

EFFECTIVE DATE: 27 FEB 79

PRODUCT CODE: 19226

PRODUCT NAME: D.E.N. (R) 439 EPOXY NOVOLAC

MSD: 0220

INGREDIENTS (TYPICAL VALUES-NOT SPECIFICATIONS) : % :

SOLID EPOXY NOVOLAC RESIN : :

#### SECTION 1

#### PHYSICAL DATA

BOILING POINT: NOT APPLICABLE : SOL. IN WATER: NONE  
VAP PRESS: NOT APPLICABLE : SP. GRAVITY: 1.18  
VAP DENSITY (AIR=1): NOT APPLIC. : % VOLATILE BY VOL: NOT APPLICABLE  
APPEARANCE AND ODOR: PALE YELLOW SOLID.

#### SECTION 2

#### FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NOT APPLICABLE : FLAMMABLE LIMITS (STP IN AIR)  
METHOD USED: ---- : LFL: NOT DETER. UFL: NOT DETER.  
EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL.  
SPECIAL FIRE FIGHTING EQUIPMENT AND HAZARDS: SOLID EPOXY NOVOLAC RESINS  
DUST PREP. WHEN HANDLED. THE DUST, WHEN SUSPENDED IN AIR, IS  
FLAMMABLE AND POSSES A DEFINITE FIRE AND EXPLOSION HAZARD. GOOD  
HOUSEKEEPING AND DUST CONTROL ARE REQUIRED.

#### SECTION 3

#### REACTIVITY DATA

STABILITY: FREQUITIVE AND EXCESS HEAT MAY DEGRADE THE RESIN.  
INCOMPATIBILITY: ACID, BASE.  
HAZARDOUS DECOMPOSITION PRODUCTS: NONE UNDER NORMAL CONDITIONS.  
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR BY ITSELF, BUT MASSES OF MORE THAN  
FOUR OZ OF PRODUCT PLUS AN ALIPHATIC AMINE CAUSE IRREVERSIBLE  
POLYMERIZATION WITH CONSIDERABLE HEAT BUILDUP.

#### SECTION 4

#### SPILL, LEAK, AND DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS (USE APPROPRIATE SAFETY EQUIPMENT): SWEEP UP AND  
DISCARD.  
DISPOSAL METHOD: BURN IN ADEQUATE INCINERATOR OR FURN IN AN APPROVED  
LANDFILL.

#### SECTION 5

#### HEALTH HAZARD DATA

(CONTINUED ON PAGE 2)

(R) INDICATES A TRADEMARK OF THE DOW CHEMICAL COMPANY

EFFECTIVE DATE: 27 FEB 79

PRODUCT CODE: 19226

PRODUCT (CONT'D): D.E.W. (P) 439 EPOXY NOVOLAC

MSD: 0220

## SECTION 5 HEALTH HAZARD DATA (CONTINUED)

INGESTION: LOW SINGLE DOSE ORAL TOXICITY; LD50 (RAT) GREATER THAN 2000 MG/KG.

EYE CONTACT: MINOR TRANSIENT IRRITATION, NO CORNEAL INJURY EXPECTED.

SKIN CONTACT: MINOR TO NO IRRITATION; MAY BE VERY WEAK SKIN SENSITIZER.

SKIN ABSORPTION: NOT LIKELY TO BE ABSORBED IN ACUTELY TOXIC AMOUNTS.

INHALATION: NO GUIDE FOR CONTROL KNOWN. DUSTS MAY BE A NUISANCE;

SUGGEST CONTROL OF DUSTS TO 10 MG/M3.

EFFECTS OF OVEREXPOSURE: ----

## SECTION 6 FIRST AID--NOTE TO PHYSICIAN

### FIRST AID PROCEDURES:

EYES: IRRIGATION OF THE EYE IMMEDIATELY WITH WATER FOR FIVE MINUTES IS GOOD SAFETY PRACTICE.

SKIN: CONTACT WILL PROBABLY CAUSE NO MORE THAN IRRITATION. WASH OFF IN FLOWING WATER OR SHOWER. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL PERSONNEL.

INGESTION: LOW TOXICITY. INDUCE VOMITING IF LARGE AMOUNTS ARE INGESTED.

### NOTE TO PHYSICIAN:

EYES: MAY CAUSE MILD IRRITATION. STAIN FOR EVIDENCE OF CORNEAL INJURY.

SKIN: MAY CAUSE MILD IRRITATION. TREAT AS ANY CONTACT DERMATITIS. KNOWN OR SUSPECTED MILD SKIN SENSITIZER.

RESPIRATORY: NO TOX DATA.

DEATH: LOW TOXICITY.

STATE TO: PRELIMINARY STUDIES SUGGEST LIVER AND KIDNEY ARE TARGET ORGANS WITH OVEREXPOSURE. NO SPECIFIC ANTIDOTE. TREATMENT BASED ON THE SOUND JUDGMENT OF THE PHYSICIAN AND THE INDIVIDUAL REACTIONS OF THE PATIENT.

## SECTION 7 SPECIAL HANDLING INFORMATION

VENTILATION: GOOD ROOM VENTILATION USUALLY ADEQUATE FOR MOST OPERATIONS. RESPIRATORY PROTECTION: NONE NORMALLY NEEDED. IF REQUIRED, USE AN APPROVED DUST RESPIRATOR.

PROTECTIVE CLOTHING: CLEAN, BODY-COVERING CLOTHING.

EYE PROTECTION: SAFETY GLASSES WITHOUT SIDE SHIELDS.

## SECTION 8 SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: SEE SECTION 2.

PRACTICE GOOD CATION AND PERSONAL CLEANLINESS TO AVOID SKIN AND EYE CONTACT. AVOID BREATHING DUST OR VAPORS OF HEATED MATERIAL. FOR

FURTHER COMPLETE INFORMATION, SEE DUW BULLETIN, "STORAGE, HANDLING AND

(CONT'D SEE ON PAGE 3)

(P) INDICATES A TRADEMARK OF THE DUW CHEMICAL COMPANY

EFFECTIVE DATE: 27 FEB 79

PRODUCT CODE: 19226

PRODUCT (CONT'D): D.E.W. (P) 439 EPOXY NOVOLAC

MSD: 0220

SECTION 8 SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION (CONTINUED)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: (CONTINUED)

"TOXICITY OF LOW EPOXY RESINS."

ADDITIONAL INFORMATION: ----

LAST PAGE

(R) INDICATES A TRADEMARK OF THE DOW CHEMICAL COMPANY

CONSULT THE DOW CHEMICAL COMPANY FOR FURTHER INFORMATION.

