below freezing point

PERCENT VOLATILES (by weight): 0.06

III. INGREDIENTS

<u>%</u>	<u>MATERIAL</u>	<u>CAS#</u>	<u>EXPOSURE LIMIT</u>
>99	Triethanolamine	102-71-6	5 mg/m ³ TWA,ACGIH

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT(test method(s)): 407°F
Pensky-Martens Closed Cup ASTM D 93
400°F
Cleveland Open Cup ASTM D 92

FLAMMABLE LIMITS IN AIR
% by volume: LOWER: Not Determined
UPPER: Not Determined

SPECIAL FIRE FIGHTING
PROCEDURES: Do not direct a solid stream of water or foam into burning molten material;
this may cause spattering and spread the fire.
Use self-contained breathing apparatus, eye protection and protective clothing.

EXTINGUISHING MEDIA: Apply alcohol-type or all-purpose-type foam by manufacturer's recommended
techniques for large fires. Use carbon dioxide or dry chemical media for
small fires.

UNUSUAL FIRE AND
EXPLOSION HAZARDS: During fire, oxides of nitrogen may be evolved.

PRODUCT NAME: TRIETHANOLAMINE, 99%

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: May cause burning or painful sensations in the mouth, throat, chest, and abdomen, nausea, vomiting, and diarrhea.
May cause dizziness, drowsiness, faintness, weakness, collapse, and coma.

SKIN ABSORPTION: No evidence of harmful effects from available information.

INHALATION: Vapor or mist from heated material may cause irritation of the respiratory tract, experienced as nasal discomfort and discharge, with chest pain and coughing.

SKIN CONTACT: Brief contact may cause slight irritation with itching and local redness. Prolonged contact may cause severe irritation, with local discomfort or pain, and local redness and swelling.

EYE CONTACT: May cause irritation, experienced as stinging with excess blinking and tear production.
Excess redness and swelling of the conjunctiva may occur.

EFFECTS OF REPEATED OVEREXPOSURE:

Repeated overexposure may cause damage to kidneys and liver.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Skin contact may aggravate an existing dermatitis.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

Recent analysis of this product for N-nitrosodiethanolamine has not revealed its presence at the detection limit of the test (20 ppb). However, amines may react with nitrites or other nitrosating agents to form nitrosamines. Some nitrosamines have been shown to be carcinogenic in laboratory animals.

OTHER EFFECTS OF OVEREXPOSURE:

Skin contact may cause sensitization and an allergic skin reaction in a small proportion of individuals.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING: If patient is fully conscious, give two glasses of water. Induce vomiting.
Obtain medical attention.

SKIN: Remove contaminated clothing. Wash skin with soap and water. Obtain medical attention if irritation persists. Wash clothing before reuse.

PRODUCT NAME: TRIETHANOLAMINE, 99%

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INHALATION: Remove to fresh air.

EYES: Immediately flush eyes with water and continue washing for several minutes. Obtain medical attention.

NOTES TO PHYSICIAN: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. The hazards of this material are due mainly to its severely irritant properties on skin and mucosal surfaces.

VI. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID: Temperatures above 250 degrees C.
May undergo self-sustaining thermal decomposition.

INCOMPATIBILITY (materials to avoid):
Strong oxidizing agents.
Strong bases.
Strong acids.
Aldehydes.
Ketones.
Acrylates.
Organic anhydrides.
Organic halides.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:
Burning can produce the following combustion products:
Oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Collect for disposal.
Wear suitable protective equipment.
Avoid contact with eyes and skin.

WASTE DISPOSAL METHOD:
Incinerate in a furnace where permitted under Federal, State, and local regulations.
See Section IX, "Other Precautions."

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type):

PRODUCT NAME: TRIETHANOLAMINE, 99%

Use self-contained breathing apparatus in high vapor concentrations.

VENTILATION: General (mechanical) room ventilation is expected to be satisfactory for use at room temperature.

PROTECTIVE GLOVES: Butyl
PVC-coated

EYE PROTECTION: Monogoggles

OTHER PROTECTIVE EQUIPMENT: Eye bath, safety shower, and chemical apron.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

WARNING! Harmful if swallowed.

Causes eye and skin irritation.

Repeated exposure may cause liver and kidney damage.

Do not swallow.

Avoid contact with eyes, skin, and clothing.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

Do not add nitrites or other nitrosating agents. A nitrosamine, which may cause cancer, may be formed.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS:

DISPOSAL - Laboratory tests show that, at very low concentration (about 10 ppm), these ethanolamines can be degraded in a biological wastewater treatment system. It may be feasible to flush a small spill of ethanolamines to a sanitary sewer, with large amounts of water. However, a large spill might be detrimental to aquatic life. If spilled material cannot be collected, it may be possible to neutralize with dilute hydrochloric acid and then, landfill the resulting salt.

WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

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

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	<1.0

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:
*** NONE ***

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

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

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	<1.0

Toxic Substances Control Act (TSCA) STATUS:

The Ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.

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

CHEMICAL	CAS NUMBER	HAZARDOUS SUBSTANCES (= > 1%) UPPER BOUND CONCENTRATION %
Triethanolamine	102-71-6	100

PENNSYLVANIA Right-to-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

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

CHEMICAL	CAS NUMBER	HAZARDOUS SUBSTANCES (= > 1%) UPPER BOUND CONCENTRATION %
Triethanolamine	102-71-6	100

PRODUCT NAME: TRIETHANOLAMINE, 99%

PAGE 7

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

Vapor Pressure <0.001 mmHg at 20°C

VOC 3 g/L

VOC 3 g/L less water and less exempted solvents

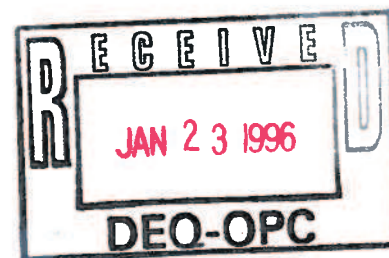
NOTE ----

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

REVISED SECTIONS:

Exposure Limit has been added to Triethanolamine
See Section III

PRODUCT: 88206
F NUMBER: N0129J



21 APRIL 1994

Industrial Chemicals Division

SARAH HAGWOOD
HERCULES INC
P.O. DRAWER 1937
HATTISBURG, MS 39401

Dear Customer:

Enclosed is the following Material Safety Data Sheet (MSDS) from Union Carbide Corporation:

TRIETHANOLAMINE, 99%

This MSDS takes precedence over and supersedes any previous MSDS you may have received for this product. Please destroy all prior versions.

In 1988, the Chemical Manufacturers Association (CMA) adopted the Responsible Care initiative which calls for continuous improvement by CMA member companies in health, safety and environment performance. As a member of the CMA, Union Carbide has pledged to manage our business according to the principles of Responsible Care and put these principles into action by implementing the initiative's six Codes of Management Practices. The Product Stewardship Code outlines the key elements which all CMA members must adhere in order to ensure that our products are safely handled.

The Material Safety Data Sheet is the primary mechanism for communicating information about potential hazards of each product and is a key part of our ongoing Product Stewardship Program. Please see that this MSDS and/or its information reaches the individuals in your organization responsible for health, safety, and environmental practices, and OSHA compliance; and ensure that your workers who use our product understand its content.

SARA TITLE III: Included in Section X of this MSDS is notification of the presence of substances (if any) subject to the reporting requirements of Section 313 of SARA Title III. Manufacturers are required to notify you of such presence with the first shipment of each calendar year; you are required to pass the notification along to anyone to whom you redistribute the product. Please read Section X.

This MSDS will be updated promptly when significant, new information is received. It is prepared and supplied in accordance with the OSHA Hazard Communication Standard. If you want additional copies, please let us know. If you have questions or require additional information in the handling, storage, use, or disposal of this product, please contact your Union Carbide sales representative or the sales office nearest you.

Patricia L. Cody (203 794-3451
Product Safety Manager

Attachment

HCC REF NO. 0020MS11



EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

SLACK WAX 200

DATE ISSUED: 06/01/89
SUPERSEDES DATE: 10/14/88

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
SLACK WAX 200

PRODUCT CODE
493650 - 03650

CHEMICAL NAME
Petroleum Wax

CAS NUMBER
64742-61-6

PRODUCT APPEARANCE AND ODOR
Crystalline slack wax, light colored
Bland petroleum odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Slack wax, petroleum	64742-61-6	100%
See Section E for Health and Hazard Information.		
See Section H for additional Environmental Information.		
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)		
Health 1	Flammability 1	Reactivity 0
BASIS Recommended by Exxon		
EXPOSURE LIMIT FOR TOTAL PRODUCT		
5 mg/m ³ for oil mist or 2 mg/m ³ for wax fumes in air; 6 mg/m ³ STEL		
BASIS OSHA Regulation 29 CFR 1910.1000 Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)		

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If hot product is splashed into eyes, flush immediately with clear water and contact physician immediately.

SKIN

Immediately contact a physician for treatment of thermal burns. In case of skin contact with product under other conditions, wash thoroughly with soap and water. Removal of product from skin may be aided by use of waterless handcleaner.

INHALATION

If overcome by fumes, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)

190°C (374°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE

Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health Flammability Reactivity
0 1 0

BASIS

Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS

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

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, 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 and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

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

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Prolonged or repeated skin contact may cause skin irritation.
Exposure to hot product may cause thermal burns.

NATURE OF HAZARD AND TOXICITY INFORMATION

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

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

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None Recognized

F. PHYSICAL DATA

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

BOILING RANGE

IBP Greater than 302°C (575°F)

SPECIFIC GRAVITY (15.6 C/15.6 C)

0.82

MOLECULAR WEIGHT

Not determined

pH

Essentially neutral

POUR, CONGEALING OR MELTING POINT

52.8°C (127°F)

Melting Point by ASTM D 127

VISCOSITY

4.1 cSt @ 100°C

VAPOR PRESSURE

Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)

Greater than 5

PERCENT VOLATILE BY VOLUME

Negligible from open container
in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)

(n-BUTYL ACETATE = 1)

Less than 0.01

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

Negligible: less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Recover free product. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers or watercourses. Assure conformity with applicable governmental regulations.

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

SLACK WAX 200

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)

No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)

No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)

No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

	Acute	Chronic	Fire	Pressure	Reactive	Not Applicable
EPA HAZARD CLASSIFICATION CODE:	Hazard	Hazard	Hazard	Hazard	Hazard	

XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

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

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

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

WORK PRACTICES / ENGINEERING CONTROLS

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

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE

Minimize breathing hot fumes, vapors, and mist.

Remove wax-impregnated clothing and launder or dry-clean before re-use. Discard wax-impregnated shoes. Wash skin thoroughly with soap and water after handling.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER

Not applicable

SLACK WAX 200

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

(OSHA Hazard Warnings not applicable for this product; therefore, no OSHA warnings would appear on the label.)

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

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

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

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

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:

DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:

MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

MATERIAL SAFETY DATA SHEET

PAGE: 01 of 06

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCULES* IP SIZE 2000
Sizing emulsion

MSDS No.: 181 6112 0400-01

Supersedes MSDS # 767 2100 6131-02

Date: 04/29/94

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE MILD EYE IRRITATION.

HERCULES* IP SIZE 2000
Sizing emulsion

HMIS RATINGS: (1)

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CASRN: Mixture

CHEMICAL & COMMON NAME: Water emulsion of alkylketene dimer

APPEARANCE AND ODOR: White liquid; mild medicinal odor

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:	%	RECOMMENDED AIRBORNE LEVELS (1)	
		1989-1990	TLV-TWA Other
HERCULES* IP SIZE 2000	100	Not Established	

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F) SOLUBILITY IN WATER: Dispersible
VAPOR PRESSURE AT 20 C: Similar to water SPECIFIC GRAVITY: Heavier than water
VAPOR DENSITY: Negligible at 20 C/68 F pH: 2.3 - 3.3
VOLATILE (WT.),%: < 1 EVAPORATION RATE: Similar to water
FREEZING POINT: N/A

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Above 300 F
FLAMMABLE LIMITS: N/A
AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, or carbon dioxide may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: None
UNUSUAL FIRE AND EXPLOSION HAZARDS: None
STABILITY CONSIDERATIONS: Stable
INCOMPATIBILITY WITH: None
HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution that will not support combustion. If heated to decomposition, it may generate carbon monoxide, carbon dioxide, and irritating aldehyde and carboxylic acids.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE MILD EYE IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause stinging and redness.
SKIN: None known
INHALATION: None known
INGESTION: None known

EMERGENCY AND FIRST AID PROCEDURES:

EYES: In case of contact, flush thoroughly with plenty of low-pressure water. If irritation persists, contact a physician.

SKIN: Wash with soap and running water.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known; none expected.

PRIMARY ROUTE OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

An emulsion containing 6% fatty acid ketene dimers did not cause skin irritation or signs of skin sensitization in a human patch test.

REPORTED ANIMAL EFFECTS:

A closely related product was tested (undiluted) for toxic effects and found to have a lethal dose greater than 5 g/kg when eaten by rats, did not cause an allergic skin reaction (sensitization) in guinea pigs, did not irritate rabbit skin, was not absorbed through rabbit skin (LD50 greater than 2 g/kg) and caused only minimal transient eye irritation which was gone by 24 hours after dosing.

In a 28-day repeated dermal application study with rats, a closely related material was applied daily at 1 g/kg for 6 hour periods. No signs of skin irritation or other clinical signs of toxicity were noted. All hematological, biochemical and urinalysis tests were normal. Necropsy did not reveal any abnormalities. The adrenal gland weights of the treated rats were larger than the control animals. However, microscopic examination of the tissues and the adrenal glands revealed no treatment related effects.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, State, and Federal regulations is an acceptable alternative. Supplemental fuel may be required.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling, and before eating, drinking or smoking.
Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses
Impervious gloves
Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Avoid freezing. Store indoors at lowest possible temperature above 4 C (40 F). Avoid storage temperatures above 32 C (90 F).

ENGINEERING CONTROLS:

Provide adequate ventilation.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	HERCULES* IP SIZE 2000 Sizing emulsion	Mixture	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, NPH	N/A

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product may contain hazardous substances listed under 40 CFR 302.4. However, they will be present only in trace or residual quantities. Under reasonably anticipated conditions of shipment or handling, it is highly unlikely that an accidental release would exceed the reportable quantity of the listed chemical.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Section 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

MATERIAL SAFETY DATA SHEET

PAGE: 01 of 08

HERCULES INCORPORATED

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

IP SIZE 67

MSDS No.: 181 6112 0300-04

Supersedes MSDS #: 181 6112 0300-03

Date: 02/10/95

1. PRODUCT IDENTIFICATION

WARNING! MAY CAUSE MILD TEMPORARY SKIN AND EYE IRRITATION.
MAY CAUSE SENSITIZATION (ALLERGIC SKIN REACTION).

POSSIBLE CANCER HAZARD: IP SIZE 67 CONTAINS LESS
THAN 1% 1,3-DICHLOROPROPANOL (1,3-DCP).
1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER
LABORATORY STUDIES.

Risk of cancer depends on duration and level of exposure.

IP SIZE 67

HMIS RATINGS: (1)

CASRN: Proprietary mixture

Health hazard:	2	Moderate (2)
Flammability hazard:	0	Minimal
Reactivity hazard:	0	Minimal

CHEMICAL AND COMMON NAME: Cationic emulsion of alkyl ketene dimer

APPEARANCE AND ODOR: White liquid; odorless

(2) Indicates there may be chronic health effects present. See Section V of MSDS.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:	%	RECOMMENDED AIRBORNE LEVELS (1)	
		OSHA TWA	TLV-TWA 1989-90
IP SIZE 67	100	Not established	
1,3-Dichloropropan-2-ol (1,3-DCP)	< 1	Not established (3)	

(3) 1,3-DCP is a by-product from the manufacture of IP SIZE 67. Although no TLV has been established, Hercules recommends that the workplace standard (TLV) of 2 ppm be applied.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 99-100 C (210-212 F)	SOLUBILITY IN WATER: Miscible
VAPOR PRESSURE AT 20 C: Similar to water	SPECIFIC GRAVITY: 1.0
VAPOR DENSITY: Lighter than air	pH: 2.5 - 4.0
VOLATILE (VOL.),%: Negligible @ 20 C	EVAPORATION RATE: Similar to water
FREEZING POINT: 0 C (32 F)	

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Noncombustible

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, carbon dioxide, or halon may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

Continued...

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

STABILITY CONSIDERATIONS:

Stable. Store as cool as possible, but above 4 C (40 F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.

INCOMPATIBILITY WITH: Alkalies, amines, or alcohols

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution which will not support combustion. If heated to decomposition, it may generate (evolve) carbon monoxide, carbon dioxide, nitrogen oxides, or hydrogen chloride. Under some fire conditions, small amounts of ammonia or hydrogen cyanide may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

WARNING! MAY CAUSE MILD TEMPORARY SKIN AND EYE IRRITATION.
MAY CAUSE SENSITIZATION (ALLERGIC SKIN REACTION).

POSSIBLE CANCER HAZARD: IP SIZE 67 CONTAINS
LESS THAN 1% 1,3-DICHLOROPROPANOL (1,3-DCP).

1,3-DCP MAY CAUSE CANCER BASED ON ANIMAL AND OTHER
LABORATORY STUDIES.

Risk of cancer depends on duration and level of exposure.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause mild eye irritation.
SKIN: Prolonged or repeated contact may cause skin irritation or sensitization (allergic skin reaction).
INHALATION: Inhaling vapor or mist may cause respiratory irritation.
INGESTION: None known.

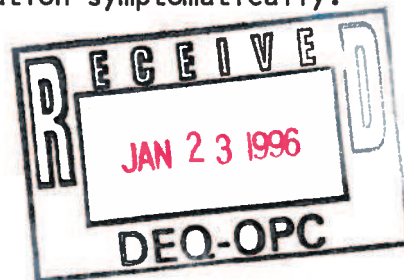
EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

Continued...



V. HEALTH HAZARD DATA

EMERGENCY & FIRST AID PROCEDURES:...Continued

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Induce vomiting. Call a physician if irritation persists. NEVER give liquids to an unconscious person. NEVER induce vomiting in an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

PRIMARY ROUTES OF EXPOSURE/ENTRY: Eyes, skin, inhalation

CANCER INFORMATION:

IP SIZE 67: The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are NOT regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have NOT been evaluated by the International Agency for Research on Cancer (IARC).

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): A recent unpublished chronic study of 1,3-DCP administered to rats in drinking water at 80 mg/liter for a period of 104 weeks found tumors of the liver, kidney, oral epithelial/tongue, and thyroid gland. At the dose level of 27 mg/liter no test material related effects were noted.

REPORTED HUMAN EFFECTS:

IP SIZE 67: COMPONENT A was neither irritating nor sensitizing when applied undiluted to the skin of 200 volunteers. COMPONENT B was also neither irritating nor sensitizing when paper, containing 1.5% fully cured resin, was applied to the skin of fifty (50) volunteers.

1,3-DICHLOROPROPAN-2-OL (1,3-DCP): None known.

REPORTED ANIMAL EFFECTS:

IP SIZE 67: This product contains a mixture of two active components. The acute oral LD50 for COMPONENT A in rats is greater than 40 g/kg and in guinea pigs is 20 g/kg. It was not a skin irritant to rabbit skin and caused neither irritation or sensitization in guinea pigs. The acute oral LD50 for COMPONENT B in rats is greater than 4 g/kg and in mice and is greater than 2.5 g/kg. Guinea pig sensitization studies have shown that COMPONENT B is a sensitizer at a 25% concentration in water.

1,3 DICHLOROPROPAN-2-OL: Acute studies; Oral LD50 (rat) 110 mg/kg; Oral LD50 (mouse) 100 mg/kg; inhalation LC50 (4 hours, rat) 125 ppm, 2/6 deaths, 250 ppm (6/6 deaths); dermal LD50 (rabbits) 800 mg/kg; skin irritation (rabbit) mild; eye irritation (rabbit) severe. Liver and kidney damage was observed in acute oral and inhalation studies.

Continued...

V. HEALTH HAZARD DATA

REPORTED ANIMAL EFFECTS:...Continued

Subacute studies: In response to a TSCA test rule, a 13-week oral gavage study with 1,3-DCP was conducted with male and female rats at dose levels of 0.1, 1, 10, and 100 mg/kg body weight/day. The highest level produced decreases in body weight gain, feed consumption, and hematologic parameters, increases in clinical chemistry values and kidney and liver weight ratios. Histopathologic changes were noted in the stomach, kidney, liver, and nasal tissues in both male and female rats. Lesser effects were noted in the 10 mg dose groups; while 1 mg/day was considered a no-observed-adverse-effect level (NOAEL).

Male Wistar rats were exposed orally to 1,3-DCP by gavage at daily doses of 0, 15, or 60 mg/kg for 14 days. Differences between treated and control animals were observed in the appearance of small spermatocoele or sperm granulomas in the efferent ducts and/or epididymis. These effects were seen in only a small number of animals and were not dose related. In addition, no morphological changes were noted in kidneys, testes, or vas deferens. Studies conducted by the Upjohn Co. found 1,3-DCP to have no sterility activity in male rats.

Chronic studies, see above: CANCER INFORMATION.

In an 8(e) submission to the EPA, a report of a two-year chronic feeding study in rats disclosed that tris (1,3-dichloropropan-2-ol) phosphate (CAS No. 13674-87-8) caused a statistically significant increase in malignant liver tumors (hepatocellular carcinomas) at 80 mg/kg/day, the highest dose studied. The significance of this study is that the product rapidly metabolized to 1,3-DCP and partial phosphate esters. Both partial esters were inactive in the Ames bacterial mutagen test in the presence of liver homogenate induction, whereas 1,3-DCP was mutagenic without activation (see below).

OTHER:

Genotoxicity: 1,3-DCP was active in the Ames salmonella bacteria test both in the presence and absence of a liver metabolizing fraction. It caused sister chromatid exchange and chromosome aberrations in Chinese hamster ovary cells in vitro and a mutation at the TK locus in the L5178Y line of mouse lymphoma cells in vitro. 1,3-DCP was active in all tests with and without activation by S-9 fraction from Aroclor* induced rat liver.

* Aroclor is a registered trademark of Monsanto Company for chlorinated biphenyl.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Flush with excess water to a wastewater treatment system.

Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

This product is biodegradable. Wastewater containing this product can be considered for treatment in an acclimated biological treatment system of adequate capacity. Incineration in accordance with local, state, and federal regulations is an acceptable alternative. Supplemental fuel may be required.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Do not allow eye or skin contact.

Avoid breathing mist.

Wash thoroughly after handling, and before eating, drinking or smoking.

Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Store as cool as possible, but above 4 C (40 F). Avoid freezing to preserve product integrity. If frozen, thaw, mix thoroughly, and use immediately.

This product may react with alkalies, amines, or alcohols and should not be stored near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	IP SIZE 67	Proprietary mixture	100
1	1,3-Dichloropropan-2-ol	96-23-1	< 1

This product is NOT known to be regulated as hazardous by EPA.

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-2, NPH	NO
1	N/A	N/A	HC-1, HC-2	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4

D. RCRA INFORMATION

Normal variations in this product may cause its pH to be equal to or less than 2.0. In those cases, the product exhibits the characteristic of corrosivity (D002) as defined in hazardous waste regulations 40 CFR 261, Subpart C, and disposal of unused product must comply with the hazardous waste regulations.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

MATERIAL SAFETY DATA SHEET

PAGE: 01 of 04

HERCULES INCORPORATED

PARACOL* 700 SERIES

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

MSDS No.: 695 6101 6700-02

Supersedes MSDS #: 695 6101 6700-1

Date: 09/30/88

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.

PARACOL* 700 SERIES

HMIS RATINGS:(1)

Paraffin wax emulsion

CAS Number: (64742-61-6)

Health hazard:	1	Slight
Flammability hazard:	0	Minimal
Reactivity hazard:	0	Minimal

APPEARANCE AND ODOR: Brownish-white liquid; mild medicinal odor

* Registered Trademark of Hercules Incorporated.

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:

RECOMMENDED AIRBORNE LEVELS(1)
OSHA PEL TLV-TWA 1987-88

Alkylamine acetate (61790-59-8)

Not established.

If this product is used in a manner that could generate paraffin fumes, the threshold limit value of 2 mg/m3 should be observed.

PF-----
FOOTNOTES

(1)Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

N/A: Not applicable

DS-----

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide for itself what safety measures are necessary to safely use this product, either alone or in combination with other products.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F) SOLUBILITY IN WATER: Water emulsion
VAPOR PRESSURE AT 20 C: Same as water SPECIFIC GRAVITY: 0.96
VAPOR DENSITY: Lighter than air pH: 5.0
VOLATILE (VOL.),%: Negligible @ 20 C EVAPORATION RATE: Same as water
FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Noncombustible

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

This product is an aqueous solution dispersion that will not support combustion. If heated to decomposition, it may generate carbon monoxide, carbon dioxide, nitrogen oxides, or hydrogen chloride. Under some fire conditions, small amounts of ammonia and hydrogen cyanide may be formed. Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, or carbon dioxide may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES:

Cool containers with water if exposed to fire.
Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None expected.

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution that will not support combustion. If heated to decomposition, it may generate carbon monoxide, carbon dioxide, paraffin wax fumes, and smoke. Depending on conditions, aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.



V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause transient eye irritation.
SKIN: May cause transient skin irritation.
INHALATION: None known.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by NTP (National Toxicology Program); not regulated as carcinogens by OSHA (Occupational Safety & Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

REPORTED HUMAN EFFECTS:

PARACOL EMULSION: None known.

PARAFFIN WAX:

Petroleum waxes are inert: wax fumes are mild eye, nose, and throat irritants.

REPORTED ANIMAL EFFECTS:

PARACOL EMULSION: None known.

ALKYLAMINE ACETATE: This material has been reported by the manufacturer to be a primary eye and skin irritant.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration of waste material in a permitted facility in accordance to local, state, and federal regulations is the recommended disposal method. Use additional fuel if necessary.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

When drum is empty, rinse it with plenty of water before discarding..

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Avoid breathing mists and vapor.

Wash thoroughly after handling, and before eating, drinking or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses

Impervious gloves

Appropriate protective clothing

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WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

Keep floors clean. Spills can be slippery.

Handle in areas with adequate ventilation. Use a respirator in accordance with OSHA Subpart I (29 CFR 1910.134), if mist and vapor levels are excessive.

HANDLING AND STORAGE PRECAUTIONS:

Avoid freezing. Store indoors at coolest possible temperatures between 4-32 C (40-90 F).

ENGINEERING CONTROLS: Provide adequate ventilation.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

HERCULES INCORPORATED
PO BOX 100
WILMINGTON, DE 19894
PHONE #: (302) 594-5000 (24 HRS)

PARACOL* 815N
MSDS NO.: 695 6101 2500-02
DATE: 01/15/88

HERSEDES MSDS NO.: 695 6101 2500-1

PRODUCT IDENTIFICATION

CAUTION MAY CAUSE MILD TRANSIENT EYE IRRITATION.
PROLONGED CONTACT MAY LEAD TO MILD SKIN IRRITATION.

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PARACOL* 815N PARAFFIN WAX EMULSION

HMSIS RATINGS:(1)

HEALTH HAZARD: 1 SLIGHT
FLAMMABILITY HAZARD: 0 MINIMAL
REACTIVITY HAZARD: 0 MINIMAL

APPEARANCE AND ODOR: BROWNISH WHITE LIQUID; MILD MEDICINAL ODOR

REGISTERED TRADEMARK OF HERCULES INCORPORATED.

HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL AND COMMON NAMES:	%	RECOMMENDED AIR-BORNE LEVELS(1)		
		OSHA PEL	TLV-TWA 1987-88	
PARAFFIN WAX (FUMES)	18002-74-2^	50 (MAX.)	NOT ESTABLISHED.	2 MG/M3

NOTES

EXPLANATION OF ACRONYMS:
S = HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING FOR THE PRODUCT AS IT SUPPLIED.
A PEL = OCCUPATIONAL SAFETY AND HEALTH STANDARDS PERMISSIBLE EXPOSURE LIMIT.
R = REGISTERED TRADEMARK OF AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS FOR THRESHOLD LIMIT VALUES.
T = TIME WEIGHTED AVERAGE
N = NOT APPLICABLE

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE FOR ITSELF WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS.

TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F) SOLUBILITY IN WATER: COMPLETELY DISPERSIBLE
VAPOR PRESSURE AT 20 C: SAME AS WATER SPECIFIC GRAVITY: 0.96
VAPOR DENSITY: LIGHTER THAN AIR PH: 4.4 - 5.2
VOLATILE (VOL.),%: 50 EVAPORATION RATE: SAME AS WATER
FREEZING POINT: 0 C (32 F)

FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: NONCOMBUSTIBLE

FLAMMABLE LIMITS: N/A

IGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

NONE REQUIRED. PRODUCT IS DISPERSED IN WATER AND AS SUCH WILL NOT BURN. HOWEVER, WATER SPRAY, DRY CHEMICAL, FOAM, OR CARBON DIOXIDE MAY BE USED ON FIRES INVOLVING THIS PRODUCT.

SPECIAL FIREFIGHTING PROCEDURES:

COOL CONTAINERS WITH WATER IF EXPOSED TO FIRE.

USUAL FIRE AND EXPLOSION HAZARDS: NONE

STABILITY CONSIDERATIONS: STABLE

COMPATIBILITY WITH: NONE

HAZARDOUS DECOMPOSITION PRODUCTS: NONE EXPECTED.

HAZARDOUS PRODUCTS OF COMBUSTION:

THIS PRODUCT IS AN AQUEOUS SOLUTION THAT WILL NOT SUPPORT COMBUSTION. IF HEATED TO DECOMPOSITION, IT MAY GENERATE CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN OXIDES, OR HYDROGEN CHLORIDE. UNDER SOME FIRE CONDITIONS, SMALL AMOUNTS OF AMMONIA AND HYDROGEN CYANIDE MAY BE FORMED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

HEALTH HAZARD DATA

CAUTION MAY CAUSE MILD TRANSIENT EYE IRRITATION.
PROLONGED CONTACT MAY LEAD TO MILD SKIN IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: MAY CAUSE MILD TRANSIENT EYE IRRITATION; REDNESS
SKIN: PROLONGED CONTACT MAY LEAD TO MILD SKIN IRRITATION; REDNESS.
INHALATION: NONE KNOWN.
INGESTION: NONE KNOWN.

FIRST AID PROCEDURES:

EYES: IN CASE OF CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF LOW PRESSURE
WATER FOR AT LEAST 15 MINUTES. REMOVE ANY CONTACT LENSES TO ENSURE
THOROUGH FLUSHING. CALL A PHYSICIAN.

SKIN: WASH WITH SOAP AND RUNNING WATER.

INHALATION: REMOVE TO FRESH AIR. TREAT ANY IRRITATION SYMPTOMATICALLY.
CALL A PHYSICIAN.

INGESTION: IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN.

ADDITIONAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
NONE KNOWN.

PRIMARY ROUTES OF ENTRY: EYES, SKIN

CANCER INFORMATION:

NONE OF THE COMPONENTS OF THIS PRODUCT ARE LISTED AS CARCINOGENS BY NTP
(NATIONAL TOXICOLOGY PROGRAM); NOT REGULATED AS CARCINOGENS BY OSHA
(OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION); NOT EVALUATED BY IARC
(INTERNATIONAL AGENCY FOR RESEARCH ON CANCER).

REPORTED HUMAN EFFECTS:

PARACOL* EMULSION: NONE KNOWN.

PARAFFIN WAX: PARAFFIN WAX IS CONSIDERED TO BE NON-TOXIC. THE TLV WAS
ESTABLISHED TO PREVENT IRRITATION OF THE RESPIRATORY TRACT AND OTHER
UNPLEASANT EFFECTS.

REPORTED ANIMAL EFFECTS:

PARACOL EMULSION: NONE KNOWN.

SPILL PROCEDURES & WASTE DISPOSAL

LEAK PROCEDURES:

SMALL SPILLS: ADD ABSORBENT, SWEEP UP, AND DISCARD. LARGE SPILLS: DIKE TO CONTAIN AND PUMP INTO DRUMS FOR USE OR DISPOSAL.

WASTE DISPOSAL METHOD:

INCINERATION OF WASTE MATERIAL IN A PERMITTED FACILITY IN ACCORDANCE TO LOCAL, STATE, AND FEDERAL REGULATIONS IS THE RECOMMENDED DISPOSAL METHOD. USE ADDITIONAL FUEL IF NECESSARY.

THIS PRODUCT IS NOT LISTED IN FEDERAL HAZARDOUS WASTE REGULATION 40 CFR 261.33, PARAGRAPH (E) OR (F) - I.E., CHEMICAL PRODUCTS THAT ARE CONSIDERED HAZARDOUS IF THEY BECOME WASTES. IT DOES NOT EXHIBIT ANY OF THE HAZARDOUS CHARACTERISTICS LISTED IN 40 CFR 261, SUBPART C. STATE OR LOCAL HAZARDOUS WASTE REGULATIONS MAY APPLY IF THEY ARE DIFFERENT FROM THE FEDERAL REGULATION.

WHEN DRUM IS EMPTY, RINSE IT WITH PLENTY OF WATER BEFORE DISCARDING.

APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.

AVOID BREATHING MIST AND VAPOR.

WASH THOROUGHLY AFTER HANDLING, AND BEFORE EATING, DRINKING OR SMOKING.

PERSONAL PROTECTIVE EQUIPMENT:

SAFETY GLASSES

IMPERVIOUS GLOVES

APPROPRIATE RESPIRATORY PROTECTION IS REQUIRED WHEN EXPOSURE TO AN AIRBORNE CONTAMINANT IS LIKELY TO EXCEED ACCEPTABLE LIMITS. RESPIRATORS SHOULD BE SELECTED AND USED IN ACCORDANCE WITH OSHA, SUBPART I (29 CFR 1910.134) AND MANUFACTURER'S RECOMMENDATIONS.

APPROPRIATE PROTECTIVE CLOTHING

WORK PRACTICES:

EYEWASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE EASILY ACCESSIBLE.

HANDLING AND STORAGE PRECAUTIONS:

AVOID FREEZING. STORE INDOORS AT COOLEST POSSIBLE TEMPERATURES ABOVE 4 C (40 F).

AVOID STORAGE TEMPERATURES ABOVE 32 C (90 F).

ENGINEERING CONTROLS:

ADEQUATE VENTILATION SHOULD BE PROVIDED TO KEEP MIST OR VAPOR CONCENTRATIONS BELOW ACCEPTABLE EXPOSURE LIMITS. DISCHARGE FROM THE VENTILATION SYSTEM SHOULD COMPLY WITH APPLICABLE AIR POLLUTION CONTROL REGULATIONS.

SAFETY MEASURES DURING REPAIR AND MAINTENANCE:

COMPLETELY ISOLATE AND THOROUGHLY CLEAN ALL EQUIPMENT, PIPING OR VESSELS BEFORE BEGINNING MAINTENANCE OR REPAIRS.

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

PARACOL* 2370
Paraffin wax emulsion
MSDS No.: 695 6101 2400-04

Supersedes MSDS #: 695 6101 2400-03

Date: 10/23/92

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.
SURFACES SUBJECT TO SPILLS OF THIS PRODUCT
CAN BECOME SLIPPERY.

PARACOL* 2370 Paraffin wax emulsion

HMIS RATINGS:(1)

CASRN: Mixture

Health hazard: 1 Slight
Flammability hazard: 0 Minimal
Reactivity hazard: 0 Minimal

CHEMICAL & COMMON NAME: Paraffin wax emulsion

APPEARANCE AND ODOR: White liquid; mild medicinal odor

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL & COMMON NAMES:	CASRN	%	RECOMMENDED AIRBORNE LEVELS(1)
			OSHA PEL TLV-TWA 1991-92

If this product is used in a manner that could generate paraffin fumes, the threshold limit value of 2 mg/m3 should be observed.

(1)Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

CAUTION! SURFACES SUBJECT TO SPILLS OF THIS PRODUCT CAN BECOME SLIPPERY.

BOILING POINT: 100 C (212 F) SOLUBILITY IN WATER: Dispersible
VAPOR PRESSURE AT 20 C: Similar to water SPECIFIC GRAVITY: 0.93
VAPOR DENSITY: Lighter than air pH: 8.3
VOLATILE (VOL.),%: Not determined EVAPORATION RATE: Similar to water
FREEZING POINT: 0 C (32 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Noncombustible - Water emulsion

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

None required. Product is dispersed in water and as such will not burn.
However, water spray, dry chemical, foam, or carbon dioxide may be used on
fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES:

Cool container's with water if exposed to fire.
Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This product is an aqueous solution that will not support combustion. If
heated to decomposition, it may generate carbon monoxide, carbon dioxide,
paraffin wax fumes, and smoke. Depending on conditions, aliphatic
aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause transient eye irritation.

SKIN: None expected.

INHALATION: None known. If paraffin wax fumes are generated, irritation of the nose and throat.

INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

PRIMARY ROUTES OF ENTRY: For product as shipped, eyes and skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are NOT regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have NOT been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

PARACOL* 2370: None known.

Petroleum waxes are inert; wax fumes are mild eye, nose, and throat irritants.

REPORTED ANIMAL EFFECTS:

PARACOL* 2370: None known.

Hercules Incorporated has not conducted any animal testing with this product.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration in accordance with local, state, and federal regulations. Supplemental fuel may be required.

When drum is empty, rinse it with plenty of water before discarding.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.
Avoid breathing fumes or mists.
Wash thoroughly after handling, and before eating, drinking or smoking.
Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical goggles
Impervious gloves
Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.
Handle in areas with adequate ventilation. Use a respirator in accordance with OSHA Subpart I (29 CFR 1910.134), if fume or mist levels are excessive.
Keep floors clean and dry. Spills can be slippery.

HANDLING AND STORAGE PRECAUTIONS:

Avoid freezing. Store indoors at coolest possible temperatures between 4 C (40 F) and 32 C (90 F).

ENGINEERING CONTROLS:

Provide adequate ventilation.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	PARACOL* 2370 Paraffin wax emulsion	Mixture	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	NHH, NPH	N/A

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does not contain any hazardous substances listed in 40 CFR 302.4.

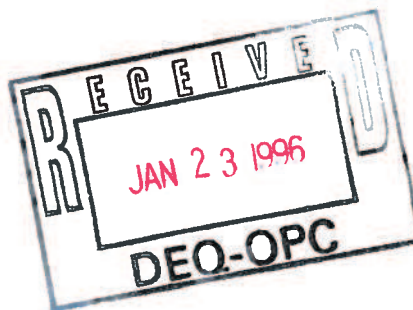
D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...



VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.



Hercules Incorporated
Hercules Plaza
Wilmington, DE 19894-0001
(302) 594-5000 (24 hrs)

MSDS NO.: 695 6101 1200 REV.: 01
ISSUE DATE: 12/30/94
SUPERSEDES: 695 6101 0500 REV.: 02
09/30/88

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME: PARACOL® 404G paraffin wax emulsion

APPEARANCE: liquid

COLOR: white

ODOR: mild medicinal

CASRN: mixture

CHEMICAL DESCRIPTION: paraffin wax emulsion

HMIS RATINGS

Health hazard: 1 SLIGHT

Flammability hazard: 0 MINIMAL

Reactivity hazard: 0 MINIMAL

SECTION 2: HAZARDOUS COMPONENT INFORMATION

If this product is heated or used at temperatures sufficient to produce smoke or fumes, refer to Section 8, Recommended Exposure Limits and Personal Protective Equipment.

Hazardous Ingredients

lignin sulfonate salts

CASRN

mixture

Wt. %

< 7.0

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: **WARNING!**

May cause mild eye irritation.

Surfaces subject to spills can become slippery.

POTENTIAL HEALTH EFFECTS:

Prolonged or repeated contact may cause skin irritation and may cause skin sensitization in susceptible individuals.

Refer to Section 5 for Hazardous Combustion Products, and Section 10 for Hazardous Decomposition/Hazardous Polymerization Products.

SECTION 4: FIRST AID PROCEDURES

EYES: Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes.

SKIN: Wash with soap and water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Get medical attention if irritation persists.

INGESTION: Do NOT induce vomiting. Get immediate medical attention.

SECTION 5: FIRE HAZARDS**FIRE FIGHTING PROCEDURES:**

This material is an aqueous emulsion and will not support combustion. Cool containers to prevent rupture. Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) and full protective gear when fighting fires involving this product.

EXTINGUISHING MEDIA:

Water spray, dry chemical, foam, or carbon dioxide may be used in fires involving this product.

CONDITIONS TO AVOID:

None known.

HAZARDOUS COMBUSTION PRODUCTS:

If heated to combustion, the following substances may be formed: carbon monoxide, carbon dioxide, paraffin wax fumes, smoke, aldehydes and carboxylic acids.

SECTION 6: ACCIDENTAL RELEASE MEASURES

For small spills: Add absorbent, sweep up and discard. For large spills, dike to contain and pump into drums for use or disposal.

In case of accidental spill or release, refer to Section 8, Personal Protective Equipment and General Hygiene Practices.

SECTION 7: HANDLING AND STORAGE**GENERAL MEASURES:**

There are no unusual hazards associated with handling of this product.

Store at temperatures above freezing and below 90°F.

MATERIALS OR CONDITIONS TO AVOID:

Avoid freezing.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**GENERAL HYGIENIC PRACTICES:**

Avoid contact with eyes, skin, and clothing.

Avoid breathing vapor or mists.