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY,  
EXPRESSED OR IMPLIED, IS MADE

## MATERIAL SAFETY DATA SHEET

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

MSD: 000217

Page: 1

PRODUCT NAME: ~~D.E.N. (R) 438-485 EPOXY NOVOLAC~~

Effective Date: 02/28/79 Date Printed: 10/16/85 Product Code: 19220

## 1. INGREDIENTS:

D.E.N. 438  
Acetone85%  
15%

## 2. PHYSICAL DATA:

BOILING POINT: Not applicable  
VAP PRESS: (mmHg @ 20C) negligible  
VAP DENSITY: Not applic.  
SOL. IN WATER: Very slight  
SP. GRAVITY: 1.14  
APPEARANCE: Pale yellow liquid.  
ODOR: Acetone.

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 93F  
METHOD USED: ASTM D1310-67, TOC.FLAMMABLE LIMITS  
LFL: 2.1% @ 70C  
UFL: Not deter.

EXTINGUISHING MEDIA: Foam, CO2, dry chemical.

FIRE &amp; EXPLOSION HAZARDS: Presence of acetone vapor requires grounding. Keep away from ignition sources such as open flames and spark-producing equipment.

FIRE-FIGHTING EQUIPMENT: Not available.

(Continued on Page 2)

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000217

Page: 2

PRODUCT NAME: D.E.N. (R) 438-A85 EPOXY NOVOLAC

Effective Date: 02/28/79 Date Printed: 10/16/85 Product Code: 19220

## 4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID)

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS:

HAZARDOUS POLYMERIZATION: Will not occur by itself, but masses of more than 1 pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.

## 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Soak up in absorbent material. Keep open flames and sparks away. Residual can be removed with non-flammable solvent such as methylene chloride.

DISPOSAL METHOD: Burn in adequate incinerator or bury in landfill.

## 6. HEALTH HAZARD DATA:

EYE: Very slight to slight irritation; may cause slight transient corneal injury.

SKIN CONTACT: Very slight to slight irritation; may be a very weak sensitizer.

SKIN ABSORPTION: Not likely to be absorbed in acutely toxic amounts.

INGESTION: Low single dose oral toxicity; LD50 rat greater than 2000 mg/kg.

INHALATION: ACGIH TLV for acetone 1000 ppm (1977), NIOSH proposal 250 ppm.

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000217

Page: 3

PRODUCT NAME: D.E.N. (R) 438-A85 EPOXY NOVOLAC

Effective Date: 02/28/79 Date Printed: 10/16/85 Product Code: 19220

## 6. HEALTH HAZARD DATA: (CONTINUED)

SYSTEMIC & OTHER EFFECTS: Irritation of nose and lungs.

## 7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Refer to medical personnel.

SKIN: Contact will probably cause no more than irritation. Wash off in flowing water or shower. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: Low in toxicity. Induce vomiting if large amounts are ingested.

INHALATION: Remove to fresh air if effects occur. Call physician and/or transport to emergency facility. If respiration stops give mouth-to-mouth resuscitation.

### NOTE TO PHYSICIAN:

Eyes: May cause mild irritation. Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Consult ophthalmologist.

Skin: May cause mild irritation. Treat as any contact dermatitis. Known or suspected weak skin sensitizer.

Respiratory: May cause moderate irritation. May cause drunkenness. Anesthetic or narcotic effect may occur. Administer oxygen if available. Bronchodilators, expectorants, and antitussives may be of help.

Oral: Low in toxicity.

Systemic: Animal studies suggest liver and kidney are target organs with overexposure. Above information based on Tox information for ingredients. No specific antidote. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

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# MATERIAL SAFETY DATA SHEET

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

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PRODUCT NAME: D.E.N. (R) 438-A85 EPOXY NOVOLAC

Effective Date: 02/28/79 Date Printed: 10/16/85 Product Code: 19220

## 8. HANDLING PRECAUTIONS:

VENTILATION: Recommend control of acetone to suggested guide.

RESPIRATORY PROTECTION: NIOSH approved respiratory protection required in absence of proper environmental control.

SKIN PROTECTION: Clean, body-covering clothing.

EYE PROTECTION: Safety glasses without side shields.

## 9. ADDITIONAL INFORMATION:

### SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Presence of acetone requires grounding. Keep away from open flames and spark-producing equipment. Practice good caution and personal cleanliness to avoid eye and skin contact. Avoid breathing vapors. Try to avoid subjecting resin to temperatures above 90F. See Dow bulletin on "Storage, Handling & Toxicity of Dow Epoxy Resins."

MSDS STATUS:

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For Further Information.

## SAFETY DATA SHEET

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.

SECTION I.	
TRADE NAME <b>CIBA-GEIGY EPOXY EPN 1138-A-85</b>	PRODUCT TYPE <b>Epoxy Phenol Novolac Resin</b>
CHEMICAL FAMILY <b>Epoxides</b>	

SECTION II. HAZARDOUS INGREDIENTS					
INGREDIENT	%	TLV (UNITS)	INGREDIENT	%	TLV (UNITS)
Acetone	ca.15	ppm 1000			

SECTION III. PHYSICAL DATA			
BOILING POINT (°F.)		SOLUBILITY IN WATER	Very Slight
MELTING POINT (°F.)		SPECIFIC GRAVITY (H <sub>2</sub> O=1)	1.14
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (=1)	
APPEARANCE AND ODOR	Pale yellow liquid with fragrant mint-like odor.		

SECTION IV. FIRE AND EXPLOSION HAZARD DATA			
FLASH POINT (°F.) (Method Used)	<65 (Pensky-Martens Closed Cup)	FLAMMABLE LIMITS IN AIR (%)	Acetone
EXTINGUISHING MEDIA	Carbon dioxide, dry chemical, foam.		
SPECIAL FIRE FIGHTING PROCEDURES	Use self-contained breathing apparatus		
UNUSUAL FIRE AND EXPLOSION HAZARDS	Dangerous fire hazard, moderate explosion hazard when vapor is exposed to flame.		

SECTION V. REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID In case of fire, acetone may produce excessive pressure; sealed drums may rupture and ignition may occur.
	STABLE	X	
INCOMPATIBILITY (Materials to Avoid)		Strong oxidizing agents, acids and bases.	
HAZARDOUS DECOMPOSITION PRODUCTS		Carbon monoxide and/or carbon dioxide.	
HAZARDOUS POLYMERIZATION	MAY OCCUR	X	CONDITIONS TO AVOID  With excess hardeners.
	WILL NOT OCCUR		

SECTION VI. HEALTH HAZARD DATA	
ORAL: LD <sub>50</sub>	(rat) > 2,000 mg/kg
DERMAL: LD <sub>50</sub>	
IRRITATION: SKIN (rabbit)	Mild. SPI CLASS. 2
EYE (rabbit)	Mild.
SENSITIZATION	May be a sensitizer
THRESHOLD LIMIT VALUE	
RESPIRATORY	
EFFECTS OF OVEREXPOSURE Stupor: Mild skin and eye irritation.	
EMERGENCY & FIRST AID PROCEDURES: Call a physician	
INHALATION	Remove to fresh air. Oxygen and artificial respiration, if necessary.
INGESTION	If conscious, give water or milk. Induce vomiting.
SKIN	Remove contaminated clothing. Wash with soap and water.
EYES	Flush with water for at least 15 minutes.
OTHER	

SECTION VII. SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
Remove all sources of ignition	
Absorb on combustible material for proper disposal.	
Flush contaminated areas with water.	
WASTE DISPOSAL METHOD	
Incineration in accordance with local pollution regulation and ordinance	

SECTION VIII. SPECIAL PROTECTION INFORMATION	
RESPIRATORY PROTECTION (Specify Type)	NIOSH approved organic vapor respirator recommended.
PROTECTIVE CLOTHING	Impervious gloves.
EYE PROTECTION	Splash-proof goggles.
VENTILATION	General mechanical ventilation and local exhaust.

SECTION IX. SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING, STORING ETC.	
<b>CAUTION: FLAMMABLE!</b>	
May cause irritation.	<b>FIRST AID:</b> In case of contact,
Avoid contact with eyes or prolonged contact with skin.	Eyes - Immediately flush eyes with plenty of water for at least 15 minutes.
Avoid repeated or prolonged inhalation of vapors or dust.	Call a physician.
Keep away from heat, sparks and open flame.	Skin - Flush skin with plenty of water.
Use with adequate ventilation.	Clothing - Wash clothing before reuse.
Keep container closed.	
For Manufacturing Use Only.	

DATE: Revised 12-30-77

SIGNATURE: \_\_\_\_\_

KTS:cm

K. T. Shen

EFFECTIVE DATE: 17 DEC 80

PRODUCT CODE: 19275

PRODUCT NAME: E.P.O. (R) 383 EPOXY RESIN

MSD: 0954

INGREDIENTS (TYPICAL VALUES-NOT SPECIFICATIONS) : % :

EPICHLOROHYDRIIN/BISPHENOL A RESIN, APPROXIMATELY : 100 :

#### SECTION 1

#### PHYSICAL DATA

BUILDING POINT: ---- : SOL. IN WATER: NONE  
VAP PRESS: NOT APPLIC. : SP. GRAVITY: 1.16  
VAP DENSITY (AIR=1): NOT APPLIC. : % VOLATILE BY VOL: 0.5 TO 1.0  
APPEARANCE AND ODOR: WATER WHITE TO LIGHT YELLOW LIQUID

#### SECTION 2

#### FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 275F, 135C : FLAMMABLE LIMITS (STP IN AIR)  
METHOD USED: PMCC : LFL: NOT DETER. UFL: NOT DETER.  
EXTINGUISHING MEDIA: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL  
SPECIAL FIRE FIGHTING EQUIPMENT AND HAZARDS: NONE

#### SECTION 3

#### REACTIVITY DATA

STABILITY: ----  
INCOMPATIBILITY: ----  
HAZARDOUS DECOMPOSITION PRODUCTS: NONE  
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR BY ITSELF, BUT MASSES OF MORE THAN  
POUND OF PRODUCT PLUS AN ALIPHATIC AMINE WILL CAUSE IRREVERSIBLE  
POLYMERIZATION WITH CONSIDERABLE HEAT BUILDUP.

#### SECTION 4

#### SPILL, LEAK, AND DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS (USE APPROPRIATE SAFETY EQUIPMENT): SOAK UP  
IN ABSORBENT MATERIAL. RESIDUAL CAN BE REMOVED WITH NON-FLAMMABLE  
SOLVENT SUCH AS TRICHLOROETHYLENE CHLORIDE.  
DISPOSAL METHOD: BURN IN ADEQUATE INCINERATOR OR FURY IN AN APPROVED  
LANDFILL.

#### SECTION 5

#### HEALTH HAZARD DATA

INGESTION: ACUTE ORAL TOXICITY MODERATE TO LOW, LD50 RATS 500-1000  
MG/KG.

(CONTINUED ON PAGE 2)

(R) INDICATES A TRADEMARK OF THE DOW CHEMICAL COMPANY

EFFECTIVE DATE: 17 DEC 80

PRODUCT CODE: 19275

PRODUCT (CONT'D): D.E.H. (F) 383 EPOXY RESIN

MSD: 0954

SECTION 5

HEALTH HAZARD DATA (CONTINUED)

EYE CONTACT: SLIGHT PAIN, OTHERWISE ESSENTIALLY NON-IRRITATING.  
SKIN CONTACT: MAY CAUSE SLIGHT IRRITATION AND ALLERGIC SKIN RESPONSE.  
SKIN ABSORPTION: NOT LIKELY TO BE ABSORBED IN ACUTELY TOXIC AMOUNTS.  
INHALATION: NO GUIDE FOR CONTROL KNOWN.  
EFFECTS OF OVEREXPOSURE: UNKNOWN

SECTION 6

FIRST AID--NOTE TO PHYSICIAN

FIRST AID PROCEDURES:

EYES: IRRIGATION OF THE EYE IMMEDIATELY WITH WATER FOR FIVE MINUTES IS GOOD SAFETY PRACTICE.

SKIN: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL PERSONNEL.

INGESTION: IF SWALLOWED, INDUCE VOMITING IMMEDIATELY BY GIVING TWO GLASSES OF WATER AND STICKING FINGER DOWN THROAT. CALL A PHYSICIAN. (NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON).

NOTE TO PHYSICIAN:

EYES: MAY CAUSE MILD IRRITATION. STAIN FOR EVIDENCE OF CORNEAL INJURY.

SKIN: MAY CAUSE MILD IRRITATION. KNOWN OR SUSPECTED SKIN SENSITIZER. TREAT AS AT CONTACT DERMATITIS. NOT LIKELY TO BE ABSORBED IN ACUTELY TOXIC AMOUNTS.

RESPIRATORY: NO TOX DATA.

ORAL: MODERATELY TOXIC.

GENERAL: HUMAN EFFECTS NOT ESTABLISHED. NO SPECIFIC ANTIDOTE.

TREATMENT BASED ON THE SOUND JUDGMENT OF THE PHYSICIAN AND THE INDIVIDUAL REACTIONS OF THE PATIENT. TRANSPORTED AT 140-160F.

SECTION 7

SPECIAL HANDLING INFORMATION

VENTILATION: GOOD ROOM VENTILATION USUALLY ADEQUATE FOR MOST OPERATIONS.

RESPIRATORY PROTECTION: NONE NORMALLY NEEDED.

PROTECTIVE CLOTHING: CLEAN, BODY-COVERING CLOTHING. IN ADDITION, RUBBER GLOVES, BOOTS, APRON DEPENDING UPON THE EXTENT AND SEVERITY OF EXPOSURE RISK.