Wash thoroughly after handling, and before eating, drinking or smoking.

RECOMMENDED EXPOSURE LIMITS:

PARAFFIN WAX FUMES: If this product is heated to temperatures sufficient to produce smoke or fumes, the TLV-TWA of 2 mg/m³ should be observed.

Hazardous Component	Wt. %	Limit
Paraffin sulfonate salts	< 7.0	Not established

PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses
Impermeable gloves
Appropriate protective clothing

WORK PRACTICES AND ENGINEERING CONTROLS:

Eyewash fountains and safety showers should be easily accessible.

Keep floors clean and dry.

Provide adequate ventilation.

If vapor or mist levels are excessive: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Completely isolate and thoroughly clean all equipment, piping, or vessels before beginning maintenance or repairs.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

pH:	6.0-6.5	
Solids, %:	47.0	
Solubility in Water:	dispersible	
Specific Gravity:	0.96	
Vapor Pressure:	similar to water	
Vapor Density:	lighter than air	
Evaporation Rate:	similar to water	
Boiling Point:	212 ° F	100 ° C
Freezing Point:	32 ° F	0 ° C

SECTION 10: STABILITY AND REACTIVITY**GENERAL STABILITY CONSIDERATIONS:**

Stable under recommended handling and storage conditions.

INCOMPATIBLE MATERIALS:

None known

HAZARDOUS DECOMPOSITION PRODUCTS:

None known

HAZARDOUS POLYMERIZATION:

Not anticipated under normal or recommended handling and storage conditions.

SECTION 11: TOXICOLOGICAL INFORMATION**REPORTED HUMAN EFFECTS:**

PRODUCT/SIMILAR PRODUCT - A 50-person repeat insult human patch test was performed, and there was no indication of dermal irritation nor sensitization.

COMPONENT - paraffin waxes: Fumes are mild eye, nose and throat irritants.

COMPONENT - lignin sulfonate salts: Reported to be a known skin sensitizer.

REPORTED ANIMAL EFFECTS:

PRODUCT/SIMILAR PRODUCT - No animal toxicity studies have been carried out with this product.

COMPONENT - lignin sulfonate salts: Oral LD50 (rat): > 10 g/kg.

CARCINOGENICITY INFORMATION:

PRODUCT/SIMILAR PRODUCT - The components of this product are not listed as carcinogens by NTP; not regulated as carcinogens by OSHA; and not evaluated by IARC.

SECTION 12: ECOLOGICAL INFORMATION**ECOTOXICITY:**

PRODUCT/SIMILAR PRODUCT - No ecological studies have been carried out on this product.

SECTION 13: DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD:**

Incineration in accordance with applicable regulations is the recommended disposal method. Supplemental fuel may be required. When the drum is empty, rinse it with plenty of water before discarding.

SECTION 14: TRANSPORTATION INFORMATION

For information regarding transportation of this product, please contact Hercules Transportation at (302) 594-7356.

SECTION 15: REGULATORY INFORMATION**CHEMICAL INVENTORIES:**

U. S. TSCA Status: Included on TSCA inventory.

SARA TITLE III**Sections 302 and 304:**

This product is not an Extremely Hazardous Substance subject to reporting under 40CFR355.

Sections 311 and 312:

HC-1: Acute health hazard

NPH: Not a physical hazard

Section 313:

This product does not contain any chemicals subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act and 40CFR372.

CERCLA

This product does not contain any chemicals subject to reporting as a CERCLA Hazardous Substance under 40CFR302.4.

RA

This product is not a hazardous waste as listed in 40CFR261.33. It does not exhibit any of the hazardous characteristics listed in 40CFR261, Subpart C.

SECTION 16: OTHER INFORMATION

LIST OF ACRONYMS:

ACGIH: American Conference of Governmental Industrial Hygienists
AICS: Australian Inventory of Chemical Substances
AIHA WEEL: American Industrial Hygienists Association - Workplace Environmental Exposure Level
ANSI: American National Standards Institute
C: Ceiling
CASRN: Chemical Abstracts Service Registry Number
CERCLA: Comprehensive Emergency Response, Compensation and Liability Act
DSL: Domestic Substances List (Canadian)
EINECS: European Inventory of Existing Commercial Chemical Substances
HMIS: Hazardous Materials Identification System
IARC: International Agency for Research on Cancer
MITI: Ministry of International Trade and Industry (Japanese)
N/A: Not Applicable
NDSL: Non-domestic Substances List (Canadian)
NOR: Not Otherwise Regulated
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: OSHA Permissible Exposure Limit
RCRA: Resource Conservation and Recovery Act
RQ: Reportable Quantity
SARA: Superfund Amendment Reauthorization Act
STEL: Short-Term Exposure Limit
TLV: Threshold Limit Values (registered trademark of ACGIH)
TPQ: Threshold Planning Quantity
TSCA: Toxic Substances Control Act
TWA: Time Weighted Average

The Information and recommendations contained in this Material Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations any applicable federal or state laws.

M S D S
U. S. DEPARTMENT OF LABOR
OCCUPATIONAL AND HEALTH ADMINISTRATION
MATERIAL SAFETY DATA SHEET

(Required under OSHA Safety and Health Regulation for Ship Repairing, Ship Building, and Ship Breaking (29CFR 1915, 1916, 1917))

SECTION I - MANUFACTURER & PRODUCT IDENTIFICATION

UNITED CATALYSTS INC. (502) 637-9751
P. O. BOX 32370
LOUISVILLE, KY. 40232

TRADE NAME AND SYNONYMS - C8-7-01

CHEMICAL FAMILY

Heterogeneous Catalyst

FORMULA

CuO + Carbon

SECTION II - HAZARDOUS INGREDIENTSHAZARDOUS COMPONENTS IN THE SOLID MIXTURE

<u>COMPONENT</u>	<u>%</u>	<u>PEL(8 hr.)</u>	<u>TWA(8 hr.)</u>
Copper Oxide	5-15	1.0 mg/M ³	1.0 mg/M ³
Carbon	85-95	NA*	10.0 mg/M ³

SECTION III - PHYSICAL DATA

APPEARANCE AND COLOR - Black granules. No odor.

MELTING POINT - Greater than 1300°C - Greater than 2300°F

SOLUBILITY IN WATER - Insoluble

SPECIFIC GRAVITY - 38 Lbs./CF

PERCENT, VOLATILE BY WEIGHT (%) AT 250°F - Less than 5%

SECTION IV - FIRE EXPLOSIVE DATA

Fire and Explosion Hazard: - Flammable/combustible solid; may be ignited by heat, sparks or flames. May burn rapidly with flare-burning effect.

Flammable Limits: 275°C in air

Fire Fighting Media: Dry chemical, sand, water spray (fog or foam)

Firefighting: Flammable 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 contact with the skin or eyes. Inhalation may produce irritation to the upper respiratory tract and may cause temporary or permanent damage to the lungs. Ingestion may result in damage to the liver, pancreas, kidney or nervous system. Prolonged or repeated contact with the skin may result in irritation and possible dermatitis in sensitive individuals. Eye contact may result in irritation.

First Aid (Inhalation) - Should large amounts of the material be inhaled, remove the affected individual to fresh air. If breathing has stopped, give artificial respiration and get medical attention promptly.

SECTION VI - REACTIVITY DATA

Reactivity - Is stable under normal temperatures and pressures in sealed containers. Hazardous polymerization will not occur. Finely divided particles can result in fire or explosion.

SECTION VII - SPILL OR LEAK PROCEDURES

Clean-up personnel need protection against inhalation of dusts. Eye protection is required. Vacuuming or wet methods of clean-up are preferred. Place in appropriate containers for disposal keeping airborne particulates at a minimum.

Disposal - In selecting the method of disposal, applicable local, state and federal regulations should be consulted. Recover metal components by reprocessing when 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.

Eye Protection - Chemical splash goggles designed in compliance with OSHA regulations are recommended. Consult your safety equipment supplier.

Protective Clothing - Wear protective clothing, including long sleeves and gloves, to prevent repeated or prolonged skin contact.

SECTION IX

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.

* Not available

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCULES* RESIN NC-11

MSDS No.: 853 2173 0100-02

Supersedes MSDS #: 853 2173 0100-01

Date: 10/06/89

I. PRODUCT IDENTIFICATION

WARNING| STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

HERCULES* RESIN NC-11 Synthetic resin

HMIS RATINGS: (1)

Health hazard:	0	Minimal
Flammability hazard:	1	Slight
Reactivity hazard:	0	Minimal

-CHEMICAL & COMMON NAME: Modified rosin acid

APPEARANCE AND ODOR: Amber-colored solid or flake; typical rosin odor

* Registered Trademark of Hercules Incorporated.

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

The ingredients in this product are not listed in 29 CFR 1910, Subpart Z, nor do they appear in "Threshold Limit Values for Chemical Substances in the Work Environment Adopted by ACGIH" for 1989-90.

If these materials are used in a manner that could generate particulates (dust), Hercules recommends that the resin dust be treated as a NUISANCE PARTICULATE according to the American Conference of Governmental Industrial Hygienists (ACGIH).

FOOTNOTES

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.
N/A: Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: N/A

SOLUBILITY IN WATER: Negligible

VAPOR PRESSURE AT 20 C: Not determined. SPECIFIC GRAVITY: 1.07

VAPOR DENSITY: N/A

pH: N/A

VOLATILE (VOL.),%: Negligible at 20 C EVAPORATION RATE: Slower than butyl acetate

SOFTENING POINT: 89 C (192 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

WARNING| STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

FLASH POINT: 211 C (411 F) COC

FLAMMABLE LIMITS: Not determined.

AUTOIGNITION TEMPERATURE: Not determined.

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS:
May form flammable dust-air mixtures.

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Dust may cause irritation by mechanical abrasion.
SKIN: Prolonged and repeated contact may cause a skin sensitization reaction in susceptible individuals (See below: MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE).
INHALATION: None known. None expected.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water. MOLTEN RESINS: If molten material comes in contact with the skin, cool under a running stream of water. Do NOT attempt to remove the resin from the skin. Removal could result in severe tissue damage. Get medical attention.

INGESTION: If swallowed, do NOT induce vomiting. Call a physician.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen the material.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This product contains rosin or a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this product after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to this product or similar materials. A thorough search of Hercules medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

WASTE DISPOSAL METHOD:

Incineration of waste material in a permitted facility in accordance to local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility is a suitable alternative.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Do not allow eye or skin contact.

Avoid breathing dust.

Wash thoroughly after handling, and before eating, drinking or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

For small packages, the following warning applies:

WARNING | STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapors may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute.

VII. APPLICABLE CONTROL MEASURES

HANDLING AND STORAGE PRECAUTIONS:...Continued

For large bags (1,000 lbs. or greater), the following warning applies:
WARNING| STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE
VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid
ignition sources such as sparks and flame. Ground all equipment and the
bag. In addition, when emptying where flammable vapors may be present,
blanket vessel with an inert gas. ATTENTION| A GROUNDING CABLE MUST BE
ATTACHED TO THE BAG GROUND CONNECTION|
Flaked forms are prone to gradual oxidation. Control inventory. Use
oldest material first.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep dust concentrations below
acceptable exposure limits. Discharge from the ventilation system should
comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate sources of ignition.

Completely isolate and thoroughly clean all equipment, piping or vessels
before beginning maintenance or repairs.

Keep area clean. Product will burn.

HERCULES INCORPORATED

JULES PLAZA

MINGTON, DE 19894

NE #: (302) 594-5000 (24 HRS)

PICCO* 5100

MSDS NO.: 866 2002 5100 02

ERSEDES MSDS #: 866 2002 5100 01

DATE: 09/22/89

PRODUCT IDENTIFICATION

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

PICCO* 5100 HYDROCARBON RESIN

HMIS RATINGS: (1)

NUMBER: (68240-01-7)

HEALTH HAZARD:	0	MINIMAL
FLAMMABILITY HAZARD:	1	SLIGHT
REACTIVITY HAZARD:	0	MINIMAL

APPEARANCE AND ODOR: BROWN SOLID OR FLAKE; TYPICAL HYDROCARBON ODOR

REGISTERED TRADEMARK OF HERCULES INCORPORATED.

NOTES

EXPLANATION OF ACRONYMS:

- S: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING FOR PRODUCT AS SUPPLIED.
- HA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
- R: REGISTERED TRADEMARK OF AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS FOR THRESHOLD LIMIT VALUES.
- T: TIME WEIGHTED AVERAGE
- N: NOT APPLICABLE

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL STATE LAWS.

HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

MICAL AND COMMON NAMES:	%	RECOMMENDED AIRBORNE LEVELS(1) OSHA TWA TLV-TWA 1988-89
ROLEUM HYDROCARBON OIL (64742-52-5) (64742-88-4)	17	5 MG/M3

THESE MATERIALS ARE USED IN A MANNER THAT COULD GENERATE PARTICULATES (ST), HERCULES RECOMMENDS THAT THE RESIN DUST BE TREATED AS A NUISANCE PARTICULATE ACCORDING TO THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH).

TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

FLASH POINT: N/A SOLUBILITY IN WATER: NEGLIGIBLE
VAPOR PRESSURE AT 20 C: NOT DETERMINED. SPECIFIC GRAVITY: 1.03 - 1.06
VAPOR DENSITY: N/A PH: N/A
BOILING POINT (VOL.),%: NEGLIGIBLE AT 20 C EVAPORATION RATE: SLOWER THAN BUTYL ACETATE
FREEZING POINT: 70-110 C (158-230 F)

FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

FLASH POINT: ABOVE 218 C (475 F) COC

FLAMMABLE LIMITS: NOT DETERMINED.

IGNITION TEMPERATURE: NOT DETERMINED.

EXTINGUISHING MEDIA: WATER SPRAY, DRY CHEMICAL, FOAM, CARBON DIOXIDE, OR HALON

SPECIAL FIREFIGHTING PROCEDURES: NONE

USUAL FIRE AND EXPLOSION HAZARDS:
MAY FORM FLAMMABLE DUST-AIR MIXTURES.

CONTINUED...

FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

CONTINUED

STABILITY CONSIDERATIONS: STABLE

COMPATIBILITY WITH: NONE

HAZARDOUS DECOMPOSITION PRODUCTS: NONE

HAZARDOUS PRODUCTS OF COMBUSTION:

CARBON MONOXIDE AND CARBON DIOXIDE. DEPENDING ON CONDITIONS, SOME ALIPHATIC ALDEHYDES AND CARBOXYLIC ACIDS ALSO MAY BE FORMED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES (DUST): MAY CAUSE MILD TRANSIENT EYE IRRITATION.

SKIN: PROLONGED CONTACT MAY CAUSE MILD SKIN IRRITATION.

INHALATION (DUST): MAY CAUSE IRRITATION OF THE RESPIRATORY TRACT.

INGESTION: NONE KNOWN.

FIRST AID PROCEDURES:

EYES: IN CASE OF CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF LOW-PRESSURE WATER FOR AT LEAST 15 MINUTES. REMOVE ANY CONTACT LENSES TO ENSURE THOROUGH FLUSHING. CALL A PHYSICIAN.

SKIN: WASH WITH SOAP AND RUNNING WATER. MOLTEN RESINS: IF MOLTEN MATERIAL COMES IN CONTACT WITH THE SKIN, COOL UNDER A RUNNING STREAM OF WATER. DO NOT ATTEMPT TO REMOVE THE RESIN FROM THE SKIN. REMOVAL COULD RESULT IN SEVERE TISSUE DAMAGE. GET MEDICAL ATTENTION.

INHALATION (DUST): REMOVE TO FRESH AIR. TREAT ANY IRRITATION SYMPTOMATICALLY. CALL A PHYSICIAN.

INGESTION: IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN.

NOTE TO PHYSICIAN: MATERIAL SHOULD NOT BE FORCIBLY PULLED FROM THE SKIN. MINERAL OIL MAY BE USED TO LOOSEN THE MATERIAL.

ADDITIONAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
NONE KNOWN.

CONTINUED...

HEALTH HAZARD DATA

.CONTINUED

IMARY ROUTE OF ENTRY:
MOLTEN RESIN - SKIN
DUST - EYES AND INHALATION

NCER INFORMATION:

PICCO 5100 FORMULATION: NOT LISTED AS A CARCINOGEN BY NTP (NATIONAL TOXICOLOGY PROGRAM); NOT REGULATED AS A CARCINOGEN BY OSHA (OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION); NOT EVALUATED BY IARC (INTERNATIONAL AGENCY FOR RESEARCH ON CANCER).

PETROLEUM HYDROCARBON OIL: THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS DETERMINED THAT THERE IS NO EVIDENCE TO SHOW THAT THIS TYPE OF OIL CAUSES CANCER IN MAN OR EXPERIMENTAL ANIMALS.

PORTED HUMAN EFFECTS:

PICCO 5100 FORMULATION: NONE KNOWN.

PETROLEUM HYDROCARBON OIL: NONE REPORTED.

ED ANIMAL EFFECTS:

PICCO 5100 FORMULATION: BASED ON THE RESULTS OF STUDIES WITH A SIMILAR TYPE OF RESIN, THIS RESIN IS NOT EXPECTED TO BE ACUTELY TOXIC BY THE ORAL ROUTE.

PETROLEUM HYDROCARBON OIL: LD50, RATS IS ESTIMATED TO BE GREATER THAN 30 G/KG.

. SPILL PROCEDURES & WASTE DISPOSAL

ILL PROCEDURES:

IF MATERIAL IS NOT CONTAMINATED, SCOOP INTO CLEAN CONTAINERS FOR USE. IF CONTAMINATED, SCOOP INTO CONTAINERS FOR DISPOSAL.

3TE DISPOSAL METHOD:

INCINERATION OR LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THIS PRODUCT IS NOT LISTED IN FEDERAL HAZARDOUS WASTE REGULATION 40 CFR 261.33, PARAGRAPH (E) OR (F) - I.E., CHEMICAL PRODUCTS THAT ARE CONSIDERED HAZARDOUS IF THEY BECOME WASTES. IT DOES NOT EXHIBIT ANY OF THE HAZARDOUS CHARACTERISTICS LISTED IN 40 CFR 261, SUBPART C. STATE OR LOCAL HAZARDOUS WASTE REGULATIONS MAY APPLY IF THEY ARE DIFFERENT FROM THE FEDERAL REGULATION.

APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.

AVOID BREATHING DUST.

WASH THOROUGHLY AFTER HANDLING, AND BEFORE EATING, DRINKING OR SMOKING.

PERSONAL PROTECTIVE EQUIPMENT:

SAFETY GLASSES

IMPERVIOUS GLOVES

APPROPRIATE RESPIRATORY PROTECTION IS REQUIRED WHEN EXPOSURE TO AN AIRBORNE CONTAMINANT IS LIKELY TO EXCEED ACCEPTABLE LIMITS. RESPIRATORS SHOULD BE SELECTED AND USED IN ACCORDANCE WITH OSHA, SUBPART I (29 CFR 1910.134) AND MANUFACTURER'S RECOMMENDATIONS. PERSONNEL EXPOSED TO HOT MOLTEN MATERIAL SHOULD WEAR PROTECTIVE CLOTHING THAT PROVIDES PROTECTION FROM THERMAL BURNS. FULL FACE SHIELD, LINED RAIN SUIT (OR OTHER HEAT RESISTANT MATERIAL), AND LINED IMPERVIOUS GLOVES ARE RECOMMENDED.

< PRACTICES:

EYEWASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE EASILY ACCESSIBLE.

HANDLING AND STORAGE PRECAUTIONS:

FOR SMALL PACKAGES, THE FOLLOWING WARNING APPLIES:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. AVOID IGNITION SOURCES SUCH AS SPARKS AND FLAME. GROUND ALL EQUIPMENT. IN ADDITION, WHEN EMPTYING BAGS WHERE FLAMMABLE VAPORS MAY BE PRESENT, BLANKET VESSEL WITH INERT GAS, GROUND OPERATOR, AND POUR MATERIAL SLOWLY INTO CONDUCTIVE, GROUNDED CHUTE.

FOR LARGE BAGS (1,000 LBS. OR GREATER), THE FOLLOWING WARNING APPLIES:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. AVOID IGNITION SOURCES SUCH AS SPARKS AND FLAME. GROUND ALL EQUIPMENT AND THE BAG. IN ADDITION, WHEN EMPTYING WHERE FLAMMABLE VAPORS MAY BE PRESENT, BLANKET VESSEL WITH AN INERT GAS. ATTENTION! A GROUNDING CABLE MUST BE ATTACHED TO THE BAG GROUND CONNECTION!

FLAKED FORMS ARE PRONE TO GRADUAL OXIDATION. CONTROL INVENTORY. USE OLDEST MATERIAL FIRST.

ENGINEERING CONTROLS:

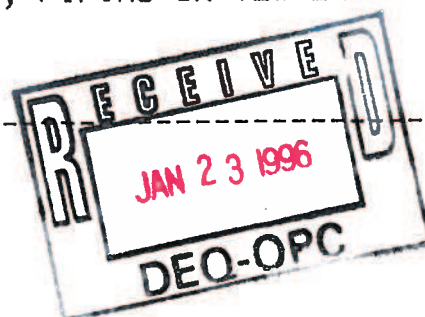
ADEQUATE VENTILATION SHOULD BE PROVIDED TO KEEP DUST CONCENTRATIONS BELOW ACCEPTABLE EXPOSURE LIMITS. DISCHARGE FROM THE VENTILATION SYSTEM SHOULD COMPLY WITH APPLICABLE AIR POLLUTION CONTROL REGULATIONS.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

ELIMINATE IGNITION SOURCES.

COMPLETELY ISOLATE AND THOROUGHLY CLEAN ALL EQUIPMENT, PIPING OR VESSELS BEFORE BEGINNING MAINTENANCE OR REPAIRS.

KEEP AREA CLEAN. PRODUCT WILL BURN.



HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCULES* PARA-CYMENE FEEDSTOCK
(PCFS)

MSDS No.: 999 0210 3003-02

Supersedes MSDS # 999 0210 3003-01

Date: 01/22/93

I. PRODUCT IDENTIFICATION

WARNING! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
VAPOR MAY CAUSE DROWSINESS AND DIZZINESS.
IF SWALLOWED, VOMITING MAY CAUSE FATAL LUNG DAMAGE.
COMBUSTIBLE LIQUID.

HERCULES* PARA-CYMENE FEEDSTOCK (PCFS)

HMIS RATINGS: (1)

CASRN: 8006-64-2

Health hazard:	2	Moderate
Flammability hazard:	2	Moderate
Reactivity hazard:	0	Minimal

CHEMICAL & COMMON NAME: Terpene-based hydrocarbon liquid

APPEARANCE AND ODOR: Pale yellow to near colorless liquid; pleasant terpene odor

* Registered Trademark of Hercules Incorporated

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL AND COMMON NAMES:

RECOMMENDED AIRBORNE LEVELS (1)
OSHA PEL TLV-TWA 1991-92

Mixed terpene hydrocarbons

Not established

Until the American Conference of Governmental Industrial Hygienists establishes a Threshold Limit Value (TLV) for this product, Hercules recommends that the current TLV established for Turpentine (100 ppm) be applied to this product.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 172 C (342 F)

SOLUBILITY IN WATER: Slight

VAPOR PRESSURE AT 25 C: 5 mm Hg

SPECIFIC GRAVITY: 0.84

VAPOR DENSITY: Heavier than air

pH: N/A

VOLATILE (WT.), %: 100

EVAPORATION RATE: Slower than butyl
acetate

FREEZING POINT: < -40 C (-40 F)

V. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

CAUTION! COMBUSTIBLE LIQUID.

FLASH POINT: 42.5 C (108.5 F) SETAFLASH

FLAMMABLE LIMITS IN AIR, BY VOLUME: Lower - 0.8, Upper - Unknown

AUTOIGNITION TEMPERATURE: Not determined

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: Strong oxidizers, chlorine

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

Continued...

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

WARNING! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
VAPOR MAY CAUSE DROWSINESS AND DIZZINESS.
IF SWALLOWED, VOMITING MAY CAUSE FATAL LUNG DAMAGE.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Liquid and Vapor - May cause eye irritation.
SKIN: Causes defatting of the skin which can lead to irritation and dermatitis.
INHALATION: Vapor may cause central nervous system depression and mucous membrane irritation. Symptoms of overexposure are light-headedness (dizziness), headache, intoxication which could lead to unconsciousness. Vapor may also cause irritation of the upper respiratory tract.
INGESTION: May cause stomach pain, nausea and vomiting, irritation of mouth and throat. Aspiration into the lungs after ingestion will cause severe lung damage (pulmonary edema and hemorrhage) which could be fatal.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly flush with running water. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, do NOT induce vomiting. Call a physician. Get immediate medical attention.

NOTE TO PHYSICIAN: This material contains a hydrocarbon solvent. Aspiration into the lungs could result in chemical pneumonitis.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known.

Continued...

V. HEALTH HAZARD DATA

...Continued

PRIMARY ROUTES OF ENTRY: Eyes, skin, inhalation

CANCER INFORMATION:

The National Toxicology Program (NTP) concluded that two-year gavage studies with d-Limonene, a component of this product, indicate clear evidence of carcinogenic activity in male rats, but not in female rats, nor in male or female mice. However, investigation of the metabolism of d-Limonene in various species suggests these findings are not relevant to human risk assessment. d-Limonene is not listed as a carcinogen by the National Toxicology Program (NTP). It is not regulated as a carcinogen by the Occupational Safety and Health Administration (OSHA) and has not been evaluated by the International Agency for Research on Cancer (IARC).

Other components of this product are not listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as a carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

PARA-CYME: In a Kligman maximization test, para-cymene was neither a skin irritant or a sensitizer. Other sources report the undiluted liquid can produce erythema, dryness, and defatting, the intensity depending on the dose and duration of contact.

REPORTED ANIMAL EFFECTS:

Developmental Toxicity: d-Limonene, a component of this product, administered to pregnant rats, mice and rabbits at daily dosage levels equivalent to approximately half the acutely lethal dose produced maternal toxicity and embryo/fetotoxicity but no evidence of teratogenicity. Toxicity was reflected primarily in weight loss or reduced weight gain and, in fetuses, delayed development.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Extinguish all ignition sources. Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration of combustible wastes in permitted facilities is the preferred disposal method.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

- Avoid contact with eyes, skin, and clothing.
- Avoid breathing vapors.
- Wash thoroughly after handling, and before eating, drinking or smoking.
- Avoid contamination of food, beverages, or smoking materials.
- Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

- Chemical goggles
- Impervious gloves
- Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.
- Appropriate protective clothing

WORK PRACTICES:

- Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

- Keep away from heat and open flame.
- Eliminate ignition sources and prevent build-up of static electric charges.
- This product may react with strong oxidizers or chlorine, and should not be stored near such materials.

ENGINEERING CONTROLS:

- Adequate ventilation should be provided to keep mist or vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

- Eliminate ignition sources.
 - Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.
 - Keep area clean. Product will burn.
-

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	HERCULES* PARA-CYMENE FEEDSTOCK (PCFS)	8006-64-2	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-3	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product exhibits the characteristic of ignitability D001 as defined in hazardous waste regulations 40 CFR 261 Subpart C. Therefore, disposal of unused product must comply with hazardous waste regulations.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

HERCULES INCORPORATED

VINSOL* 2511

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

MSDS No.: 926 6651 0900-04

Supersedes MSDS #: 926 6651 0900-03

Date: 03/09/90

I. PRODUCT IDENTIFICATION

DANGER| MAY CAUSE EYE BURNS OR SKIN IRRITATION.

VINSOL* 2511 Resin Soap Solution

HMIS RATINGS: (1)

Health hazard:	3	Serious
Flammability hazard:	0	Minimal
Reactivity hazard:	0	Minimal

CHEMICAL AND COMMON NAME: Sodium resinate emulsion

APPEARANCE AND ODOR: Dark brown liquid; resinous odor

* Registered Trademark of Hercules Incorporated.

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

The ingredients in this product are not listed in 29 CFR 1910 Subpart Z nor do they appear in "Threshold Limit Values for Chemical Substances in the Work Environment Adopted by ACGIH for 1988-89".

The hazard associated with this product is due to its alkaline nature (pH).

FOOTNOTES

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

N/A: Not applicable

Hercules Incorporated has compiled the information and recommendations contained in this Material Safety Data Sheet from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 100 C (212 F) - water

SOLUBILITY IN WATER: Appreciable

VAPOR PRESSURE AT 20 C: Same as water

SPECIFIC GRAVITY: 1.09

VAPOR DENSITY: Lighter than air

pH: 12.4

VOLATILE (VOL.),%: Negligible at 20 C (68 F) EVAPORATION RATE: Same as water

FREEZING POINT: -2 C (28 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Nonflammable

FLAMMABLE LIMITS: N/A

AUTOIGNITION TEMPERATURE: N/A

EXTINGUISHING MEDIA:

Product is dispersed in water and as such will not burn. However, water spray, dry chemical, foam, or carbon dioxide may be used on fires involving this product.

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH:

Acids. Neutralizing the emulsion will cause it to separate.

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

This material is not expected to support combustion. If heated to decomposition, it may evolve carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

DANGER| MAY CAUSE EYE BURNS OR SKIN IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Causes severe eye irritation and possibly eye burns.
SKIN: Causes skin irritation. Prolonged and repeated contact may cause a skin sensitization reaction in susceptible individuals (see below - "MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE").
INHALATION: Mist is irritating to the respiratory tract.
INGESTION: May cause gastrointestinal tract irritation.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly wash with soap and running water. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician.

INGESTION: If conscious, the person should immediately drink large quantities of liquid to dilute this product. Do NOT induce vomiting. Call a physician. NEVER give liquids to an unconscious person.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This material contains a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this resin after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to this resin or similar materials. A thorough search of Hercules medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

PRIMARY ROUTES OF ENTRY: Eyes, skin, inhalation, ingestion

CANCER INFORMATION:

Not listed as a carcinogen by NTP (National Toxicology Program); not regulated as a carcinogen by OSHA (Occupational Safety & Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration in accordance with local, state, and federal regulations. Supplemental fuel may be required.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid breathing mist.

Do not allow eye or skin contact.

Remove contaminated clothing promptly and clean thoroughly before reuse.

Wash thoroughly after handling, and before eating, drinking or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical goggles

Impervious gloves

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

This product may react with acids and should not be stored near such materials. Neutralizing the emulsion will cause it to separate.

Store in cool, dry, well-ventilated area.

ENGINEERING CONTROLS: Provide adequate ventilation.

VIII. ENVIRONMENTAL REGULATORY DATA

The following Environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P 1	VINSOL* 2511 Sodium hydroxide	N/A 1310-73-2	100 3 Max.

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, NPH	Not listed.
P	N/A	N/A	HC-1	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

VINSOL 2511 contains Sodium hydroxide that is a "Hazardous Substance" listed in 40 CFR 302.4. VINSOL 2511 has a "Reportable Quantity" of 33,000 lbs.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

None

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: Product does NOT contain an EHS.

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: Product does NOT contain an EHS.

SEC 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

This product does NOT contain 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 Part 372 Toxic Chemical Reporting requirements.

Doc. No. 2473s

10/10/90
10/10/90
10/10/90

CHEMICAL NAME: Oxalic Acid

SUPPLIED BY:

TELEPHONE#:

CAS#: 144-62-7

UN#: 1693

DATE: 1/15/91

LABEL: None

Record#: 25 1-22-91

Page 1

Section I - General Information

TRADE NAME: Oxalic Acid

CHEMICAL FAMILY: Organic Acid

Hazard Ratings (H.M.I.S.):

FORMULA: C₂H₂O₄ · 2H₂O

HEALTH: 2

FIRE: 1

REACTIVITY: 0

SPECIAL:

Hazard Rating Scale:

0 = minimal 3 = serious

1 = slight 4 = severe

2 = moderate NR = not rated

Section II - Hazard Ingredients / Identity

HAZARDOUS INGREDIENT:

TWA 1 mg/m(3) STEL 2 mg/m(3)

OSHA*:

ACGIH:

PEL:

TLV:

OTHER EXPOSURE LIMITS:

Section III - Physical and Chemical Characteristics

BOILING POINT: Decomposes

VAPOR PRESSURE(mm/Hg): NA

MELTING POINT: 101.5 deg C

VAPOR DENSITY(alr=1): NA

SPECIFIC GRAVITY: 1.553

REACTIVITY IN WATER: NA

SOLUBILITY IN WATER: at 20 deg C 95.2 g/l

APPEARANCE AND ODOR: White crystalline, odorless

OTHER:

Section IV - Fire and Explosion Data

FLASH POINT: Non flammable

METHODS USED: NA

FLAMMABLE LIMITS: NA

LEL:

UEL:

AUTOIGNITION TEMPERATURE: NA

EXTINGUISHER MEDIA: All types OK

SPECIAL FIRE FIGHTING
PROCEDURES: NA

UNUSUAL FIRE AND
EXPLOSION HAZARDS: Generates poisonous gases as material decomposes.

MATERIAL SAFETY DATA SHEET

Section V - Physical Hazards (Reactivity Data)

STABILITY STABLE: Yes UNSTABLE: No Record#: 25 Page 2

CONDITIONS TO AVOID: NA

INCOMPATIBILITY, MATERIALS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS:

HAZARDOUS POLYMERIZATION: MAY OCCUR: No WILL NOT OCCUR: Yes
POLYMERIZATION CONDITIONS TO AVOID: NA

Section VI - Health Hazards

Chemical(s) listed as carcinogen or potential carcinogens:

OSHA: No NATIONAL TOXICOLOGY PROGRAM: No I.A.R.C. MONOGRAPHS: No

SIGNS & SYMPTOMS OF EXPOSURE:

If inhaled will cause difficulty in breathing. Will burn eyes, nose and throat. If ingested will cause severe gastroenteritis and secondary shock will cause death in a few hours.

EMERGENCY FIRST AID PROCEDURES:

EYES:

Wash thoroughly with water. Get medical attention.

SKIN:

Remove contaminated clothing and wash thoroughly with water.

MATERIAL SAFETY DATA SHEET

Section VI - Health Hazards (Continued)

Record#: 25 Page 3

INHALATION:

Move to fresh air. If breathing stopped give artificial respiration. If breathing difficult, give oxygen. Consult physician.

INGESTION:

Due to corrosive damage causing severe gastroenteritis and secondary shock, death can occur in a few hours. Have conscious victim drink water or milk. Do not induce vomiting. GET MEDICAL HELP IMMEDIATELY.

ADDITIONAL INFORMATION:

Section VII- Special Precautions & Spill / Leak Procedures

HANDLING AND STORAGE:

Store in cool, dry area.

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

Sweep up and store in suitable waste disposal drum. Neutralize with lime or soda ash.

WASTE DISPOSAL METHODS:

(Consult Federal, State, and local regulations)

Section VIII - Special Protection / Control Measures

RESPIRATORY PROTECTION: Self contained breathing apparatus

VENTILATION:

LOCAL EXHAUST: Yes

SPECIAL VENTILATION:

OTHER VENTILATION NEEDS:

MECHANICAL:

Section VIII - Special Protection / Control Measures (Continued)

Record#: 25 Page 4

PROTECTIVE GLOVES: Rubber gloves

EYE PROTECTION: Goggles

OTHER SPECIAL CLOTHING/EQUIPMENT:
Rubber apron

WORK/HYGENIC PRACTICES:

Usual good housekeeping and hygiene procedures.

Section IX - Transportation Data

PROPER SHIPPING NAME: Oxalic Acid

D.O.T. HAZARD CLASS: ORM-~~R~~n.o.s.

LABEL REQUIREMENT: None

PLACARD: None

UN: NA 1693

RQ: None

CAS:6153-56-6

*For Chemical Emergencies (Spills, Leaks, Fire, Exposure or Accident)
Call CHEMTREC - Day or Night - at 800 424 9300.*

888 8-2391

9/3/91

MONSANTO PRODUCT NAME
MALEIC ANHYDRIDE

MONSANTO COMPANY
800 NORTH LINDBERGH BLVD.
ST. LOUIS, MO 63167

Emergency Phone No.
(Call Collect)
(314) 694-1000

PRODUCT IDENTIFICATION

Synonyms: Cis-Butenedioic Anhydride
Chemical Name: 2,5-Furandione

Chemical Formula: C₄H₂O₃

Chemical Family: Acid Anhydride

CAS No.: 108-31-6

TSCA Inventory: 2,5-Furandione (maleic anhydride) appears on the Inventory of Chemical Substances published by the U.S. Environmental Protection Agency (EPA) under authority of the Toxic Substances Control Act (TSCA).

DOT Proper Shipping Name: Maleic Anhydride

DOT Hazard Class/LD. No./PG: 8 (Corrosive Material)/UN2215/PG III

DOT Label(s): Corrosive

Reportable Quantity (RQ)
Under U.S. EPA CERCLA
Regulations: Maleic Anhydride, 5000 lbs. (2,270 kg)

U.S. Surface
Freight Classification: Maleic Anhydride

SARA Hazard Notification

Hazard Categories Under
Criteria of SARA Title III
Rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s):

This product contains the following substance(s) which are defined as toxic chemicals under, and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

Toxic Chemical
Name

Chemical Abstract
Service Registry Number

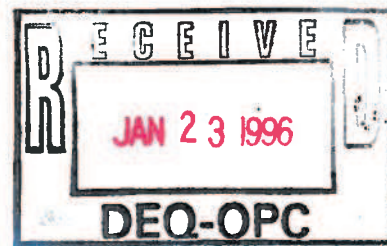
Percent by Weight
in Product

Maleic Anhydride

108-31-6

Approx. 100%

Master File
Do Not Remove
This Copy



PRODUCT IDENTIFICATION - CONTINUED

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:

This substance is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):

Maleic Anhydride, CAS Reg. No. 108-31-6

WARNING STATEMENTS

DANGER!

CAUSES BURNS TO EYES AND SKIN

DUST OR VAPOR CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HARMFUL IF ABSORBED THROUGH SKIN

MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTION

HOT MELTED MATERIAL CAUSES THERMAL BURNS TO EYES AND SKIN

PRECAUTIONARY MEASURES

Do not get in eyes, on skin, or clothing.

Avoid breathing dust, vapor or mist.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

Keep hot melted material away from sparks and flame to prevent ignition.

Avoid contact with hot liquid.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID: IF IN EYES OR ON SKIN, Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Contact a poison control center. In case of contact with hot liquid, treat for thermal effects. Wash clothing before reuse. Destroy contaminated shoes.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

IN CASE OF SPILL OR LEAK: Eliminate all sources of ignition. Allow product to solidify if molten. While using personal protection equipment, pick up solid material for re-use or disposal. Flush area with water and neutralize washings.

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

Skin Protection: Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Wear chemical goggles,

OCCUPATIONAL CONTROL PROCEDURES - CONTINUED

a face shield, and chemical resistant clothing such as a rubber apron when splashing is likely. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Attention! Repeated or prolonged contact may cause allergic skin reaction in some people.

Respiratory Protection: Avoid breathing vapor, mist, fume or dust. Use NIOSH/MSHA approved respiratory protection equipment (full facepiece recommended) when airborne exposure is excessive. If used, full facepiece replaces need for full face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR Subsection 1910.134.

Attention! Repeated or prolonged inhalation may cause allergic respiratory reaction in some people.

Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust systems.

Airborne Exposure Limits:

Maleic Anhydride

OSHA PEL: 0.25 ppm (1 mg/m³)
ACGIH TLV: 0.25 ppm (1 mg/m³)

Some individuals have experienced eye and upper respiratory tract irritation at levels as low as 0.4 mg/m³.

FIRE PROTECTION INFORMATION

Flash Point: 215°F

Method: Pensky-Martens Closed Cup

Melting Point: 127°F

Ignition Temperature: 890°F

Flammable Limits in Air, (% by Vol.): Lower: 1.4
Upper: 7.1

Extinguishing Media: Water spray, foam, carbon dioxide. Note: DO NOT use dry chemical. (See "Unusual Fire and Explosion Hazard" section below.)

Special Firefighting Procedures: Firefighters and others exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated thoroughly after use.

Unusual Fire or Explosion Hazards: Dust formed when handling this product when mixed in sufficient quantities in air may form explosive mixtures. Eliminate ignition sources and prevent build-up of static electrical charges. Ground all equipment.

FIRE PROTECTION INFORMATION - CONTINUED

Vapors from melted material can be ignited. Keep melted material away from sparks, open flames, or other possible ignition sources.

Dry chemical extinguishing agents can react with maleic anhydride to produce large volumes of gases that could rupture equipment not properly vented.

REACTIVITY DATA

Stability: Maleic anhydride reacts with water or moist air to form maleic acid and heat. If kept dry, product is stable under normal conditions of storage and use. Molten product should be stored under 158°F (70°C).

Materials to Avoid: Alkali metal ions and amines. At temperatures above 150°C, these materials (at concentrations as low as 200 ppm) can trigger a rapid decomposition and polymerization reaction which will produce heat and gas and may cause equipment to rupture.

Hazardous Decomposition Products: Smoke, soot, carbon monoxide (CO), and hydrocarbons.

Hazardous Polymerization: Will not self-polymerize but can undergo uncontrolled co-polymerization in presence of other monomers and catalysts. Also see reaction in "Materials to Avoid" section above.

HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of maleic anhydride on the health of exposed individuals and to support precautionary statements and Occupational Control Procedures recommended in this document. Proper evaluation of this health-related data may require the assistance of individuals trained in interpretation of this type of information.

Effects of Exposure

Dermal contact and inhalation are expected to be the primary routes of occupational exposure to maleic anhydride. Maleic anhydride is considered to be corrosive to the eyes and skin. (Note: May or may not occur. Will depend on individual, amount of material, amount of moisture, etc.) A burning sensation is immediately observed if the skin is moist, however, if the skin is dry, contact with the material may not result in an immediate burning sensation. Repeated contact with maleic anhydride may cause dermatitis and allergic skin reaction in susceptible individuals.

Maleic anhydride in the form of dust, vapor or fume is severely irritating to the eyes, skin and respiratory tract and is a potential respiratory sensitizer. Exposure to concentrations as low as 0.4 mg/m³ has been reported to produce eye and upper respiratory tract irritation. Exposure to higher concentrations has been reported to cause a burning sensation in the eyes and some temporary difficulty in visual acuity, including painful sensitiveness to strong light, double vision and a visual phenomenon of seeing rings or halos around lights. Overexposure to maleic anhydride can trigger asthma attacks in susceptible individuals. Symptoms of acute overexposure to dust or vapor include nausea, headache, coughing, sneezing, vomiting, nosebleed and an intense burning sensation in the throat. Repeated exposure of workers to high concentrations has been reported to cause ulceration of nasal mucous membranes, chronic bronchitis and asthma. Symptoms of pulmonary sensitization include asthmatic response, bronchitis and pulmonary edema which may have a delayed onset. Due to the potential for maleic anhydride to produce severe respiratory irritation and respiratory sensitization, workers with pulmonary disease or compromised pulmonary function should have only limited exposure to this material.

HEALTH EFFECTS SUMMARY - CONTINUED

Toxicological Data

Data from laboratory studies conducted by Monsanto and from the scientific literature are summarized below.

Oral LD50 (Rat): 900 mg/kg, Slightly Toxic

Dermal LD50 (Rabbit): Estimated to be between 398 and 631 mg/kg, Moderately Toxic

Eye Irritation (Rabbit, 24-hr): Corrosive

Skin Irritation (Rabbit, 24-hr): Corrosive

DOT Skin Corrosion (Rabbit, 4-hr): Not Corrosive

In a 6-month vapor inhalation study, rats, hamsters and monkeys were exposed to maleic anhydride at total maleic concentrations of 0, 1.1, 3.3 and 9.8 mg/m³ for 6 hours/day, 5 days/week. Dose-related signs of nasal and ocular irritation were observed in all animals. Weight gain was reduced at the mid- and high-dose levels in the rat. Proliferative, metaplastic and/or inflammatory changes were observed in the nasal tissues of rats and hamsters at all dose levels. In addition, inflammatory changes were observed in the nasal tissues of monkeys at all dose levels. No other treatment-related histopathological changes were observed in this study. No treatment-related alterations in hematological, biochemical, urinalysis and pulmonary function parameters (measured in monkeys only), or in brain, plasma and erythrocyte cholinesterase activities were observed.

Maleic anhydride was administered to male and female rats at dietary levels of 0, 10, 32, and 100 mg/kg/day for 2 years. Slight reductions in body weights were reported in both the mid- and high-dose groups. At 6-months, reduced red blood cell counts and hematocrits were noted in male animals. No treatment-related effects in neurologic, biochemical, gross pathology or histopathologic evaluations were reported.

No teratogenic or fetotoxic effects were observed in the offspring of rats administered maleic anhydride by gavage at 0, 30, 90 or 140 mg/kg/day on days 6 through 15 of gestation. Maternal toxicity, in the form of reduced body weight gain, was observed in all treatment groups.

Rats received 0, 20, 55 and 150 mg/kg/day of maleic anhydride, by gavage, during a two generation reproduction study. As a result of poor survival, the high-dose group was terminated during this study. Parental body weights were reduced during both generations and kidney weights were significantly increased in adults from all dose groups. No treatment-related effects on reproductive parameters were observed.

No mutagenic or genotoxic effects were observed in microbial assays using five Salmonella strains, with and without mammalian microsomal activation, or in an *in vivo* rat bone marrow cell clastogenesis assay. Maleic anhydride has been reported to cause chromosome aberrations in Chinese hamster cells in a study in the scientific literature.

Additional Information

Maleic anhydride reacts with water or moist air to form maleic acid. This reaction can occur in the gastrointestinal tract following ingestion of maleic anhydride or outside of the body upon contact with moisture. Maleic acid causes severe skin and mucous membrane irritation and is considered to be corrosive or severely irritating to the eyes and respiratory tract.

A Threshold Limit Value (TLV) has been established by the American Conference of Governmental Industrial Hygienists for maleic anhydride. For further information on this material, please refer to the current edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices.

PHYSICAL DATA

Appearance: Colorless crystalline needles or white lumps or pellets

Odor: Sharp acrid, irritating odor.

Boiling Point, 760 mm Hg: 395°F (202°C)

Melting Point: 127°F(53°C)

Vapor Pressure @ 40.0°C:	.98 mm Hg
@ 122.0°C:	60.0 mm Hg
@ 202.0°C:	750.0 mm Hg

Vapor Density (Air = 1): 3.38

Solubility in Water: Hydrolyzes readily. Soluble in acetone, ethyl acetate, chloroform and benzene.

Specific Gravity(Molten) @ 70/70°C:	1.3
(Solid)	1.48

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

SPILL, LEAK & DISPOSAL INFORMATION

Emergency Spill and Leak Information: Eliminate all sources of ignition. Allow product to solidify if molten. While using personal protection equipment, pick-up solid material for re-use or disposal.

Release of more than 5,000 pounds to the environment in a 24-hour period requires notification to the National Response Center, 1-800-424-8802. Notification of state or local authorities may also be required.

Disposal Information: This product can become a hazardous waste as designated by the Environmental Protection Agency under the authority of the Resources Conservation and Recovery Act (RCRA). Product (or waste) has RCRA Hazardous Waste Number U147 as designated in 40 CFR 261.33. This material is subject to the RCRA Land Disposal Restriction of 40 CFR 268. Disposal by incineration or by fuel substitution is Best Available Demonstrated Treatment (BDAT). All federal, state, and local regulations should be followed in disposing of this substance.

ADDITIONAL COMMENTS

Maleic anhydride is an intense local irritant. Although maleic anhydride is a solid at room temperature, its vapor pressure is sufficient to cause objectionable fumes if a large surface area is exposed for an appreciable period of time. When the product is melted, the vapor pressure increases and it fumes more readily.

ENVIRONMENTAL EFFECTS

Environmental Toxicity Information:

48-hr LC50 Daphnia magna: 330 mg/l, Practically Nontoxic
96-hr LC50 Rainbow trout: 75 mg/l, Slightly Toxic
96-hr LC50 Bluegill sunfish: 75 mg/l, Slightly Toxic

DATE 8/23/91
MSDS NO. 000108318

SUPERSEDES 8/5/91

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

Product Safety Coordinator
Specialties Division
Monsanto Chemical Company
(314) 694-2333
(A Unit of Monsanto Company)

SMALEANH

NOTICE: 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, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

1
GANTRADE CORPORATION
210 SUMMIT AVENUE
MONTVALE, NJ 07645
(201) 573-1955

500-1
1-15-91
CHEMTREC
1-(800) 424-9300

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

TRADE NAME
Glycerin U.S.P.

CHEMICAL NAME
Glycerol

CHEMICAL FAMILY
Polyhydric Alcohol

MOLECULAR WEIGHT
92.09

SYNONYMS
1,2,3-Propanetriol

FORMULA
 $C_3H_5(OH)_3$

HAZARDOUS INGREDIENTS

TOXICOLOGICAL DATA

Avoid breathing mist.

Animal: Very low toxicity; avoid ingestion;

Fish: Not toxic, but may cause localized fish kill
at high concentration. Avoid entry into
natural waters.

PHYSICAL DATA

Boiling Point, 760 mmHg	: 290°C(554°F)
Vapor Pressure, mm Hg @100°F(38°C)	: 0.0013
Specific Gravity ($H_2O=1$) 20/20°C	: 1.2624 Minimum
Solubility in Water	: Mixes completely
Appearance & Odor	: Clear liquid, none

This information is given without warranty or representation and is based upon the best laboratory and technical information available to us. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification.

FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)
199°C (390°F) PMCC

AUTOIGNITION TEMPERATURE
393°C (739°F)

FLAMMABLE LIMITS IN AIR, % BY VOL.
Will burn, but does not ignite easily.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Reacts with oxidizing materials.

EXTINGUISHING MEDIA
Dry chemical, carbon dioxide (CO₂), water fog, foam.
Dike liquid run-off, prevent entry to natural waters or
sewers.

SPECIAL FIREFIGHTING INSTRUCTIONS
Clothing: wear full turn-out clothing and if downwind of fire,
use self-contained breathing apparatus.

HEALTH HAZARD INFORMATION

THRESHOLD LIMIT VALUE - N.A.

EFFECTS OF OVEREXPOSURE - N.A.

FIRST AID PROCEDURES

EYES:	Irrigation immediately with water for 5 minutes is good safety practice.
SKIN:	Wash off in flowing water.
CLOTHING:	Remove contaminated clothing and wash before reuse.
INHALATION:	Remove to fresh air if effects occur. Call a physician and/or take to a medical facility.

REACTIVITY DATA

STABILITY

Stable: Very stable.

Unstable: (Conditions to avoid) Reacts with oxidizing materials.

INCOMPATIBILITY

N.A.

HAZARDOUS DECOMPOSITION PRODUCTS

N.A.

HAZARDOUS POLYMERIZATION

Does not occur

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILLS

Spills slippery - dike and control.

WASTE DISPOSAL METHOD

Keep from sewers and natural waters.

Consult local and state laws.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Ventilation: Local Exhaust - Avoid mist.

Mechanical - General.

Protective Clothing: Minimum Chemical, Gloves.

Eye Protection: Goggles.

SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

N.A.

HANDLING AND STORAGE CONDITIONS

Protect from freezing.

Should be above 38°C (100°F) to pump well.

A
GANTRADE CORPORATION
210 SUMMIT AVENUE
MONTVALE, NJ 07645
(201) 573-1955

CHEMTREC
1-(800) 424-9300

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Appearance & Odor	: Clear liquid, none

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an experimental animal carcinogen (IARC, NTP), a probable human carcinogen (IARC), and a potential cancer hazard (OSHA).

Reproduction: Formaldehyde showed no evidence of reproductive effects in animal studies (mice, rats, dogs).

Other: Formaldehyde – no evidence of effects on liver, kidneys, nervous system or blood in 180-day studies of rats, monkeys or hamsters.

Emergency and first aid procedures

Ingestion (swallowing): Induce vomiting of conscious patient immediately by giving two glasses of water and pressing finger down throat. Contact a physician immediately.

Inhalation (breathing): Remove patient from contaminated area. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact a physician immediately.

Skin contact: Remove contaminated clothing and wash contaminated skin with large amounts of water. If irritation persists, contact a physician.

Eye contact: Flush eyes with water for at least 15 minutes. Contact a physician immediately.

Note to physician: Pulmonary edema can occur. Signs and symptoms of pulmonary edema can be delayed for several hours.

Spill or leak procedures

Steps to be taken if material is released or spilled:

Eliminate ignition sources. Avoid eye or skin contact. Place leaking containers in well-ventilated area. Neutralize with ammonium hydroxide or sodium sulfite. NOTE: This reaction is reversible.

All clean-up and disposal should be carried out in accordance with federal, state and local regulations. If required, state and local authorities should be notified. Use standard clean-up procedures such as vacuuming or sweeping.

Waste disposal method:

This product when spilled or disposed is a non-hazardous solid waste as defined in Resource Conservation Recovery Act regulations (40CFR261). Product must be disposed of properly under state regulations for industrial waste. Preferred method is incineration or biological treatment in federal/state approved facility.

Special protection information

Respiratory protection:

Use full-face NIOSH-approved formaldehyde or acid gas cartridge or canister respirator with particulate filter within use limitations of these devices; in all other situations, use self-contained breathing apparatus (SCBA).

Ventilation

Local exhaust: Recommended when appropriate to control employee exposure.

Mechanical (general): Not recommended as the sole means of controlling employee exposure.

Protective gloves:

Neoprene or rubber.

Eye protection:

Chemical safety goggles.

Other protective equipment:

For operations where spills can occur, use impervious body covering and boots. A safety shower and eye bath should be available.

Special precautions

Precautions to be taken in handling and storing:

Store in a cool, well-ventilated area. Do not expose to temperatures above 38°C (100°F). Keep away from heat, sparks and flame. Keep containers closed. Use only DOT-approved containers. Provide emergency exhaust. Avoid breathing dust or vapor. When transferring follow proper grounding procedures. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Discard contaminated leather clothing. Do not enter storage area unless adequately ventilated.

Chemical Group

Hoechst Celanese Corporation
PO Box 569320 Dallas, Texas 75356-9320
Information phone: 214 689 4000

The Hoechst name and logo are registered trademarks of Hoechst AG

Chemical Group
Hoechst Celanese Corporation
P.O. Box 569320 / Dallas, Texas 75356-9320
Information phone: 214 689 4000
Emergency phone: 800 835 5235

Issued March 20, 1989

#69

Identification

Product name: Paraformaldehyde prills, 91-93%

Chemical name: Paraformaldehyde

Chemical family: Aldehyde polymer

Formula: HO(CH₂O)_nH

Molecular weight (average): 600

CAS number: 30525-89-4

CAS name: Paraformaldehyde

Synonyms: Paraform,
polyoxymethylene

Department of Transportation information

Hazard classification: ORM-A

Shipping Name: Paraformaldehyde

United Nations Number: UN2213

DOT Emergency Response Guide no.: 32

Physical data

Boiling point (760 mm Hg): Does not boil. Gives off formaldehyde gas when heated.

Melting range: 120-170°C (248-338°F)

Vapor pressure (25°C): 1.45 mm Hg

Vapor density (Air = 1 @ 20°C): 1.03 (calculated)

Solubility in water (% by WT @ 20°C): Complete

Percent volatiles by volume: <10

Particle density: 1.4 g/ml

Appearance and odor: White free-flowing solid prill with strong, pungent formaldehyde odor.

Fire and explosion hazard data

Flammable limits in air, % by volume

Upper: 73.0

Lower: 7.0

Flash point (test method):

Tag closed cup (ASTM D56): 158°F (70°C)

Extinguishing media:

Use CO₂ or dry chemical for small fires, alcohol-type aqueous film-forming foam or water spray for large fires.

Special fire-fighting procedures:

Wear self-contained breathing apparatus (SCBA) and complete personal

Hazardous ingredients information

Component, wt. %	Exposure levels			Subject to SARA §313 reporting?
	OSHA PEL	ACGIH TLV*	IDLH ⁽¹⁾	
Paraformaldehyde* CAS No. 30525-89-4	5 mg/m ³ 8-hr TWA (respirable fraction) 10 mg/m ³ 8-hr TWA (total dust)	5 mg/m ³ 8-hr TWA (respirable fraction) 10 mg/m ³ 8-hr TWA (total dust)	NVE ⁽²⁾	No
*or Formaldehyde (the off-gas of paraformaldehyde)	1 ppm, 8-hr TWA, 2 ppm, 15-min STEL	1 ppm, 8-hr TWA, 2 ppm, 15-min STEL	100 ppm	Yes

(1) Immediately Dangerous to Life or Health

(2) No value established

protective equipment when potential for exposure to vapors or products of combustion exists. Use water spray to cool fire-exposed structures and vessels.

Unusual fire and explosion hazards:

Do not use compressed air to transfer this material.

Special hazard designations

	HMIS	NFPA	Key
Health:	3	2	0 - Minimal
Flammability:	1	1	1 - Slight
Reactivity:	0	0	2 - Moderate
Personal protective equipment:	G	—	3 - Serious 4 - Severe

SARA §311 hazard categories

Acute health:	Yes
Chronic health:	Yes
Fire:	Yes
Sudden release of pressure:	Yes
Reactive:	No

Reactivity data

Stability:

Stable.

Hazardous polymerization:

Will not occur.

Conditions to avoid:

Temperatures above 100°F (38°C); sparks; flame.

Materials to avoid:

Caustic soda, soda ash and other alkalis; acids; amines; oxygen, hydrogen peroxide and other strong oxidizing agents.

Hazardous combustion or decomposition products:

Carbon monoxide; formaldehyde vapor.

Health data

Effects of exposure/toxicity data

Acute:

Ingestion (swallowing): Causes severe irritation and inflammation of mouth, throat and stomach. Severe stomach pains follow, with possible loss of consciousness. Slightly toxic to animals (oral LD50, rats: 0.68 g/kg).

Inhalation (breathing): Highly irritating to nasal passages. Can cause inflammation of lining of nose, throat and lungs. Can cause pneumonia and abnormal accumulation of fluid in the lungs. Sensitizer (allergic reaction possible). May cause sensitization of the respiratory system. Moderately toxic to animals (inhalation LC50, rats, 4 hrs: 1.1 mg/l).

Skin contact: Can cause moderate injury - reddening and swelling. Sensitizer (allergic reaction possible). Dust can cause drying, cracking and scaling. Repeated or prolonged contact causes hardening (tanning). Slightly toxic to animals by absorption (dermal LD50, rabbits: >2 g/kg).

Eye contact: Can cause chemical burn - damage irreversible. Exposure to high vapor concentrations, or to dust, causes irritation and tearing.

Chronic:

Mutagenicity: *In vitro*, formaldehyde is mutagenic (mutagenic activity detected in *E. coli*, *Pseudomonas fluorescens*, and *Saccharomyces cerevisiae*). *In vivo*, no information.

Carcinogenicity: Formaldehyde is carcinogenic to animals (nasal cancer, lifetime inhalation study, rats). Listed as

(continued)

Product Name: PARAFORMALDEHYDE PRILLS, 91-93%
Product Code: 146111
MSDS Number : 69
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Material Safety Data Sheet

Print date -- January 5th, 1995 2:41 a.m. 3820 PG1A X0H21001 -- 85.1 (500/591)

----- 1. CHEMICAL PRODUCT and COMPANY IDENTIFICATION -----

PRODUCT NAME: PARAFORMALDEHYDE PRILLS, 91-93%

SYNONYMS: PARAFORM, POLYOXYMETHYLENE

HOECHST CELANESE CHEMICAL GROUP
1601 W. LBJ FREEWAY
PO BOX 819005
DALLAS, TX 753819005
USA

TRANSPORTATION EMERGENCY PHONE
NUMBER (24 HOURS/DAY):
In USA, call.....800 424 9300.
Outside USA, call*....202 483 7617.
*collect calls accepted
In Canada, call.....403 477 8339.
In Europe, call (31) 10 400 22 64.

----- 2. COMPOSITION / INFORMATION on INGREDIENTS -----

COMPONENT	CAS NUMBER	
FORMALDEHYDE *	50-00-0	(**)
PARAFORMALDEHYDE *	30525-89-4	91 - 93%
WATER	7732-18-5	9%

*OSHA hazardous according to 29 CFR 1910.1200
(**) Paraformaldehyde will off-gas formaldehyde.

----- 3. HAZARDS IDENTIFICATION -----

Paraformaldehyde is a white, free-flowing solid with a strong, pungent formaldehyde odor.

EMERGENCY OVERVIEW:

CAUTION!
Combustible
Dust from this product can form an explosive organic dust cloud.

POTENTIAL HEALTH EFFECTS

(Information is for paraformaldehyde unless otherwise noted)

ROUTES OF EXPOSURE:

Skin, eyes, inhalation, ingestion.

☎ TRANSPORTATION EMERGENCY:.....(800) 424 9300	IN U.S., CHEMTREC - 24 HRS/DAY
PRODUCT EMERGENCY:.....(800) 835 5235	HOECHST CELANESE, 24 HRS/DAY
PRODUCT INFORMATION:.....(214) 277 4000	(7:30 AM TO 4:15 PM, CST)

Product Name: PARAFORMALDEHYDE PRILLS, 91-93%
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----- 3. HAZARDS IDENTIFICATION (continued) -----

IMMEDIATE EFFECTS

SKIN:

Can cause moderate injury--reddening and swelling. Sensitizer (allergic reaction possible). Dust can cause drying, cracking and scaling. Repeated or prolonged contact causes hardening (tanning). May cause irritation.

EYES:

Can cause chemical burn--damage irreversible. Exposure to high vapor concentrations, or to dust, causes irritation and tearing.

INHALATION:

Highly irritating to nasal passages. Can cause inflammation of lining of nose, throat and lungs. Can cause pneumonia and pulmonary edema (accumulation of fluid in the lungs). Signs and symptoms of pulmonary edema can be delayed for several hours. May cause sensitization of the respiratory system (allergic reaction possible).

INGESTION:

Causes severe irritation and inflammation of mouth, throat and stomach. Severe stomach pains follow with possible loss of consciousness.

DELAYED/LONG TERM EFFECTS

CARCINOGENIC:

Formaldehyde is listed as an experimental animal carcinogen (IARC, NTP), a probable human carcinogen (IARC), a potential cancer hazard (OSHA), and a suspected human carcinogen (ACGIH).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, skin and/or eyes.

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PRODUCT EMERGENCY:.....(800) 835 5235
PRODUCT INFORMATION:.....(214) 277 4000

IN U.S., CHEMTREC - 24 HRS/DAY
HOECHST CELANESE, 24 HRS/DAY
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4. FIRST AID MEASURES

SKIN:

Remove contaminated clothing and wash contaminated skin with large amounts of soap and water. If irritation persists, contact a physician.

EYES:

Flush eyes with water for at least 15 minutes. Contact a physician immediately.

INHALATION:

Remove patient from contaminated area. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact a physician immediately.

INGESTION:

Induce vomiting of conscious patient immediately by giving two glasses of water and pressing finger down throat. Contact a physician immediately.

5. FIRE FIGHTING MEASURES

NFPA (H, F, R): 2, 1, 0

FLAMMABLE PROPERTIES

FLASHPOINT CLOSED CU: 158.0 F (70.0 C)

UPPER EXPLOSIVE LMT : 73.0 %

In air by volume of formaldehyde gas

LOWER EXPLOSIVE LMT : 7.0 %

In air by volume of formaldehyde gas

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide; formaldehyde.

EXTINGUISHING MEDIA:

Use carbon dioxide or dry chemical for small fires; alcohol-type aqueous film-forming foam or water spray for large fires.

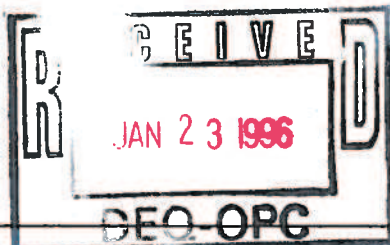
FIRE FIGHTING INSTRUCTIONS:

If potential for exposure to vapors or products of combustion exists, wear complete personal protective equipment, including self-contained breathing apparatus with full face-piece operated in pressure demand or other positive pressure mode. Use water spray to cool fire-exposed structures and vessels.



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PRODUCT EMERGENCY:.....(800) 835 5235
PRODUCT INFORMATION:.....(214) 277 4000

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6. ACCIDENTAL RELEASE MEASURES

Eliminate ignition sources. Avoid eye or skin contact; see "Section 8 - Exposure Controls/Personal Protection" for respirator information. Place leaking containers in well-ventilated area with spill containment. If fire potential exists, blanket spill with alcohol-type aqueous film-forming foam or use water spray to disperse vapors. Contain spill to facilitate clean-up. Clean-up methods may include absorbent materials, vacuum truck, etc. Avoid runoff into storm sewers and ditches which lead to natural waterways. Neutralize with ammonium hydroxide or sodium sulfite.

Call the National Response Center (800 424 8802) if the quantity (of any component) spilled is equal to or greater than the reportable quantity (RQ) under CERCLA "Superfund": 1000 lb/day.

7. HANDLING and STORAGE

CAUTION: Dust from this material can form an explosive organic dust cloud. If air is used to transfer this material, special safety design considerations and procedures must be utilized to prevent potential fires and explosions.

CAUTION: Flexible intermediate bulk containers can build static electrical charge while contents are being emptied or filled. Do not allow contents to free fall in areas where potential flammable air-vapor or air-dust mixtures exist. Use proper grounding procedures when transferring. For example, use of a grounded intermediate hopper or conveyor is recommended. Do not allow any ungrounded conducting objects such as equipment, tools, rings, watches, etc in the work area.

Store in a cool, well-ventilated area. Do not expose to temperatures above 100 deg. F (38 deg. C). Keep away from heat, sparks and flame. Keep containers closed when not in use. Use only DOT-approved containers. Use with adequate ventilation. Provide emergency exhaust. Avoid breathing dust or vapor. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly. Discard contaminated leather clothing. Do not enter storage area unless adequately ventilated.

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PRODUCT EMERGENCY:.....(800) 835 5235 HOECHST CELANESE, 24 HRS/DAY
PRODUCT INFORMATION:.....(214) 277 4000 (7:30 AM TO 4:15 PM, CST)

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred.

PROTECTIVE EQUIPMENT

A safety shower and eye bath should be readily available.

SKIN:

For operations where spills or splashing can occur, use chemical protective clothing, including gloves (neoprene or rubber) and boots.

EYES:

Chemical safety goggles.

INHALATION:

Based on workplace contaminate level and working limits of the respirator, use a respirator approved by NIOSH/MSHA. The following is the minimum recommended equipment for an acceptable level of exposure. To estimate an acceptable level of exposure, see "Section 3 - Hazards Identification", "Section 8 - Exposure Controls/Personal Protection" and "Section 11 - Toxicological Information".

For formaldehyde concentrations ≥ 1 and ≤ 10 times the acceptable level: Use air-purifying respirator with full facepiece and HEPA particulate filters with either cartridge(s) or canister specifically approved for protection against formaldehyde, or a full facepiece powered air-purifying respirator fitted with HEPA particulate filters and with either cartridge(s) or canister specifically approved for protection against formaldehyde.

For formaldehyde concentrations > 10 and < 100 times the acceptable level: Use Type C full facepiece supplied-air pressure-demand or continuous-flow respirator.

For formaldehyde concentrations ≥ 100 times the acceptable level or unknown concentration (such as in emergencies): Use positive-pressure self-contained breathing apparatus with full facepiece. Type C positive-pressure full facepiece supplied-air respirator with an auxiliary positive-pressure self-contained breathing apparatus escape system.

For escape: Use positive-pressure self-contained breathing apparatus with full facepiece or full facepiece mask with

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INHALATION: (continued)

chin style or front or back mounted type industrial size canister specifically approved for protection against formaldehyde.

For total dust concentrations ≥ 15 mg/m³ or respirable dust concentrations ≥ 5 mg/m³: Use a respirator equipped with HEPA or high-efficiency particulate filter.

EXPOSURE GUIDELINES:

FORMALDEHYDE (50-00-0)

OSHA PEL	ACGIH TLV	HCC WEL
0.75 PPM (TWA)	0.3 PPM (CEIL)	0.75 (TWA)
2 PPM (STEL)		2 PPM (STEL)

PARTICULATES:

PNOR	PNOC
OSHA PEL	ACGIH TLV
15 MG/M ³ (*)	10 MG/M ³
5 MG/M ³ (**)	

(*) Total dust

(**) Respirable fraction

HCC WEL - Hoechst Celanese Corporation
Workplace Exposure Level

Hoechst Celanese has adopted the ACGIH TLV for PNOC.

Hoechst Celanese has decided not to adopt the ACGIH TLV for formaldehyde based on a scientific evaluation of all the available data.

Immediately Dangerous to Life or Health (IDLH) level:

Paraformaldehyde - No value established.

Formaldehyde - 100 ppm

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE	: White free-flowing solid prill.
ODOR	: Strong, pungent formaldehyde odor.
VAPOR PRESSURE	: 1.45 mm Hg (25 deg. C)
VAPOR DENSITY	: 1.03 Air = 1 at 20 deg. C (calculated)
BOILING POINT	: Does not boil. Gives off formaldehyde when heated. (760 mm Hg)

TRANSPORTATION EMERGENCY:.....(800) 424 9100
PRODUCT EMERGENCY:.....(800) 835 5235
PRODUCT INFORMATION:.....(214) 277 4000

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9. PHYSICAL and CHEMICAL PROPERTIES (continued)

MELTING POINT : 120.0 C (248.0 F) TO 170.0 C (338.0 F)
SOLUBILITY : Soluble in water at 20 deg C.
MOLECULAR WEIGHT : 600.0
(Average)

10. STABILITY and REACTIVITY

CHEMICAL STABILITY:
Stable.

CONDITIONS TO AVOID:
Temperatures above 100 deg. F (38 deg. C); sparks; flame.

INCOMPATIBILITY:
Caustic soda, soda ash and other alkalis; acids; amines;
oxygen, hydrogen peroxide and other strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon monoxide; formaldehyde vapor.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. TOXICOLOGICAL INFORMATION

(Information is for paraformaldehyde unless otherwise noted)

Oral LD50 : 0.68 g/kg (rats)

Dermal LD50 : > 2 g/kg (rabbits)

Inhalation LC50 : 1.1 mg/l (rats, 4 hrs.)

Eye contact : Can cause chemical burn--damage
irreversible.

Mutagenicity : Formaldehyde is mutagenic (mutagenic
activity detected in E. coli, Pseudomonas fluorescens, and
Saccharomyces cerevisiae); in vivo, no information.

Carcinogenicity : Formaldehyde is carcinogenic to animals
(nasal cancer, lifetime inhalation study, rats).

Reproduction : Formaldehyde showed no evidence of repro-
ductive effects in animal studies (mice, rats, dogs).

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PRODUCT EMERGENCY:.....(800) 835 5235
PRODUCT INFORMATION:.....(214) 277 4000

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11. TOXICOLOGICAL INFORMATION (continued)

Other : Formaldehyde showed no evidence of effects on liver, kidneys, nervous system or blood in 180-day studies of rats, monkeys and hamsters.

12. ECOLOGICAL INFORMATION

This information is being researched.

13. DISPOSAL CONSIDERATIONS

All notification, clean-up and disposal should be carried out in accordance with federal, state and local regulations. Preferred methods of waste disposal are incineration or biological treatment in federal/state approved facility.

Hazardous waste (40 CFR 261): No.

Note: This information applies to the manufactured product.

14. TRANSPORT INFORMATION

Shipping name : Paraformaldehyde
Hazard class : 4.1, Flammable Solid
(9.2, Canada)
United Nations no. : UN2213
Packing group : III
Emergency Response Guide no.: 32
DOT Reportable Quantity (RQ): 1000 lb/454 kg

15. REGULATORY INFORMATION

RECIPIENT MUST COMMUNICATE ALL PERTINENT INFORMATION HEREIN TO EMPLOYEES AND CUSTOMERS.

STATE REGULATIONS

The following chemicals associated with the product are subject to the right-to-know regulations in these states:

FORMALDEHYDE (50-00-0): CA, CT, FL, IL, LA, MA, MI, NJ, NY, PA, RI

TRANSPORTATION EMERGENCY:.....(800) 424 9100 IN U.S., CHEMTREC - 24 HRS/DAY
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STATE REGULATIONS (continued)

PARAFORMALDEHYDE (30525-89-4): CT, FL, IL, LA, MA, NJ, NY,
PA, RI

CALIFORNIA PROPOSITION 65:

"Formaldehyde is known by the state of California to cause cancer."

U.S. FEDERAL REGULATIONS

TSCA: We certify that all components are either on the TSCA inventory or qualify for an exemption.

OSHA FORMALDEHYDE STANDARD: This product is capable of emitting free formaldehyde and is covered by the OSHA Formaldehyde Standard, 29 CFR 1910.1048.

FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA): Hoechst Celanese Chemical Group formaldehyde-based products are not registered nor intended for any active ingredient use associated with pesticides, fungicides, rodenticides or any activities requiring registration under FIFRA.

SARA 313 : FORMALDEHYDE (50-00-0)

ENVIRONMENTAL:

CERCLA : FORMALDEHYDE (50-00-0)
PARAFORMALDEHYDE (30525-89-4)

SARA 302 : FORMALDEHYDE (50-00-0)

SARA 304 : FORMALDEHYDE (50-00-0)
PARAFORMALDEHYDE (30525-89-4)

SARA 311 : Acute health----- Yes
Chronic health----- Yes
Fire----- Yes
Sudden release of pressure-- No
Reactive----- No

INTERNATIONAL REGULATIONS

PARAFORMALDEHYDE:

Listed on the chemical inventories of the following countries: Australia, Canada, Japan and Korea. (The European inventory (EINECS) does not list polymers such as para-formaldehyde but rather the monomer, such as formaldehyde.)

FORMALDEHYDE:

Listed on the chemical inventories of the following countries: Australia, Canada, Europe (EINECS), Japan and Korea.

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----- 15. REGULATORY INFORMATION (continued) -----

WHMIS INGREDIENT DISCLOSURE LISTED COMPONENTS:

WHMIS CLASSIFICATION: Class B, Division 4; Class D,
 Division 1, Subdivision B.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

----- 16. OTHER INFORMATION -----

MSDS prepared by: Product Stewardship Department
 Hoechst Celanese Chemical Group

HAZARD RATINGS

	HEALTH	FLAMM	REACT	OTHER
NFPA	2	1	0	
HMIS	3	1	0	X

This information is intended solely for the use of individuals trained in the NFPA and HMIS systems.

REVISION INDICATORS:

The following sections have been revised:

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION
 EXPOSURE GUIDELINES

DISCLAIMER:

The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Hoechst Celanese Chemical Group, Inc. makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

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 PRODUCT EMERGENCY:.....(800) 835 5235
 PRODUCT INFORMATION:.....(214) 277 4000

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01/05/1995

The following MSDS are being sent to you because the product contains chemicals listed in SARA 313:

1 146111 PARAFORMALDEHYDE PRILLS, 91-93%

***** END REPORT *****



chemists helping chemists in research & industry

aldrich chemical co.

P.O. Box 355, Milwaukee, Wisconsin 53201 USA

Telephone: (414) 273-3850
TWX: (910) 262-3052 Aldrichem MI
Telex: 26 843 Aldrich MI
FAX: (414) 273-4979

ATTN: SAFETY DIRECTOR
HERCULES INC
BOX 1937
HATTIESBURG MS 39401

92917

DATE: 02/05/9
CUST#: 251453
PO#: 92917

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

PAGE 1

IDENTIFICATION

PRODUCT #: C12145-2
CAS #: 99-87-6
MF: C10H14

NAME: P-CYMENE, 99%

NONYMS

BENZENE, 1-ISOPROPYL-4-METHYL- * CAMPHOGEN * CUMENE, P-METHYL- *
CYMENE * P-CYMENE (DOT) * CYMOL * DOLCYMENE * P-
ISOPROPYLMETHYLBENZENE * 4-ISOPROPYL-1-METHYLBENZENE * P-
ISOPROPYLTOLUENE * P-METHYLISOPROPYL BENZENE * 1-METHYL-4-
ISOPROPYLBENZENE * PARACYMENE * PARACYMOL * UN 2046 (DOT) *

TOXICITY HAZARDS

TECS NO: GZ5950000

P-CYMENE

IRRITATION DATA

SKN-RBT 500 MG/24H MOD

FCTXAV 12,401,74

CITY DATA

FCTXAV 2,327,64

ORL-RAT LD50:4750 MG/KG

REVIEWS, STANDARDS, AND REGULATIONS

NOES 1983: HZD X8309; NIS 50; TNF 2536; NOS 49; TNE 80204; TFE 14309

EPA TSCA CHEMICAL INVENTORY, JUNE 1990

EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, SEPTEMBER 1990

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

MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.

CAUSES SKIN IRRITATION.

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

FIRST AID

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF
WATER FOR AT LEAST 15 MINUTES.

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS
AMOUNTS OF WATER.

IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.

CONTINUED ON NEXT PAGE

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Aldrich Chemie
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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#: 251453
PO#: 92917

PRODUCT #: C12145-2
CAS #: 99-87-6
MF: C10H14

NAME: P-CYMENE, 99%

----- HEALTH HAZARD DATA -----

WASH CONTAMINATED CLOTHING BEFORE REUSE.

----- PHYSICAL DATA -----

BOILING PT: 176 C TO 178 C
SPECIFIC GRAVITY: 0.860
VAPOR DENSITY: 4.62
VAPOR PRESSURE: 1.5 MM @ 20 C
3.7 MM @ 37.7 C

APPEARANCE AND ODOR
COLORLESS LIQUID

----- FIRE AND EXPLOSION HAZARD DATA -----

FLASHPOINT: 117 F
AUTOIGNITION TEMPERATURE: 817 F
LOWER EXPLOSION LEVEL: .7%
UPPER EXPLOSION LEVEL: 5.6%

EXTINGUISHING MEDIA
WATER SPRAY.

CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.

SPECIAL FIREFIGHTING PROCEDURES

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

COMBUSTIBLE.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.

----- REACTIVITY DATA -----

INCOMPATIBILITIES

STRONG OXIDIZING AGENTS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

TOXIC FUMES OF:

CARBON MONOXIDE, CARBON DIOXIDE

----- SPILL OR LEAK PROCEDURES -----

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
EVACUATE AREA.

CONTINUED ON NEXT PAGE

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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 3

CUST#: 251453

PO#: 92917

PRODUCT #: C12145-2
CAS #: 99-87-6
MF: C10H14

NAME: P-CYMENE, 99%

----- SPILL OR LEAK PROCEDURES -----

WEAR SELF-CONTAINED BREATHING APPARATUS, 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

THIS COMBUSTIBLE MATERIAL MAY BE BURNED 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 ---

CHEMICAL SAFETY GOGGLES.
RUBBER GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
DO NOT BREATHE VAPOR.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
HARMFUL VAPOR.
KEEP TIGHTLY CLOSED.
KEEP AWAY FROM HEAT AND OPEN FLAME.
STORE IN A COOL DRY PLACE.

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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MATERIAL SAFETY DATA SHEET

9/13/91
PAGE: 01 of 07

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

HERCULES* PARA-CYMENE
Liquid terpene
MSDS No.: 857 2127 0100-05

Supersedes MSDS No.: 857 2127 0100-04 Date: 09/06/91

I. PRODUCT IDENTIFICATION

WARNING! CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
MAY BE HARMFUL IF SWALLOWED.
COMBUSTIBLE LIQUID.

HERCULES* PARA-CYMENE
Liquid terpene

HMIS RATINGS: (1)

CASRN: 99-87-6

Health hazard: 2 Moderate
Flammability hazard: 2 Moderate
Reactivity hazard: 0 Minimal

CHEMICAL & COMMON NAMES: Benzene, 1-methyl-4-(1-methyl ethyl)-; para-Cymene;
Isopropyltoluene; p-Cymene

APPEARANCE AND ODOR: Colorless, mobile liquid; gassy kerosene-like odor

* Registered Trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

CHEMICAL AND COMMON NAMES:

RECOMMENDED AIRBORNE LEVELS (1)
OSHA TWA TLV-TWA 1990-91

Mixed terpene hydrocarbons

Not established (2)

(2) Until the American Conference of Governmental Industrial Hygienists establishes a Threshold Limit Value (TLV) for this product, Hercules recommends that the current TLV established for Turpentine (100 ppm) be applied to this product.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstract Substance Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

DISTILLATION RANGE: 176-178 C (349-352 F) SOLUBILITY IN WATER: Slight
VAPOR PRESSURE AT 20 C: 7.15 mm Hg SPECIFIC GRAVITY: 0.86
VAPOR DENSITY: Heavier than air pH: N/A
VOLATILE (WT.), %: 100 EVAPORATION RATE: Slower than
FREEZING POINT: -73 C (-100 F) butyl acetate

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

CAUTION! COMBUSTIBLE LIQUID.

FLASH POINT: 47 C (117 F)

FLAMMABLE LIMITS IN AIR, BY VOLUME: Lower: 0.7; Upper: 5.6

AUTOIGNITION TEMPERATURE: 436 C (817 F)

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES: Use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

STABILITY CONSIDERATIONS: Stable

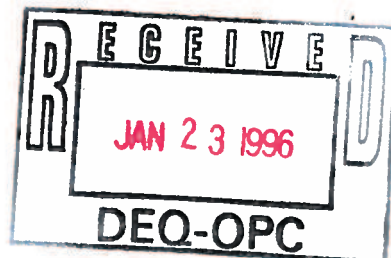
INCOMPATIBILITY WITH: Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.



V. HEALTH HAZARD DATA

WARNING! CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
MAY BE HARMFUL IF SWALLOWED.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

- EYES: Liquid and vapors - Causes eye irritation.
- SKIN: Causes defatting of the skin which can lead to irritation and dermatitis.
- INHALATION: Vapor causes central nervous system depression and mucous membrane irritation. Symptoms of overexposure are light-headedness (dizziness), headache, intoxication which could lead to unconsciousness. Vapor may also cause irritation of the upper respiratory tract.
- INGESTION: Causes stomach pain, nausea and vomiting, irritation of mouth and throat. Aspiration into the lungs after ingestion may cause severe lung damage (pulmonary edema and hemorrhage) which could be fatal.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly flush with running water. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, do NOT induce vomiting. Call a physician. Get immediate medical attention.

NOTE TO PHYSICIAN: This material contains a hydrocarbon solvent. Aspiration into the lungs could result in fatal chemical pneumonitis.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:
None known

PRIMARY ROUTES OF ENTRY: Eyes, skin, inhalation

Continued...