EYE PROTECTION: SAFETY GLASSES WITHOUT SIDE SHIELDS.

SECTION 8

SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: ----

(CONTINUED ON PAGE 3)

(F) ISOCYANATES - TRADEMARK OF THE DOW CHEMICAL COMPANY

EFFECTIVE DATE: 17 DEC 80

PRODUCT CODE: 19275

PRODUCT (CONT'D): D.E.R. (R) 363 EPOXY RESIN

MSD: 0954

SECTION 6 SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION (CONTINUED)

ADDITIONAL INFORMATION: 17 DEC 80 REVISIONS OF 31 OCT 79 -- EYES  
STATEMENT ON FIRST AID PROCEDURES.

LAST PAGE

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CONSULT THE DOW CHEMICAL COMPANY FOR FURTHER INFORMATION.

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000227

Page: 1

PRODUCT NAME: ~~D.E.R. (R) 331 EPOXY RESIN~~

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19248

## 1. INGREDIENTS:

Reaction products of epichlorohydrin  
& bisphenol a

## 2. PHYSICAL DATA:

BOILING POINT: Not applicable  
VAP PRESS: Not applicable  
VAP DENSITY: Not applic.  
SOL. IN WATER: None  
SP. GRAVITY: 1.16  
APPEARANCE: Water-white to yellow liquid to semi-solid.  
ODOR: Not available.

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 485F, 252C  
METHOD USED: PMCC

FLAMMABLE LIMITS  
LFL: Not deter.  
UFL: Not deter.

EXTINGUISHING MEDIA: Foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: None.

FIRE-FIGHTING EQUIPMENT: None.

(Continued on Page 2)

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

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

MSD: 000227

Page: 2

PRODUCT NAME: D.E.R. (R) 331 EPOXY RESIN

Effective Date: 09/18/84   Date Printed: 10/16/85   Product Code: 19248

## 4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID)   Excess heating over long periods of time degrades the resin.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)   Base.

HAZARDOUS DECOMPOSITION PRODUCTS:   None under normal conditions.

HAZARDOUS POLYMERIZATION:   Will not occur by itself, but masses of more than 1 pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.

## 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS:   Soak up in absorbent material or scrape up. Residual can be removed with non-flammable solvent such as methylene chloride.

DISPOSAL METHOD:   Burn in adequate incinerator or bury in an approved landfill.

## 6. HEALTH HAZARD DATA:

EYE:   Minor transient irritation.   No corneal injury likely.

SKIN CONTACT:   Only minor irritation, may be a skin sensitizer.

SKIN ABSORPTION:   Not likely to be absorbed through skin in toxic amounts.

INGESTION:   Low acute oral toxicity; LD50 (rat) greater than 2000 mg/kg.

INHALATION:   No guide for control known.   Not considered a problem unless heated to high temperature.

SYSTEMIC & OTHER EFFECTS:   None known.

(Continued on Page 3)

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# MATERIAL SAFETY DATA SHEET

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

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PRODUCT NAME: D.E.R. (R) 331 EPOXY RESIN

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19248

## 7. FIRST AID:

EYES: Irrigation of the eye immediately with water for five minutes is good safety practice. Consult medical personnel.

SKIN: Contact will probably cause no more than irritation. Wash off in flowing water or shower. Wash clothing before reuse.

INGESTION: Low in toxicity. Induce vomiting if large amounts are ingested.

INHALATION: Remove to fresh air if effects occur. Consult medical personnel.

### NOTE TO PHYSICIAN:

Eyes: Injury is unlikely. Stain for evidence of corneal injury. Skin: May cause dermatitis. Treat as any contact dermatitis. Known or suspected skin sensitizer. Not likely to be absorbed in acutely toxic amounts.

Respiratory: Injury is unlikely.

Oral: Low in toxicity.

Systemic: Human effects not established. No specific antidote. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

## 8. HANDLING PRECAUTIONS:

VENTILATION: Good room ventilation usually adequate for most operations.

RESPIRATORY PROTECTION: None normally needed.

SKIN PROTECTION: Clean, body-covering clothing.

EYE PROTECTION: Safety glasses without side shields.

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000227

Page: 4

PRODUCT NAME: D.E.R. (R) 331 EPOXY RESIN

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19248

## 9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: See Dow bulletin entitled, "Storage, Handling and Toxicity of Dow Epoxy Resins." Practice good caution and personal cleanliness to avoid skin and eye contact. Avoid breathing vapors of heated material.

MSDS STATUS: Revised flash point from 290F to 485F.

(R) Indicates a trademark of The Dow Chemical Company  
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For Further Information.

# MATERIAL SAFETY DATA SHEET

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

## SECTION I

MANUFACTURER'S NAME <b>KRAFELT COMPANY</b>		EMERGENCY TELEPHONE NO. <b>1-215-827-9106</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>VICTORIA PLACE CHESTER SPRINGS PA 19425</b>		
CHEMICAL NAME AND SYNONYMS <b>LIQUID EPOXY RESINS</b>	TRADE NAME AND SYNONYMS <b>KEC-EPOXIES-COLORANTS</b>	
CHEMICAL FAMILY <b>REACTION PRODUCTS OF EPICHLOROHYDRIN</b>	FORMULA <b>AND BISPHENOL A</b>	

## SECTION II - HAZARDOUS INGREDIENTS

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

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	NA	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	1.16
VAPOR PRESSURE (mm Hg.)	NA	PERCENT, VOLATILE BY VOLUME (%)	.5 tol.
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	NONE		
APPEARANCE AND ODOR	Paste Colorant per color specification		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) <b>465-490° TAG OPEN CUP</b>	FLAMMABLE LIMITS <b>NONE</b>	LeI	UeI
EXTINGUISHING MEDIA <b>FOAM CO<sup>2</sup>, Dry chemical</b>			
SPECIAL FIRE FIGHTING PROCEDURES			
<b>NONE</b>			
UNUSUAL FIRE AND EXPLOSION HAZARDS			
<b>NONE</b>			

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	None suggested
EFFECTS OF OVEREXPOSURE	Inhalation No Problem at Handling temperatures
	Eye contact - Transient irritation
EMERGENCY AND FIRST AID PROCEDURES	Continued skin contact may sensitize, Not absorbed through skin.
	Flush eye contact 5 minutes with water.

## SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Extreme temperatures
INCOMPATIBILITY (Materials to avoid)			
Avoid direct contact with bases.			
HAZARDOUS DECOMPOSITION PRODUCTS			
None			
HAZARDOUS POLYMERIZATION	MAY OCCUR	X	CONDITIONS TO AVOID
	WILL NOT OCCUR		Avoid Aliphatic amines in concentration.

## SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	Soak or scrape up residue, will remove with non-flammable Solvent. (Methylene Chloride)
WASTE DISPOSAL METHOD	Burn in adequate incinerator

## SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)		
Not necessary		
VENTILATION	LOCAL EXHAUST	SPECIAL None
	MECHANICAL (General)	Adequate
OTHER		
PROTECTIVE GLOVES	Recommended	EYE PROTECTION
		Goggles
OTHER PROTECTIVE EQUIPMENT		
None necessary		

## SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	None
OTHER PRECAUTIONS	Avoid breathing vapors of material heated in excess of 250°F

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000230

Page: 1

PRODUCT NAME: D.E.R. (R) 511-A80 ~~EPOXY RESIN~~

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19286

## 1. INGREDIENTS:

A glycidyl ether of brominated  
bisphenol a  
Acetone

80%  
20%

## 2. PHYSICAL DATA:

BOILING POINT: 135F, 57C\*  
VAP PRESS: 181.7 mmHg @ 20C\*  
VAP DENSITY: 2.00\*  
SOL. IN WATER: Slightly  
SP. GRAVITY: 1.22 @ 25C  
APPEARANCE: Light yellow liquid.  
ODOR: Acetone odor.

\*Based on acetone only.

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: <34F, 1.11C  
METHOD USED: PMCC

### FLAMMABLE LIMITS

LFL: 2.6%  
UFL: 12.8%\*

EXTINGUISHING MEDIA: Foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Presence of acetone requires grounding.  
Keep away from possible ignition sources such as open flames and  
flame-producing equipment.

FIRE-FIGHTING EQUIPMENT: In case of fire, hazardous hydrogen  
bromide may be generated, wear self-contained breathing

(Continued on Page 2)

(R) Indicates a trademark of The Dow Chemical Company

# MATERIAL SAFETY DATA SHEET

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

MSD: 000230

Page: 2

PRODUCT NAME: D.E.R. (R) 511-A80 EPOXY RESIN

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19286

## 3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

apparatus.

\*Based on acetone only.

## 4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) If fire occurs, acetone may produce excessive pressure; sealed drums may rupture and ignition may occur.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Base.

HAZARDOUS DECOMPOSITION PRODUCTS: Under conditions of imperfect combustion or pyrolysis various phenolic and/or brominated compounds, such as hydrogen bromide, may be evolved.

HAZARDOUS POLYMERIZATION: Will not occur by itself, but masses of more than one pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.

## 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Soak up in absorbent material. Keep open flames & sparks away. Residual resin can be removed by use of non-flammable solvent such as methylene chloride.

DISPOSAL METHOD: Bury in an approved landfill.

## 6. HEALTH HAZARD DATA:

EYE: Essentially non-irritating.

SKIN CONTACT: Only minor irritation, however product may be a weak sensitizer.

(Continued on Page 3)

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000230

Page: 3

PRODUCT NAME: D.E.R. (R) 511-A80 EPOXY RESIN

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19286

## 6. HEALTH HAZARD DATA: (CONTINUED)

SKIN ABSORPTION: Considered to be low in toxicity by this route.

INGESTION: Low single dose oral toxicity; LD50 rats >4 g/kg.

INHALATION: OSHA guide and ACGIH TLV is 1000 ppm for (acetone) solvent.

SYSTEMIC & OTHER EFFECTS: Irritation.

## 7. FIRST AID:

EYES: Irrigation of the eye immediately with water for five minutes is good safety practice.

SKIN: Contact will probably cause no more than irritation. Wash off in flowing water or shower. Wash clothing before reuse.

INGESTION: Low in toxicity. Induce vomiting if large amounts are ingested.

INHALATION: Remove to fresh air if effects occur. Call physician and/or transport to medical facility.

### NOTE TO PHYSICIAN:

Eyes: May cause mild irritation. Injury unlikely.

Skin: May cause mild irritation. Known or suspected skin sensitizer. Treat as any contact dermatitis.

Respiratory: May cause drunkenness. Anesthetic or narcotic effect may occur. Administer oxygen if available.

Oral: Low in toxicity. Consider effects of acetone.

Systemic: Human effects not established. No specific antidote. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

(Continued on Page 4)

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000230

Page: 4

PRODUCT NAME: D.E.R. (R) 511-A80 EPOXY RESIN

Effective Date: 09/18/84 Date Printed: 10/16/85 Product Code: 19286

## 8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): If fire occurs, acetone may produce excessive pressure. Sealed drums may rupture & ignition may occur.

VENTILATION: Local exhaust preferred. Recommend control of acetone vapors to suggested guide.

RESPIRATORY PROTECTION: Approved respiratory protection required in absence of proper environmental control. For emergencies, a self-contained breathing apparatus or a full-face respirator is recommended.

SKIN PROTECTION: Clean, body-covering clothing.

EYE PROTECTION: Safety glasses without side shields.

## 9. ADDITIONAL INFORMATION:

### SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Practice caution and personal cleanliness. Avoid breathing vapors. Try to avoid subjecting resin to temperatures above 100F, 38C. For more complete information, see Dow bulletin on "Storage, Handling and Toxicity of Dow Epoxy Resins." See section 2.

MSDS STATUS: Revised flash point from <65F to <34F.

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The Information Herein Is Given In Good Faith, But No Warranty,  
Expressed Or Implied, Is Made. Consult The Dow Chemical Company  
For Further Information.

# MATERIAL SAFETY DATA SHEET

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

MSD: 000370

Page: 1

PRODUCT NAME: D.E.R. (R) 661-A80 ~~POXY-RESIN~~

Effective Date: 09/18/81 Date Printed: 10/16/85 Product Code: 19319

## 1. INGREDIENTS:

D.E.R. 661

80%

Acetone

20%

## 2. PHYSICAL DATA:

BOILING POINT: \*134F, 57C

VAP PRESS: \*(mmHg @ 20C) 110 mmHg

VAP DENSITY: 2

SOL. IN WATER: Very slight

SP. GRAVITY: 1.097

APPEARANCE: Pale yellow liquid.

ODOR: Acetone odor.

\*as acetone

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: <65F; <18C

METHOD USED: PMCC

### FLAMMABLE LIMITS

LFL: \*2.6%

UFL: \*12.8%

EXTINGUISHING MEDIA: Foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Presence of acetone requires grounding.

Keep vapors away from possible ignition sources such as open flames and spark-producing equipment.

\*as acetone

FIRE-FIGHTING EQUIPMENT: Not available.

(Continued on Page 2)

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# MATERIAL SAFETY DATA SHEET

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

MSD: 000370

Page: 2

PRODUCT NAME: D.E.R. (R) 661-A80 EPOXY RESIN

Effective Date: 09/18/81 Date Printed: 10/16/85 Product Code: 19319

## 4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) If fire occurs, acetone may produce excessive pressure. Sealed drums may rupture and ignition may occur.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Base.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

## 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Soak up in absorbent material. Keep open flames and sparks away. Residual resin can be removed with non-flammable solvent such as methylene chloride.