V. HEALTH HAZARD DATA

...Continued

CANCER INFORMATION:

The National Toxicology Program (NTP) concluded that two-year gavage studies with d-Limonene, a component of this product, indicate clear evidence of carcinogenic activity in male rats, but not in female rats, nor in male or female mice. However, investigation of the metabolism of d-Limonene in various species suggests these findings are not relevant to human risk assessment. d-Limonene is not listed as a carcinogen by the National Toxicology Program (NTP). It is not regulated as a carcinogen by the Occupational Safety and Health Administration (OSHA) and has not been evaluated by the International Agency for Research on Cancer (IARC).

Other components of this product are not listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as a carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED ANIMAL EFFECTS:

Developmental Toxicity: d-Limonene, a component of this product, administered to pregnant rats, mice and rabbits at daily dosage levels equivalent to approximately half the acutely lethal dose produced maternal toxicity and embryo/fetotoxicity but no evidence of teratogenicity. Toxicity was reflected primarily in weight loss or reduced weight gain and, in fetuses, delayed development.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Extinguish all ignition sources. Small Spills: Add absorbent, sweep up, and discard. Large Spills: Dike to contain and pump into drums for use or disposal.

WASTE DISPOSAL METHOD:

Incineration of combustible wastes in permitted facilities is the preferred disposal method.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Avoid breathing vapors.

Do not swallow.

Wash thoroughly after handling, and before eating, drinking or smoking.

Avoid contamination of food, beverages, or smoking materials.

Remove contaminated clothing promptly and clean thoroughly before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical goggles

Impervious gloves

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Appropriate protective clothing

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

Keep away from heat and flame.

Eliminate ignition sources and prevent build-up of static electric charges.

This product may react with strong oxidizing agents, and should not be stored near such materials.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate ignition sources.

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

Keep area clean. Product will burn.

VIII. ENVIRONMENTAL REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	HERCULES* PARA-CYMENE Liquid terpene	99-87-6	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-3	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product exhibits the characteristic of ignitability (D001) as defined in hazardous waste regulations 40 CFR 261 Subpart C. Therefore, disposal of unused product must comply with hazardous waste regulations.

E. OTHER

None

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CAS NUMBER	WT. PERCENT
P	HERCULES* PARA-CYMENE Liquid terpene	99-87-6	100

B. SARA TITLE II (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-3	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product exhibits the characteristic of ignitability (D001) as defined in hazardous waste regulations 40 CFR 261 Subpart C. Therefore, disposal of unused product must comply with hazardous waste regulations.

E. OTHER

None

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard
HC-2 Delayed (chronic) health hazard
HC-3 Fire hazard
HC-4 Sudden release of pressure hazard
HC-5 Reactive hazard
NHH Not a health hazard
NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

CHEMICAL NAME: PENTAERYTHRITOL, TECHNICAL

CAS #: 115-77-5

LABEL: NONE

7/17/92

Section I - GENERAL INFORMATION

SUPPLIER NAME: BROWNING CHEMICAL CORPORATION
ADDRESS: 707 WESTCHESTER AVENUE
CITY: WHITE PLAINS
STATE: NEW YORK
ZIP: 10604
TELEPHONE NO: 914-686-0300

TRADE NAME: PE
CHEMICAL FAMILY: POLYHYDRIC ALCOHOL
FORMULA: C(CH₂OH)₄

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL
CHEMTREC - DAY OR NIGHT - (1-800-424-9300):

HAZARD RATING (N.F.P.A.)

HEALTH :
FIRE :
REACTIVITY :
SPECIAL :

} NOT RATED

HAZARD RATING SCALE:

0 = MINIMAL 3 = SERIOUS
1 = SLIGHT 4 = SEVERE
2 = MODERATE

DATE PREPARED: 6/17/92

Section II - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component (s) (Chemical and common names (s))	OSHA PEL	ACGIH TLV	OTHER EXPOSURE LIMITS TWA
PENTAERYTHRITOL			10 Mg/M ³

Section III - PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: Sublimes at 1 ATM.

MELTING POINT: 261°C

SPECIFIC GRAVITY: 1.39 @ 25°C (solid)

SOLUBILITY IN WATER: Soluble

APPEARANCE AND ODOR: White crystalline, odorless

VAPOR PRESSURE (mm Hg): n/a

VAPOR DENSITY (AIR=1): n/a

REACTIVITY IN WATER: n/a

OTHER:

Section IV - FIRE & EXPLOSION DATA

FLASH POINT: NOT PERTINENT

FLAMMABLE LIMITS: NOT PERTINENT

AUTO-IGNITION TEMPERATURE: 842°F (Dust Cloud)

EXTINGUISHING MEDIA: Water, dry chemical, Carbon Dioxide

METHOD USED: n/a

LEL:

UEL:

SPECIAL FIRE FIGHTING PROCEDURES: Material is combustible. Wet thoroughly
or blanket completely.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

Section V - PHYSICAL HAZARDS (REACTIVITY DATA)

STABILITY
CONDITIONS TO AVOID:

UNSTABLE:

STABLE: X

COMPATIBILITY

MATERIALS TO AVOID: No reaction with common materials.

HAZARDOUS DECOMPOSITION PRODUCTS: POSSIBLE CARBON MONOXIDE/DIOXIDE

HAZARDOUS POLYMERIZATION:

MAY OCCUR:

WILL NOT OCCUR: X

CONDITIONS TO AVOID:

Section VI - HEALTH HAZARDS

ACUTE: NOT CONSIDERED HARMFUL.

CHRONIC: NOT CONSIDERED HARMFUL.

SYMPTOMS OF EXPOSURE: DUST INHALATION MAY CAUSE SNEEZING.

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN

HA YES: NO: X NATIONAL TOXICOLOGY PROGRAM YES: NO: X
A.R.C. MONOGRAPHS YES: NO: X

EMERGENCY FIRST AID PROCEDURES:

INHALATION: BREATHE FRESH AIR.

EYES: HOLD EYELIDS OPEN AND FLUSH WITH PLENTY OF WATER.

SKIN: WASH THOROUGHLY WITH SOAP AND WATER.

INGESTION: DRINK PLENTY OF WATER - INDUCE VOMITING.

TOXICITY: GRADE 0: LD50 > 15 G/KG.

Section VII - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: NORMAL GOOD WAREHOUSING PROCEDURE - COOL, DRY AREA.

PRECAUTIONS: N/A

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: SWEEP UP INTO DISPOSAL DRUM. CHECK WITH LOCAL AUTHORITIES FOR DISPOSAL.

SAFE DISPOSAL METHODS (Consult federal, state, and local regulations): IF MATERIAL CANNOT BE SALVAGED, IT SHOULD BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

RESPIRATORY PROTECTION (specify type): DUST MASK

VENTILATION:

LOCAL EXHAUST: X
MECHANICAL:
SPECIAL:
OTHER:

PROTECTIVE GLOVES: RUBBER GLOVES

EYE PROTECTION: GOGGLES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: N/A

WORK/HYGIENIC PRACTICES:

Section IX - TRANSPORTATION DATA

PROPER SHIPPING NAME: PENTAERYTHRITOL, TECHNICAL
DOT/HAZARD CLASS: NOT LISTED
LABEL REQUIREMENT: NOT REQUIRED

RQ: NONE
UN: NONE
PLACARD: NONE

ALL INFORMATION, RECOMMENDATIONS, AND SUGGESTIONS CONTAINED HEREIN REGARDING THIS PRODUCT ARE BASED ON DATA OBTAINED FROM THE MANUFACTURERS AND/OR RECOGNIZED TECHNICAL SOURCES. HOWEVER, BROWNING CHEMICAL CORPORATION MAKES NO WARRANTY, EXPRESS OR IMPLIED AS TO ITS ACCURACY OR COMPLETENESS, AND NONE IS MADE AS TO THE USE OF THIS PRODUCT BY OTHERS WHICH IS BEYOND OUR CONTROL. IT IS THE USERS RESPONSIBILITY TO DETERMINE THE SAFETY, TOXICITY, AND SUITABILITY FOR HIS OWN APPLICATION AND USE, HANDLING AND DISPOSAL OF THE PRODUCT. THE INFORMATION IN THIS MSDS RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN AND DOES NOT RELATE TO THE USE IN COMBINATION, MIXTURE, PROCESS OR OTHERWISE WITH ANY OTHER MATERIAL.

MATERIAL SAFETY DATA SHEET

HAZARD RATINGS
HMIS NFPA
H 3 3
F 1 1
R 0 0
PP E

0.1

MANUFACTURER'S NAME : SCHENECTADY CHEMICALS, INC.
STREET ADDRESS : P.O. BOX 1046
CITY, STATE, ZIP CODE : SCHENECTADY, NEW YORK 12301
EMERGENCY TELEPHONE NO. : (518) 370-4200

CHEMICAL NAME/CLASS: PARA-TERT-BUTYLPHENOL

TRADE NAME: PARA-TERT-BUTYLPHENOL (PTBP) - FLAKED

NIOSH NO: SJ8925000

SECTION II-HAZARDOUS SUBSTANCES (29 CFR 1910.1200)

HAZARDOUS SUBSTANCE(S)	WT. %	VAP PRESSURE MM HG @ C
PARA-T-BUTYLPHENOL	98	1070

SECTION III-PHYSICAL DATA

FORM (@25 C) WHITE TO YELLOW SOLID

B.P. 237 C
GRAVITY 1.037
M.P. 97.5 C
LBS/GAL 8.6

VAPORATION RATE	FLASH PT	WATER SOL.	% WT SOLIDS	PH	VAP DENS
ETHER	118 C	SLIGHT	100.0	N.A.	> AIR

SECTION IV-FIRE/EXPLOSION/DOT HAZARD DATA

DOT NAME:
CORROSIVE SOLID NOS, CORROSIVE MATERIAL, UN 1759
CHEMICALS NOI, VNX \$1.70/LB

DOT UN/NA: UN 1759	DOT RESPONSE GUIDE NO: 60
DOT HAZARD CLASS: CORROSIVE SOLID	FIREFIGHTERS GUIDE NO: A-132

EXTINGUISHING MEDIA: CO2, DRY, FOAM, FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS:
WHEN HEATED TO DECOMPOSITION IT MAY EMIT TOXIC FUMES.

SPECIAL FIRE FIGHTING PROCEDURES:
EXCLUDE AIR; TREAT LIKE A GASOLINE OR OIL FIRE. WEAR FULL
PROTECTIVE CLOTHING WITH SUPPLIED AIR SOURCE.

HAZARDOUS SUBSTANCE(S) VALUES:	%LEL:	%UEL:	DOTRQ LBS:
PARA-T-BUTYLPHENOL	N/A	N/A	N/A

SECTION IV-FIRE/EXPLOSION/DOT HAZARD DATA

(CONTINUED)

SECTION V-STORAGE AND SPILL PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

STORE MATERIAL IN COOL, VENTILATED, DRY AREA (40-80 F).

KEEP CONTAINERS CLOSED WHEN NOT IN USE, AND GROUNDED AT ALL TIMES.

FOR PROPER STORAGE STABILITY AND OTHER INFORMATION CONSULT APPLICABLE TECHNICAL DATA SHEETS.

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

- 1. STOP SOURCE OF SPILL AND REMOVE ALL IGNITION SOURCES.
- 2. VENTILATE AREA OF SPILL.
- 3. COLLECT SPILLED MATERIAL IN MOST CONVENIENT AND SAFE MANNER FOR RECLAMATION OR FOR DISPOSAL.
- 4. DECONTAMINATE THE AREA, COLLECTING ANY CLEANING AND RINSING MEDIA FOR PROPER RECLAMATION OR DISPOSAL.
- 5. DETERMINE THE APPROPRIATE COURSE OF ACTION FOR THE COLLECTED MATERIAL.
- 6. CONTACT THE APPROPRIATE AUTHORITIES AND DISPOSE ACCORDING TO GOVERNMENTAL REGULATIONS.

PERSONS NOT WEARING APPROPRIATE PROTECTIVE EQUIPMENT AND CLOTHING SHOULD BE RESTRICTED FROM AREAS OF SPILLS UNTIL CLEANUP HAS BEEN COMPLETED AS OUTLINED ABOVE.

SECTION VI-REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: AVOID ANY HEAT, SPARKS OR STATIC ELECTRICITY.

INCOMPATIBILITY: (MATERIALS TO AVOID)
AVOID STRONG OXIDANTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
ON THERMAL DECOMPOSITION IT MAY EMIT TOXIC FUMES, INCLUDING CO AND/OR CO2.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID:
DURING A CURING/REACTION PROCESS, TOXIC BYPRODUCTS MAY BE EMITTED. DO NOT REROUTE VENTED GASES BACK INTO THE WORK AREA.

SECTION VII-PERSONAL PROTECTION

FOLLOWING PERSONAL PROTECTION IS RECOMMENDED DURING NORMAL OPERATIONS AND THE REPAIR OF CONTAMINATED EQUIPMENT OR DURING MATERIAL CLEANUP OPERATIONS:

HYGIENIC PRACTICES:

REQUIRED. WEAR APPROPRIATE CLEAN, PROTECTIVE CLOTHING AND KEEP CONTACT (BODY) AREAS CLEAN.

VENTILATION:

REQUIRED. MAINTAIN VAPOR LEVELS BELOW CITED TLV OR EXPLOSION LIMITS FOR MENTIONED HAZARDOUS MATERIALS.

PROTECTIVE GLOVES:

REQUIRED. SELECT THOSE IMPERVIOUS TO THE CITED SOLVENTS OR OTHER HAZARDOUS SUBSTANCES.

EYE PROTECTION:

REQUIRED. CHEMICAL SAFETY GLASSES/GOGGLES OR FACE SHIELD.

CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS MATERIAL.

OTHER PROTECTIVE EQUIPMENT:

APPROPRIATE RESPIRATION EQUIPMENT NEEDED IF CITED PEL/TLV LIMITS ARE EXCEEDED.

SECTION VIII-EMERGENCY FIRST AID PROCEDURES

EMERGENCY FIRST AID PROCEDURES:

IN THE EVENT OF AN EMERGENCY OF UNEXPECTED OVEREXPOSURE TO THE MATERIAL, THE NATIONAL TECHNICAL INFORMATION SERVICE RECOMMENDS INSTITUTING FIRST AID PROCEDURES AND THAT ONE IMMEDIATELY SENDS FOR MEDICAL ASSISTANCE.

EXPOSURE

PROCEDURES

EYE

WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, LIFTING THE LOWER AND UPPER LIDS OCCASIONALLY. IF THERE ARE ANY SIGNS OF EYE IRRITATION OR CHEMICAL BURNS, GET PROMPT MEDICAL ATTENTION.

SKIN

WASH THE CONTAMINATED SKIN WITH WATER. IF THE MATERIAL PENETRATES THROUGH THE PROTECTIVE CLOTHING, REMOVE THE CLOTHING AND FLUSH THE SKIN WITH WATER. IF THERE ARE ANY SIGNS OF SKIN SENSITIZATION, IRRITATION, OR CHEMICAL BURNS GET PROMPT MEDICAL ATTENTION.

LUNGS

IF THIS MATERIAL IS INHALED IN LARGE AMOUNTS OR BREATHING PROBLEMS OCCUR, MOVE THE PERSON TO FRESH AIR AT ONCE. IF BREATHING HAS STOPPED, PERFORM

SECTION VIII-EMERGENCY FIRST AID PROCEDURES

(CONTINUED)

ARTIFICIAL RESPIRATION. KEEP THE AFFECTED PERSON WARM AND AT REST WHILE GETTING MEDICAL ATTENTION.

STOMACH/GASTROINTESTINAL TRACT

IF THIS MATERIAL HAS BEEN SWALLOWED, OBTAIN PROMPT MEDICAL ATTENTION. IF THE MEDICAL ATTENTION, OR ADVICE, IS NOT IMMEDIATELY AVAILABLE, AND THE PERSON IS CONSCIOUS AND ABLE TO FOLLOW INSTRUCTIONS, GET THE AFFECTED PERSON TO SWALLOW LARGE AMOUNTS OF WATER TO DILUTE THE MATERIAL IN THE PERSON'S SYSTEM. DO NOT ATTEMPT TO MAKE THE PERSON VOMIT.

RESCUE

IF A PERSON IS INVOLVED IN A HAZARDOUS EXPOSURE SITUATION, MOVE THE AFFECTED PERSON FROM THE AREA. IF THE PERSON IS "OVERCOME" IMMEDIATELY CONTACT MEDICAL AUTHORITIES AND IMPLEMENT APPROPRIATE EMERGENCY RESCUE PROCEDURES. DO NOT BECOME A CASUALTY--FOLLOW THE FACILITY'S EMERGENCY PROCEDURES AND UTILIZE PROTECTIVE EQUIPMENT AS NECESSARY. FOLLOW OTHER FIRST AID PROCEDURES DEPENDING UPON THE TYPE AND EXTENT OF EXPOSURE.

SECTION IX-HEALTH HAZARD DATA

CARCINOGEN: NTP:NO IARC:NO OSHA:NO OTHER:NO

ORGANS AFFECTED: SKIN, EYE, NOSE, THROAT, LUNGS

ROUTE OF ENTRY: CONTACT, INGESTION, INHALATION

THE HEALTH HAZARDS PRESENTED ARE THOSE FOR THE HAZARDOUS SUBSTANCES PRESENTED IN SECTION II UNLESS OTHERWISE NOTED.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

REVIEW OF AVAILABLE DATA INDICATES ANY PREEXISTING ABNORMAL CONDITIONS WITH THE LISTED TARGET ORGANS AND/OR THE LIVER MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

HAZARDOUS SUBSTANCE(S):

PARA-T-BUTYLPHENOL

EXPOSURE VALUES:

	PPM:	MG/M3:		PPM:	MG/M3:
PEL	N/A	N/A	ACGIH TLV	N/A	N/A
SHA STEL	N/A	N/A	ACGIH STEL	N/A	N/A

SECTION IX-HEALTH HAZARD DATA

(CONTINUED)

SHA CEILING	N/A	N/A	ACGIH CEILING	N/A	N/A
...	N/A	N/A			
ENDOR TWA	N/A	10	NIOSH TWA	N/A	N/A
ENDOR C	N/A	N/A	NIOSH C	N/A	N/A
ENDOR STEL	N/A	N/A	NIOSH STEL	N/A	N/A

CUTE:

CONTACT
PARA-TERT-BUTYLPHENOL IS CONSIDERED CORROSIVE TOWARD SKIN AS DEFINED BY
SHA AND DOT.

EYE
PARA-TERT-BUTYLPHENOL IS EXPECTED TO BE CORROSIVE TOWARD EYES.

INGESTION
PARA-TERT-BUTYLPHENOL HAS AN ORAL (RAT) LD50 OF 5660 MG/KG (PER NIOSH).

INHALATION
PARA-TERT-BUTYLPHENOL IS EXPECTED TO CAUSE IRRITATION TO NOSE, THROAT,
AND LUNGS.

TOXIC: (SEE ORGANS AFFECTED ABOVE)

SECTION X-OTHER

OTHER:

DUE TO THE PHYSICAL FORM OF FLAKED PARA-TERT-BUTYLPHENOL, THIS
MATERIAL IS CLASSIFIED AS A NUISANCE DUST WITH A TLV OF 10 MG/M3.

THE HEALTH AND SAFETY EFFECTS INFORMATION PRESENTED IS THAT AVAILABLE TO
HENECTADY CHEMICALS, INC. (SCI) AS OF THE DATE PUBLISHED. SCI MAKES
REPRESENTATION OF THE INFORMATION'S COMPLETENESS OR ACCURACY. SCI
EXPECTS THOSE PERSONS RECEIVING THIS MSDS WILL EXERCISE THEIR INDEPEN-
DENT JUDGEMENT, OR CONSULT WITH A COMPETENT HEALTH/SAFETY PROFESSIONAL,
DETERMINING THIS MATERIAL'S APPROPRIATENESS FOR A SPECIFIC USE AND
THE TYPE OF PERSONAL PROTECTION EQUIPMENT DEEMED NECESSARY FOR THE GIVEN USE
AND THE AVAILABLE ENGINEERING CONTROLS.

N/A = NOT AVAILABLE//N.A. = NOT APPLICABLE//N.D. = NOT DETERMINED

635 R5 (3/87)

HMSRA# 0

DATE/INITIALS 11/17/86 GHL

DEC 17 1990 12-

HERCULES INCORPORATED
Hercules Plaza
Wilmington, Delaware, 19894

MATERIAL SAFETY DATA SHEET

MSDS No.: 844 3510 0100-1
Date: 01/10/86
Page: 1 of 3

Phone Number: (302) 594-5000 (all hours)

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.

ABALYN[®] Methyl ester of rosin

CAS Number: [68186-14-1]

HMIS*Rating

Health hazard: 1 Slight
Flammability hazard: 1 Slight
Reactivity hazard: 0 Minimal

Appearance and odor: Amber-colored, tacky, viscous liquid; rosin odor.

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

Chemical & Common Names of Hazardous Ingredients	%	Recommended Air-borne levels TLV*-TWA 1984-85
Methyl ester of rosin [68186-14-1]	100	Not established

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling point:	352-356°C (666-673°F)	Solubility in water:	Negligible
Vapor pressure @ 20°C:	Unknown	Specific gravity:	1.03
Vapor density:	Heavier than air	pH:	N/A
% volatile (vol.):	Negligible at 20°C	Evaporation rate:	Slower than butyl acetate
Freezing point:	Not determined		

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

Flash point: 180°C (356°F) COC Flammable limits: Not determined

Autoignition temperature: Unknown

Extinguishing media: Water spray, dry chemical, foam, or carbon dioxide.

Special fire-fighting procedures: Cool containers with water if exposed to fire.

Unusual fire & explosion hazards: None

Continued...

*HMIS (Hazardous Materials Identification System) Rating for the product as it is supplied.
*TLV is a registered trademark of Amer. Conf. of Gov. Indust. Hygienists for Threshold Limit Values.
N/A - not applicable

We cannot anticipate all conditions under which this information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combination for their own purposes. Unless otherwise agreed in writing, we sell the products without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of our products, whether used alone or in combination with other products.

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

...Continued

Stability considerations: Stable

Incompatibility with: None

Hazardous decomposition products: None

Hazardous products of combustion: Carbon monoxide, carbon dioxide and smoke.

Hazardous polymerization: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.Signs & symptoms of overexposure in the workplace:

Eyes: May cause eye irritation.

Skin: Causes skin irritation. Prolonged and repeated contact may cause skin sensitization in susceptible individuals (see Reported Human Effects).

Inhalation: None known, none expected.

Ingestion: None known.

EMERGENCY & FIRST AID PROCEDURES:**EYES:** In case of contact, immediately flush with plenty of low pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.**SKIN:** Promptly flush with running water and soap. Remove contaminated clothing. Wash clothing before reuse.**INHALATION:** Remove to fresh air. Treat any irritation symptomatically. Call a physician.**INGESTION:** If swallowed, do NOT induce vomiting. Call a physician.**NOTE TO PHYSICIAN:** No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

Medical conditions generally recognized as being aggravated by exposure: None known.Primary Routes of Entry: Eyes, Skin

Not listed as a carcinogen by NTP (National Toxicology Program); not regulated as a carcinogen by OSHA (Occupational Safety & Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

Reported Human Effects: Rosin and some of its derivatives have been reported to cause skin sensitization. Two human patch tests that have been conducted with Abalyn did not show any skin sensitization potential. Thirty subjects known to be sensitized to rosin were each subjected to five Abalyn applications. Seventy-six percent of the applications produced no response. It was not possible to determine if the positive responses were results of cross-sensitization or due only to irritation. However, the number of positive responses produced by Abalyn were significantly less in number than those produced by the glycerol, pentaerythritol and propylene glycol esters of rosin.Reported Animal Effects: Acute oral LD₅₀, rats - > 10 g/kg.
Acute oral LD₅₀, guinea pigs - > 10 g/kg.
Acute oral LD₅₀, rabbits - > 10 g/kg.
Acute dermal LD₅₀ - 5 g/kg.
Dermal irritation, rabbits - moderately irritating.

VI. SPILL & LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Scrape up and salvage in metal containers. Soak up small spills with earth or sand. Wash area with detergent and water.

Waste Disposal Method: Incineration of combustible wastes in permitted facilities is the preferred disposal method.

This product is not listed in federal hazardous waste regulations 40CFR261.33 paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40CFR261 Subpart C. State or local hazardous waste regulations may apply if different from the federal.

VII. APPLICABLE CONTROL MEASURES

Appropriate hygienic practices: Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling, and before eating, drinking or smoking.

Personal protective equipment: Chemical goggles
Impervious gloves

Work practices: Eyewash fountains and safety showers should be easily accessible.

Handling and storage precautions: None

Engineering controls: Provide adequate ventilation

SEPARATE PAGE USED ONLY TO DEVELOP THE LABEL TEXT, BUT NOT DISTRIBUTED AS PART OF MSDS.

VIII PRECAUTIONARY LABELING

ABALYN® Methyl ester of rosin

HMIS*

Rating

Health hazard:	1 Slight
Flammability hazard:	1 Slight
Reactivity hazard:	0 Minimal

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION.
Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.
Provide adequate ventilation.

FIRST AID:

EYES: In case of contact, immediately flush with plenty of low pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Promptly flush with running water and soap. Remove contaminated clothing. Wash clothing before reuse.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician.

INGESTION: If swallowed, do NOT induce vomiting. Call a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

SPILLS & LEAKS: Scrape up and salvage in metal containers. Soak up small spills with earth or sand. Wash area with detergent and water.

*HMIS (Hazardous Materials Identification System) Rating for the product as it is supplied.

fnc 1594s

Material Safety Data Sheet

SOLTEX
Polymer
Corporation
AMERICA Company

Section I		Name									
FORTIFLEX T60-1000		24 Hour Emergency Assistance									
Chemical Name / Synonyms: Polyethylene		SOLTEX - (713) 479-2381 CHEMTREC - 1-800-424-9300									
Chemical Family: Polyolefin		Hazard Rating									
Formula: $(-CH_2-CH_2-)_n$		<table border="1"> <tr> <td>Least</td> <td>Slight</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>Moderate</td> <td>Extreme</td> </tr> <tr> <td>2</td> <td>3</td> </tr> </table>		Least	Slight	0	1	Moderate	Extreme	2	3
Least	Slight										
0	1										
Moderate	Extreme										
2	3										
A.S. Number: 9002-88-4	UN Number: N/A	<table border="1"> <tr> <td>Health</td> <td>0</td> </tr> <tr> <td>Fire</td> <td>1</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> </table>		Health	0	Fire	1	Reactivity	0		
Health	0										
Fire	1										
Reactivity	0										

Section II		
Hazardous Components		
Composition	%	Toxicity Data
N/A		N/A

Section III		
Physical Data		
Boiling Point (°F): N/A	Melting Point (°F): 230 - 275	Vapor Pressure (mmHg): N/A
Specific Gravity (H ₂ O = 1): 0.935 - 0.970	% Volatile By Volume: N/A	Vapor Density (Air = 1): N/A
Insoluble	Evaporation Rate (_____ = 1): N/A	
Appearance And Odor: Odorless white pellets or granules		

Section IV	
Reactivity	
Stability: <input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Stable	Hazardous Polymerization: <input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur

Conditions And Materials To Avoid

1. Temperatures above 650°F may cause degradation
2. Strong oxidizing agents

Hazardous Decomposition Products

Carbon Monoxide, Carbon Dioxide

Fire And Explosion Hazards

ASTM E136

> 650°F (Est.)

Flammable Limits (% Volume in Air)	
Lower	Upper
1.1	8.4

Lower

Upper

N/A

unquishing Media

Dry Chemical; Water Fog

Special Fire Fighting Procedures And Precautions

None

Usual Fire And Explosion Hazards

See Section X

Emergency And First Aid Procedures

haiation

None

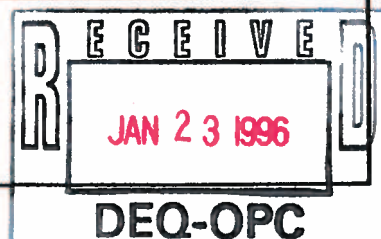
No.

None

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If molten polymer should contact skin, cool rapidly with water and obtain medical attention for thermal burn.

gestion



Section VII					Employee Protection				
Respiratory Protection (Type)									
None									
Ventilation		Local Exhaust		Mechanical (General)		Special		Other	
		Preferred		Acceptable					
Protective Gloves					Eye Protection				
Recommended During Processing									
Other Protective Clothing or Equipment									
None									

Section VIII										Health Information									
Signs and Symptoms of Exposure										1. Acute Overexposure									
										None Determined									
Medical Conditions Generally Aggravated by Exposure										2. Chronic Overexposure									
										None Determined									
Chemical Listed as Carcinogen										National Toxicology Program									
or Potential Carcinogen										Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
										I.A.R.C. Monographs Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
										OSHA Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
OSHA Permissible Exposure Limit					ACGIH Threshold Limit Value					Other Exposure Limit Used									
5Mg/M ³ Respirable Dust					5Mg/M ³ Respirable Dust					N/A									
15Mg/M ³ Total Dust					10Mg/M ³ Total Dust														

Section IX		Environmental Protection	
Leakage and Spill			
Spilled material should be swept up and disposed of as normal refuse to avoid loss of footing.			
Water Spill			
Advise authorities if floating material enters a water course or sewer. Contain floating material and skim from surface.			
Waste Disposal			
Dispose of in an appropriate manner in compliance with local regulations.			
Environmental Hazards			
None			

Section X

Special Precautions

Storage and handling systems should be inspected regularly for possible accumulation of fines. Dust of fines can be considered an explosion hazard when exposed to heat, sparks and open flame. Adequate ventilation should be provided.

Allow hatches and outlets on hopper cars to ventilate before handling material. Keep all sources of ignition away from unloading area. Use proper grounding procedures.

Section XI

Transportation Requirements

Department Of
Transportation
Classification

☐ Flammable
Liquid

☐ Combustible
Liquid

☐ Oxidizing
Material

☐ Non-Flammable
Gas

☐ Flammable
Solid

☐ Poison,
Class A

☐ Corrosive
Material

☒ Not Hazardous By
D.O.T. Regulations

☐ Flammable
Gas

☐ Poison,
Class B

☐ Irritating
Material

☐ Other -
Specify Below

O.T. Proper Shipping Name

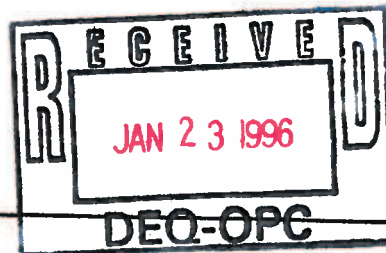
N/A

Regulations

Section XII

Other Regulatory Controls

N/A



SOLTEX Polymer Corporation
3333 Richmond Avenue
Houston, Texas 77098
Phone: (713) 522-1781

To the best of our knowledge the information contained in this Material Safety Data Sheet is accurate. However, neither SOLTEX Corporation or any of its affiliates makes any warranty, expressed or implied, or accepts any liability in connection with information or its use.

Prepared By:

Date Prepared

Jan M. Kallough
1/30/87

MATERIAL SAFETY DATA SHEET

3-25-88

SECTION I

MARTIN MARIETTA MAGNESIA SPECIALTIES
EXECUTIVE PLAZA II
HUNT VALLEY, MD 21030
(301) 687-0200

IDENTITY (AS USED ON LABEL AND LIST)

MAG CHEM 30

DATE PREPARED

JANUARY 6, 1988

4130

EMERGENCY TELEPHONE NUMBER

616-723-2577

CHEMICAL DESCRIPTION

MAGNESIUM OXIDE (MgO) CAS# 1309-48-4

SECTION II INGREDIENTS

HAZARDOUS INGREDIENTS	ACGIH TWA-TLV	OTHER LIMITS
NONE		

SECTION III PHYSICAL DATA

BOILING POINT(°F) M.P.	NOT DET.	SPECIFIC GRAVITY (H ₂ O = 1)	NOT DET.
VAPOR PRESSURE (mm Hg.)	NOT DET.	PERCENT VOLATILE BY VOLUME (%)	NOT DET.
VAPOR DENSITY (AIR = 1)	NOT DET.	EVAPORATION RATE	NOT DET.
SOLUBILITY IN WATER	NOT DET.		
APPEARANCE AND ODOR	WHITE POWDER. NO ODOR		

SECTION IV FIRE & EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LeI	Uel
MATERIAL IS NOT COMBUSTIBLE	NONE	NONE	NONE
EXTINGUISHING MEDIA	1		
MATERIAL IS NOT COMBUSTIBLE			
SPECIAL FIRE FIGHTING PROCEDURES	NONE		
UNUSUAL FIRE AND EXPLOSION HAZARDS	NONE		

SECTION V REACTIVITY DATA

STABILITY	UNSTABLE	CONDITIONS TO AVOID
	STABLE	OLE
INCOMPATABILITY (MATERIALS TO AVOID)	ACIDS, PHOSPHORUS PENTACHLORIDE (PCl ₅) AND THIOBROMINE TRICHLORIDE (Cl ₃ Br)	
HAZARDOUS DECOMPOSITION PRODUCTS	NONE	
HAZARDOUS POLYMERIZATION	MAY OCCUR	CONDITIONS TO AVOID
	WILL NOT OCCUR	NONE

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SECTION VI
HEALTH HAZARD
DATA

THRESHOLD LIMIT VALUE		MAG CHEM 30		4130
NONE DETERMINED		INHALATION?		INGESTION?
ROUTES OF ENTRY		YES		NO
HEALTH HAZARDS (ACUTE AND CHRONIC)				
MAY CAUSE EYE, SKIN OR RESPIRATORY IRRITATION.				
CARCINOGENICITY	NTP?	IARC MONOGRAPHS?	OSHA REGULATED?	
	NO	NO	NO	
SIGNS AND SYMPTOMS OF EXPOSURE				
SEE HEALTH HAZARDS ABOVE				
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE				
NONE KNOWN				
EMERGENCY AND FIRST AID PROCEDURES				
EYES - FLUSH WITH WATER				
SKIN - WASH WITH SOAP AND WATER				
RESPIRATORY - REMOVE TO FRESH AIR				

SECTION VII
SPILL OR LEAK
PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
CLEAN IN A MANNER TO AVOID GENERATION OF DUST.
WASTE DISPOSAL METHOD
DISPOSE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII
SPECIAL PROTECTION
INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)		
RECOMMEND NIOSH APPROVED DUST MASK.		
VENTILATION	LOCAL EXHAUST	SPECIAL
	DURING HANDLING.	NONE
	MECHANICAL (GENERAL)	OTHER
NO SPECIFIC RECOMMENDATIONS		NONE
PROTECTIVE GLOVES		EYE PROTECTION
NO SPECIFIC RECOMMENDATIONS		SAFETY GLASSES
OTHER PROTECTIVE EQUIPMENT		
NONE		

SECTION IX
PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
NONE
OTHER PRECAUTIONS
NONE

NOTICE: THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. ANY RECOMMENDATIONS OR SUGGESTIONS MADE ARE WITHOUT WARRANTY OR GUARANTEE OF RESULTS SINCE CONDITIONS OF HANDLING AND OF USE ARE BEYOND OUR CONTROL; WE, THEREFORE, ASSUME NO LIABILITY FOR LOSS OR DAMAGE INCURRED BY FOLLOWING THESE SUGGESTIONS. SELLER WARRANTS ONLY THAT THIS PRODUCT WILL MEET THE SPECIFICATIONS SET FORTH. ANY OTHER REPRESENTATION OR WARRANTY, EITHER EXPRESS OR IMPLIED, IS SPECIFICALLY DISCLAIMED INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY. SELLER'S AND MANUFACTURER'S ONLY OBLIGATION SHALL BE TO REPLACE SUCH QUANTITY OF THE PRODUCT PROVED TO BE DEFECTIVE BEFORE USING. USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR USER'S INTENDED APPLICATION AND USER ASSUMES ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THEREWITH. NEITHER SELLER NOR MANUFACTURER SHALL BE LIABLE IN TORT, CONTRACT OR UNDER ANY THEORY FOR ANY LOSS OR DAMAGE, INCIDENTAL OR CONSEQUENTIAL, ARISING OUT OF THE USE OF OR THE INABILITY TO USE THE PRODUCT.

J. T. Baker Chemical Co. 1309-48-4

222 Red School Lane Phillipsburg, N.J. 08865
24-Hour Emergency Telephone -- (201) 859-2151

Chemtrec # (800) 424-9300
National Response Center # (800) 424-8802

MATERIAL SAFETY DATA SHEET

M0182 -01

Magnesium Oxide

Effective: 03/13/86

Page: 1
Issued: 03/15/86

SECTION I - PRODUCT IDENTIFICATION

Product Name: Magnesium Oxide
Formula: MgO
Formula Wt: 40.30
CAS No.: 1309-48-4
NIOSH/RTECS No.: OM3850000
Product Codes: 2477, 2484, 2476, 2480

PRECAUTIONARY LABELLING

BAKER SAF-T-DATATM System

HEALTH	FLAMMABILITY	REACTIVITY	CONTACT
1	0	1	1
SLIGHT	NONE	SLIGHT	SLIGHT

Laboratory Protective Equipment



Precautionary Label Statements

WARNING!
MAY BE HARMFUL IF INHALED
MAY CAUSE IRRITATION

During use avoid contact with eyes, skin, clothing. Wash thoroughly after handling. When not in use keep in tightly closed container.

SECTION II - HAZARDOUS COMPONENTS

Component	%	CAS No.
Magnesium Oxide	90-100	1309-48-4

SECTION III - PHYSICAL DATA

Boiling Point:	3600°C (6512°F)	Vapor Pressure(mmHg):	N/A
Melting Point:	2800°C (5072°F)	Vapor Density(air=1):	N/A
Specific Gravity: (H ₂ O=1)	3.60	Evaporation Rate: (Butyl Acetate=1)	N/A

Continued on Page: 2

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Magnesium Oxide

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Effective: 03/13/86

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SECTION VII - SPILL AND DISPOSAL PROCEDURES (Continued)

Disposal Procedure

Dispose in accordance with all applicable federal, state, and local environmental regulations.

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

Ventilation: Use general or local exhaust ventilation to meet TLV requirements.

Respiratory Protection: Respiratory protection required if airborne concentration exceeds TLV. At concentrations up to 45 ppm, a high-efficiency particulate respirator is recommended. Above this level, a self-contained breathing apparatus is advised.

Eye/Skin Protection: Safety glasses with sideshields, neoprene gloves are recommended.

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

MSDS DATATM Storage Color Code: Orange

Special Precautions

Keep container tightly closed. Suitable for any general chemical storage area.

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

Proper Shipping Name Chemicals, n.o.s.

INTERNATIONAL (I.M.O.)

Proper Shipping Name Chemicals, n.o.s.

N/A = Not Applicable or Not Available

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

TRIMET**TECHNICAL
PRODUCTS**24 HOUR EMERGENCY (215) 433-6330
CHEMTREC (800) 424-93005-14-93
TRIMET Technical Products, Inc.
2409 N. Cedar Crest Blvd.
Allentown, PA 18104
Telephone (215) 433-6330
FAX: (215) 433-6361**MATERIAL SAFETY DATA
CALCIUM FORMATE**

NFPA-

HEALTH-2

FIRE-1

REAC.-0

HMIS-

HEALTH-3

FIRE-1

REAC.-0

EQUIP.-E

DOT Hazard Class: Non-Regulated

DOT Shipping Name: N.Ap.

UN Number: N.Ap.

I COMPONENT INFORMATION**INGREDIENTS**

CASRN

WT %

OSHA
PELACGIH
TWA

*Calcium formate

Y

544-17-2

98

15mg/m3

15mg/m3

*Hazardous within the meaning of "29 CFR 1910.1200"

II PHYSICAL DATA

APPEARANCE: Free flowing off-white crystals; pH N.Ap.

VISCOSITY: N.Ap.

FREEZING POINT: Decomp.

VAPOR PRESSURE: N.Ap.

H2O SOLUBILITY: Complete

BOILING POINT: N.Av.

VAPOR DENSITY: N.Ap.

PERCENT VOLATILE: N.Ap.

SPECIFIC GRAVITY: 2.02

EVAPORATION RATE (BuAc=1): N.Ap.

III FIRE AND EXPLOSION HAZARD DATA

----EXPLOSIVE LIMITS----

FLASH POINT: N.Ap.

A.I.TEMP.: N.Ap.

LEL-N.Ap. UEL-N.Ap.

EXTINGUISHING MEDIA: Carbon dioxide or dry chemicals for small fires; alcohol foam, universal foam, or water spray for large fires.

SPECIAL FIRE FIGHTING PROCEDURES: None required.

UNUSUAL FIRE AND EXPLOSION HAZARDS: To reduce potential explosion hazard, avoid dispersion of dust in air.

IV REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Excessive heat.

INCOMPATIBILITY (Materials to avoid): Strong acids and oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce formaldehyde, carbon monoxide & calcium carbonate.

V HEALTH HAZARD DATA

ACUTE

EYE: Severely Irritating - possibility of permanent corneal damage.

SKIN CONTACT: Mildly Irritating.

INGESTION: Slightly toxic.

TRIMET**TECHNICAL
PRODUCTS**

24 HOUR EMERGENCY (215) 433-6330
CHEMTREC (800) 424-3300

TRIMET Technical Products, Inc.
2409 N. Cedar Crest Blvd.
Allentown, PA 18104
Telephone (215) 433-6330
FAX: (215) 433-6361

MATERIAL SAFETY DATA CALCIUM FORMATE

PAGE 2 OF 2

VI EMERGENCY AND FIRST AID PROCEDURES

INHALATION - If exposure to dust causes irritation or distress, remove subject to fresh air.

Give oxygen or artificial respiration if needed.

EYE CONTACT - Flush eyes with plenty of water for at least 30 minutes occasionally lifting lids. Get prompt medical attention.

SKIN CONTACT - Remove contaminated clothing and wash contact area with soap and water for 15 minutes.

If irritation persists, seek medical attention. Launder clothing before reuse.

INGESTION - If appreciable amounts are swallowed, call a physician or Poison Control Center. Drink one or two glasses of water. Do not induce vomiting or give anything by mouth to an unconscious person.

VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILLS OR LEAKS

Sweep or scoop up and collect for disposal. Flush area with water. Prevent washings from entering waterways.

WASTE DISPOSAL METHODS

Landfill or dissolve in suitable solvent and incinerate in accordance with federal, state and local regulations.

VIII SPECIAL PROTECTION INFORMATION

VENTILATION - Dust respirator.

RESPIRATORY PROTECTION - Wear a properly fitted NIOSH/MSHA approved respirator where dust is likely to exceed applicable levels.

PROTECTIVE GLOVES - For operations where contact can occur, wear impervious gloves.

EYE PROTECTION - If high dust concentrations exist, tight fitting goggles are recommended to reduce exposure to the eyes.

OTHER PROTECTIVE EQUIPMENT - For operations where excessive contact can occur, wear clothing that limits skin contact.

A safety shower and eye wash facility should be available.

IX TOXICITY INFORMATION

ORAL LD50 = (RAT) 2.65 g/kg

Eye irritation (RBT) - Severe.

X STORAGE AND HANDLING PROCEDURES

Store product at ambient temperature.

XI REGULATORY AND ENVIRONMENTAL INFORMATION

We certify that all components of this product are listed on the TSCA inventory.

This product contains no chemicals identified by the state of California as Carcinogens or Reproductive Toxicants.

PREPARED BY:

M.J.Weber
TRIMET Technical Products Inc.
Using previously published data.

Effective date: 2/19/92

The information herein is given in good faith
but no warranty is expressed or implied.

--- END OF MATERIAL SAFETY DATA SHEET ---

HERCULES INCORPORATED

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

POLY-PALE*

Partially polymerized rosin

MOLTEN or SOLID

MSDS No.: 853 2171 0100-05

Supersedes MSDS #: 853 2171 0100-04

Date: 04/23/93

I. PRODUCT IDENTIFICATION

A. POLY-PALE* Partially polymerized rosin, MOLTEN

DANGER! MOLTEN RESIN. CAUSES SEVERE BURNS ON CONTACT.
PRODUCT MAY BURN IF IGNITED.

APPEARANCE AND ODOR: Straw-colored viscous liquid at 100-175 C (212-347 F);
rosin odor

B. POLY-PALE* Partially polymerized rosin, SOLID

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE
VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL
HAZARDS).

APPEARANCE AND ODOR: Amber solid or flake; low odor

CASRN: 65997-05-9

HMIS RATINGS:(1)

Health hazard:	0	Minimal
Flammability hazard:	1	Slight
Reactivity hazard:	0	Minimal

CHEMICAL & COMMON NAME: Partially polymerized (dimerized) rosin

* Registered Trademark of Hercules Incorporated

(1)Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a health hazard.

If this product is used in a manner that could generate particulates (dust), Hercules recommends that the dust be treated as a NUISANCE PARTICULATE (Particulates Not Otherwise Classified) as defined by the American Conference of Governmental Industrial Hygienists (ACGIH) or (Particulates not otherwise Regulated) as defined by OSHA.

RECOMMENDED AIRBORNE LEVELS

1992-1993

OSHA TWA

TLV-TWA

Particulates not
Otherwise classified/regulated

15 mg/m3 total
5 mg/m3 respirable fraction

10 mg/m3

If this product is heated to temperatures sufficient to produce smoke or fumes, the TLV-TWA of 0.1 mg/m3 (as formaldehyde), for rosin core solder pyrolysis products should be observed.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: N/A

SOLUBILITY IN WATER: Negligible

VAPOR PRESSURE AT 20 C: Not determined

SPECIFIC GRAVITY: 1.07

VAPOR DENSITY: N/A

pH: N/A

VOLATILE (WT.),%: Not determined

EVAPORATION RATE: Slower than
butyl acetate

SOFTENING POINT: 98-105 C (208-221 F)



IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

A. MOLTEN product

CAUTION! PRODUCT MAY BURN IF IGNITED.

B. SOLID product

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL HAZARDS).

FLASH POINT: 218 C (424 F) Cleveland Open Cup

FLAMMABLE LIMITS: Not determined

AUTOIGNITION TEMPERATURE: Not determined

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES:

Use self-contained breathing apparatus.

Apply water to MOLTEN RESIN fires from a safe, protected location to avoid body contact with hot resin.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May form flammable dust-air mixtures.

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

A. MOLTEN product

DANGER! MOLTEN RESIN. CAUSES SEVERE BURNS ON CONTACT.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

- EYES: Burns can cause irreversible eye injury and blindness. Smoke or fumes from rosin products may cause eye irritation with redness, tearing and discomfort.
- SKIN: Serious burns will result from contact with molten product. Repeated or prolonged contact may cause an allergic skin reaction (sensitization) in susceptible individuals. See MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.
- INHALATION: Breathing smoke or fumes from molten rosin products may produce breathing discomfort, coughing and sore throat.
- INGESTION: None known

EMERGENCY & FIRST AID PROCEDURES:

EYES: Cool burns with plenty of low-pressure water. Get medical attention immediately.

SKIN: Immediately cool burn area with cold water and cold packs for at least 15 minutes. Do NOT put ice directly on the skin. Do NOT attempt to remove solidified resin from the skin as severe tissue damage may result. Get medical attention.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen and soften the material.

B. SOLID product

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

- EYES: Dust may cause irritation by mechanical abrasion.
- SKIN: Prolonged and repeated contact may cause a skin sensitization reaction in susceptible individuals (See below: MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE).
- INHALATION: None known. None expected.
- INGESTION: None known.

Continued...

V. HEALTH HAZARD DATA

B. SOLID product...Continued

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen the material.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This product contains rosin or a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals after repeated or prolonged skin contact. Hercules Incorporated is unaware of any allergic skin reactions caused by industrial exposure to this product or similar materials. A thorough search of Hercules' medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

REPORTED HUMAN EFFECTS:

Prolonged exposure to smoke or fumes generated by heating this product may cause respiratory irritation with throat discomfort, coughing or breathing difficulty. Repeated exposure may lead to respiratory sensitization (asthma). See SECTION II.

REPORTED ANIMAL EFFECTS:

Two-year chronic feeding studies were conducted with rats and dogs fed diets containing 1% and 0.05% of each of the partially and fully polymerized rosins. At the 1% dietary levels, food consumption of the rats was approximately 10% less than the control animals, and the growth of the rats was slightly depressed. Liver enlargement was noted in both species at the 1% dietary levels with both rosins but not at the 0.05% level. Microscopic examination of the tissues, including the livers, revealed no tissue changes that could be attributed to ingestion of the test diets. Tumor incidence was not statistically different from that of the control animals.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

WASTE DISPOSAL METHOD:

Incineration of waste material in a permitted facility in accordance to local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility is a suitable alternative.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Avoid breathing dust or vapor.

Wash thoroughly after handling, and before eating, drinking or smoking.

A. MOLTEN product - PERSONAL PROTECTIVE EQUIPMENT:

Face shield, safety glasses and hard hat

Long-sleeve protective shirt, long pants and work shoes

Long-cuff lined gloves

Lined rain suit with protective hood or shoulder shroud or full aluminized or thermal suit with hood

Protective clothing should be made of six-ounce (6 oz) or greater fabric; polyester should be avoided.

Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

B. SOLID product - PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

Continued...

VII. APPLICABLE CONTROL MEASURES

...Continued

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

A. MOLTEN product - HANDLING AND STORAGE PRECAUTIONS:

If allowed to solidify to solid or flake form, this product can exhibit the characteristics of solid or flake resin, and may form flammable dust-air mixtures. See HANDLING AND STORAGE PRECAUTIONS for solid product below. Water contact with hot molten resin may result in foaming or spattering which can cause burns upon skin or eye contact.

B. SOLID product - HANDLING AND STORAGE PRECAUTIONS:

For small packages, the following warning applies:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapors may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute.

For large bags (1,000 lbs. or greater, the following warning applies:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment and the bag. In addition, when emptying where flammable vapors may be present, blanket vessel with an inert gas. ATTENTION! A GROUNDING CABLE MUST BE ATTACHED TO THE BAG GROUND CONNECTION!

Flaked forms are prone to gradual oxidation. Control inventory. Use oldest material first.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep dust or vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate sources of ignition.

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

Keep area clean. Product will burn.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	POLY-PALE* Partially polymerized rosin	65997-05-9	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	NHH, HC-3 (dust)	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

MATERIAL SAFETY

BASF Corporation Chemicals Division
100 Cherry Hill Road, Parsippany, New Jersey 07054, (201) 318-3000

BASF

TA SHEET

HMIS: H3 F1 R0

3-9-89

12-4-90

PRODUCT NUMBER: 526247 Phthalic Anhydride (Flake)

SECTION I - IDENTIFICATION

TRADE NAME: Phthalic Anhydride (Flake)

CHEMICAL NAME: Phthalic Anhydride

SYNONYMS: PA, PAN, Phthalic Acid Anhydride

FORMULA: $C_8H_4O_3$

CHEMICAL FAMILY: Aromatic Acid Anhydride

MOL WGT.: 148.1

SECTION II - INGREDIENTS

COMPONENT	CAS NO.	%	PEL/TLV - SOURCE
Phthalic Anhydride	85-44-9	99.8	1 ppm, ACGIH 2 ppm PEL OSHA (Trans.) 1 ppm TWA OSHA (Final)

11 components are in TSCA inventory.
ARA Title III Sect. 313: Listed.

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SECTION III - PHYSICAL DATA

BOILING/MELTING POINT @760 mm Hg: 284.5°C/ N/A

pH: N/A

VAPOR PRESSURE mm Hg @20 C: < 0.05

Freezing Point: 131°C

SPECIFIC GRAVITY OR BULK DENSITY: 1.53

Vapor Density: 5.1 (Air=1)

SOLUBILITY IN WATER: 0.62 g/100 g @ 25°C

APPEARANCE: White Flakes

ODOR: Irritating

INTENSITY: Strong

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): 152°C (PMCC)

AUTOIGNITION TEMP: 570°C

FLAMMABILITY LIMITS IN AIR (% BY VOL)

LOWER: 1.7

UPPER: 10.4

EXTINGUISHING
MEDIUM

Use water fog, foam, CO2 or dry chemical extinguishing media.

SPECIAL
FIREFIGHTING
PROCEDURES

Firefighters should be equipped with self-contained breathing apparatus and turn out gear.

UNUSUAL FIRE
AND EXPLOSION
HAZARDS

Combustible solid sublimes and gives off flammable vapors when heated. A severe dust explosion can occur at or above 0.015 g/l of air-dispersed particulate.

EMERGENCY TELEPHONE NUMBER

CHEMTREC 800-424-9300

201-318-3000

201-578-2300

THIS NUMBER IS AVAILABLE DAYS, NIGHTS, WEEKENDS, AND HOLIDAYS

SECTION V - HEALTH DATA

TOXICOLOGICAL TEST DATA:

Phthalic Anhydride
Rat, oral LD50
Rabbit, skin irritation
Rabbit, eye irritation

RESULT:

4.02 g/kg
mildly irritating
severely irritating

Chronic: In a study conducted by the National Cancer Institute it was concluded that under the conditions of the bioassay, phthalic anhydride did not act as a carcinogen for the animals studied.

EFFECTS OF OVEREXPOSURE:

Phthalic anhydride is a strong irritant of the skin, eyes, nose, and throat. Moisture increases the severity of the irritation. Skin irritation symptoms are sometimes delayed. Inhalation of dust or vapor may cause coughing, sneezing or nosebleeds, and may produce asthma attacks in sensitive individuals. Repeated or prolonged exposure may cause skin rash or chronic eye irritation. Exposure to hot material may cause thermal burns.

FIRST AID PROCEDURES:

Eyes-Immediately wash eyes with running water for 15 minutes.
If irritation develops, consult a physician.

Skin-Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.

Ingestion-If swallowed, dilute with water and immediately induce vomiting. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

Inhalation-Move to fresh air. Aid in breathing; if necessary, and get immediate medical attention.

SECTION VI - REACTIVITY DATA

STABILITY: Stable. Avoid excessive heat; ignition sources. Moisture causes decomposition to phthalic acid.

CONDITIONS TO AVOID: Strong oxidizing agents, nitric acid, water.

CHEMICAL INCOMPATIBILITY: Phthalic acid, CO.

HAZARDOUS DECOMPOSITION PRODUCTS: Does not occur
N/A

HAZARDOUS POLYMERIZATION: N/A

CONDITIONS TO AVOID: No

CORROSIVE TO METAL: No

OXIDIZER: No

SECTION VII - SPECIAL PROTECTION

RESPIRATORY PROTECTION:

If vapors or mists are generated, wear a NIOSH/MSHA approved organic vapor/mist respirator if the TLV (PEL) is exceeded.
Use an air-supplied or a self-contained breathing apparatus in emergency or non-routine, high exposure situations.

EYE PROTECTION: Chemical goggles.

PROTECTIVE CLOTHING: Gloves, coveralls, apron, boots as necessary to prevent skin contact.

VENTILATION: Local exhaust to control to recommended P.E.L.

OTHER: Eyewash fountains and safety showers should be easily accessible.
Motors should be explosion-proof.

PRODUCT NUMBER: 526247 Phthalic Anhydride (Flake)

SECTION VII - ENVIRONMENTAL DATA

ENVIRONMENTAL TOXICITY DATA:

None available.

SPILL AND LEAK PROCEDURES:

Spills should be contained and placed in suitable containers for disposal in a RCRA licensed facility. This material is RCRA hazardous.

HAZARDOUS SUBSTANCE SUPERFUND: Yes RQ (lbs): 8000

WASTE DISPOSAL METHOD:

Incinerate or bury as a solid only in a RCRA licensed facility. Do not discharge into waterways or sewer systems without proper authority.

HAZARDOUS WASTE 40CFR261: Yes HAZARDOUS WASTE NUMBER: U180

CONTAINER DISPOSAL:

Empty containers with less than 1 inch of residue may be landfilled at a licensed facility. Recommend crushing or other means to prevent unauthorized reuse. Other containers must be disposed of in a RCRA licensed facility.

SECTION VIII - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME (49CFR172.101-102)

None

HAZARDOUS SUBSTANCE
(49CFR CERCLA LIST)

Yes--Phthalic Anhydride

REPORTABLE QUANTITY (RQ) 5,000

D.O.T. HAZARD CLASSIFICATION (CFR172.101-102)
PRIMARY

None

SECONDARY

None

D.O.T. LABELS REQUIRED (49CFR172.101-102)

None

D.O.T. PLACARDS
REQUIRED (CFR172.504)

None

POISON CONSTITUENT
(49CFR172.203(K))

BILL OF LADING DESCRIPTION

Phthalic Anhydride

CG NO. 423

UN/NA CODEN/A

DATE PREPARED: 8 / 12 / 88

UPDATED: 9 / 8 / 88

- WHILE BASF CORPORATION BELIEVES THE DATA SET FORTH HEREIN ARE ACCURATE AS OF THE DATE HEREOF, BASF CORPORATION MAKES NO WARRANTY WITH RESPECT THERETO AND EXPRESSLY DISCLAIMS ALL LIABILITY FOR RELIANCE THEREDN. SUCH DATA ARE OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION.

SECTION 9 - PRODUCT LABEL

PHthalic ANHYDRIDE (FLAKE)

CAUTION:
CONTACT RESULTS IN STRONG IRRITATION OF THE EYES AND SKIN. MOISTURE INCREASES THE SEVERITY OF THE IRRITATION. SKIN IRRITATION SYMPTOMS ARE SOMETIMES DELAYED. INHALATION OF DUST OR VAPOR MAY RESULT IN IRRITATION AND MAY PRODUCE ASTHMA ATTACKS IN SENSITIVE INDIVIDUALS. REPEATED OR PROLONGED EXPOSURE MAY RESULT IN SKIN RASH OR CHRONIC EYE IRRITATION. EXPOSURE TO HOT MATERIAL MAY CAUSE THERMAL BURNS.

Use with local exhaust. Wear a NIOSH/MSHA-approved organic vapor/mist respirator if vapors or mists are generated, chemical goggles, gloves, coveralls, apron, boots and other protective clothing as necessary to prevent contact. Eyewash fountains and safety showers must be easily accessible.

FIRST AID:

Eyes-Immediately wash eyes with running water for 15 minutes.

If irritation develops, consult a physician.

Skin-Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.

Ingestion-If swallowed, dilute with water and immediately induce vomiting. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

Inhalation-Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

STORAGE AND HANDLING: Avoid excessive heat, moisture, and sources of ignition.

IN CASE OF SPILLS OR LEAKS: Material is a RCRA-regulated product. Spills should be contained, absorbed and placed in suitable containers for disposal in a RCRA-licensed facility.

IN CASE OF FIRE: Use water fog, foam, CO2 or dry chemical extinguishing media. Firefighters should be equipped with self-contained breathing apparatus and turn-out gear. Combustible solid sublimates and gives off flammable vapors when heated. A severe dust explosion can occur at or above 0.015 g/l of air-dispersed particulate.

EMPTY CONTAINERS: All labeled precautions must be observed when handling, storing and transporting empty containers due to product residues. Do not reuse this container unless it is professionally cleaned and reconditioned.

DISPOSAL: Spilled material, unused contents and empty containers must be disposed of in accordance with local, state and federal regulations. Refer to our Material Safety Data Sheet for specific disposal instructions.

IN CASE OF CHEMICAL EMERGENCY: Call CHEMTREC day or night for assistance and information concerning spilled material, fire, exposure and other chemical accidents 800-424-8300.

ATTENTION: This product is sold solely for use by industrial institutions.

Refer to our Technical Bulletin and Material Safety Data Sheet regarding safety, usage, applications, hazards, procedures and disposal of this product. Consult your supervisor for additional information.

CAS NO. 85-44-8.

HMIS: H3 F1 R0

Made in USA.

Basic Organic Chemicals

0886

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: 22399

Page: 1

PRODUCT NAME: DOWANOL (R) EPH GLYCOL ETHER

Effective Date: 01/23/85 Date Printed: 02/06/86

MSDS:000065

1. INGREDIENTS:

Ethylene glycol phenyl ether, approx.	90%
Diethylene glycol phenyl ether, approx.	10%

2. PHYSICAL DATA:

BOILING POINT: 245.6C (473F)
VAP PRESS: .007 mmHg @ 25C
VAP DENSITY: 4.8
SOL. IN WATER: 2.3 g/100 g
SP. GRAVITY: 1.1 @ 20/4C
FREEZING POINT: 51F, 11C.
APPEARANCE: Colorless.
ODOR: Pleasant smelling liquid.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 127C (260F)
METHOD USED: PMCC

FLAMMABLE LIMITS
LFL: Not det.
UFL: Not det.

EXTINGUISHING MEDIA: Water fog, CO2, dry chemical, foam, alcohol foam

FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus.

(Continued on Page 2)

(R) Indicates a trademark 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: 22399

Page: 2

PRODUCT NAME: DOWANOL (R) EPH GLYCOL ETHER

Effective Date: 01/23/85 Date Printed: 02/06/86

MSDS:000065

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable under normal storage conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Oxidizing material, aluminum, magnesium, zinc, and galvanized metals.

HAZARDOUS DECOMPOSITION PRODUCTS: Burning produces normal products of combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Use absorbent material. Remove with shovel.

DISPOSAL METHOD: Burn in an approved incinerator in accordance with all local, state, and federal requirements.

6. HEALTH HAZARD DATA:

EYE: May cause moderate eye irritation and moderate corneal injury.

SKIN CONTACT: Prolonged or repeated exposure not likely to cause significant skin irritation. May cause more severe response if confined to skin.

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. Repeated skin exposure may result in absorption of harmful amounts. Excessive exposure may cause hemolysis, thereby impairing the blood's ability to transport oxygen.

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is 1400-3000 mg/kg. Amounts ingested incidental to industrial handling are not likely to cause injury; however

(Continued on Page 3)

(R) Indicates a trademark 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: 22399

Page: 3

PRODUCT NAME: DOWANOL (R) EPH GLYCOL ETHER

Effective Date: 01/23/85 Date Printed: 02/06/86

MSDS:000065

6. HEALTH HAZARD DATA: (CONTINUED)

ingestion of larger amounts may cause injury.

INHALATION: At room temperature, exposures to vapors are unlikely due to physical properties; higher temperatures may generate vapor levels sufficient to cause irritation and other effects.

SYSTEMIC & OTHER 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. Remove contaminated clothing immediately, preferably under safety shower, and wash before reuse. Destroy contaminated shoes and other leather items or articles which cannot be decontaminated.

INGESTION: Induce vomiting if large amounts are ingested. Consult medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Dow Industrial Hygiene Guide is 25 ppm (skin) for ethylene glycol phenyl ether.

VENTILATION: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

(Continued on Page 4)

(R) Indicates a trademark 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: 22399

Page: 4

PRODUCT NAME: DOWANOL (R) EPH GLYCOL ETHER

Effective Date: 01/23/85 Date Printed: 02/06/86

MSDS:000065

8. HANDLING PRECAUTIONS: (CONTINUED)

RESPIRATORY PROTECTION: If respiratory irritation is experienced, 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. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Contaminated leather items, such as shoes, belts and watchbands, should be removed and destroyed.

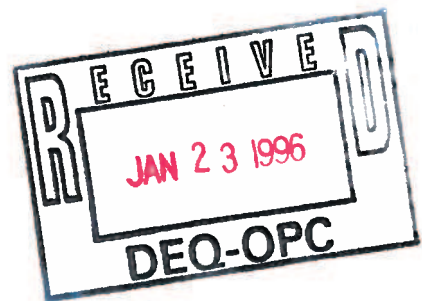
EYE PROTECTION: Use chemical goggles.

Notes: The following should be effective protective clothing materials: Neoprene and butyl rubber.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not get in eyes. Avoid prolonged or repeated skin contact. Avoid breathing vapors given off when product is heated. See also section 4.

MSDS STATUS: Revised 6 - 9.



(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.



DOW CHEMICAL U.S.A.

February 7, 1986

WILLARD H. DOW CENTER
MIDLAND, MICHIGAN 48674

HERCULES INC

5134929

WEST 7TH STREET
HATTIESBURG

MS 39401

Sir/Madam:

Enclosed are Material Safety Data Sheet(s) which provide information on products which you have purchased from us in the recent past. Since you may redirect the products to more than one place within your location, please make sure this information is available to all persons handling and/or using the product.

These Material Safety Data Sheet(s) have either been revised since you last received them or are for products which you recently purchased. Please consider them as the current copy to replace any previous version you may have received.

The distribution of these sheets is part of a continuing program of providing information and updating our customers. The regulations promulgated by OSHA for Hazard Communication, 29 CFR 1910.1200, as well as several state and local laws and regulations, have been considered in preparing these Material Safety Data Sheet(s).

Thank you for your help.

A.T. Talcott

A.T. Talcott
Manager, Product Safety Compliance
Quality Assurance Department

bb

Enclosures

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

CIBA-GEIGY CORPORATION
ADDITIVES DIVISION
SEVEN SKYLINE DRIVE
HAWTHORNE, NEW YORK 10532
(914) 785-2000

EMERGENCY PHONE NUMBER:

(800) 888-8372

SECTION I-IDENTITY INFORMATION

IDENTITY (TRADE NAME): IRGANOX 1010

FAMILY/CHEMICAL NAME:

TETRAKIS(METHYLENE(3,5-DI-TERT-BUTYL-4-HYDROXYHYDROCINNAMATE))
METHANE CAS REG. NO. 6683-19-8

PRODUCT TYPE:

ANTIOXIDANT/STABILIZER.

IMPORTANT:

* THIS MATERIAL IS NOT INTENDED FOR USE IN PRODUCTS FOR *
* WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR ABRAD- *
* ED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS *
* SPECIFICALLY INTENDED, UNLESS THE FINISHED PRODUCT HAS *
* BEEN TESTED IN ACCORDANCE WITH THE FOOD AND DRUG ADMIN- *
* ISTRATION AND/OR OTHER APPLICABLE SAFETY TESTING RE- *
* QUIREMENTS. BECAUSE OF THE WIDE RANGE OF SUCH POTEN- *
* TIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE TO RECOM- *
* MEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR SUCH USES *
* AND ASSUMES NO LIABILITY FOR ANY SUCH USES. *

THE ABOVE DISCLAIMER HAS BEEN REVISED.

HAZARD STATEMENT :

* THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN *
* PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD *
* COMMUNICATION STANDARD 29 CFR 1910.1200. *
* THIS PRODUCT IS NOT CONSIDERED TO BE A HAZARDOUS *
* CHEMICAL UNDER THAT STANDARD. *

IRGANOX 1010

SECTION II-HAZARDOUS INGREDIENTS

NONE KNOWN

SECTION III-PHYSICAL DATA

APPEARANCE:

WHITE TO OFF-WHITE, CRYSTALLINE POWDER.

ODOR:

ODORLESS.

BOILING POINT:

NOT APPLICABLE.

MELTING POINT:

110-125C

DECOMPOSITION TEMPERATURE:

GREATER THAN 220C.

EVAPORATION RATE:

NOT APPLICABLE.

PERCENT VOLATILE:

LESS THAN 0.5%.

VAPOR DENSITY:

NOT APPLICABLE.

VAPOR PRESSURE:

AT 20C, CA. 1×10^{-12} (MM HG)

SOLUBILITY IN WATER:

AT 20C, < 1 PPM

PH:

NOT APPLICABLE.

SPECIFIC GRAVITY:

CA. 1.15 (H₂O = 1)

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:

567F (MARCUSSON)

FLAMMABLE LIMITS IN AIR-LOWER:

NOT DETERMINED.

FLAMMABLE LIMITS IN AIR-UPPER:

NOT DETERMINED.

NFPA CODE:

NONE.

EXTINGUISHING MEDIA:

CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY.

FIRE FIGHTING PROCEDURES-SPECIAL:

USE SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

THE PRODUCT CAN FORM AN EXPLOSIVE DUST/AIR MIXTURE. AVOID DUST FORMATION AND CONTROL IGNITION SOURCES; EMPLOY GROUNDING, VENTING AND EXPLOSION RELIEF PROVISIONS IN ACCORD WITH ACCEPTED ENGINEERING PRACTICES IN PROCESS OPERATIONS CAPABLE OF GENERATING DUST AND/OR STATIC ELECTRICITY.

WARNING! CONDUCTIVE (OR ANTI-STATIC) PACKAGE. THIS APPLIES TO PRODUCT PACKAGED IN FUSED LINED FIBER DRUMS, LOOSE CARBON-BLACK FILLED FIBER DRUMS, OR SUPER SACKS/BULK BAGS. WHEN EMPTYING CONTENTS, USE PROPER GROUNDING TECHNIQUES. FAILURE TO USE PROPER GROUNDING TECHNIQUES MAY RESULT IN BUILD-UP OF HAZARDOUS ELECTROSTATIC CHARGES WHICH COULD CAUSE FLASH FIRE OR EXPLOSION WHEN CONTENTS ARE EMPTIED INTO A FLAMMABLE ATMOSPHERE.

NON-CONDUCTIVE PACKAGE AND/OR LINER. THIS APPLIES TO PRODUCT PACKAGED IN BOXES, LOOSE POLYETHYLENE-LINED FIBER DRUMS OR PLASTIC PAILS. EMPTY ONLY INTO INERT OR NON-FLAMMABLE ATMOSPHERE. EMPTYING CONTENTS INTO A NON-INERT ATMOSPHERE WHERE FLAMMABLE VAPORS MAY BE PRESENT COULD CAUSE FLASH FIRE OR EXPLOSION DUE TO POSSIBLE ELECTROSTATIC DISCHARGE.

SEE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODE 77, "RECOMMENDED PRACTICE ON STATIC ELECTRICITY," 1988 (OR LATEST EDITION), CHAPTER 7, SECTIONS 8 AND 9, AND PLANT OPERATIONS PROGRESS, VOL. 7, NO. 1, JANUARY 1988 FOR MORE INFORMATION. THESE WARNINGS DO NOT APPLY TO 1 POUND OR SMALLER CONTAINERS.

SECTION V-REACTIVITY DATA

STABILITY:

STABLE.

INCOMPATIBILITY:

STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION AND BURNING MAY PRODUCE CARBON MONOXIDE AND CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

SECTION VI-HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE:

DERMAL, INGESTION, AND INHALATION.

THRESHOLD LIMIT VALUE:

NONE ESTABLISHED.

ORAL LD50:

(RATS) >5000 MG/KG

DERMAL LD50:

(RABBITS) >3160 MG/KG

SKIN IRRITATION:

(RABBITS) NONE (DRAIZE SCORE 0/8)

EYE IRRITATION:

(RABBITS) NONE (DRAIZE SCORE 0/110)

- SENSITIZATION:

RIPT (HUMANS) NOT A PRIMARY IRRITANT AND NO EVIDENCE OF SENSITIZATION UNDER THE CONDITIONS OF THE STUDY, WHICH INVOLVED TESTING OF A 0.5% W/V SOLUTION IN DIMETHYL PHTHALATE.

INHALATION LC50:

(RATS) >46 MG/L AIR FOR A 1-HOUR DUST EXPOSURE;
(RATS) EXPOSURE FOR 4-HOURS TO THE FUMES AND VAPORS EMITTED
WHEN PRODUCT WAS HEATED TO 316C RESULTED IN NO DEATHS OR
UNTOWARD BEHAVIORAL REACTIONS FOR AN AVERAGE NOMINAL
CONCENTRATION OF 0.11 MG/L AIR.

TERATOGENICITY:

(RATS AND MICE) NO TERATOGENIC EFFECTS.

MUTAGENICITY:

AMES TEST: NEGATIVE

DOMINANT LETHAL, MICE: NO EVIDENCE OF A DOMINANT LETHAL EFFECT.

NUCLEUS ANOMALY TEST, CHINESE HAMSTER: NEGATIVE.

CHROMOSOME STUDIES IN SOMATIC CELLS, CHINESE HAMSTER: NEGATIVE.

SIGNS AND SYMPTOMS OF EXPOSURE-ACUTE/CHRONIC:

NO IDENTIFIED HEALTH EFFECTS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

NONE KNOWN.

EMERGENCY AND FIRST AID PROCEDURES-EYES:

FOR EYE CONTACT, FLUSH EYES WITH PLENTY OF WATER FOR SEVERAL
MINUTES. GET MEDICAL ATTENTION IF IRRITATION OCCURS.

EMERGENCY AND FIRST AID PROCEDURES-SKIN:

FOR SKIN CONTACT, WASH AFFECTED AREAS WITH PLENTY OF WATER,
AND SOAP, IF AVAILABLE, FOR SEVERAL MINUTES. GET MEDICAL
ATTENTION IF IRRITATION OCCURS.

EMERGENCY AND FIRST AID PROCEDURES-INGESTION:

IF SWALLOWED, GIVE AT LEAST 3-4 GLASSES OF WATER BUT DO NOT
INDUCE VOMITING. DO NOT GIVE ANYTHING BY MOUTH TO AN UN-
CONSCIOUS OR CONVULSING PERSON.

EMERGENCY AND FIRST AID PROCEDURES-INHALATION:

IF INHALED, REMOVE FROM AREA TO FRESH AIR. GET MEDICAL
ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING
BECOMES DIFFICULT.

EMERGENCY AND FIRST AID PROCEDURES-OTHER:

WASH CONTAMINATED CLOTHING PRIOR TO REUSE.

SECTION VII-SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:

SWEEP OR VACUUM AND PLACE INTO CLOSABLE CONTAINER FOR
DISPOSAL. WEAR PROTECTIVE EQUIPMENT SPECIFIED BELOW.
THOROUGHLY FLUSH RESIDUE WITH WATER.

WASTE DISPOSAL METHODS:

INCINERATE IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTER-
BURNER AND SCRUBBER. FOLLOW ALL FEDERAL, STATE AND LOCAL
REGULATIONS.

EFFLUENT DATA-BOD:

AEROBIC SEWAGE OECD COUPLED UNITS TEST NO. 303A: AVERAGE
ELIMINATION MEASURED BY SPECIFIC ANALYSIS WAS 45.2% OF THE
INITIALLY MEASURED CONCENTRATION.

EFFLUENT DATA-COD:

1.79 AND 2.38 G COD/G IRGANOX 1010 (2 STUDIES).

SEWAGE BACTERIAL TOXICITY:

INHIBITORY CONCENTRATION ON RESPIRATION OF AEROBIC WASTE WATER
BACTERIA: IC20, IC50, IC80 >100 PPM.

FISH TOXICITY:

ZEBRA FISH, LC50 96 H: >100 PPM

INVERTEBRATE TOXICITY:

DAPHNIA MAGNA, EC50 24 H: >86 PPM

SECTION VIII-SPECIAL PROTECTION INFORMATION

VENTILATION:

USE LOCAL EXHAUST FOR DUSTY USE CONDITIONS.

PROTECTIVE GLOVES:

WEAR GLOVES AS A STANDARD HANDLING PROCEDURE.

EYE PROTECTION:

WEAR SAFETY GLASSES OR GOGGLES TO PROTECT AGAINST DUST PARTICLES.

RESPIRATORY PROTECTION:

USE NIOSH APPROVED DUST MASK, IF REQUIRED.

OTHER PROTECTIVE EQUIPMENT:

WEAR COVERALLS.

SECTION IX-SPECIAL PRECAUTIONS

HMIS CODE:

HEALTH : 1

FIRE : 1

REACTIVITY : 0

HANDLING PRECAUTIONS:

IN ACCORDANCE WITH GOOD INDUSTRIAL PRACTICE, HANDLE WITH CARE AND AVOID UNNECESSARY PERSONAL CONTACT. AVOID CONTACT WITH EYES AND PROLONGED OR REPEATED SKIN CONTACT. AVOID CONTINUOUS OR REPETITIVE BREATHING OF DUST. USE ONLY WITH ADEQUATE VENTILATION . FOR INDUSTRIAL USE ONLY.

SHIPPING AND STORING PRECAUTIONS:

KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING TRANSPORT.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING.

SECTION X-REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:

NOT REGULATED AS A HAZARDOUS MATERIAL BY THE U.S. DEPT. OF TRANSPORTATION (DOT) 49 CFR 172.101 HAZARDOUS MATERIALS TABLE.

DOT CLASS:

NONE.

DOT NUMBER:

NONE.

RCRA STATUS:

NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).

SARA/TITLE III - CERCLA LIST:

THIS PRODUCT DOES NOT CONTAIN A 'CERCLA' LISTED HAZARDOUS SUBSTANCE FOR EMERGENCY RELEASE NOTIFICATION UNDER SEC. 304 (40 CFR 302).

SARA/TITLE III - TOXIC CHEMICALS LIST:

THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE

ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SEC. 313
(40 CFR 372).

TSCA INVENTORY STATUS:

CHEMICAL COMPONENTS LISTED ON TSCA INVENTORY.

CALIFORNIA PROPOSITION 65:

THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS CURRENTLY ON
THE CALIFORNIA LIST OF KNOWN CARCINOGENS AND REPRODUCTIVE
TOXINS.

NEW JERSEY RIGHT-TO-KNOW LABELING INFORMATION:

THIS PRODUCT CONTAINS THE FOLLOWING :

CHEMICAL NAME : TETRAKIS(METHYLENE(3,5-DI-TERT-BUTYL-4-HYDRO
XYHYDROCINNAMATE)) METHANE

CAS NUMBER : 6683-19-8

* * *

CHEMICAL NAME : PENTAERYTHRITOL TRIS ESTER WITH 3-(3,5-DI-TE
RT-BUTYL-4-HYDROXYPHENYL)PROPIONIC ACID

CAS NUMBER : 84633-54-5

PERCENT : IMPURITY

* * *

PENNSYLVANIA RIGHT-TO-KNOW ACT:

THE FOLLOWING IS REQUIRED COMPOSITION INFORMATION.

CHEMICAL NAME : BENZENEPROPANOIC ACID, 3,5-BIS(1,1-DIMETHYLE
THYL)-4-HYDROXY-, 2,2-BIS({3-(3,5-BIS(1,1-DI
METHYLETHYL)-4-HYDROXYPHENYL)-1-OXOPROPOXY}M
ETHYL)-1,3-PROPANEDIYL ESTER

CAS NUMBER : 6683-19-8

COMMON NAME : TETRAKIS(METHYLENE(3,5-DI-TERT-BUTYL-4-HYDROXYHY
DROCINNAMATE))METHANE; 3,5-DI-TERT-BUTYL-4-HYDRO
XYHYDROCINNAMIC ACID, NEOPENTANETETRAYL ESTER; P
ENTAERYTHRITOL TETRAKIS(3,5-DI-TERT-BUTYL-4-HYDR
OXYHYDROCINNAMATE); IRGANOX 1010

COMMENTS : NOT ON PENNSYLVANIA HAZARDOUS SUBSTANCE LIST.

* * *

ISSUE DATE: 08/03/92 REVISION: 14C

FOR FURTHER INFORMATION, PLEASE CONTACT: BRUCE SCHWEMMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE
BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE
OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH
RESPECT TO THE INFORMATION CONTAINED HEREIN.

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 -- (908) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

1949 M06
EFFECTIVE: 03/09/92

PHENOL

PAGE: 1
ISSUED: 03/28/92

J.T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

=====

SECTION I - PRODUCT IDENTIFICATION

=====

PRODUCT NAME: PHENOL
COMMON SYNONYMS: CARBOLIC ACID; HYDROXYBENZENE; MONOHYDROXYBENZENE; PHENIC
ACID; PHENYLIC ACID
CHEMICAL FAMILY: PHENOLS
FORMULA: C6H5OH
FORMULA WT.: 94.11
CAS NO.: 108-95-2
NIOSH/KTECS NO.: SJ3325000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 2862, 2858, TEST, 4056

=====

PRECAUTIONARY LABELING

=====

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	3	SEVERE (LIFE)
FLAMMABILITY	-	2	MODERATE
REACTIVITY	-	1	SLIGHT
CONTACT	-	4	EXTREME (CORROSIVE)

LABORATORY PROTECTIVE EQUIPMENT

CODE NOT ON FILE

U.S. PRECAUTIONARY LABELING

POISON DANGER

COMBUSTIBLE. CAUSES SEVERE BURNS. RAPIDLY ABSORBED THROUGH SKIN. MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. EXCEPTIONAL HEALTH AND CONTACT HAZARDS: READ MATERIAL SAFETY DATA SHEET.
KEEP AWAY FROM HEAT, SPARKS, FLAME. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE DUST. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. IN CASE OF SPILL, SWEEP UP AND REMOVE. FLUSH SPILL AREA WITH WATER.

CONTINUED ON PAGE: 2

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 -- (908) 859-2151

CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

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PRECAUTIONARY LABELING (CONTINUED)

INTERNATIONAL LABELING

TOXIC IN CONTACT WITH SKIN AND IF SWALLOWED. CAUSES BURNS.
KEEP OUT OF REACH OF CHILDREN. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH
PLENTY OF SOAP AND WATER. IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE
LABEL WHERE POSSIBLE).

SAF-T-DATA* STORAGE COLOR CODE: RED STRIPE (STORE SEPARATELY)

SECTION II - COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
PHENOL	108-95-2	99-100	5 PPM	5 PPM

SECTION III - PHYSICAL DATA

BOILING POINT: 182 C (359 F)
(AT 760 MM HG)

VAPOR PRESSURE (MMHG): 0.35
(20 C)

MELTING POINT: 40 C (104 F)
(AT 760 MM HG)

VAPOR DENSITY (AIR=1): 3.24

SPECIFIC GRAVITY: 1.07
(H2O=1)

EVAPORATION RATE: <1
(BUTYL ACETATE = 1)

SOLUBILITY(H2O): MODERATE (1-10%)

% VOLATILES BY VOLUME: 100
(21 C)

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: SOLID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: COLORLESS TO PINK CRYSTALS. SWEET ODOR.

CONTINUED ON PAGE: 3

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT (CLOSED CUP): 79 C (175 F) NFPA 704M RATING: 3-2-0

AUTOIGNITION TEMPERATURE: 714 C (1319 F)

FLAMMABLE LIMITS: UPPER - 8.6 % LOWER - 1.5 %

FIRE EXTINGUISHING MEDIA

USE WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS

GIVES OFF HEAVY SMOKE. GIVES OFF FLAMMABLE VAPORS. VAPORS MAY FORM EXPLOSIVE MIXTURE WITH AIR. CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE.

TOXIC GASES PRODUCED

CARBON MONOXIDE, CARBON DIOXIDE

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): 19 MG/M3 (5 PPM)

THE TLV LISTED DENOTES TLV (SKIN).

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

PERMISSIBLE EXPOSURE LIMIT (PEL): 19 MG/M3 (5 PPM)

THE PEL LISTED DENOTES PEL (SKIN).