DISPOSAL METHOD: Burn in adequate incinerator or bury in an approved landfill.

## 6. HEALTH HAZARD DATA:

EYE: Very slight to slight irritation; not likely to cause corneal injury.

SKIN CONTACT: Very slight to slight irritation; may be a very weak sensitizer.

SKIN ABSORPTION: Not likely a problem; considered low in toxicity by this route.

INGESTION: Low single dose oral toxicity.

INHALATION: OSHA guide and ACGIH TLV is 1000 ppm for solvent (acetone).

SYSTEMIC & OTHER EFFECTS: Irritation of nose and lungs.

(Continued on Page 3)

(R) Indicates a trademark of The Dow Chemical Company

# MATERIAL SAFETY DATA SHEET

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

MSD: 000370

Page: 3

PRODUCT NAME: D.E.R. (R) 661-A80 EPOXY RESIN

Effective Date: 09/18/81 Date Printed: 10/16/85 Product Code: 19319

## 7. FIRST AID:

EYES: Irrigation of the eye immediately with water for five minutes is good safety practice.

SKIN: Contact will probably cause no more than irritation. Wash off in flowing water or shower. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Call a physician.

INHALATION: Remove to fresh air if effects occur. Call physician and/or transport to medical facility.

### NOTE TO PHYSICIAN:

Eyes: May cause mild irritation. Stain for evidence of corneal injury.

Skin: May cause mild irritation. Treat as any contact dermatitis. Known or suspected mild skin sensitizer.

Respiratory: May cause moderate irritation. May cause drunkenness. Anesthetic or narcotic effect may occur. Administer oxygen if available.

Oral: Probably low in toxicity.

General: Above information based on Tox information for ingredients. No specific antidote. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

## 8. HANDLING PRECAUTIONS:

VENTILATION: Recommend control of acetone vapors to suggested guide. Recommend local ventilation.

RESPIRATORY PROTECTION: Approved organic vapor-type respirator required in absence of proper environmental control. For emergencies, a positive-pressure breathing apparatus or a full-face respirator is recommended.

SKIN PROTECTION: Clean, body-covering clothing.

(Continued on Page 4)

(R) Indicates a trademark of The Dow Chemical Company

# **MATERIAL SAFETY DATA SHEET**

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

**MSD: 000370**

**Page: 4**

**PRODUCT NAME: D.E.R. (R) 661-A80 EPOXY RESIN**

**Effective Date: 09/18/81 Date Printed: 10/16/85 Product Code: 19319**

## **8. HANDLING PRECAUTIONS: (CONTINUED)**

**EYE PROTECTION: Safety glasses without side shields.**

## **9. ADDITIONAL INFORMATION:**

### **SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:**

Practice good caution and personal cleanliness to avoid eye and skin contact. Try to avoid subjecting resin to temperature above 100F. Avoid breathing vapors. See Dow bulletin on "Storage, Handling & Toxicity of Dow Epoxy Resins". See section 3.

**MSDS STATUS: Revised 2, 3, and 8.**

(R) Indicates a trademark of The Dow Chemical Company  
The Information Herein Is Given In Good Faith, But No Warranty,  
Expressed Or Implied, Is Made. Consult The Dow Chemical Company  
For Further Information.

(Approved by U.S. Department of Labor "Essentially Similar" to Form OSHA-20)

D-2

# ELANESE

ONE-PIECE FRONT PLAZA

**SECRET**

**【例題】**

**MANUFACTURERS CODE IDENTIFICATION:**

**29L115A**

**CMD 50921**

## Section 4 - HAZARDOUS INGREDIENTS

INGREDIENT:	PERCENT	TLV		LEL	VAPOR PRESSURE
		PPM	mg/M <sup>3</sup>		

## Section III - PHYSICAL DATA

☐ LIGHTER, THAN AIR

**WEIGHT PER  
GALLON: 9.80**

## Section IV - FIRE AND EXPLOSION HAZARD DATA

**LEL:** N/A

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None

**SPECIAL FIRE FIGHTING PROCEDURES:** Water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak. Water spray may be used to flush spills away from exposure. Wear self-contained breathing apparatus; wear goggles if eye protection not provided.

information contained herein is based on data believed by Celanese Plastics & Specialties Company to be accurate, but we do not assume any liability for the accuracy of this information. We neither suggest nor guarantee that any hazards mentioned are the only ones which exist. Anyone intending to rely on any recommendation or to use any equipment, technique or material mentioned should also satisfy himself that he can meet all applicable safety and health standards. Determination of the suitability of any information or product for the use contemplated by any user, the manner of that use and whether there is any infringement of patents is the sole responsibility of the user.

## Section V — HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE:** Not Established (See Section II)

**EFFECTS OF OVEREXPOSURE:** This product contains materials (epoxy resins) which may cause skin and eye irritation and/or sensitization after repeated contact.

**EMERGENCY AND FIRST AID PROCEDURES:** In case of skin contact, wash immediately with soap and water. For eyes, flush with plenty of water for 15 minutes and SEEK MEDICAL ATTENTION IMMEDIATELY.

## Section VI — REACTIVITY DATA

**STABILITY:** ☐ UNSTABLE ☒ STABLE **CONDITIONS TO AVOID:**

**INCOMPATIBILITY (Materials to avoid):** Strong acids, amines, mercaptans and bases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may produce carbon monoxide and/or carbon dioxide.

**HAZARDOUS POLYMERIZATION:** ☒ MAY OCCUR ☐ WILL NOT OCCUR

**CONDITIONS TO AVOID:** Strong acids, amines, mercaptans and bases.

## Section VII — SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Absorb with inert material (sand, vermiculite, etc.), sweep or scoop up and put in disposal container. Flush area immediately with plenty of water; prevent washings from entering waterways.

**WASTE DISPOSAL METHOD:** Incinerate in furnace or bury in landfill in accordance with federal, state and local regulations.

## Section VIII — SPECIAL PROTECTION INFORMATION

**RESPIRATORY PROTECTION:** NIOSH approved organic vapor respirators are only required where ventilation is inadequate. NIOSH approved air-line respirators with auxiliary escape air-tanks or self-contained breathing apparatus should be used in confined spaces.

**VENTILATION:** Mechanical Exhaust

**PROTECTIVE GLOVES:** Impervious gloves

**EYE PROTECTION:** Safety Glasses

**OTHER PROTECTIVE EQUIPMENT:** Safety shower eye bath. Use coveralls or apron to protect against skin and clothing contamination.

## Section IX — SPECIAL PRECAUTIONS

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:** Practice reasonable care and cleanliness.

**OTHER PRECAUTIONS:** Avoid gross contamination of skin. Wash off skin with soap and water. S.P.I. Class 2 (ANSI K68.1-1972).

DATE OF PREP.: 4/29/80 JAL

D-2

## Section I



PLASTICS &amp; SPECIALTIES COMPANY

A Division of Celanese Corporation

ONE RIVERFRONT PLAZA

RD BOX 32180

LOUISVILLE, KY 40232

EMERGENCY TELEPHONE NO.: (502) 585-8113 (If no answer, dial (502) 585-8119)

PRODUCT CLASS: Liquid Epoxy Resin

MANUFACTURERS CODE IDENTIFICATION:

RDX-47682

TRADE NAME: CMD 50922

## Section II - HAZARDOUS INGREDIENTS

INGREDIENT:	PERCENT	TLV		LEL	VAPOR PRESSURE
		PPM	mg/M <sup>3</sup>		

## Section III - PHYSICAL DATA

BOILING RANGE: N/A

VAPOR DENSITY:

☒ HEAVIER☐ LIGHTER, THAN AIREVAPORATION RATE: ☐ FASTER ☒ SLOWER, THAN ETHERPERCENT VOLATILE  
BY VOLUME: 0WEIGHT PER  
GALLON: 9.80

## Section IV - FIRE AND EXPLOSION HAZARD DATA

DOT CATEGORY: Not regulated; greater than  
200°F.

FLASHPOINT: &gt;200°F.

LEL: N/A

EXTINGUISHING MEDIA: Use water spray, dry chemical, foam or carbon dioxide. Treat as a Class B fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

**SPECIAL FIRE FIGHTING PROCEDURES:** Water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak. Water spray may be used to flush spills away from exposure. Wear self-contained breathing apparatus; wear goggles if eye protection not provided.

Information contained herein is based on data believed by Celanese Plastics & Specialties Company to be accurate, but we do not assume any liability for the accuracy of this information. We neither suggest nor guarantee that any hazards mentioned are the only ones which exist. Anyone intending to rely on any recommendation or to use any equipment, technique or material mentioned should also satisfy himself that he can meet all applicable safety and health standards. Determination of the suitability of any information or product for the use contemplated by any user, the manner of that use and whether there is any infringement of patents is the sole responsibility of the user.

**THRESHOLD LIMIT VALUE:** Not Established (See Section II)

**EFFECTS OF OVEREXPOSURE:** This product contains materials (epoxy resins) which may cause skin and eye irritation and/or sensitization after repeated contact.

**EMERGENCY AND FIRST AID PROCEDURES:** In case of skin contact, wash immediately with soap and water. For eyes, flush with plenty of water for 15 minutes and SEEK MEDICAL ATTENTION IMMEDIATELY.

#### Section VI - REACTIVITY DATA

**STABILITY:** ☐ UNSTABLE ☒ STABLE **CONDITIONS TO AVOID:**

**INCOMPATIBILITY (Materials to avoid):** Strong acids, amines, mercaptans and bases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may produce carbon monoxide and/or carbon dioxide.

**HAZARDOUS POLYMERIZATION:** ☒ MAY OCCUR ☐ WILL NOT OCCUR

**CONDITIONS TO AVOID:** Strong acids, amines, mercaptans and bases.

#### Section VII - SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Absorb with inert material (sand, vermiculite etc.), sweep or scoop up and put in disposal container. Flush area immediately with plenty of water; prevent runnings from entering waterways.

**WASTE DISPOSAL METHOD:** Incinerate in furnace or bury in landfill in accordance with federal, state and local regulations.

#### Section VIII - SPECIAL PROTECTION INFORMATION

**RESPIRATORY PROTECTION:** NIOSH approved organic vapor respirators are only required where ventilation is inadequate. NIOSH approved air-line respirators with auxiliary escape air-tanks or self-contained breathing apparatus should be used in confined spaces.

**VENTILATION:** Mechanical Exhaust

**PROTECTIVE GLOVES:** Impervious gloves

**EYE PROTECTION:** Safety Glasses

**OTHER PROTECTIVE EQUIPMENT:** Safety shower eye bath. Use coveralls or apron to protect against skin and clothing contamination.

#### Section IX - SPECIAL PRECAUTIONS

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:** Practice reasonable care and cleanliness.

**OTHER PRECAUTIONS:** Avoid gross contamination of skin. Wash off skin with soap and water. S.P.I. Class 2 (ANSI K68.1-1972).

## 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  
PLASTICS & ADDITIVES DIVISION  
THREE SKYLINE DRIVE  
HAWTHORNE, NEW YORK 10532

EMERGENCY PHONE NUMBERS:  
SAFETY/HEALTH: (914) 347-4700  
AFTER HOURS : (800) 334-9481

## SECTION I-IDENTITY INFORMATION

IDENTITY (TRADENAME):    HARDENER HT 976

FAMILY/CHEMICAL NAME:

4,4'-SULFONYLDIANILINE

PRODUCT TYPE:

AROMATIC AMINE

IMPORTANT:

\* \* \* \* \*  
\*        THIS MATERIAL WILL NOT BE SOLD FOR USE IN PRODUCTS \*  
\* FOR WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR    \*  
\* ABRADED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS \*  
\* SPECIFICALLY INTENDED. BECAUSE OF THE WIDE RANGE OF    \*  
\* SUCH POTENTIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE \*  
\* TO RECOMMEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR    \*  
\* SUCH USES AND ASSUMES NO LIABILITY FOR ANY SUCH USES.    \*  
\* \* \* \* \*

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 CONSIDERED TO BE A HAZARDOUS        \*  
\* CHEMICAL UNDER THAT STANDARD.                            \*  
\* \* \* \* \*

## SECTION II-HAZARDOUS INGREDIENTS

SPECIFIC CHEMICAL NAME:

4,4'-SULFONYLDIANILINE

CAS #: 80-08-0

COMMON NAME: DIAMINODIPHENYL SULFONE

EXPOSURE LIMITS:

OSHA PEL: NOT ESTABLISHED

HARDENER HT 976

ACGIH TLV: NOT ESTABLISHED  
CARCINOGENICITY:  
THIS CHEMICAL IS NOT CONSIDERED TO BE CARCINOGENIC  
BY NTP, IARC, OR OSHA.

---

### SECTION III-PHYSICAL DATA

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APPEARANCE AND ODOR:  
TAN POWDER  
MELTING POINT:  
170 -180C  
PERCENT VOLATILE:  
NIL.  
VAPOR PRESSURE:  
NOT DETERMINED.  
SOLUBILITY IN WATER:  
INSOLUBLE.

---

### SECTION IV-FIRE AND EXPLOSION HAZARD DATA

---

FLASH POINT:  
>200F CLOSED CUP  
EXTINGUISHING MEDIA:  
CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY.  
FIRE FIGHTING PROCEDURES-SPECIAL:  
USE SELF-CONTAINED BREATHING APPARATUS.  
UNUSUAL FIRE AND EXPLOSION HAZARDS:  
DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE TOXIC.