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

TOXICITY OF COMPONENTS

ORAL RAT LD50 FOR PHENOL
SKIN RAT LD50 FOR PHENOL
INTRAPERITONEAL RAT LD50 FOR PHENOL
INHALATION RAT LC50 FOR PHENOL

317 MG/KG
609 MG/KG
127 MG/KG
316 MG/M3

CARCINOGENICITY: NTP: NO IARC: NO

Z LIST: NO OSHA REG: NO

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION:

GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE,
COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY
EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE,
EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS,
UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS
AND MAY BE FATAL

SKIN CONTACT:

IRRITATION

EYE CONTACT:

IRRITATION

SKIN ABSORPTION:

GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE,
COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY
EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE,
EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS,
UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS
AND MAY BE FATAL

INGESTION:

GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE,
COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY
EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE,
EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS,
UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS
AND MAY BE FATAL

CHRONIC EFFECTS: NONE IDENTIFIED

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

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TARGET ORGANS

LIVER, KIDNEYS, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
KIDNEY DISORDERS

PRIMARY ROUTES OF ENTRY

INHALATION, ABSORPTION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, GIVE
ACTIVATED CHARCOAL IN WATER, OLIVE OIL, OR MARGARINE. THEN
INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE
OXYGEN.

SKIN CONTACT: IN CASE OF SKIN CONTACT, IMMEDIATELY REMOVE ALL CONTAMINATED
CLOTHING AND SHOES. SWAB ALL CONTAMINATED SKIN WITH COTTON
WOOL SOAKED IN GLYCEROL OR POLYETHYLENE GLYCOL FOR AT LEAST
10 MINUTES. WASH SKIN WITH COPIOUS AMOUNTS OF SOAPY WATER
FOR AN ADDITIONAL 15 MINUTES. REMOVE THE VICTIM TO A PLACE
EQUIPPED WITH RESUSCITATION EQUIPMENT AND OBSERVE FOR 24
HOURS.

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: YES PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: YES CONTAINS PHENOL (RQ = 1,000 LBS, TPQ =
500/10,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS PHENOL (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: YES CONTAINS PHENOL

GENERIC CLASS: C05

TSCA INVENTORY: YES

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SECTION VI - REACTIVITY DATA

STABILITY: STABLE A HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION, LIGHT, AIR
V.

INCOMPATIBLES: STRONG OXIDIZING AGENTS, STRONG BASES, ALKALIES,
CALCIUM HYPOCHLORITE

DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE

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. SHUT
OFF IGNITION SOURCES; NO FLARES, SMOKING, OR FLAMES IN AREA. WITH CLEAN
SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER;
REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE

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

EPA HAZARDOUS WASTE NUMBER: 0188 (TOXIC WASTE)

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP TO 50 PPM, A CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE IS RECOMMENDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED.

EYE/SKIN PROTECTION: SAFETY GOGGLES AND FACE SHIELD, UNIFORM, PROTECTIVE SUIT, VITON GLOVES ARE RECOMMENDED.

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SECTION IX - STORAGE AND HANDLING PRECAUTIONS

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SAF-T-DATA* STORAGE COLOR CODE: RED STRIPE (STORE SEPARATELY)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED,
FLAMMABLE LIQUID STORAGE AREA OR CABINET. ISOLATE FROM INCOMPATIBLE
MATERIALS. STORE IN LIGHT-RESISTANT CONTAINERS.

SPECIAL PRECAUTIONS

MATERIAL IS HYGROSCOPIC.

=====

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

=====

DOMESTIC (D.U.T.)

PROPER SHIPPING NAME: PHENOL
HAZARD CLASS: POISON B
UN/NA: UN1671 REPORTABLE QUANTITY: 1000 LBS.
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.101; 173.369

INTERNATIONAL (I.M.U.)

PROPER SHIPPING NAME: PHENOL, SOLID
HAZARD CLASS: 6.1
UN: UN1671 MARINE POLLUTANTS: NO
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.102; PART 176; IMU

I.M.U. PAGE: 6199
PACKAGING GROUP: II

AIR (I.C.A.U.)

PROPER SHIPPING NAME: PHENOL, SOLID
HAZARD CLASS: 6.1
UN: UN1671
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.101; 173.6; PART 175; ICAU/IATA== WE BELIEVE
THE TRANSPORTATION DATA AND REFERENCES CONTAINED HEREIN
TO BE FACTUAL AND THE OPINION OF QUALIFIED EXPERTS. THE
DATA IS MEANT AS A GUIDE TO THE OVERALL CLASSIFICATION
OF THE PRODUCT AND IS NOT PACKAGE SIZE SPECIFIC, NOR
SHOULD IT BE TAKEN AS A WARRANTY OR REPRESENTATION FOR
WHICH THE COMPANY ASSUMES LEGAL RESPONSIBILITY.== THE
INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION,
INVESTIGATION, AND VERIFICATION. ANY USE OF THE

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SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION (CONTINUED)

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INFORMATION MUST BE DETERMINED BY THE USER TO BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. SEE SHIPPER REQUIREMENTS 49CFR 172.3 AND EMPLOYEE TRAINING 49CFR 173.1.

U.S. CUSTOMS HARMONIZATION NUMBER: 29071100007

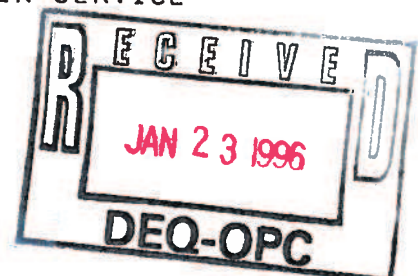
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N/A = NOT APPLICABLE OR NOT AVAILABLE
N/E = NOT ESTABLISHED

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 THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL. BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY, OR ITS FITNESS FOR A PARTICULAR PURPOSE. THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET. NOTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE NUMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL NON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE (1-800-JTBAKER) FOR ASSISTANCE.

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

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GE Specialty Chemicals

2 cc

Safety

1-14-92

MATERIAL SAFETY DATA SHEET

WESTON® W618F

12/15/91 PAGE 01

CHEMICAL PRODUCT & COMPANY IDENTIFICATION

MANUFACTURER / SUPPLIER

GE Specialty Chemicals
5th & Avery Streets
Parkersburg, WV 26102

EMERGENCY TELEPHONE

(304) 863-7284 (24 hour Medical)
(304) 296-2554 (24 hour Other)

NON-EMERGENCY TELEPHONE

(304) 424-5910

PRODUCT IDENTIFIER:

WESTON

PRODUCT DESCRIPTION:

Distearyl pentaerythritol diphosphite
(CAS# 3806-34-6).

PRODUCT USE:

Antioxidant/stabilizer for use in polymers.

COMPOSITION/INFORMATION ON INGREDIENTS

Additional compositional data are provided in the REGULATORY INFORMATION section for WHMIS, SARA 313, California Proposition 65 and various state right-to-know laws.

CAS NUMBER
CHEMICAL NAME

OSHA PEL

UNITS

ACGIH TLV UNITS

This product does not contain reportable hazardous ingredients as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Waxy solid or viscous liquid material with a slight odor. Can burn in a fire creating dense toxic smoke.

POTENTIAL HEALTH EFFECTS

EYE:

May cause mild irritation.

SKIN:

May cause skin irritation or rash.

INGESTION:

Not acutely toxic.

INHALATION:

May be irritating to the respiratory tract.

SUBCHRONIC:

May cause central nervous system injury based upon animal studies.

CHRONIC/CARCINOGENICITY

NTP:

Not Tested

OSHA:

Not Regulated

IARC:

Not Listed

CHRONIC/OTHER:

Certain skin sensitive individuals and individuals with respiratory impairments may be affected by exposure to this product.

MEDICAL RESTRICTIONS:

Persons with certain types of neurological diseases should consult a physician prior to exposure to this product.

FIRST AID MEASURES

EYES:

Remove contact lenses at once. Immediately flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.

SKIN:

Immediately wash with soap and water for at least 15 minutes. If irritation develops, seek medical attention. Remove contaminated clothing immediately.

INGESTION:

Seek immediate medical attention.

INHALATION:

If inhaled, move victim to fresh air and immediately seek medical attention.

FIRE FIGHTING MEASURES**FIRE FIGHTING:**

Approved pressure demand breathing apparatus and protective clothing should be used for all fires. Use extinguishing water stream carefully and contain runoff.

EXTINGUISHING MEDIA:

Dry chemical, foam, water spray, carbon dioxide.

HAZARDOUS COMBUSTION PRODUCTS:

Hazardous combustion products may include intense heat, dense black smoke, carbon monoxide, carbon dioxide, hydrocarbon fragments, phosphine, fragments of phosphite/phosphate esters and oxides of phosphorus.

FLASH POINT:

185 C (365 F)

LOWER FLAMMABLE LIMIT:

Not Established

UPPER FLAMMABLE LIMIT:

Not Established

AUTOIGNITION:

Not Established

CONDITIONS OF FLAMMABILITY:

Requires a continuous flame source to ignite.

EXPLOSION DATA**IMPACT SENSITIVITY:**

Not sensitive to mechanical impact.

STATIC DISCHARGE:

Sensitive to static discharge under dust cloud conditions.

ACCIDENTAL RELEASE MEASURES**GENERAL:**

Contain spills. Prevent runoff to waterways. Transfer spilled materials and contaminated soil into dry impervious containers. Dispose of in accordance with federal, state and local regulations. Residual materials may be cleaned up with soap, water and sorbents. (See DISPOSAL INFORMATION)

HANDLING AND STORAGE**HANDLING:**

Follow recommendations on label and in technical literature. Avoid inhalation of dust and contact with skin and eyes. Use good industrial hygiene practices. Provide adequate ventilation. Avoid dust cloud generation and dust accumulation; employ bonding, grounding, venting and explosion relief provisions in accordance with accepted engineering practices.

STORAGE:

Store in a dry place away from moisture, ignition sources, and heat. Storage temperatures should be maintained below 38C (100F) to prevent blocking in bags and silos. Avoid storage near foods to prevent food contamination.

EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS:**

Ventilation requirements must be locally determined to limit exposure to materials at their point of use. Design techniques and guidelines may be found in publications such as:

Industrial Ventilation; available from the American Conference of Governmental Industrial Hygienists, Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48901.

PERSONAL PROTECTION**EYE/FACE:**

Wear safety glasses with side shields or chemical goggles.

SKIN:

When handling avoid contact with skin. Use appropriate protective clothing, including chemical resistant gloves.

RESPIRATORY:

When dust and powder are not adequately controlled, use respirator approved for protection from dust.

PHYSICAL AND CHEMICAL PROPERTIES**PHYSICAL STATE:**

Solid

ODOR AND APPEARANCE:

Powder with slight odor.

BOILING POINT:

Not Applicable

MELTING POINT:

Not Established

VAPOR PRESSURE (mmHg):

5 @ 204 C

VAPOR DENSITY (air=1):

25.3

SPECIFIC GRAVITY (water=1):

0.9 @ 25 C

WATER SOLUBILITY:

Insoluble

% VOLATILES:

Not Established

PH:	Not Established
ODOR THRESHOLD:	Not Established
EVAPORATION RATE:	Not Established
COEFFICIENT WATER/OIL DISTR:	Not Established

STABILITY AND REACTIVITY

STABILITY:	Stable under recommended conditions of storage and handling.
REACTIVITY:	Reacts with water and strong oxidizers.
CONDITIONS TO AVOID:	Avoid getting product wet during storage or transportation.
HAZARDOUS DECOMPOSITION:	Hydrolyzed by moisture with the production of phosphorous acid, aliphatic alcohol and pentaerythritol.

TOXICOLOGICAL INFORMATION

PRODUCT:	
EYE:	Moderately irritating based upon rabbit study.
SKIN:	Dermal LD50 (Rabbit) >800 mg/kg.
ACUTE ORAL:	Oral LD50 (Rat) >5 g/kg.
ACUTE INHALATION:	Inhalation LC50 (Rat) >2 mg/l.
SUBCHRONIC:	Shown to be neurotoxic at only the high dose in chickens at 5 gm/kg.

ECOLOGICAL INFORMATION

GENERAL:	The aquatic toxicity of this product has not been determined. Therefore, avoid discharge to all bodies of water.
-----------------	--

DISPOSAL INFORMATION

RCRA HAZARDOUS WASTE:	Product is not a RCRA hazardous waste.
WASTE DISPOSAL:	Incinerate in accordance with federal, state and local requirements.

TRANSPORTATION INFORMATION

DOT HAZARD CLASS:	Not Regulated
PROPER SHIPPING NAME:	Not Regulated
IDENTIFICATION NUMBER:	Not Listed
TDGA:	Not Listed

REGULATORY INFORMATION

Listed below are chemical substances subject to supplier notification requirements. The percentages, when present, represent average values.

CAS NUMBER	SARA	WHMIS	CA-65	FL ,RI
CHEMICAL NAME	313,%	%	%	
2082-80-6		27.5		
phosphorous acid, trioctadecyl ester				
3806-34-6		65.9		
3,9-bis(octadecyloxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro{5.5}undecane				
TSCA STATUS:	This product is listed on the US EPA TSCA Chemical Substances Inventory.			
WHMIS CLASSIFICATION:	D2			

OTHER

PREPARED BY:	Product Safety Department (413) 448-4811
---------------------	--

The above information and recommendations are believed accurate and reliable. Because it is not possible to anticipate all conditions of use additional safety precautions may be required. GENERAL ELECTRIC COMPANY makes no warranty, either express or implied, including merchantability and fitness. USER RESPONSIBILITY: Each user should read and understand this information and incorporate it into individual site safety programs in accordance with applicable hazard communication standards and regulations.

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REVISIONS IN THIS MSDS SINCE YOUR LAST ORDER ARE IN THE FOLLOWING SECTION(S):

REGULATORY INFORMATION :



100 Supply 11202 211

GE Specialty Chemicals

MATERIAL SAFETY DATA SHEET

WESTON® TNPP

03/06/91 PAGE 01

CHEMICAL PRODUCT & COMPANY IDENTIFICATION

GE Specialty Chemicals
5th & Avery Streets
Parkersburg, WV 26102

MANUFACTURER / SUPPLIER

EMERGENCY TELEPHONE
(304) 863-7284 (24 hour Medical)
(304) 296-2554 (24 hour Other)

EMERGENCY TELEPHONE

(304) 424-5910

NON-EMERGENCY TELEPHONE

PRODUCT IDENTIFIER:
PRODUCT DESCRIPTION:
PRODUCT USE:

WESTON
Tris(nonylphenyl)phosphite (CAS# 26523-78-4).
Antioxidant/stabilizer for use in polymers.

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COMPOSITION/INFORMATION ON INGREDIENTS

Additional compositional data are provided in the REGULATORY INFORMATION section for WHMIS, SARA 313, California Proposition 65 and various state right-to-know laws.

CAS NUMBER	OSHA PEL	UNITS	ACGIH TLV	UNITS
CHEMICAL NAME				

This product does not contain reportable hazardous ingredients as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Liquid material with a slight phenolic/hydrocarbon odor. May hydrolyze to produce phosphorous acid and phenolic vapors. Can burn in a fire creating dense toxic smoke.

POTENTIAL HEALTH EFFECTS

EYE:	May cause mild irritation.
SKIN:	May cause skin irritation/or rash.
INGESTION:	Not acutely toxic.
INHALATION:	May be irritating to the respiratory tract.
SUBCHRONIC:	May cause kidney injury based upon animal studies.

CHRONIC/CARCINOGENICITY

NTP:	Not Tested
OSHA:	Not Regulated
IARC:	Not Listed
MEDICAL RESTRICTIONS:	There are no known human health effects aggravated by exposure to this product.

FIRST AID MEASURES

EYES:	Remove contact lenses at once. Immediately flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. Seek medical attention.
SKIN:	Immediately wash with soap and water for at least 15 minutes. If irritation develops, seek medical attention. Remove contaminated clothing immediately.
INGESTION:	Seek immediate medical attention.
INHALATION:	If inhaled, move victim to fresh air and immediately seek medical attention.

FIRE FIGHTING MEASURES

FIRE FIGHTING: Approved pressure demand breathing apparatus and protective clothing should be used for all fires. Use extinguishing water stream carefully and contain runoff.

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, foam. Water spray can be used to cool adjacent surfaces.

HAZARDOUS COMBUSTION PRODUCTS: Hazardous combustion products may include intense heat, dense black smoke, carbon monoxide, carbon dioxide, hydrocarbon fragments, phosphine, fragments of phosphite/phosphate esters and oxides of phosphorus.

FLASH POINT: 207 C (405 F)

LOWER FLAMMABLE LIMIT: Not Established

UPPER FLAMMABLE LIMIT: Not Established

AUTOIGNITION: Not Established

CONDITIONS OF FLAMMABILITY: Requires a continuous flame source to ignite.

EXPLOSION DATA

IMPACT SENSITIVITY: Not sensitive to mechanical impact.

STATIC DISCHARGE: Sensitive to static discharge.

ACCIDENTAL RELEASE MEASURES

GENERAL: Contain and use absorbent where necessary, and transfer to proper containers. Remaining material may be emulsified with soap and water and absorbed on additional sorbent. Contaminated soil should be gathered into dry drums. Do not flush to sewer. Since phosphites can hydrolyze, notification of the governing agencies may be appropriate due to the possible release of phenolic materials. (See DISPOSAL INFORMATION)

HANDLING AND STORAGE

HANDLING: Follow recommendations on label and in product guide. Prevent contact with skin and eyes. Use good industrial hygiene practices. Provide adequate ventilation. Use aggressive housekeeping activities to prevent material accumulation; employ bonding, grounding, venting and explosion relief provisions in accord with accepted engineering practices.

STORAGE: Store in a dry place away from moisture, excessive heat and sources of ignition. Avoid storage near foods to prevent food contamination.

EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Ventilation requirements must be locally determined to limit exposure to materials at their point of use. Design techniques and guidelines may be found in publications such as:

Industrial Ventilation; available from the American Conference of Governmental Industrial Hygienists, Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48901.

PERSONAL PROTECTION**EYE/FACE:**

Wear safety glasses with side shields or chemical goggles.

SKIN:

When handling avoid contact with skin. Use appropriate protective clothing, including chemical resistant gloves.

RESPIRATORY:

When exposures are not adequately controlled, use respirator approved for protection from organic vapors.

PHYSICAL AND CHEMICAL PROPERTIES**PHYSICAL STATE:**

Liquid

ODOR AND APPEARANCE:

Liquid with mild odor.

BOILING POINT:

Not Established

MELTING POINT:

Not Established

VAPOR PRESSURE (mmHg):

5 (225 C)

VAPOR DENSITY (air=1):

23.8

SPECIFIC GRAVITY (water=1):

0.98 @ 25 C

WATER SOLUBILITY:

Insoluble

% VOLATILES:

Not Established

pH:

Not Established

ODOR THRESHOLD:

Not Established

EVAPORATION RATE:

Not Established

COEFFICIENT WATER/OIL DISTR: Not Established

STABILITY AND REACTIVITY

STABILITY: Stable under recommended conditions of storage and handling.

REACTIVITY: Reacts with water and strong oxidizers.

CONDITIONS TO AVOID: Avoid getting product wet during storage or transportation.

HAZARDOUS DECOMPOSITION: Hydrolyzed by moisture with the production of phosphorous acid and nonylphenol.

TOXICOLOGICAL INFORMATION

PRODUCT:

SKIN: Dermal LD50 (Rabbit) >200 mg/kg.

ACUTE ORAL: Oral LD50 (Rat) >10 g/kg.

ACUTE INHALATION: Inhalation LC50 (Rat) >2 mg/l.

SUBCHRONIC: 90-day feeding study in weanling rats produced kidney damage at 5% of the diet but no effect at the 0.2% and 1.0% levels.

CHRONIC: Rats fed 0.1%, 0.3% and 1.0% product in the diet for 2 years showed no significant product related abnormalities. 2-year study in dogs showed no effects at 0.1%, 0.3% and 1.0% product in the diet. A multigeneration reproductive study in rats fed at 50, 157 and 500 mg/kg showed only reduced food uptake at the 500 mg/kg dose.

ECOLOGICAL INFORMATION

GENERAL: The aquatic toxicity of this product has not been determined. Therefore, avoid discharge to all bodies of water.

DISPOSAL INFORMATION

RCRA HAZARDOUS WASTE: Product is not a RCRA hazardous waste.

WASTE DISPOSAL: Incinerate in accordance with federal, state and local requirements.

TRANSPORTATION INFORMATION

DOT HAZARD CLASS: Not Regulated

PROPER SHIPPING NAME: Not Regulated

IDENTIFICATION NUMBER: Not Listed

TDGA: Not Listed

REGULATORY INFORMATION

Listed below are chemical substances subject to supplier notification requirements. The percentages, when present, represent average values.

CAS	NUMBER	SARA	WHMIS	CA-65	FL	RI
	CHEMICAL NAME	313,%	%	%		

This product does not contain reportable quantities of substances subject to supplier notification.

TSCA STATUS: This product is listed on the US EPA TSCA Chemical Substances Inventory.

WHMIS CLASSIFICATION: Not a controlled product.

OTHER

PREPARED BY: Product Safety Department (413) 448-4811

The above information and recommendations are believed accurate and reliable. Because it is not possible to anticipate all conditions of use additional safety precautions may be required. GENERAL ELECTRIC COMPANY makes no warranty, either express or implied, including merchantability and fitness.

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it into individual site safety programs in accordance with applicable hazard communication standards and regulations.

WESTON is a registered trademark of the GENERAL ELECTRIC COMPANY or its

REVISIONS IN THIS MSDS SINCE YOUR LAST ORDER ARE IN THE FOLLOWING SECTION(S):



GE Specialty Chemicals

General Electric Company
Parkersburg Center, Fifth & Avery Streets
Parkersburg, WV 26102

02/27/92

HERCULES INCORPORATED

WEST 7TH STREET

HATTIESBURG MS 39401

Dear Customer:

Material Safety Data Sheets (MSDS) are sent to you with your initial product order each year you order the product in the USA and every three years in Canada. This MSDS contains chemical identity, environmental, health and safety, safe handling, and regulatory information for your employees. This is being mailed to the shipping address on your order for this product.

This MSDS is designed to be in compliance with OSHA in the USA and WHMIS in Canada. A REGULATORY INFORMATION Section contains information to help you meet the requirements of SARA Title III, WHMIS, Proposition 65 in California and other State-Right-To-Know regulations.

You will automatically receive revisions of this MSDS, if such occurs, with subsequent orders during the calendar year of your order.

We value you as a customer, and truly appreciate your continuing business.

Sincerely yours,

J. Fred Pendleton, Ph.D.
Manager, Product Safety

A-1

MATERIAL SAFETY DATA SHEET

PAGE: 01 of 05

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

VINSOL* RESIN Synthetic resin
Solid, flaked or pulverized

MSDS No.: 859 2143 1200-02

Supersedes MSDS #: 859 2143 1200-01

Date: 10/06/89

I. PRODUCT IDENTIFICATION

WARNING | STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE
VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL
HAZARDS).

VINSOL* RESIN Synthetic resin
Solid, flaked or pulverized

HMIS RATINGS: (1)

Health hazard: 0 Minimal
Flammability hazard: 1 Slight
Reactivity hazard: 0 Minimal

CAS # (8050-09-7)

APPEARANCE AND ODOR: Dark brown solid, flake, or powder; odor characteristic
of pine-derived resin

* Registered Trademark of Hercules Incorporated.

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

Note: The ingredients in this product are not listed in 29 CFR 1910, Subpart
Z, nor do they appear in "Threshold Limit Values for Chemical Substances in
the Work Environment Adopted by ACGIH" for 1989-90.

If these materials are used in a manner that could generate particulates
(dust), Hercules recommends that the resin dust be treated as a NUISANCE
PARTICULATE according to the American Conference of Governmental Industrial
Hygienists (ACGIH).

FOOTNOTES

(1) Explanation of acronyms:
HMIS: Hazardous Materials Identification System rating for product as supplied.
N/A: Not applicable

Hercules Incorporated has compiled the information and recommendations
contained in this Material Safety Data Sheet from sources believed to be
reliable and to represent the most reasonable current opinion on the subject
when the MSDS was prepared. No warranty, guaranty or representation is made
as to the correctness or sufficiency of the information. The user of this
product must decide what safety measures are necessary to safely use this
product, either alone or in combination with other products, and determine its
environmental regulatory compliance obligations under any applicable federal
or state laws.

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: N/A SOLUBILITY IN WATER: Negligible
VAPOR PRESSURE @ 20 C: Not determined. SPECIFIC GRAVITY: 1.22 (solid resin)
VAPOR DENSITY: N/A pH: N/A
% VOLATILE (VOL.): Negligible at 20 C EVAPORATION RATE: N/A
SOFTENING POINT: 124 C (255 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

WARNING | STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE
VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR ADDITIONAL
HAZARDS).

FLASH POINT: 280 C (536 F) Pensky-Martens

FLAMMABLE LIMITS: Not determined.

AUTOIGNITION TEMPERATURE: 878 C (470 F)

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES: N/A

UNUSUAL FIRE & EXPLOSION HAZARDS:
May form flammable dust-air mixtures.

STABILITY CONSIDERATIONS:

Stable. Conditions to Avoid: Spontaneous heating may occur if stored in a non-ventilated area at elevated temperatures.

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide, carbon dioxide and smoke. Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

SIGNS & SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Dust may cause irritation by mechanical abrasion.
SKIN: Prolonged and repeated contact may cause a skin sensitization reaction in susceptible individuals (See below: Medical conditions generally recognized as being aggravated by exposure).
INHALATION: None known. None expected.
INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

MOLTEN RESINS: If molten material comes in contact with the skin, cool under a running stream of water. Do NOT attempt to remove the resin from the skin. Removal could result in severe tissue damage. Get medical attention.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen the material.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This product contains rosin or a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals under certain non-industrial exposure conditions of repeated and prolonged skin contact. Individuals sensitized to rosin derivatives may also react to this product after skin contact. Hercules is unaware of any allergic skin reactions caused by industrial exposure to this product or similar materials. A thorough search of Hercules medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

PRIMARY ROUTE OF ENTRY: Eyes, skin

CANCER INFORMATION:

The components of this product are NOT listed as carcinogens by the National Toxicology Program (NTP). They are not regulated as carcinogens by the Occupational Safety and Health Administration (OSHA) and have not been evaluated by the International Agency for Research on Cancer (IARC).

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

WASTE DISPOSAL METHOD:

Incineration of waste material in a permitted facility in accordance to local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility is a suitable alternative.

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Do not allow eye or skin contact.
Avoid breathing dust.

Wash thoroughly after handling, and before eating, drinking or smoking.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves
Safety glasses

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations. Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

HANDLING AND STORAGE PRECAUTIONS:

For small packages, the following warning applies:

WARNING | STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapors may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute.

Continued...

VII. APPLICABLE CONTROL MEASURES

HANDLING AND STORAGE PRECAUTIONS:...Continued

For large bags (1,000 lbs. or greater), the following warning applies:
WARNING| STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE
VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid
ignition sources such as sparks and flame. Ground all equipment and the
bag. In addition, when emptying where flammable vapors may be present,
blanket vessel with an inert gas. ATTENTION| A GROUNDING CABLE MUST BE
ATTACHED TO THE BAG GROUND CONNECTION|
Flaked forms are prone to gradual oxidation. Control inventory. Use
oldest material first.

ENGINEERING CONTROLS:

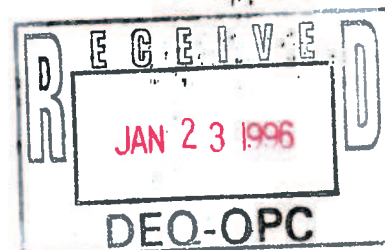
Adequate ventilation should be provided to keep dust concentrations below
acceptable exposure limits. Discharge from the ventilation system should
comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate sources of ignition.

Completely isolate and thoroughly clean all equipment, piping or vessels
before beginning maintenance or repairs.

Keep area clean. Product will burn.

Doc. No. 2465s



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HERCULES INCORPORATED

Hercules Plaza

Wilmington, DE 19894

Phone #: (302) 594-5000 (24 hrs)

ABITOL* Hydrobietyl alcohol

ABITOL* E Hydroabietyl alcohol

MSDS No.: 844 3530 0100-04

Supersedes MSDS #: 844 3530 0100-03

Date: 02/19/93

I. PRODUCT IDENTIFICATION

CAUTION! MAY CAUSE MILD EYE IRRITATION.

ABITOL* Hydroabietyl alcohol
ABITOL* E Hydroabietyl alcohol

HMIS RATINGS:(1)

CASRN: Mixture

Health hazard: 1 Slight
Flammability hazard: 1 Slight
Reactivity hazard: 0 MinimalCHEMICAL & COMMON NAME: Mixture of primary monohydric alcohols derived from
rosin acids

APPEARANCE AND ODOR: Water white, tacky viscous liquid; typical rosin odor

* Registered trademark of Hercules Incorporated

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

As Hercules interprets the U.S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a hazardous material. Although Hercules believes this product may be a mild eye and skin irritant, the irritancy is not great enough to be classed as hazardous under the Hazard Communication Standard.

If this product is heated to temperatures sufficient to produce smoke or fumes, the TLV-TWA of 0.1 mg/m³ (as formaldehyde), for rosin core solder pyrolysis products should be observed.

(1) Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: Not determined SOLUBILITY IN WATER: Negligible
VAPOR PRESSURE AT 20 C: Not determined SPECIFIC GRAVITY: 1.008
VAPOR DENSITY: Heavier than air pH: Not determined
VOLATILE (WT.,%): Negligible at 20 C EVAPORATION RATE: Slower than
FREEZING POINT: Not determined butyl acetate

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

FLASH POINT: Above 170 C (338 F) COC
FLAMMABLE LIMITS: Not determined
AUTOIGNITION TEMPERATURE: Not determined
EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon
SPECIAL FIREFIGHTING PROCEDURES:
Cool containers with water if exposed to fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None
STABILITY CONSIDERATIONS: Stable
INCOMPATIBILITY WITH: None
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS PRODUCTS OF COMBUSTION:
Carbon monoxide and carbon dioxide. Depending on conditions, some
aliphatic aldehydes and carboxylic acids also may be formed.
HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

CAUTION! MAY CAUSE MILD EYE IRRITATION.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: May cause temporary redness and itching.
SKIN: None known. See MEDICAL CONDITIONS GENERALLY RECOGNIZED AS
BEING AGGRAVATED BY EXPOSURE.

Continued...

V. HEALTH HAZARD DATA

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:...Continued

INHALATION: Breathing smoke or fumes from decomposition of rosin products heated to high temperatures may produce breathing discomfort, coughing, and sore throat.

INGESTION: None known.

EMERGENCY & FIRST AID PROCEDURES:

EYES: In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician if irritation persists.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

This product contains rosin or a rosin derivative. Rosin and some of its derivatives have been reported to cause an allergic skin reaction (sensitization) in susceptible individuals after repeated or prolonged skin contact. Hercules Incorporated is unaware of any allergic skin reactions caused by industrial exposure to this product or similar materials. A thorough search of Hercules medical records has disclosed no case of skin sensitization to rosin or its derivatives from industrial exposure in our workers. None have been reported by our customers.

PRIMARY ROUTES OF ENTRY: Eyes, skin

CANCER INFORMATION:

Not listed as a carcinogen by NTP (National Toxicology Program); not regulated as a carcinogen by OSHA (Occupational Safety & Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

REPORTED HUMAN EFFECTS:

Prolonged exposure to smoke or fumes generated by heating this product to decomposition may cause respiratory irritation with throat discomfort, coughing or breathing difficulty. Repeated exposure may lead to respiratory sensitization (asthma). See SECTION II.

REPORTED ANIMAL EFFECTS:

Acute Oral LD50, rat and guinea pig - greater than 10 g/kg.

Acute Dermal LD50, rabbit - greater than 5 g/kg.

Skin Irritation, rabbit - 24 hour occlusion with abraded and non-abraded skin sites - not irritating.

Continued...

V. HEALTH HAZARD DATA

REPORTED ANIMAL EFFECTS:...Continued

Eye Irritation, rabbit - mild transient irritation.

Inhalation - thermal decomposition products; rats were exposed to the fumes generated by heating 25 g of Abitol to 175 C. The exposure time was 4 hours and there were 10 exposures. Exposure to the fumes caused mucous membrane irritation, labored respiration and aggressive behavior.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

Scrape up and salvage in metal containers. Soak up small spills with combustible adsorbent, such as sawdust, for disposal by incineration. Wash area with detergent and water.

WASTE DISPOSAL METHOD:

Incineration should be in accordance with local, state, and federal regulations. Supplemental fuel may be required.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Wash thoroughly after handling, and before eating, drinking, or smoking.

Avoid breathing fumes, vapor or mist.

PERSONAL PROTECTIVE EQUIPMENT:

Impervious gloves

Safety glasses

Appropriate protective clothing

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

Continued...

VII. APPLICABLE CONTROL MEASURES

...Continued

HANDLING AND STORAGE PRECAUTIONS:

Store in a cool, dry, well-ventilated area.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep fumes, vapor or mist concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate ignition sources.

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

Keep area clean. Product will burn.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	ABITOL* and ABITOL* E Hydroabietyl alcohol	Mixture	100

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	HC-1, HC-3	N/A

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33 paragraphs (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261 Subpart C. State or local hazardous waste regulations may apply if different from the federal regulation.

E. TSCA STATUS

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

HERCULES INCORPORATED
Hercules Plaza
Wilmington, DE 19894
Phone #: (302) 594-5000 (24 hrs)

PICCO* 6100 Hydrocarbon resin
~~MOLTEN or SOLID~~

MSDS No.: 866 2001 1300-03

Supersedes MSDS #: 866 2001 1300-02

Date: 04/09/93

I. PRODUCT IDENTIFICATION

A. PICCO* 6100 Hydrocarbon resin, MOLTEN

DANGER! MOLTEN RESIN. CAUSES SEVERE BURNS ON CONTACT.
PRODUCT MAY BURN IF IGNITED.

APPEARANCE AND ODOR: Amber-colored liquid at 250 C (482 F); typical
hydrocarbon odor

Meat
Do Not Remove
This Copy

B. PICCO* 6100 Hydrocarbon resin, SOLID

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR
FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR
ADDITIONAL HAZARDS).

APPEARANCE AND ODOR: Amber-colored solid; typical hydrocarbon odor

CASRN: Mixture

HMIS RATINGS:(1)

Health hazard:	0	Minimal
Flammability hazard:	1	Slight
Reactivity hazard:	0	Minimal

CHEMICAL & COMMON NAME: Aromatic hydrocarbon resin

* Registered Trademark of Hercules Incorporated

(1)Explanation of acronyms:

HMIS: Hazardous Materials Identification System rating for product as supplied.

CASRN: Chemical Abstracts Service Registry Number

AIHA WEEL: American Industrial Hygienists Association - Workplace
Environmental Exposure Level.

OSHA: Occupational Safety and Health Administration.

TLV: Registered trademark of American Conference of Governmental Industrial
Hygienists for Threshold Limit Values.

TWA: Time Weighted Average

STEL: Short term exposure limit (See 29 CFR 1910.1048, March 1, 1989, revision)

C: Ceiling exposure concentration (See 29 CFR 1910.1000, March 1, 1989, rev.)

SKIN: May be absorbed through skin (See 29 CFR 1910.1048, March 1, 1989, rev.)

N/A: Not applicable

II. HAZARDOUS INGREDIENTS & EXPOSURE LIMITS

If this product is used in a manner that could generate particulates (dust), Hercules recommends that the dust be treated as a NUISANCE PARTICULATE (Particulates Not Otherwise Classified) as defined by the American Conference of Governmental Industrial Hygienists (ACGIH) or (Particulates not otherwise Regulated) as defined by OSHA.

RECOMMENDED AIRBORNE LEVELS
1992-1993

OSHA TWA TLV-TWA

Particulates not	15 mg/m3 total	10 mg/m3
Otherwise classified/regulated	5 mg/m3 respirable fraction	

As Hercules interprets the U. S. Occupational Safety and Health Act and Regulations, including the Hazard Communication Standard 29 CFR 1910.1200 dated August 24, 1987, this product should NOT be considered a health hazard. However, this product contains 12 weight percent petroleum hydrocarbon oil. If this product is to be used in a manner that could generate an oil mist, the following airborne limits should be observed:

RECOMMENDED AIRBORNE LEVELS(1)
1992-1993

OSHA TWA TLV-TWA STEL

Oil mist, mineral	5 mg/m3	5 mg/m3	10 mg/m3
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III. TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: N/A

SOLUBILITY IN WATER: Negligible

VAPOR PRESSURE AT 20 C: Not determined

SPECIFIC GRAVITY: 1.02

VAPOR DENSITY: N/A

pH: N/A

VOLATILE (WT.),%: Negligible at 20 C

EVAPORATION RATE: Slower than
butyl acetate

SOFTENING POINT: 98-102 C (208-216 F)

IV. FIRE, EXPLOSION, & REACTIVITY HAZARD DATA

A. MOLTEN product

CAUTION! PRODUCT MAY BURN IF IGNITED.

B. SOLID product

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR
FLAMMABLE VAPORS MAY CAUSE FLASH FIRE.
MAY FORM FLAMMABLE DUST-AIR MIXTURES.
(FOR BAGS 1000 LBS. OR GREATER, SEE SECTION VII FOR
ADDITIONAL HAZARDS).

FLASH POINT: 242 C (468 F) Setaflash Closed Cup

FLAMMABLE LIMITS: Not determined

AUTOIGNITION TEMPERATURE: Not determined

EXTINGUISHING MEDIA: Water spray, dry chemical, foam, carbon dioxide, or halon

SPECIAL FIREFIGHTING PROCEDURES:

Use self-contained breathing apparatus.

Apply water to MOLTEN RESIN fires from a safe, protected location to avoid
body contact with hot resin.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May form flammable dust-air mixtures.

STABILITY CONSIDERATIONS: Stable

INCOMPATIBILITY WITH: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS PRODUCTS OF COMBUSTION:

Carbon monoxide and carbon dioxide. Depending on conditions, some
aliphatic aldehydes and carboxylic acids also may be formed.

HAZARDOUS POLYMERIZATION: Will not occur.

V. HEALTH HAZARD DATA

A. MOLTEN product

DANGER! MOLTEN RESIN. CAUSES SEVERE BURNS ON CONTACT.

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES: Burns can cause irreversible eye injury and blindness.
SKIN: Serious burns will result from contact with molten product.
INHALATION: Exposure to smoke or fumes can cause throat discomfort,
coughing or breathing difficulty.
INGESTION: None known

EMERGENCY & FIRST AID PROCEDURES:

EYES: Cool burns with plenty of low-pressure water. Get medical attention immediately.

SKIN: Immediately cool burn area with cold water and cold packs for at least 15 minutes. Do NOT put ice directly on the skin. Do NOT attempt to remove solidified resin from the skin as severe tissue damage may result. Get medical attention.

INHALATION: Remove to fresh air. Treat any irritation symptomatically. Call a physician.

INGESTION: If this material is swallowed, get medical attention.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen and soften the material.

B. SOLID product

SIGNS AND SYMPTOMS OF OVEREXPOSURE IN THE WORKPLACE:

EYES (dust): May cause mild transient eye irritation.
SKIN: Prolonged contact may cause mild skin irritation.
INHALATION (dust): May cause irritation of the respiratory tract.
INGESTION: None known.

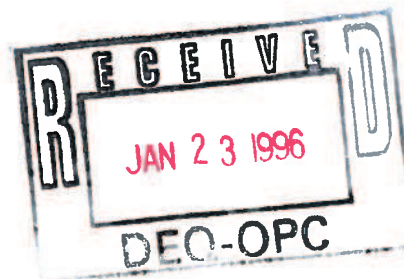
EMERGENCY & FIRST AID PROCEDURES:

EYES (dust): In case of contact, immediately flush with plenty of low-pressure water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Call a physician.

SKIN: Wash with soap and running water.

INHALATION (dust): Remove to fresh air. Treat any irritation symptomatically. Call a physician.

Continued...



V. HEALTH HAZARD DATA

B. SOLID product...Continued

EMERGENCY & FIRST AID PROCEDURES:

INGESTION: If swallowed, do NOT induce vomiting. Call a physician.

NOTE TO PHYSICIAN: Material should not be forcibly pulled from the skin. Mineral oil may be used to loosen the material.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE:

None known.

PRIMARY ROUTES OF ENTRY: Dust - eyes, skin, inhalation

CANCER INFORMATION:

PICCO* 6100 HYDROCARBON RESIN: Not listed as a carcinogen by NTP (National Toxicology Program); not regulated as a carcinogen by OSHA (Occupational Safety & Health Administration); not evaluated by IARC (International Agency for Research on Cancer).

PETROLEUM HYDROCARBON OIL: The International Agency for Research on Cancer (IARC) has determined that there is no evidence to show that this type of oil causes cancer in man or experimental animals.

REPORTED HUMAN EFFECTS:

PICCO* 6100 HYDROCARBON RESIN: None known.

PETROLEUM HYDROCARBON OIL: None reported.

REPORTED ANIMAL EFFECTS:

PICCO 6100 HYDROCARBON RESIN: Based on the results from studies with similar resins the acute oral LD50 rats - greater than 5,000 mg/kg W. Gross necropsy revealed effects on the kidneys at test levels exceeding 1,000 mg/kg. An inhalation study was conducted with the fumes generated by heating to about 180 C Picco 6100 resin. Rats were exposed for 6 hours at a nominal concentration of 1.17 mg/l air. No adverse effects were noted.

PETROLEUM HYDROCARBON OIL: LD50, rats is estimated to be greater than 30 g/kg.

VI. SPILL PROCEDURES & WASTE DISPOSAL

SPILL PROCEDURES:

If material is not contaminated, scoop into clean containers for use. If contaminated, scoop into containers for disposal.

WASTE DISPOSAL METHOD:

Incineration of waste material in a permitted facility in accordance to local, state, and federal regulations is the recommended disposal method. Landfilling in a licensed facility equipped with leachate collection is a suitable alternative.

Refer to Section VIII for specific Federal Environmental and Regulatory Data regarding use or disposal of this product.

VII. APPLICABLE CONTROL MEASURES

APPROPRIATE HYGIENIC PRACTICES:

Avoid contact with eyes, skin, and clothing.

Avoid breathing dust or vapor.

Wash thoroughly after handling, and before eating, drinking or smoking.

A. MOLTEN product - PERSONAL PROTECTIVE EQUIPMENT:

Face shield, safety glasses and hard hat

Long-sleeve protective shirt, long pants and work shoes

Long-cuff lined gloves

Lined rain suit with protective hood or shoulder shroud or full aluminized or thermal suit with hood

Protective clothing should be made of six-ounce (6 oz) or greater fabric; polyester should be avoided.

Appropriate respiratory protection required when exposure to airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

B. SOLID product - PERSONAL PROTECTIVE EQUIPMENT:

Safety glasses

Impervious gloves

Appropriate respiratory protection is required when exposure to an airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA, Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

Personnel exposed to hot molten material should wear protective clothing that provides protection from thermal burns. Full face shield, lined rain suit (or other heat resistant material), and lined impervious gloves are recommended.

Continued...

VII. APPLICABLE CONTROL MEASURES

...Continued

WORK PRACTICES:

Eyewash fountains and safety showers should be easily accessible.

A. MOLTEN product - HANDLING AND STORAGE PRECAUTIONS:

If allowed to solidify to solid or flake form, this product can exhibit the characteristics of solid or flake resin, and may form flammable dust-air mixtures. See HANDLING AND STORAGE PRECAUTIONS for solid product below. Water contact with hot molten resin may result in foaming or spattering which can cause burns upon skin or eye contact.

B. SOLID product - HANDLING AND STORAGE PRECAUTIONS:

For small packages, the following warning applies:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE IN OR NEAR FLAMMABLE VAPORS MAY CAUSE FLASH FIRE. MAY FORM FLAMMABLE DUST-AIR MIXTURES. Avoid ignition sources such as sparks and flame. Ground all equipment. In addition, when emptying bags where flammable vapors may be present, blanket vessel with inert gas, ground operator, and pour material slowly into conductive, grounded chute.

For large bags (1,000 lbs. or greater, the following warning applies:

WARNING! STATIC CHARGES GENERATED BY EMPTYING PACKAGE MAY IGNITE FLAMMABLE VAPORS OR DUST-AIR MIXTURES. MAY FORM FLAMMABLE DUST-AIR MIXTURES. avoid ignition sources such as sparks and flame. Ground all equipment and the bag. In addition, when emptying where flammable vapors may be present, blanket vessel with an inert gas. ATTENTION! A GROUNDING CABLE MUST BE ATTACHED TO THE BAG GROUND CONNECTION!

Avoid dust accumulations and suspending dust in air.

Pastillated forms are prone to gradual oxidation. Control inventory. Use oldest material first.

ENGINEERING CONTROLS:

Adequate ventilation should be provided to keep dust or vapor concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with applicable air pollution control regulations.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE:

Eliminate ignition sources.

Completely isolate and thoroughly clean all equipment, piping or vessels before beginning maintenance or repairs.

Keep area clean. Product will burn.

VIII. ENVIRONMENTAL & REGULATORY DATA

The following environmental and regulatory data are provided to assist users of this product in defining their regulatory environmental compliance obligations.

A. PRODUCT COMPOSITION

PRODUCT (P) or COMPONENT NO.	TRADE NAME or CHEMICAL COMPONENT	CASRN	WT. PERCENT
P	PICCO* 6100	Mixture	100
	Hydrocarbon resin		
1	Petroleum hydrocarbon oil	Mixture	12

B. SARA TITLE III (See footnotes)

COMPONENT NO.	SEC. 304 EHS RQ (lbs)	SEC. 302 EHS TPQ (lbs)	SEC. 311/312 HAZARD CATEGORY	SEC. 313 TOXIC CHEMICAL (YES, NO)
P	N/A	N/A	NHH, HC-3 (dust)	N/A
1	N/A	N/A	NHH	NO

C. CERCLA (40 CFR 302.4 HAZARDOUS SUBSTANCE & REPORTABLE QUANTITIES)

This product does NOT contain any hazardous substances listed in 40 CFR 302.4.

D. RCRA INFORMATION

This product is not listed in federal hazardous waste regulation 40 CFR 261.33, paragraph (e) or (f) - i.e., chemical products that are considered hazardous if they become wastes. It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C. State or local hazardous waste regulations may apply if they are different from the federal regulation.

E. OTHER

This product contains a petroleum hydrocarbon. Prevent runoff from spills or leaks entering navigable waters, streams or other bodies of water. If runoff occurs, notify the National Response Center (NRC) at 800-424-8802.

The components of this product are included on the EPA TSCA Chemical Substance Inventory.

Continued...

VIII. ENVIRONMENTAL REGULATORY DATA

...Continued

FOOTNOTES:

SEC. 302 - Threshold Planning Quantity, Extremely Hazardous Substance (EHS) (40 CFR 355 Emergency Planning and Notification regulations)

N/A: This chemical is not an EHS. Therefore, there is no Threshold Planning Quantity (TPQ).

SEC. 304 - Reportable Quantity for Releases of an EHS (40 CFR 355, Appendix A)

N/A: This chemical is not an EHS. Therefore, there is no Reportable Quantity (RQ).

SEC. 311/312 - 40 CFR 370 Hazardous Chemical Reporting Requirements "Hazard Categories"

HC-1 Immediate (acute) health hazard

HC-2 Delayed (chronic) health hazard

HC-3 Fire hazard

HC-4 Sudden release of pressure hazard

HC-5 Reactive hazard

NHH Not a health hazard

NPH Not a physical hazard

SEC. 313 - 40 CFR 372 Toxic Chemical Release Reporting Requirements

NO: This component is NOT subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements.

YES: This component is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 Toxic Chemical Reporting requirements. Percent composition (or estimated range) is listed above.

N/A: This product is a mixture. As such, it is not listed as a Toxic Chemical under 40 CFR 372, Sect. 313 reporting requirements. Reportable constituents are listed individually where they exceed threshold concentration limits.

HERCULES INCORPORATED HAS COMPILED THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS MATERIAL SAFETY DATA SHEET FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE MOST REASONABLE CURRENT OPINION ON THE SUBJECT WHEN THE MSDS WAS PREPARED. NO WARRANTY, GUARANTY OR REPRESENTATION IS MADE AS TO THE CORRECTNESS OR SUFFICIENCY OF THE INFORMATION. THE USER OF THIS PRODUCT MUST DECIDE WHAT SAFETY MEASURES ARE NECESSARY TO SAFELY USE THIS PRODUCT, EITHER ALONE OR IN COMBINATION WITH OTHER PRODUCTS, AND DETERMINE ITS ENVIRONMENTAL REGULATORY COMPLIANCE OBLIGATIONS UNDER ANY APPLICABLE FEDERAL OR STATE LAWS.

EthylChemicals
Group

MATERIAL SAFETY DATA SHEET

FOR EMERGENCIES ONLY - Phone 504-344-7147

For Nonemergency Health and Safety Information Phone 504-388-7717

24.0.15

PRODUCT IDENTIFICATION

TRADE NAME: ETHANOX (R) 323 Antioxidant
CHEMICAL NAME: Nonylphenol Disulfide Polymer
CAS NO.: Not assigned.
CHEMICAL FORMULA: $C_{15}H_{23}OS[(C_{15}H_{22}O)_x(Sy)_x]SOC_{15}H_{23}$
 $x=0-4; y=0-4$
CHEMICAL FAMILY: Sulfurized alkyl phenol

THIS MATERIAL IS IN COMPLIANCE WITH
THE TOXIC SUBSTANCES CONTROL ACT (15
USC 2601 - 2629).

NOTE: The number of S atoms in each unit can
vary within one polymer chain.

SUMMARY OF HAZARDS

Skin and eye irritant.

HAZARDOUS COMPONENTS

CHEMICAL NAME	CAS NO.	NOTE+	EXPOSURE LIMIT
Nonylphenol disulfide polymer	None	NL	Not established by OSHA/ACGIH.

+NOTE: Carcinogenicity listing of components at concentrations
greater than or equal to 0.1% indicated by: @=NTP; #-IARC;
&=OSHA; *=OTHER; NL=Not Listed

10/12/89

Ethyl Corporation - Chemicals Group

Ethyl Tower 451 Florida Blvd., Baton Rouge, LA 70801

REPRESENTING ETHYL FOREIGN SALES CORPORATION FOR EXPORT SALES

E-500

EMERGENCY PHONE NUMBER
(504) 344-7147

TRADE NAME:

ETHANOX (R) 323
Antioxidant
24.0.15

CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE/ODOR: Dark brown viscous liquid/phenolic odor.

BOILING POINT: Not established.

VAPOR PRESSURE: 7 mm Hg @ 20C/68F.

SOLUBILITY IN WATER: Negligible.

SPECIFIC GRAVITY: 1.030

FIRE AND EXPLOSION HAZARDS

FLASH POINT(METHOD): 160C/320F (PMCC).

FLAMMABLE LIMITS: Not established.

EXTINGUISHING MEDIA: Dry chemical, water spray (fog), foam or carbon dioxide.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Includes oxides of carbon and sulfur.

SPECIAL FIRE FIGHTING PROCEDURES:
Avoid breathing smoke and vapor.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None known.

REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: None known.

MATERIALS TO AVOID: None known.

HAZARDOUS POLYMERIZATION:
Will not occur.

10/12/89

EMERGENCY PHONE NUMBER
(504) 344-7147

TRADE NAME:

ETHANOX (R) 323
Antioxidant
24.0.15

HEALTH HAZARDS

INHALATION: Not expected to be a primary route of exposure.

EYE CONTACT: Eye irritant.

SKIN CONTACT: Skin irritant.

CHRONIC EFFECTS OF OVEREXPOSURE: None known.

TOXICITY DATA: ORAL LD50 (rat) > 5g/kg. DERMAL LD50 (rabbit) > 2g/kg.

EMERGENCY FIRST AID PROCEDURES

INHALATION: If inhaled, remove to fresh air.

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

SKIN CONTACT: Flush skin with plenty of water. Get medical attention.

INGESTION: If swallowed, give two glasses of water. Do not induce vomiting.

EXPOSURE CONTROL INFORMATION

EXPOSURE LIMITS: Not established by OSHA/ACGIH.

EYE PROTECTION: Chemical goggles or face shield.

PROTECTIVE GLOVES: Resistant to chemical penetration.

RESPIRATORY PROTECTION: None under normal conditions. NIOSH approved supplied-air respirator when exposed to vapor from heated material.

MECHANICAL VENTILATION: Recommended.

LOCAL EXHAUST VENTILATION:

At bulk vessel openings when handling
10/12/89

EXPLANATION OF MATERIAL SAFETY DATA SHEET TERMINOLOGY

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).

TYPE OF EXPOSURE LIMITS

TLV® - 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) - 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.

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 known hazard based on human experience and animal data.

NIH - National Toxicology Program.

NIH - National Institute for Research in Chemical Carcinogenesis.

Chem - may include preliminary data or limited data not evaluated by the major agencies. Also includes NIOSH and OSHA 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 ml
Insoluble	< 0.1
Slight	0.1 - 1.0
Modest	1 - 10
Readily soluble	> 10

Available in all major chemical catalogs.

SPECIFIC GRAVITY

Ratio of the weight of a volume of the product to the weight of an equal volume of water (liquid/solid) or air (gas).

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.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS

Known hazardous products resulting from heating or burning the compound.

SPECIAL FIREFIGHTING PROCEDURES

Special firefighting procedures for chemical fires are not described, but special precautions are given, if required.

OTHER FIRE AND EXPLOSION HAZARDS

Hazards not covered by other sections of the MSDS pertaining to thermal reaction in the presence of heat and/or fire.

REACTIVITY DATA

STABILITY

Indicates the susceptibility of the product to chemical decomposition.

CONDITIONS AND MATERIALS TO AVOID

States the conditions and materials that may cause undesirable reactions or instability of the product.

HAZARDOUS DECOMPOSITION PRODUCTS

Indicates 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

States the immediate effects of over-exposure 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.

**BorgWarner
Chemicals**

Date November 1, 1986
MSDS No. CS-0028-6A

5. HEALTH HAZARD INFORMATION (CONTINUED)

.. TOXICITY INFORMATION.....

- * Acute oral LD50 (rats) > 15.38g/kg
- * Acute inhalation LC50 (rats) > 2mg/L
- * Acute dermal LD50 (rabbits) > 800mg/kg
- * D.O.T. Corrosivity: Non-Corrosive
- * Primary Skin Irritation Study-Rabbits: Not a skin irritant.
- * Ninety-day Subacute Oral Toxicity Study (rats): No effect at the 300, 1,000, and 3,000 ppm levels.
- * Ninety-day Subacute Oral Toxicity Study (dogs): No effect at the 300, 1,000, and 3,000 ppm levels.
- * Survival Rate of Chick Embryos: WESTON 618 was not embryotoxic when injected into the yolk sac at the rate of 5mg/egg.
- * Not a mutagen by the Ames (Salmonella) assay.

.. FIRST AID PROCEDURES

INGESTION: If person is conscious, give large amounts of water to drink. Keep person warm and quiet. Get medical attention immediately.

INHALATION: Remove to fresh air immediately. If breathing has stopped, give artificial respiration. Keep the affected person warm and at rest. Get medical attention immediately.

SKIN CONTACT: Immediately wash with soap and water. If irritation develops, obtain medical attention. Remove contaminated clothing immediately, wash before reuse. Remove and discard contaminated shoes.

EYE CONTACT: Immediately wash with large amounts of water, keeping the lids open. Get medical attention immediately. Contact lenses should not be worn when working with this material.

7. ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

.. VENTILATION: Recommended; sufficient to control vapors and odors.

.. PERSONAL PROTECTIVE EQUIPMENT

DEGREE OF EXPOSURE	EYE	SKIN	RESPIRATORY	OTHERS
I CLOSED SYSTEM (REMOTE)	A	A	none	none
II OCCASIONAL (INFREQUENT)	A	A	none	B
III REPEATED & PROLONGED	B	A	A	BC
IV SPILLS (GROSS CONTACT)	B	B	A	BD

RESPIRATORY PROTECTION: NIOSH approved organic vapor cartridges.

GLOVES: Impervious, such as rubber or plastic.

KEY FOR PERSONAL PROTECTIVE EQUIPMENT

EYE	A SAFETY GLASSES	OTHERS	A FACESHIELD
	B CHEMICAL GOGGLES		B GLOVES
	C GAS TIGHT GOGGLES		C APRON
			D BOOTS
SKIN	A ORDINARY WORK CLOTHES		
	B IMPERVIOUS CLOTHING		
	C IMPERVIOUS AND GAS TIGHT		

RESPIRATORY PROTECTION

A HALF MASK W/CARTRIDGE
B FULL FACE W/CANNISTER
C FULL FACE W/SUPPLIED AIR

unk = UNKNOWN

n.a. = NOT APPLICABLE

> = GREATER THAN

< = LESS THAN

FOR ADDITIONAL INFORMATION TELEPHONE304-296-2554 or if
no answer 304-863-7480

DATE OF ISSUE
11/04/85

DATE REVISED
11/1/86

REPLACES
CS-0028-5A

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

CIBA-GEIGY CORPORATION
ADDITIVES DIVISION
SEVEN SKYLINE DRIVE
HAWTHORNE, NEW YORK 10532
(914) 785-2000

EMERGENCY PHONE NUMBER:

(800) 888-8372

SECTION I-IDENTITY INFORMATION

IDENTITY (TRADENAME): IRGANOX 565

FAMILY/CHEMICAL NAME:

4-((4,6-BIS(OCTYLTHIO)-S-TRIAZIN-2-YL)AMINO)-2,6-DI-TERT-BUTYLPHENOL, CAS REG. NO. 991-84-4

PRODUCT TYPE:

ANTIOXIDANT/STABILIZER.

IMPORTANT:

* THIS MATERIAL IS NOT INTENDED FOR USE IN PRODUCTS FOR *
* WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR ABRAD- *
* ED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS *
* SPECIFICALLY INTENDED, UNLESS THE FINISHED PRODUCT HAS *
* BEEN TESTED IN ACCORDANCE WITH THE FOOD AND DRUG ADMIN- *
* ISTRATION AND/OR OTHER APPLICABLE SAFETY TESTING RE- *
* QUIREMENTS. BECAUSE OF THE WIDE RANGE OF SUCH POTEN- *
* TIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE TO RECOM- *
* MEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR SUCH USES *
* AND ASSUMES NO LIABILITY FOR ANY SUCH USES. *

THE ABOVE DISCLAIMER HAS BEEN REVISED.

HAZARD STATEMENT :

* THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN *
* PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD *
* COMMUNICATION STANDARD 29 CFR 1910.1200. *
* THIS PRODUCT IS NOT CONSIDERED TO BE A HAZARDOUS *
* CHEMICAL UNDER THAT STANDARD. *

IRGANOX 565

SECTION II-HAZARDOUS INGREDIENTS

NONE KNOWN

SECTION III-PHYSICAL DATA

APPEARANCE:

WHITE TO OFF-WHITE, CRYSTALLINE POWDER.

ODOR:

ODORLESS.

BOILING POINT:

NOT DETERMINED.

MELTING POINT:

91-96C

DECOMPOSITION TEMPERATURE:

>220C.

EVAPORATION RATE:

NOT APPLICABLE.

PERCENT VOLATILE:

< 0.5%.

VAPOR DENSITY:

NOT APPLICABLE.

VAPOR PRESSURE:

AT 20C, CA. 1×10^{-10} (MM HG)

SOLUBILITY IN WATER:

AT 20C, INSOLUBLE

PH:

NOT APPLICABLE.

SPECIFIC GRAVITY:

1.1 (H₂O = 1)

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:

545F (MARCUSSE)

FLAMMABLE LIMITS IN AIR-LOWER:

NOT DETERMINED.

FLAMMABLE LIMITS IN AIR-UPPER:

NOT DETERMINED.

NFPA CODE:

NONE.

EXTINGUISHING MEDIA:

CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY.

FIRE FIGHTING PROCEDURES-SPECIAL:

USE SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

THE PRODUCT CAN FORM AN EXPLOSIVE DUST/AIR MIXTURE. AVOID DUST FORMATION AND CONTROL IGNITION SOURCES; EMPLOY GROUNDING, VENTING AND EXPLOSION RELIEF PROVISIONS IN ACCORD WITH ACCEPTED ENGINEERING PRACTICES IN PROCESS OPERATIONS CAPABLE OF GENERATING DUST AND/OR STATIC ELECTRICITY.

WARNING! NON-CONDUCTIVE PACKAGE AND/OR LINER. THIS APPLIES TO PRODUCT PACKAGED IN BOXES, LOOSE POLYETHYLENE-LINED FIBER DRUMS, OR PLASTIC PAILS. EMPTY ONLY INTO INERT OR NON-FLAMMABLE ATMOSPHERE. EMPTYING CONTENTS INTO A NON-INERT ATMOSPHERE WHERE FLAMMABLE VAPORS MAY BE PRESENT COULD CAUSE FLASH FIRE OR EXPLOSION DUE TO POSSIBLE ELECTROSTATIC DISCHARGE. SEE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODE 77, "RECOMMENDED PRACTICE ON STATIC ELECTRICITY," 1988 (OR LATEST) EDITION, CHAPTER 7, SECTIONS 8 AND 9, AND PLANT OPERATIONS PROGRESS, VOL. 7, NO. 1, JANUARY 1988 FOR MORE INFORMATION. THIS WARNING DOES NOT APPLY TO 1 POUND OR SMALLER CONTAINERS.

SECTION V-REACTIVITY DATA

STABILITY:

STABLE.

INCOMPATIBILITY:

STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION AND BURNING MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN OXIDES AND SULFUR OXIDES.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

SECTION VI-HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE:

DERMAL, INGESTION, AND INHALATION.

THRESHOLD LIMIT VALUE:

NONE ESTABLISHED.

ORAL LD50:

(RATS) >5000 MG/KG

DERMAL LD50:

(RABBITS) >2000 MG/KG

SKIN IRRITATION:

(RABBITS) MINIMAL (DRAIZE SCORE 0.1/8)

EYE IRRITATION:

(RABBITS) MINIMAL (DRAIZE SCORE 2.7/110)

SENSITIZATION:

(GUINEA PIGS) MILD SENSITIZER IN A MODIFIED MAXIMIZATION TEST (3/20 ANIMALS POSITIVE).

RIPT (HUMANS) NOT A PRIMARY IRRITANT AND NO EVIDENCE OF SENSITIZATION UNDER THE CONDITIONS OF THE STUDY; A 0.5% SOLUTION IN DIMETHYL PHTHALATE WAS TESTED.

INHALATION LC50:

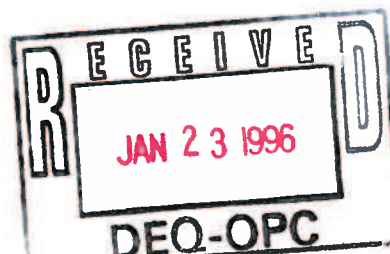
(RATS) >1 MG/L AIR FOR A 4-HOUR AEROSOL EXPOSURE WITH 94% OF PARTICLES <7 MICRONS.

TERATOGENICITY:

(RATS): NO EVIDENCE OF TERATOGENICITY OR OF SIGNIFICANT EFFECTS ON EMBRYO-FETAL DEVELOPMENTS.

MUTAGENICITY:

AMES TEST: NEGATIVE



NUCLEUS ANOMALY TEST, CHINESE HAMSTERS: NO EVIDENCE OF
MUTAGENIC EFFECTS
SISTER CHROMATID EXCHANGE STUDY, CHINESE HAMSTERS: NO
INDICATION OF MUTAGENIC EFFECTS
CELL TRANSFORMATION ASSAY: NO TRANSFORMATIVE PROPERTIES
OBSERVED
SIGNS AND SYMPTOMS OF EXPOSURE-ACUTE:
NO IDENTIFIED HEALTH EFFECTS.
SIGNS AND SYMPTOMS OF EXPOSURE-CHRONIC:
NO IDENTIFIED HEALTH EFFECTS.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
NONE KNOWN.
EMERGENCY AND FIRST AID PROCEDURES-EYES:
FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES.
GET MEDICAL ATTENTION.
EMERGENCY AND FIRST AID PROCEDURES-SKIN:
WASH WITH MILD SOAP AND WATER.
EMERGENCY AND FIRST AID PROCEDURES-INGESTION:
IF CONSCIOUS, GIVE LARGE QUANTITIES OF WATER. GET
MEDICAL ATTENTION.
EMERGENCY AND FIRST AID PROCEDURES-INHALATION:
REMOVE TO FRESH AIR.
EMERGENCY AND FIRST AID PROCEDURES-OTHER:
WASH CONTAMINATED CLOTHING PRIOR TO REUSE.

SECTION VII-SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:
SWEEP OR VACUUM AND PLACE INTO CLOSABLE CONTAINER FOR
DISPOSAL. WEAR PROTECTIVE EQUIPMENT SPECIFIED BELOW.
THOROUGHLY FLUSH RESIDUE WITH WATER.
WASTE DISPOSAL METHODS:
INCINERATE IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTER-
BURNER AND SCRUBBER. FOLLOW ALL FEDERAL, STATE AND LOCAL
REGULATIONS.
EFFLUENT DATA-BOD:
MODIFIED STURM TEST: NOT BIODEGRADABLE
AEROBIC SEWAGE OECD COUPLED UNITS TEST NO. 303A: AVERAGE
ELIMINATION MEASURED BY SPECIFIC ANALYSIS WAS 47.3% OF THE
INITIALLY MEASURED CONCENTRATION.
EFFLUENT DATA-COD:
2.41 G. COD/G.
SEWAGE BACTERIAL TOXICITY:
INIBITORY CONCENTRATION ON RESPIRATION OF AEROBIC WASTE WATER
BACTERIA: IC20, IC50, IC80 >100 PPM.
FISH TOXICITY:
ZEBRA FISH, LC50 96 H: >100 PPM
INVERTEBRATE TOXICITY:
-DAPHNIA MAGNA, EC50 24 H: >37 PPM

SECTION VIII-SPECIAL PROTECTION INFORMATION

VENTILATION:

USE LOCAL EXHAUST FOR DUSTY USE CONDITIONS.
PROTECTIVE GLOVES:
WEAR IMPERVIOUS GLOVES AS A STANDARD HANDLING PROCEDURE.
EYE PROTECTION:
WEAR SAFETY GLASSES OR GOGGLES TO PROTECT AGAINST DUST PARTICLES.
RESPIRATORY PROTECTION:
USE NIOSH APPROVED DUST MASK, IF REQUIRED.
OTHER PROTECTIVE EQUIPMENT:
WEAR COVERALLS.

SECTION IX-SPECIAL PRECAUTIONS

HANDLING PRECAUTIONS:
IN ACCORDANCE WITH GOOD INDUSTRIAL PRACTICE, HANDLE WITH CARE AND AVOID UNNECESSARY PERSONAL CONTACT. AVOID CONTACT WITH EYES AND PROLONGED OR REPEATED SKIN CONTACT. AVOID CONTINUOUS OR REPETITIVE BREATHING OF DUST. USE ONLY WITH ADEQUATE VENTILATION . FOR INDUSTRIAL USE ONLY.
SHIPPING AND STORING PRECAUTIONS:
KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING TRANSPORT.
PERSONAL HYGIENE:
WASH THOROUGHLY AFTER HANDLING.

SECTION X- REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:
NOT REGULATED AS A HAZARDOUS MATERIAL BY THE U.S. DEPT. OF TRANSPORTATION (DOT) 49 CFR 172.101 HAZARDOUS MATERIALS TABLE.
DOT CLASS:
NONE.
DOT NUMBER:
NONE.
RCRA STATUS:
NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).
CERCLA STATUS:
NOT LISTED.
SARA/TITLE III - TOXIC CHEMICALS LIST:
THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SEC. 313 (40 CFR 372).
TSCA INVENTORY STATUS:
CHEMICAL COMPONENTS LISTED ON TSCA INVENTORY.
CALIFORNIA PROPOSITION 65:
THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS CURRENTLY ON THE CALIFORNIA LIST OF KNOWN CARCINOGENS AND REPRODUCTIVE TOXINS.
NEW JERSEY RIGHT-TO-KNOW LABELING INFORMATION:
THIS PRODUCT CONTAINS THE FOLLOWING :

CHEMICAL NAME : 4-{{4,6-BIS(OCTYLTHIO)-1,3,5-TRIAZIN-2-YL}AM

CAS NUMBER : 991-84-4
INO)-2,6-DI-TERT-BUTYLPHENOL

* * *

PENNSYLVANIA RIGHT-TO-KNOW ACT:
THE FOLLOWING IS REQUIRED COMPOSITION INFORMATION.

CHEMICAL NAME : PHENOL, 4-({4,6-BIS(OCTYLTHIO)-1,3,5-TRIAZIN
-2-YL}AMINO)-2,6-BIS(1,1-DIMETHYLETHYL)-
CAS NUMBER : 991-84-4
COMMON NAME : 4-({4,6-BIS(OCTYLTHIO)-S-TRIAZIN-2-YL}AMINO}
-2,6-DI-TERT-BUTYLPHENOL; IRGANOX 565
COMMENTS : NOT ON PENNSYLVANIA HAZARDOUS SUBSTANCE LIST.
* * *

ISSUE DATE: 06/14/91 REVISION: 13C
FOR FURTHER INFORMATION, PLEASE CONTACT: BRUCE SCHWEMMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE
BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE
OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH
RESPECT TO THE INFORMATION CONTAINED HEREIN.

Rec
7/12/91

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

CIBA-GEIGY CORPORATION
ADDITIVES DIVISION
SEVEN SKYLINE DRIVE
HAWTHORNE, NEW YORK 10532
(914) 785-2000

EMERGENCY PHONE NUMBER:

(800) 888-8372

SECTION I-IDENTITY INFORMATION

IDENTITY (TRADE NAME): IRGANOX 1425

Master File
Do Not Remove
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FAMILY/CHEMICAL NAME:

CALCIUM BIS(MONOETHYL(3,5-DI-TERT-BUTYL-4-HYDROXYBENZYL)
PHOSPHONATE), CAS REG. NO. 65140-91-2

PRODUCT TYPE:

ANTIOXIDANT.

IMPORTANT:

* THIS MATERIAL IS NOT INTENDED FOR USE IN PRODUCTS FOR *
* WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR ABRAD- *
* ED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS *
* SPECIFICALLY INTENDED, UNLESS THE FINISHED PRODUCT HAS *
* BEEN TESTED IN ACCORDANCE WITH THE FOOD AND DRUG ADMIN- *
* ISTRATION AND/OR OTHER APPLICABLE SAFETY TESTING RE- *
* QUIREMENTS. BECAUSE OF THE WIDE RANGE OF SUCH POTEN- *
* TIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE TO RECOM- *
* MEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR SUCH USES *
* AND ASSUMES NO LIABILITY FOR ANY SUCH USES. *

THE ABOVE DISCLAIMER HAS BEEN REVISED.

HAZARD STATEMENT :

* THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN *
* PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD *
* COMMUNICATION STANDARD 29 CFR 1910.1200. *
* THIS PRODUCT IS NOT CONSIDERED TO BE A HAZARDOUS *
* CHEMICAL UNDER THAT STANDARD. *

IRGANOX 1425

SECTION II-HAZARDOUS INGREDIENTS

SPECIFIC CHEMICAL NAME:
NONE KNOWN

SECTION III-PHYSICAL DATA

APPEARANCE:
OFF-WHITE POWDER.
ODOR:
ODORLESS.
BOILING POINT:
NOT APPLICABLE.
MELTING POINT:
>260C
DECOMPOSITION TEMPERATURE:
>260C
EVAPORATION RATE:
NOT APPLICABLE.
PERCENT VOLATILE:
<0.5 BY WEIGHT
VAPOR DENSITY:
NOT APPLICABLE.
VAPOR PRESSURE:
AT 25C, CA. 1×10^{-13} (MM HG)
SOLUBILITY IN WATER:
AT 25C, INSOLUBLE
PH:
NOT APPLICABLE.
SPECIFIC GRAVITY:
CA. 1.2 (H₂O = 1)

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:
>302F (MARCUSON)
FLAMMABLE LIMITS IN AIR-LOWER:
NOT DETERMINED.
FLAMMABLE LIMITS IN AIR-UPPER:
NOT DETERMINED.
NFPA CODE:
NONE.
EXTINGUISHING MEDIA:
CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY.
FIRE FIGHTING PROCEDURES-SPECIAL:
USE SELF-CONTAINED BREATHING APPARATUS.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
THE PRODUCT CAN FORM AN EXPLOSIVE DUST/AIR MIXTURE. AVOID
DUST FORMATION AND CONTROL IGNITION SOURCES; EMPLOY GROUND-
ING, VENTING AND EXPLOSION RELIEF PROVISIONS IN ACCORD WITH
ACCEPTED ENGINEERING PRACTICES IN PROCESS OPERATIONS CAP-
ABLE OF GENERATING DUST AND/OR STATIC ELECTRICITY.

WARNING! NON-CONDUCTIVE PACKAGE AND/OR LINER. THIS APPLIES TO PRODUCT PACKAGED IN BOXES, LOOSE POLYETHYLENE-LINED FIBER DRUMS, OR PLASTIC PAILS. EMPTY ONLY INTO INERT OR NON-FLAMMABLE ATMOSPHERE. EMPTYING CONTENTS INTO A NON-INERT ATMOSPHERE WHERE FLAMMABLE VAPORS MAY BE PRESENT COULD CAUSE FLASH FIRE OR EXPLOSION DUE TO POSSIBLE ELECTROSTATIC DISCHARGE. SEE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODE 77, "RECOMMENDED PRACTICE ON STATIC ELECTRICITY," 1988 (OR LATEST) EDITION, CHAPTER 7, SECTIONS 8 AND 9, AND PLANT OPERATIONS PROGRESS, VOL. 7, NO. 1, JANUARY 1988 FOR MORE INFORMATION. THIS WARNING DOES NOT APPLY TO 1 POUND OR SMALLER CONTAINERS.

SECTION V-REACTIVITY DATA

STABILITY:

STABLE.

INCOMPATIBILITY:

NONE KNOWN.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION AND BURNING MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, AND PHOSPHORUS OXIDES.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

SECTION VI-HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE:

DERMAL, INGESTION, AND INHALATION.

THRESHOLD LIMIT VALUE:

NONE ESTABLISHED.

ORAL LD50:

(RATS) >6000 MG/KG; (CHINESE HAMSTERS) >2000 MG/KG

INTRAPERITONEAL LD50:

(RATS) 662 MG/KG (ESTIMATE)

SKIN IRRITATION:

(RABBITS) MINIMAL (DRAIZE SCORE 0.2/8)

PHOTOTOXICITY:

(HUMANS) NEGATIVE

EYE IRRITATION:

(RABBITS) NONE (DRAIZE SCORE 0/110)

SENSITIZATION:

(GUINEA PIGS) NO ANIMAL SENSITIZED IN MODIFIED MAXIMIZATION TEST.

INHALATION LC50:

(RATS) >2.35 MG/L AIR FOR A 4-HOUR AEROSOL EXPOSURE WITH APPROX. 80% OF PARTICLES <7 MICRONS.

TERATOGENICITY:

(RATS) DEVOID OF EMBRYOTOXIC ACTIVITY AND NO TERATOGENIC POTENCY

MUTAGENICITY:

AMES TEST: NEGATIVE.

NUCLEUS ANOMALY TEST, CHINESE HAMSTER: NO EVIDENCE OF
MUTAGENIC EFFECTS.

SIGNS AND SYMPTOMS OF EXPOSURE-ACUTE:

NO IDENTIFIED HEALTH EFFECTS.

SIGNS AND SYMPTOMS OF EXPOSURE-CHRONIC:

NO IDENTIFIED HEALTH EFFECTS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

NONE KNOWN.

EMERGENCY AND FIRST AID PROCEDURES-EYES:

FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES.

GET MEDICAL ATTENTION.

EMERGENCY AND FIRST AID PROCEDURES-SKIN:

WASH WITH MILD SOAP AND WATER.

EMERGENCY AND FIRST AID PROCEDURES-INGESTION:

IF CONSCIOUS, GIVE LARGE QUANTITIES OF WATER. GET MEDICAL ATTENTION.

EMERGENCY AND FIRST AID PROCEDURES-INHALATION:

REMOVE TO FRESH AIR.

EMERGENCY AND FIRST AID PROCEDURES-OTHER:

WASH CONTAMINATED CLOTHING PRIOR TO REUSE.

SECTION VII-SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:

SWEEP OR VACUUM AND PLACE INTO CLOSABLE CONTAINER FOR DISPOSAL. WEAR PROTECTIVE EQUIPMENT SPECIFIED BELOW.

THOROUGHLY FLUSH RESIDUE WITH WATER.

WASTE DISPOSAL METHODS:

INCINERATE IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTER-BURNER AND SCRUBBER. FOLLOW ALL FEDERAL, STATE AND LOCAL REGULATIONS.

EFFLUENT DATA-BOD:

STURM TEST: NOT BIODEGRADABLE, WITH 1 - 26% IN 28 DAYS.

SEWAGE BACTERIAL TOXICITY:

INHIBITORY CONCENTRATION ON RESPIRATION OF AEROBIC WASTE WATER

BACTERIA: IC20, IC50, IC80 >100 PPM

FISH TOXICITY:

ZEBRA FISH, ACUTE 96 HOUR LC50: >100 PPM

INVERTEBRATE TOXICITY:

DAPHNIA MAGNA, ACUTE 24 HOUR EC50: 510 PPM

SECTION VIII-SPECIAL PROTECTION INFORMATION

VENTILATION:

USE LOCAL EXHAUST.

PROTECTIVE GLOVES:

WEAR GLOVES AS A STANDARD HANDLING PROCEDURE.

EYE PROTECTION:

WEAR SAFETY GLASSES OR GOGGLES TO PROTECT AGAINST DUST PARTICLES.

RESPIRATORY PROTECTION:

USE NIOSH APPROVED DUST MASK, IF REQUIRED.

OTHER PROTECTIVE EQUIPMENT:

WEAR COVERALLS.

SECTION IX-SPECIAL PRECAUTIONS

HANDLING PRECAUTIONS:

IN ACCORDANCE WITH GOOD INDUSTRIAL PRACTICE, HANDLE WITH CARE AND AVOID UNNECESSARY PERSONAL CONTACT. AVOID CONTACT WITH EYES AND PROLONGED OR REPEATED SKIN CONTACT. AVOID CONTINUOUS OR REPETITIVE BREATHING OF DUST. USE ONLY WITH ADEQUATE VENTILATION. FOR INDUSTRIAL USE ONLY.

SHIPPING AND STORING PRECAUTIONS:

KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING TRANSPORT.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING.

SECTION X- REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:

NOT REGULATED AS A HAZARDOUS MATERIAL BY THE U.S. DEPT. OF TRANSPORTATION (DOT) 49 CFR 172.101 HAZARDOUS MATERIALS TABLE.

DOT CLASS:

NONE.

DOT NUMBER:

NONE.

RCRA STATUS:

NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).

CERCLA STATUS:

NOT LISTED.

SARA/TITLE III - TOXIC CHEMICALS LIST:

THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SEC. 313 (40 CFR 372).

TSCA INVENTORY STATUS:

CHEMICAL COMPONENTS LISTED ON TSCA INVENTORY.

CALIFORNIA PROPOSITION 65:

THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS CURRENTLY ON THE CALIFORNIA LIST OF KNOWN CARCINOGENS AND REPRODUCTIVE TOXINS.

NEW JERSEY RIGHT-TO-KNOW LABELING INFORMATION:

THIS PRODUCT CONTAINS THE FOLLOWING :

CHEMICAL NAME : CALCIUM BIS(MONOETHYL(3,5-DI-TERT-BUTYL-4-HYDROXYBENZYL)PHOSPHONATE}

CAS NUMBER : 65140-91-2

* * *

PENNSYLVANIA RIGHT-TO-KNOW ACT:

THE FOLLOWING IS REQUIRED COMPOSITION INFORMATION.

CHEMICAL NAME : PHOSPHONIC ACID, ({3,5-BIS(1,1-DIMETHYLETHYL)-4-HYDROXYPHENYL}METHYL)-, MONOETHYL ESTER, CALCIUM SALT (2:1)

CAS NUMBER : 65140-91-2

COMMON NAME : CALCIUM BIS(MONOETHYL(3,5-DI-TERT-BUTYL-4-HY
DROXYBENZYL)PHOSPHONATE); IRGANOX 1425
COMMENTS : NOT ON PENNSYLVANIA HAZARDOUS SUBSTANCE LIST.

* * *

ISSUE DATE: 06/14/91 REVISION: 11C
FOR FURTHER INFORMATION, PLEASE CONTACT: BRUCE SCHWEMMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE
BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE
OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH
RESPECT TO THE INFORMATION CONTAINED HEREIN.

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 -- (908) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

1949 MO6
EFFECTIVE: 03/09/92

PHENOL

PAGE: 1
ISSUED: 03/28/92

J.T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

SECTION 1 - PRODUCT IDENTIFICATION

PRODUCT NAME: PHENOL
COMMON SYNONYMS: CARBOLIC ACID; HYDROXYBENZENE; MONOHYDROXYBENZENE; PHENIC
ACID; PHENYLIC ACID
CHEMICAL FAMILY: PHENOLS
FORMULA: C6H5OH
FORMULA WT.: 94.11
CAS NO.: 108-95-2
NIOSH/ATECS NO.: SJ3325000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 2862, 2858, TEST, 4056

PRECAUTIONARY LABELING

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	3	SEVERE (LIFE)
FLAMMABILITY	-	2	MODERATE
REACTIVITY	-	1	SLIGHT
CONTACT	-	4	EXTREME (CORROSIVE)

LABORATORY PROTECTIVE EQUIPMENT

CODE NOT ON FILE

U.S. PRECAUTIONARY LABELING

POISON DANGER

COMBUSTIBLE. CAUSES SEVERE BURNS. RAPIDLY ABSORBED THROUGH SKIN. MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. EXCEPTIONAL HEALTH AND CONTACT HAZARDS: READ MATERIAL SAFETY DATA SHEET.
KEEP AWAY FROM HEAT, SPARKS, FLAME. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE DUST. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. IN CASE OF SPILL, SWEEP UP AND REMOVE. FLUSH SPILL AREA WITH WATER.

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PRECAUTIONARY LABELING (CONTINUED)

=====

INTERNATIONAL LABELING

TOXIC IN CONTACT WITH SKIN AND IF SWALLOWED. CAUSES BURNS.
KEEP OUT OF REACH OF CHILDREN. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH
PLENTY OF SOAP AND WATER. IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE
LABEL WHERE POSSIBLE).

SAF-T-DATA* STORAGE COLOR CODE: RED STRIPE (STORE SEPARATELY)

=====

SECTION II - COMPONENTS

=====

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
PHENOL	108-95-2	99-100	5 PPM	5 PPM

=====

SECTION III - PHYSICAL DATA

=====

BOILING POINT: 182 C (359 F)
(AT 760 MM HG)

VAPOR PRESSURE (MMHG): 0.35
(20 C)

MELTING POINT: 40 C (104 F)
(AT 760 MM HG)

VAPOR DENSITY (AIR=1): 3.24

SPECIFIC GRAVITY: 1.07
(H2O=1)

EVAPORATION RATE: <1
(BUTYL ACETATE = 1)

SOLUBILITY(H2O): MODERATE (1-10%)

% VOLATILES BY VOLUME: 100
(21 C)

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: SOLID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: COLORLESS TO PINK CRYSTALS. SWEET ODOR.

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PHENOL

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA

=====

FLASH POINT (CLOSED CUP): 79 C (175 F) NFPA 704M RATING: 3-2-0

AUTOIGNITION TEMPERATURE: 714 C (1319 F)

FLAMMABLE LIMITS: UPPER - 8.6 % LOWER - 1.5 %

FIRE EXTINGUISHING MEDIA

USE WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS

GIVES OFF HEAVY SMOKE. GIVES OFF FLAMMABLE VAPORS. VAPORS MAY FORM EXPLOSIVE MIXTURE WITH AIR. CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE.

TOXIC GASES PRODUCED

CARBON MONOXIDE, CARBON DIOXIDE

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): 19 MG/M3 (5 PPM)

THE TLV LISTED DENOTES TLV (SKIN).

SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED

PERMISSIBLE EXPOSURE LIMIT (PEL): 19 MG/M3 (5 PPM)

THE PEL LISTED DENOTES PEL (SKIN).

CONTINUED ON PAGE: 4

1949 M06
EFFECTIVE: 03/09/92

PHENOL

PAGE: 4
ISSUED: 03/28/92

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

TOXICITY OF COMPONENTS

ORAL RAT LD50 FOR PHENOL	317	MG/KG
SKIN RAT LD50 FOR PHENOL	609	MG/KG
INTRAPERITONEAL RAT LD50 FOR PHENOL	127	MG/KG
INHALATION RAT LC50 FOR PHENOL	316	MG/M3
CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO USHA REG: NO		

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE, COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE, EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS, UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS AND MAY BE FATAL

SKIN CONTACT: IRRITATION

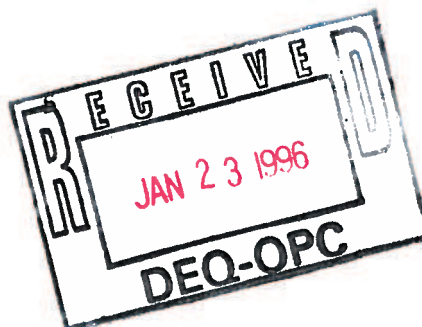
EYE CONTACT: IRRITATION

SKIN ABSORPTION: GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE, COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE, EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS, UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS AND MAY BE FATAL

INGESTION: GASTROINTESTINAL PAIN, DILATED PUPILS, IRREGULAR PULSE, COLD LIMBS, BLOODY URINE, INCREASED SWEATING, PULMONARY EDEMA, PULMONARY EDEMA, REDUCED BODY TEMPERATURE, EUPHORIA (FOLLOWED BY CNS DEPRESSION), CYANOSIS, UNCONSCIOUSNESS, COMA, CONVULSIONS, LOCAL TISSUE NECROSIS AND MAY BE FATAL

CHRONIC EFFECTS: NONE IDENTIFIED

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SECTION V - HEALTH HAZARD DATA (CONTINUED)

TARGET ORGANS
LIVER, KIDNEYS, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
KIDNEY DISORDERS

PRIMARY ROUTES OF ENTRY
INHALATION, ABSORPTION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, GIVE
ACTIVATED CHARCOAL IN WATER, OLIVE OIL, OR MARGARINE. THEN
INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE
OXYGEN.

SKIN CONTACT: IN CASE OF SKIN CONTACT, IMMEDIATELY REMOVE ALL CONTAMINATED
CLOTHING AND SHOES. SWAB ALL CONTAMINATED SKIN WITH COTTON
WOOL SOAKED IN GLYCEROL OR POLYETHYLENE GLYCOL FOR AT LEAST
10 MINUTES. WASH SKIN WITH COPIOUS AMOUNTS OF SOAPY WATER
FOR AN ADDITIONAL 15 MINUTES. REMOVE THE VICTIM TO A PLACE
EQUIPPED WITH RESUSCITATION EQUIPMENT AND OBSERVE FOR 24
HOURS.

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: YES PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: YES CONTAINS PHENOL (RQ = 1,000 LBS, TPQ =
500/10,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS PHENOL (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: YES CONTAINS PHENOL

GENERIC CLASS: COS

TSCA INVENTORY: YES

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J.T.BAKER INC. 224 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 -- (908) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

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SECTION IX - STORAGE AND HANDLING PRECAUTIONS

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SAF-T-DATA* STORAGE COLOR CODE: RED STRIPE (STORE SEPARATELY)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED,
FLAMMABLE LIQUID STORAGE AREA OR CABINET. ISOLATE FROM INCOMPATIBLE
MATERIALS. STORE IN LIGHT-RESISTANT CONTAINERS.

SPECIAL PRECAUTIONS

MATERIAL IS HYGROSCOPIC.

=====

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

=====

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: PHENOL
HAZARD CLASS: POISON B
UN/NA: UN1671 REPORTABLE QUANTITY: 1000 LBS.
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.101; 173.309

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: PHENOL, SOLID
HAZARD CLASS: 6.1
UN: UN1671 MARINE POLLUTANTS: NO
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.102; PART 176; IMDG

I.M.O. PAGE: 6199
PACKAGING GROUP: II

AIR (I.C.A.O.)

PROPER SHIPPING NAME: PHENOL, SOLID
HAZARD CLASS: 6.1
UN: UN1671
LABELS: POISON
REGULATORY REFERENCES: 49CFR 172.101; 173.6; PART 175; ICAO/IATA== WE BELIEVE
THE TRANSPORTATION DATA AND REFERENCES CONTAINED HEREIN
TO BE FACTUAL AND THE OPINION OF QUALIFIED EXPERTS. THE
DATA IS MEANT AS A GUIDE TO THE OVERALL CLASSIFICATION
OF THE PRODUCT AND IS NOT PACKAGE SIZE SPECIFIC, NOR
SHOULD IT BE TAKEN AS A WARRANTY OR REPRESENTATION FOR
WHICH THE COMPANY ASSUMES LEGAL RESPONSIBILITY.== THE
INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION,
INVESTIGATION, AND VERIFICATION. ANY USE OF THE

CONTINUED ON PAGE: 8

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SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION (CONTINUED)

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INFORMATION MUST BE DETERMINED BY THE USER TO BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. SEE SHIPPER REQUIREMENTS 49CFR 172.3 AND EMPLOYEE TRAINING 49CFR 173.1.

U.S. CUSTOMS HARMONIZATION NUMBER: 29071100007

=====

N/A = NOT APPLICABLE OR NOT AVAILABLE
N/E = NOT ESTABLISHED

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES.

EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL. BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET.

NOTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE NUMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL NON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE (1-800-JTBAKER) FOR ASSISTANCE.

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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

24-HOUR EMERGENCY TELEPHONE -- (908) 859-2151

CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

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PHENOL

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APPROVED BY QUALITY ASSURANCE DEPARTMENT.

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"ISSUED BY VWR 01/09/93"

MATERIAL SAFETY DATA SHEET

IDENTITY (As used on label) Phenolic Resin Bonded Structural Panels		MANUFACTURER'S NAME Champion International Corporation	
NYMS Plywood		ADDRESS One Champion Plaza Stamford, CT	
CAS NUMBER None		EMERGENCY TELEPHONE NO. 203-358-6493	
DATE PREPARED 7/31/89		INFORMATION TELEPHONE NO. 203/358-6493	

I. HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	ACGIH STEL	OSHA STEL	OSHA PEL	ACGIH TLV	%
Softwood dust	10 mg/mn ³	10mg/m ³	5mg/m ³	5 mg/m ³	98-86
Hardwood dust (beech, oak)	none	10 mg/m ³	5 mg/m ³	1 mg/m ³	98-86
Free Formaldehyde (Action level .5 ppm)	2 ppm	2 ppm	1 ppm	1 ppm	< .04
Many states have their own occupational safety and health regulations and may have more restrictive limits.					

II. PHYSICAL DATA

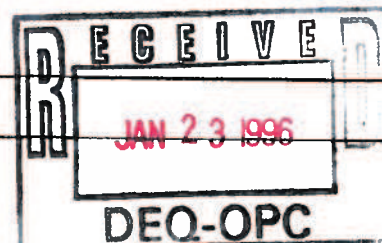
BOILING POINT (760 mm, Hg)	N/A	MELTING POINT	N/A	pH	N/A
SPECIFIC GRAVITY (H ₂ O = 1)	0.8	VAPOR PRESSURE AT 20° C	N/A		
RELATIVE DENSITY (air = 1)	N/A	SOLUBILITY IN WATER, % by wt.	6%		
PERCENT VOLATILES BY VOLUME	0	EVAPORATION RATE (Butyl Acetate = 1)	N/A		
APPEARANCE AND ODOR	White, brown, or tan panel with slightly aromatic wood odor.				

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	N/A		AUTOIGNITION TEMPERATURE	400-500°F		
FLAMMABLE LIMITS IN AIR, percent by volume			LOWER (LEL)	N/A	UPPER (UEL)	N/A
EXTINGUISHING MEDIA:	Water, Sand					
SPECIAL FIRE FIGHTING PROCEDURES:	Use water to wet down dust to reduce the likelihood of ignition or dispersion of dust into the air. Remove burned or wet dust to open area after fire is extinguished.					
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Wood dust is a strong to severe explosion hazard if a dust "cloud" contacts an ignition source.					

IV. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID	
Unstable	Stable	Good housekeeping and routine disposal of panel dust is recommended.	
	X		
INCOMPATIBILITY (materials to avoid)			
Oxidizing agents and drying oils.			
HAZARDOUS DECOMPOSITION PRODUCTS:			
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID	
May Occur	Will Not Occur	N/A	
	X		



V. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE

1. Acute Overexposure: Panel dust may be mechanical irritant to eyes. Excessive concentration may cause deposit in nasal passages resulting in rhinorrhea, dry cough, wheezing, sinusitis.
2. Chronic Overexposure: Some species of wood dust can elicit allergic contact dermatitis in sensitized individuals as well as mechanical irritation resulting in erythema and hives. Prolonged exposure to certain species of hardwood dust have been statistically associated with nasal cancer in British furniture workers.

NOTE: These products are manufactured using a phenol-formaldehyde thermoset resin. Maximum indoor formaldehyde levels associated with freshly manufactured panels are similar to outdoor background levels in urban areas (less than 0.1 ppm; and levels decrease through time as the panels age).

EMERGENCY AND FIRST AID PROCEDURES

1. Inhalation: Remove to fresh air. If persistent irritation, severe coughing, breathing difficulties or rash occur, seek medical advice. (Primary route of exposure is inhalation.)
2. Eyes: Panel dust may mechanically irritate the eye resulting in redness or watering. Flush with water to remove dust particles. If irritation persists, seek medical attention.
3. Skin: Various species of wood dust can elicit allergic contact dermatitis in sensitized individuals after repetitive contact. If a rash, or persistent irritation, or dermatitis occur, seek medical advice.
4. Ingestion: N/A

VI. PRECAUTIONS FOR SAFE HANDLING AND USE

Special handling precautions are required. Panels are combustible. Keep in cool, dry place away from open flame and other sources of ignition.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Not applicable for product in purchased form. Panel dust may be vacuumed or shoveled for recovery or disposal. Avoid dusting conditions. Provide good ventilation where dusting is possible. Use NIOSH/MSHA approved dust respirator and goggles where ventilation is not possible.

WASTE DISPOSAL METHOD

If disposed or discarded in its purchased form, incineration is preferable. Dry land disposal is acceptable in most states. It is, however, the user's responsibility to determine at the time of disposal whether your product meets federal, state or local regulations.

VIII. CONTROL MEASURES

Precautions: If this product is used in a process which generates dust levels in excess of the allowable exposure limit(s) for wood dust, a NIOSH/MSHA approved dust respirator and goggles should be worn. Due to the explosive potential of wood dust when suspended in air, precautions should be taken to prevent sparks or other ignition sources in ventilation systems. Use of totally enclosed motors is recommended or may be warranted if process generates excessive levels of wood dust.

DISCLAIMER

The information set forth herein is offered as a service to our customers and is not intended to relieve a customer from its responsibility to determine the suitability of this information or of the materials described herein for purchaser's purposes, to investigate other sources of information, to comply with all laws and procedures regarding safe use of these materials; and to use these materials in a safe manner. Although this information is believed to be accurate, Champion specifically disclaims responsibility for any inaccuracy set forth herein. Thus, Champion disclaims liability of any kind arising from any party's use of or reliance on information or recommendations set forth herein. Furthermore, no warranty of any kind shall be construed to arise by implication from any information or recommendation contained herein, or otherwise.

I. PRODUCT IDENTIFICATION

CHEMICAL NAME AND SYNONYMS		Phenolic Resin Cement	REGULAR TELEPHONE NO. 302-995-0400
			EMERGENCY TELEPHONE NO. 302-995-0496
CHEMICAL FAMILY	Phenolic Resins	CAS NO.	Not Applicable
FORMULA	Not Applicable	MOLECULAR WEIGHT	Not Applicable
TRADE NAME AND SYNONYMS	Haveg 41-NF Cement		

II. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV-TWA VALUES ADOPTED BY ACGIH
Talc (nonabestiform)	(by wgt.) 50	20 mppcf

III. PHYSICAL DATA

BOILING POINT, 760 mm Hg	Not Applicable	FREEZING POINT	Not Applicable
VAPOR PRESSURE @	" "	SPECIFIC GRAVITY (H ₂ O=1)	1.73 (uncured)
VAPOR DENSITY (AIR=1)	" "	PERCENT VOLATILE BY VOLUME (%)	Not Applicable
SOLUBILITY IN WATER, % BY WEIGHT @	Negligible	EVAPORATION RATE (BUTYL ACETATE=1)	" "

APPEARANCE AND ODOR: Light brown colored, putty-like material - Characteristic Phenolic odor

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD)	Not Applicable	AUTOIGNITION TEMPERATURE	Not Applicable
FLAMMABLE LIMITS IN AIR PERCENT BY VOLUME	LOWER Not Applicable	UPPER Not Applicable	

EXTINGUISHING MEDIA:

Water

SPECIAL FIRE-FIGHTING PROCEDURES:

NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS:

NONE

NOTES: NA = NOT APPLICABLE

We cannot anticipate all conditions under which this information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combination for their own purposes. Unless otherwise agreed in writing, we sell the products without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of our products, whether used alone or in combination with other products.

V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: Not established.

EFFECTS OF OVEREXPOSURE: Excessive contact with skin may result in dermatitis in some individuals.

EMERGENCY AND FIRST AID PROCEDURES: Wash off skin with soap and water. If material gets in the eyes, flush with copious quantities of water and consult a physician.

VI. REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID: NONE
UNSTABLE	
STABLE	

X

INCOMPATIBILITY (MATERIALS TO AVOID): NONE

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide and/or carbon dioxide.

HAZARDOUS	MAY OCCUR	X	CONDITIONS TO AVOID: Do not use excess of catalyst, otherwise rapid polymerization will occur.
POLYMERIZATION	WILL NOT OCCUR		

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: If uncatalyzed cement is spilled near a water way, it should be scooped up immediately to prevent leaching of phenolic resin from the material into the water.

WASTE DISPOSAL METHOD: Landfill in accordance with state and federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)	NONE			
VENTILATION	LOCAL EXHAUST	--	SPECIAL	--
	MECHANICAL (GENERAL)	--	OTHER	--
PROTECTIVE GLOVES: Rubber gloves			EYE PROTECTION: Use safety glasses	
OTHER PROTECTIVE EQUIPMENT: --			when mixing with acid catalyst	

IX. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING:

- 1.) CAUTION: Hardener is an acid solution - avoid contact with the skin and eyes - use rubber gloves.
- 2.) CAUTION: When preparing surfaces of Havg 41 equipment, which contain asbestos, it is possible that airborne dust would be generated, in which case OSHA Asbestos Standard 29 CFR 1910.1001 must be complied with for protection of workers and others.

OTHER HANDLING AND STORAGE CONDITIONS: Store at temperatures between 40°F. and 70°F. in a sealed container to insure optimum shelf life.



MATERIAL SAFETY DATA SHEET

ULTRANOX® U257

05/07/93 PAGE 01/03

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

MANUFACTURER / SUPPLIER

GE Specialty Chemicals
5th & Avery Streets
Parkersburg, WV 26102

EMERGENCY TELEPHONE

(800) 447-4545 (24 hour)
(304) 296-2554 (24 hour)

Medical
Other

NON-EMERGENCY TELEPHONE

(800) 872-0022

PRODUCT IDENTIFIER:

ULTRANOX

PRODUCT DESCRIPTION:

Butylated reaction product of the condensation
of p-cresol and dicyclopentadiene (CAS# 68610-51-5).

PRODUCT USE:

Antioxidant/stabilizer for use in polymers.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Additional compositional data are provided in the REGULATORY INFORMATION
section for WHMIS, SARA 313, California Proposition 65 and various state
right-to-know laws.

CAS NUMBER	OSHA	UNITS	ACGIH	UNITS
68610-51-5				
4-methylphenol, reaction products with dicyclopentadiene & isobutylene				
	5.0	mg/m3		(GE exposure limit)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Material with a slight hydrocarbon odor.
Can burn in a fire creating dense toxic smoke.

POTENTIAL HEALTH EFFECTS

EYE:

Product may cause irritation or injury due to
mechanical action.

SKIN:

May cause mild irritation.

INGESTION:

Not Tested

INHALATION:

May be irritating to the respiratory tract.

CHRONIC/CARCINOGENICITY

NTP:

Not Tested

OSHA:

Not Regulated

IARC:

Not Listed

MEDICAL RESTRICTIONS:

Certain skin sensitive individuals and
individuals with respiratory impairments may be affected by exposure to this
product.

4. FIRST AID MEASURES

EYES:

Remove contact lenses at once. Immediately
flush eyes well with copious quantities of water or normal saline for at
least 20-30 minutes. Seek medical attention.

SKIN:

Immediately wash with soap and water for at
least 15 minutes. If irritation develops, seek medical attention. Remove
contaminated clothing immediately.

INGESTION:

Not probable. If a large amount is swallowed,
seek medical attention.

INHALATION:

If inhaled, move victim to fresh air and
immediately seek medical attention.

5. FIRE FIGHTING MEASURES

FIRE FIGHTING: Approved pressure demand breathing apparatus and protective clothing should be used for all fires. Use extinguishing water stream carefully and contain runoff.

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

HAZARDOUS COMBUSTION PRODUCTS: Hazardous combustion products may include intense heat, dense black smoke, carbon monoxide, carbon dioxide and hydrocarbon fragments.

FLASH POINT: 215 C (419 F)

LOWER FLAMMABLE LIMIT: Not Established

UPPER FLAMMABLE LIMIT: Not Established

AUTOIGNITION: Not Established

CONDITIONS OF FLAMMABILITY: Requires a continuous flame source to ignite.

EXPLOSION DATA

IMPACT SENSITIVITY: Not sensitive to mechanical impact.

STATIC DISCHARGE: Sensitive to static discharge under dust cloud conditions.

6. ACCIDENTAL RELEASE MEASURES

GENERAL: Contain spills. Prevent runoff to waterways. Transfer spilled materials and contaminated soil into dry impervious containers. Dispose of in accordance with federal, state and local regulations. Residual materials may be cleaned up with soap, water and sorbents. (See DISPOSAL INFORMATION)

7. HANDLING AND STORAGE

HANDLING: Follow recommendations on label and in technical literature. Avoid inhalation of dust and contact with skin and eyes. Use good industrial hygiene practices. Provide adequate ventilation. Avoid dust cloud generation and dust accumulation; employ bonding, grounding, venting and explosion relief provisions in accordance with accepted engineering practices.

STORAGE: Store in a dry place away from excessive heat. Avoid storage near foods to prevent food contamination.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Ventilation requirements must be locally determined to limit exposure to materials at their point of use. Design techniques and guidelines may be found in publications such as:

Industrial Ventilation; available from the American Conference of Governmental Industrial Hygienists, Committee on Industrial Ventilation; P.O. Box 16153, Lansing, MI 48901.

PERSONAL PROTECTION

EYE/FACE: Wear safety glasses with side shields or chemical goggles.

SKIN: When handling avoid contact with skin. Use appropriate protective clothing, including chemical resistant gloves.

RESPIRATORY: When dust and powder are not adequately controlled, use respirator approved for protection from dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Solid

ODOR AND APPEARANCE: Powder with slight odor.

BOILING POINT: Not Applicable

MELTING POINT: 115 C (239 F)

VAPOR PRESSURE (mmHg): Not Applicable

VAPOR DENSITY (air=1): Not Applicable

SPECIFIC GRAVITY (water=1): 1.1 @ 20 C

WATER SOLUBILITY: Insoluble

% VOLATILES: Not Applicable

pH: Not Applicable

ODOR THRESHOLD: Not Established

EVAPORATION RATE: Not Applicable

COEFFICIENT WATER/OIL DISTR: Not Established

10. STABILITY AND REACTIVITY

STABILITY: Stable under recommended conditions of storage and handling.
REACTIVITY: Reacts with strong oxidizers.
CONDITIONS TO AVOID: Avoid getting product wet during storage or transportation.
HAZARDOUS DECOMPOSITION: Not Established

11. TOXICOLOGICAL INFORMATION

PRODUCT:
ACUTE ORAL: Oral LD50 (Rat) >2 g/kg, estimated.

12. ECOLOGICAL INFORMATION

GENERAL: The aquatic toxicity of this product has not been determined. Therefore, avoid discharge to all bodies of water.

13. DISPOSAL INFORMATION

RCRA HAZARDOUS WASTE: Product is not a RCRA hazardous waste.
WASTE DISPOSAL: Incinerate in accordance with federal, state and local requirements.

14. TRANSPORTATION INFORMATION

DOT HAZARD CLASS: Not Regulated
PROPER SHIPPING NAME: Not Regulated
IDENTIFICATION NUMBER: Not Listed
TDGA: Not Listed

15. REGULATORY INFORMATION

Listed below are chemical substances subject to supplier notification requirements. The percentages, when present, represent average values.

CAS	NUMBER	SARA	WHMIS	CA-65	FL	RI
	CHEMICAL NAME	313,%	%	%		

This product does not contain reportable quantities of substances subject to supplier notification.

TSCA STATUS: This product complies with the Chemical Substance Inventory requirements of the US EPA Toxic Substances Control Act (TSCA).
WHMIS CLASSIFICATION: Not a controlled product.

16. OTHER

PREPARED BY: Product Stewardship

The above information and recommendations are believed accurate and reliable. Because it is not possible to anticipate all conditions of use additional safety precautions may be required. GENERAL ELECTRIC COMPANY makes no warranty, either express or implied, including merchantability and fitness.
USER RESPONSIBILITY: Each user should read and understand this information and incorporate it into individual site safety programs in accordance with applicable hazard communication standards and regulations.

ULTRANOX is a registered trademark of the GENERAL ELECTRIC COMPANY or its affiliates.

REVISIONS IN THIS MSDS SINCE YOUR LAST ORDER ARE IN THE FOLLOWING SECTION(S):

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION



Safety
1-18-93

Page 1 of 4

SECTION I - PRODUCT IDENTIFICATION AND PHYSICAL DATA

CHEMICAL NAME: Lithium Carbonate
COMMON NAME: Lithium Carbonate

CHEMICAL FORMULA: Li_2CO_3 (CAS: 554-13-2)

APPEARANCE AND ODOR: White granules or powder. Odorless.

HAZARDOUS COMPONENTS OF MIXTURE: Lithium Carbonate is a compound, not a mixture.

VAPOR PRESSURE: Effectively Zero at 20°C MELTING POINT: 618°C

FLASH POINT: Not Flammable FLAMMABLE LIMITS: Not Flammable

OTHER CHARACTERISTICS: 99% Li_2CO_3 Basic - pH 11.4

SECTION II - FIRE, EXPLOSION, AND PHYSICAL HAZARD DATA

FIRE AND EXPLOSION HAZARDS: Not Flammable

REACTIVITY DATA: Stable material. Incompatible with concentrated acids.

EXTINGUISHING MEDIA: Not Flammable

SPECIAL FIRE FIGHTING PROCEDURES: Not Flammable

OTHER PHYSICAL HAZARDS: None

SECTION III - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Sweep up and return to container. Small quantities may be washed away with water.

WASTE DISPOSAL METHOD: Follow state and local regulations.

DATE OF ISSUE: 10 May 93

REVIEWED BY: D. B. Coghlan

SUPERSEDES: 11 February 91

TITLE: Manager, Special Projects

SECTION IV - HEALTH HAZARD DATA

Page 2 of 4

EXPOSURE LIMIT VALUE(S): Neither OSHA nor ACGIH lists a threshold limit value for lithium carbonate, but Cyprus Foote recommends that exposure not exceed $5\text{mg}/\text{m}^3$, one half of the ACGIH limit for nuisance dust.

PRIMARY ROUTE(S) OF EXPOSURE: Inhalation or ingestion.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: If accidental large doses were inhaled or ingested, the first symptoms would be tremor and nausea. If such symptoms occur, seek immediate medical attention.

EFFECTS OF OVEREXPOSURE: By the RCRA definition of acute toxicity, lithium carbonate is not a toxic chemical. Lithium carbonate is widely used as a medication for manic-depression. Thus, a substantial amount of information has been developed on its use for such purposes and on the effects and treatment of overdose conditions. The typical therapeutic dosage level in treatment is about 1000mg per day. Animal tests have shown an LD_{50} (lethal dose for 50% fatality) through ingestion at substantially higher levels (over $500\text{mg}/\text{kg}$ body weight -- equivalent to $35,000\text{mg}$ for an average person). Exposure to lithium carbonate at the level of the ACGIH nuisance dust limit of $5\text{mg}/\text{m}^3$ for an 8-hour day, assuming a respiratory level of 30 liters per minute, would lead to the inhalation of approximately 72mg for such day.

Human case studies reveal that there is a slightly higher than normal incidence of birth defects among manic-depressive women on therapeutic dosage levels of lithium carbonate during pregnancy. In addition, some animal studies have shown a relationship between the administration of lithium carbonate to pregnant females at dosage levels equivalent to or higher than human therapeutic dosage levels and an increase in birth defects. Therefore, lithium carbonate at those levels may be considered potentially teratogenic (i.e., potentially interfering with normal embryo development) although the evidence on this is not conclusive.

There is no evidence of teratogenic effects at lower levels and in view of the overall evidence, lithium carbonate would not be expected to be teratogenic at such low levels. Nevertheless, Cyprus Foote recommends that pregnant women in the first trimester be excluded from processes where exposure is in excess of $5\text{mg}/\text{m}^3$.

POTENTIAL FOR CARCINOGENICITY: Lithium Carbonate is not listed as a carcinogen or potential carcinogen by the National Toxicology Program of the U.S. Public Health Service, nor has it been found to be a carcinogen or potential carcinogen by OSHA or the International Agency for Research on Cancer. Cyprus Foote is not aware of any data indicating that lithium carbonate produces cancer.

CALIFORNIA PROPOSITION 65: On 1 January 91 the State of California added lithium carbonate to its list: "Chemicals known to the State to cause reproductive toxicity".

In California workers exposed to lithium carbonate must each be warned as follows: "Warning: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm."

EMERGENCY/FIRST AID PROCEDURES:

On contact with skin, practice proper hygiene.

On contact with eyes, flush eyes thoroughly with potable water for 15 minutes.

On inhalation or ingestion of accidental overdose (over 1000mg) seek immediate medical attention.

SECTION V - SPECIAL PROTECTION AND PRECAUTIONS

VENTILATION AND ENGINEERING CONTROLS: Engineering controls (e.g., mechanical exhaust) should be in place in order to ensure that employee exposures to lithium carbonate do not exceed $5\text{mg}/\text{m}^3$.

PERSONAL PROTECTIVE EQUIPMENT: Under conditions in which lithium carbonate dust levels exceed $5\text{mg}/\text{m}^3$, NIOSH-approved dust respirators should be worn. Dust goggles, gloves and full length clothing help prevent the lithium carbonate from contact with body moisture.

SAFE HANDLING, USE AND STORAGE: No special precautions.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE: Thoroughly clean equipment before repairs. Wash out with water and collect the solution in storage containers. Wear personal protective equipment during cleanup or repair to prevent the lithium carbonate from contact with skin and eyes.

If there is a possibility of producing a mist during clean out, wear a NIOSH-approved mist respirator.

SECTION VI - TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Lithium Carbonate
HAZARD CLASS OR DIVISION:	Not Applicable - Not Hazardous
IDENTIFICATION NUMBER:	Not Applicable - Not Hazardous
PACKING GROUP:	Not Applicable - Not Hazardous
LABEL(S) REQUIRED:	Not Applicable - Not Hazardous

EMERGENCY RESPONSE CONTACT FOR AN INCIDENT DURING TRANSPORTATION:
Chemtrec 1-800-424-9300 or 1-202-483-7616

ADDITIONAL INFORMATION REGARDING THIS MATERIAL AND APPROPRIATE
EMERGENCY PROCEDURES MAY BE OBTAINED FROM:

**CUSTOMER SERVICE DEPARTMENT
CYPRUS FOOTE MINERAL COMPANY**

Suite 301
301 Lindenwood Drive
Malvern, PA 19355-1740
(215)889-9605
Chemtrec 1-800-424-9300

The data in this Material Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data that Cyprus Foote Mineral believes to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside our control, we make no warranties, expressed or implied, and assume no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under or a recommendation to infringe any patents. Any use of these data and information must be determined by the user to be in accordance with Federal, state and local laws and regulations.

MONSANTO PRODUCT NAME
SANTONOX® R ANTIOXIDANT

1-26-90

MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167
EMERGENCY PHONE NO.
(CALL COLLECT)
314-694-1000

PRODUCT IDENTIFICATION

Chemical Names: 4,4'-Thiobis(6-tert-butyl-m-cresol);
4,4'-Thiobis(3-methyl-6-tertiary butyl phenol)

CAS No.: 96-69-5

DOT Proper Shipping Name: Not Applicable

DOT Hazard Class/I.D. No.: Not Applicable

DOT Label: Not Applicable

U.S. Surface Freight Classification: Rubber Preservative, N.O.I.B.N.

Reportable Quantity (RQ) Under

DOT (49 CFR) and CERCLA Regulations: Not Applicable

SARA Hazard Notification

Hazard Categories under criteria of
SARA Title III rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s): Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:

This substance is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Master File

Do Not Remove

This Copy /

WARNING STATEMENTS

WARNING!

MAY FORM EXPLOSIVE DUST-AIR MIXTURE

IMPROPER TRANSFER MAY CAUSE ELECTROSTATIC SPARK

CAUSES IRRITATION TO EYES AND SKIN

PRECAUTIONARY MEASURES

Keep away from heat, spark and flame.

Avoid creating dust in handling, transfer or clean up.

Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. DO NOT REUSE THIS CONTAINER.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID: IF IN EYES, flush with plenty of water for at least 15 minutes. Get medical attention.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing. Get medical attention. Wash clothing before reuse.

IN CASE OF SPILL OR LEAK, wear gloves and eye protection. Sweep, then shovel up into clean, dry covered containers. Keep this material out of watersheds and waterways. (See "Spill, Leak & Disposal Information" section).

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: SANTONOX® R antioxidant causes only slight eye irritation. No special protection is required. Avoid eye contact as good industrial practice.

Skin Protection: Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

Respiratory Protection: Avoid breathing dust of this material. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure is excessive. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134.

Ventilation: Provide natural or mechanical ventilation to minimize exposure. Dilution ventilation is acceptable, but local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

Airborne Exposure Limits:

Product: 4,4'-thiobis(6-tert-butyl-m-cresol)

OSHA PEL/8-hour Time-weighted average: None established

ACGIH TLV/8-hour Time-weighted average: 10 mg/m³

FIRE PROTECTION INFORMATION

Flash Point: Approximately 420°F

Method: Pensky-Martens Open Cup

Autoignition Point, F: *

Flammable Limits: *

Extinguishing Media: Water spray or other Class A extinguishing agent.

Special Firefighting Procedures: Firefighters and others exposed to products of combustion (see "Hazardous Decomposition Products" below) should wear full protective clothing including self-contained breathing apparatus. Fire fighting equipment should be thoroughly decontaminated after use.

Unusual Fire and Explosion Hazards: Hazardous products of decomposition include carbon monoxide and sulfur dioxide. *

FIRE PROTECTION INFORMATION (continued)

- * **NOTE:** SANTONOX R antioxidant is sometimes sold as a milled grade. This fine particle size creates the potential for dust explosions or fires. For any operation involving milled SANTONOX R or any addition to flammable solvents, use only CLASS II, Division I electrical equipment. Ensure that all equipment is adequately grounded.

As with any dry material, pouring SANTONOX R antioxidant or allowing it to free-fall or to be conveyed through chutes or pipes can accumulate and generate electrostatic sparks, potentially causing ignition of the material itself, or of any flammable materials which may come in contact with the material or its container. Take proper precautions when transferring SANTONOX R antioxidant, including grounding all equipment, providing an inert atmosphere and properly designing material handling equipment, to prevent electrostatic charge formation.

REACTIVITY DATA

Stable.

Materials to Avoid: None

Hazardous Decomposition Products: Carbon monoxide and sulfur dioxide gases are liberated when this material is ignited.

Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of SANTONOX R antioxidant on the health of exposed individuals and to support the Precautionary Measures and Occupational Control Procedures recommended in this document. Proper evaluation of these health-related data may require the assistance of individuals trained in interpretation of this type of information.

Effects of Exposure

Dermal contact and inhalation are expected to be the primary routes of occupational exposure to SANTONOX R antioxidant. Occupational exposure to this material has been reported to cause dermal irritation. On the basis of available information, exposure to SANTONOX R antioxidant is not expected to produce significant adverse human health effects when safety precautions recommended to minimize exposure are followed.

Toxicological Data

Data from Monsanto studies indicate the following:

Oral LD50 (Rat): 6,900 mg/kg, Practically Nontoxic
Dermal LD50 (Rabbit): >1,260 mg/kg, Moderately Toxic
Eye Irritation (Rabbit): (FHSA) 6.0 on a scale of 110.0, Slightly Irritating
Skin Irritation (Rabbit): (FHSA) 0.5 on a scale of 8.0, Practically Nonirritating

HEALTH EFFECTS SUMMARY (continued)

Patch testing of 50 human volunteers with SANTONOX R antioxidant produced no positive reactions following initial application, any of the 15 serial applications, or upon subsequent challenge 2 weeks later. SANTONOX R antioxidant is not considered a primary irritant, a cumulative irritant or a sensitizing agent.

No mutagenic effects were observed when SANTONOX R antioxidant was evaluated in microbial mutagenicity assays utilizing five Salmonella strains and one yeast strain with and without mammalian microsomal activation.

Reports found in the scientific literature on 4,4'-thiobis(6-tert-butyl-m-cresol) indicate the following:

Rats were given 4,4'-thiobis(6-tert-butyl-m-cresol) in the diet at concentrations of 0.05% and 0.25% for 30 days. No adverse effects were observed in the low-dose animals; however, a reduction in growth rate and an increase in liver weights were observed in the high-dose group.

4,4'-Thiobis(6-tert-butyl-m-cresol) was given to rats at concentrations of 0.005% and 0.05% in the diet for 90 days. No adverse effects were observed in the treated animals. However, reductions in food consumption and in the growth rate were observed in the high-dose animals. Histopathological examination did not reveal any abnormalities.

Additional Information

A Threshold Limit Value (TLV) has been established by the American Conference of Governmental Industrial Hygienists for 4,4'-thiobis(6-tert-butyl-m-cresol). For further information on this material, please refer to the current edition of the Documentation of Threshold Limit Values and Biological Exposure Indices.

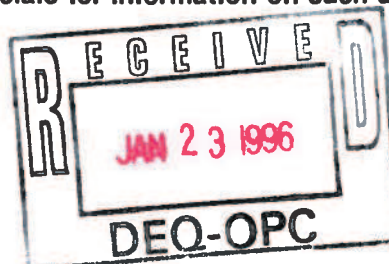
PHYSICAL DATA

Appearance: Fine white crystals
Odor: Slightly aromatic
Melting Point: Approximately 162°C
Specific Gravity @ 25°C: 1.06 - 1.12
Solubility in Water @ 25°C: Insoluble
 in Alcohol: Soluble
 in Acetone: Soluble
 in Naphtha: Soluble

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

SPILL, LEAK & DISPOSAL INFORMATION

Waste Disposal: When discarded, SANTONOX R antioxidant is not a "hazardous waste" as that term is defined in 40 CFR 261, "Identification and Listing of Hazardous Waste." Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state and federal laws and regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.



SPILL, LEAK & DISPOSAL INFORMATION (continued)

Spill or Leakage Procedures: Wear gloves and eye protection. Sweep, then shovel up into clean, dry, covered container. Keep this material out of watersheds and waterways.

Containers: Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state and federal laws and regulations.

ENVIRONMENTAL EFFECTS

96-hr LC50 Trout: 0.16 mg/l, Highly Toxic

96-hr LC50 Bluegill: 0.24 mg/l, Highly Toxic

96-hr LC50 Fathead Minnow: 0.36 mg/l, Highly Toxic

48-hr LC50 Daphnia: 0.7 mg/l, Highly Toxic

96-hr EC50 Algae, Cell Count: 126 mg/l, Practically Nontoxic

48-hr LC50 Paratanytarsus parthenogenetica (Nidge): >1,000 mg/l, Nontoxic

ADDITIONAL COMMENTS

Store in closed containers in a cool (less than 35°C), dry place. Suggested maximum storage time is one year.

For additional product information, including product forms, characteristics and applications, and FDA regulations, consult the Monsanto Rubber Chemicals Purchasing Guide.

DATE: 1/26/90

SUPERSEDES: 12/5/89

MSDS NUMBER S00010081

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

Manager, Product Safety
Rubber Chemicals Division
Monsanto Chemical Company
Rubber Chemicals Division
314-694-1000

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, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.



Mississippi Department of Environmental Quality
Office of Pollution Control

I-sys 2000 Master Site Detail Report

Site Name: Hercules Inc

PHYSICAL ADDRESS

LINE 1: 613 West 7th Street

LINE 2:

LINE 3:

MUNICIPALITY: Hattiesburg

STATE CODE: MS

ZIP CODE: 39401-

MAILING ADDRESS

LINE 1: 613 West 7th Street

LINE 2:

LINE 3:

MUNICIPALITY: Hattiesburg

STATE CODE: MS

ZIP CODE: 39401-

OTHER INFORMATION

MASTER ID: 002022

COUNTY: Forrest

REGION SRO

SIC 1: 2822

AIR TYPE: TITLE V

HW TYPE: LARGE QUANTITY

SOLID TYPE:

WATER TYPE: INDUSTRIAL

BRANCH: Chemical

ECED CONTACT:

Yassin, Mohammad

BASIN:

AIR PROGRAMS



SIP



PSD



NSPS



NESHAPS



MACT



Mississippi Department of Environmental Quality Office of Pollution Control

Permits

PROGRAM	PERMIT TYPE	PERMIT #	MDEQ PERMIT CONTACT	ACTIVE
HAZ. WASTE	EPA ID	MSD008182081		NO
AIR	TITLE V	080000001	Ketchum, Brian	YES
AIR	SOP	080000001	Ketchum, Brian	NO
WATER	NPDES - MAJOR	MS0001830	Cook, Charles	NO
WATER	NPDES - MAJOR	MS0001830	Cook, Charles	NO
WATER	NPDES - MAJOR	MS0001830	Beasley, Jerry	YES
WATER	PRE-TREATMENT	MSP091286	Tomkins, Tracy	YES
GENERAL	SARA TITLE III	MSR110153	Lavallee, Louis	YES
AIR	TITLE V	0800-00001	Glenn, Montie	NO

Compliance Actions

MEDIA	ACTIVITY TYPE	SCHEDULED	COMPLETED	INSPECTED B
WATER	CEI - NA	3/17/99	3/17/99	Yassin, Mohammad
WATER	CMI - PRETREATMENT	11/1/99		Sharp, Loyd
WATER	CMI - NPDES	4/1/00		Sharp, Loyd
WATER	CMI - NPDES	11/1/99		Sharp, Loyd
WATER	CEI - NA	9/30/00		Yassin, Mohammad
HAZ WASTE	Compliance Evaluation Inspection	9/30/00		Yassin, Mohammad
AIR	State Compliance Inspection	9/30/00		Yassin, Mohammad
HAZ WASTE	Compliance Evaluation Inspection	6/30/99	6/30/99	Yassin, Mohammad
AIR	State Compliance Inspection	6/29/99	6/29/99	Yassin, Mohammad
WATER	CEI - NA	6/30/99	6/30/99	Yassin, Mohammad