---

### SECTION V-REACTIVITY DATA

---

STABILITY:  
STABLE  
INCOMPATIBILITY:  
STRONG OXIDIZING AGENTS.  
HAZARDOUS DECOMPOSITION PRODUCTS:  
CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN AND SULFUR  
CONTAINING COMPOUNDS.  
HAZARDOUS POLYMERIZATION:  
WILL NOT OCCUR.  
CONDITIONS TO AVOID:  
UNCONTROLLED CURING OF EPOXY SYSTEMS EN MASSE MAY LEAD TO  
EXCESSIVE EXOTHERM AND DECOMPOSITION OF THE PRODUCT.

---

### SECTION VI-HEALTH HAZARD DATA

---

PRIMARY ROUTES OF EXPOSURE:  
DERMAL, INHALATION.  
ORAL LD50:  
(RATS) 640 MG/KG  
SKIN IRRITATION:  
(RABBITS) NON-IRRITATING.

HARDENER HT 976

**SENSITIZATION:**

SEVERE DERMAL SENSITIZATION REACTIONS IN HUMANS.

**OVEREXPOSURE EFFECTS:**

FEVER, SORE THROAT, BODY DISCOMFORT, HEADACHE, WEAKNESS, HEMOLYSIS, METHEMOGLOBINEMIA AND OTHER BLOOD DISORDERS, IRRITATION, DERMATITIS.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:**

INDIVIDUALS WITH GLUCOSE 6 PHOSPHATE DEHYDROGENASE DEFICIENCY; INDIVIDUALS HYPERSENSITIVE TO SULFONAMIDES.

**EMERGENCY AND FIRST AID PROCEDURES-EYES:**

PROMPTLY FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

**EMERGENCY AND FIRST AID PROCEDURES-SKIN:**

PROMPTLY 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. IF DIFFICULTY IN BREATHING, GIVE ARTIFICIAL RESPIRATION AND OXYGEN AS NECESSARY.

**EMERGENCY AND FIRST AID PROCEDURES-OTHER:**

PROMPTLY REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. DESTROY CONTAMINATED LEATHER AND ABSORBENT SHOES.

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**SECTION VII-SPILL OR LEAK PROCEDURES**

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**SPILL PROCEDURES:**

PREMET MATERIAL WITH WATER TO AVOID DUST FORMATION. SWEEP AND PLACE INTO CLOSABLE CONTAINER FOR DISPOSAL. WEAR PROTECTIVE EQUIPMENT SPECIFIED BELOW.

**WASTE DISPOSAL METHODS:**

DISPOSE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

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**SECTION VIII-SPECIAL PROTECTION INFORMATION**

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**VENTILATION:**

GOOD GENERAL MECHANICAL VENTILATION AND LOCAL EXHAUST RECOMMENDED.

**PROTECTIVE GLOVES:**

WEAR IMPERVIOUS GLOVES.

**EYE PROTECTION:**

WEAR CHEMICAL GOGGLES.

**RESPIRATORY PROTECTION:**

USE NIOSH APPROVED RESPIRATOR OR DUST MASK, IF NEEDED.

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**SECTION IX-SPECIAL PRECAUTIONS**

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**HANDLING, SHIPPING AND STORING PRECAUTIONS:**

WARNING!! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION AND DERMATITIS. DO NOT TASTE OR TAKE INTERNALLY. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. DO NOT BREATHE DUST. WASH THOROUGHLY AFTER HANDLING. PROLONGED OR REPEATED EXPOSURE

MAY CAUSE DELAYED AND SERIOUS INJURY. KEEP CONTAINER TIGHTLY CLOSED. USE ONLY WITH ADEQUATE VENTILATION. FOR INDUSTRIAL USE ONLY.

PLEASE NOTE:

THE PHARMACEUTICAL GRADE OF 4,4'-SULFONYLDIANILINE HAS BEEN IN USE FOR MORE THAN 30 YEARS AND SEVERAL MILLION PEOPLE HAVE RECEIVED THE MATERIAL FOR A VARIETY OF REASONS. IT IS THE DRUG OF CHOICE IN THE TREATMENT OF LEPROSY AND DERMATITIS HERPETIFORMIS, AND HAS BEEN USED BY THE ARMED SERVICES TO TREAT MALARIA. IN ADDITION, IT IS USEFUL IN THE TREATMENT OF A VARIETY OF ACNE AND DERMATITIS DISEASES.

THE NATIONAL CANCER INSTITUTE HAS CONDUCTED A CARCINOGENESIS BIOASSAY STUDY OF 4,4'-SULFONYLDIANILINE, REPORTED UNDER THE GENERIC NAME DAPSONE. IN LIFETIME FEEDING STUDIES IN MICE AND RATS, DAPSONE WAS NOT CARCINOGENIC FOR MICE OF EITHER SEX, OR FOR FEMALE RATS. HOWEVER, DAPSONE WAS CARCINOGENIC FOR MALE RATS.

CIBA-GEIGY CONSIDERS THAT THE RESULTS OF THE ANIMAL STUDIES ARE DIFFICULT TO RELATE TO HUMANS. THERE IS NO CONVINCING EVIDENCE THAT DAPSONE HAS BEEN RELATED TO AN INCREASED INCIDENCE OF CANCER IN LEPROSY OR MALARIA PATIENTS. THERE HAS BEEN NO EVIDENCE OF A CARCINOGENIC EFFECT IN INDUSTRIAL USE AND NO OCCUPATIONAL POISONING HAS BEEN REPORTED. HOWEVER, BASED ON THE NATIONAL CANCER INSTITUTE REPORT, WE RECOMMEND THAT POTENTIAL FOR EXPOSURE SHOULD BE REDUCED.

THESE RESULTS DO NOT INDICATE THAT 4,4'-SULFONYLDIANILINE POSES A CHRONIC HEALTH HAZARD TO HUMANS UNDER CONTROLLED CONDITIONS OF GOOD INDUSTRIAL PRACTICE.

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SECTION X- REGULATORY INFORMATION

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DOT CLASS:

NOT REGULATED.

RCRA STATUS:

NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).

CERCLA STATUS:

NOT LISTED.

ISSUE DATE: 08/15/86 REVISION: 05C

FOR FURTHER INFORMATION, PLEASE CONTACT: DR. JONAS WEISS

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.

SUPPLIER THE HARSHAW CHEMICAL COMPANY EMERGENCY  
PHONE NO. (216) 721-8300

ADDRESS 1945 E. 97th ST., CLEVELAND, OHIO 44106

PRODUCT NAME(S) ~~Boron Fluoride Monoethylamine~~  
Boron Fluoride Monoethylamine Complex

DESCRIPTION White to pale amber flake. Very hygroscopic.  
Sp. gr. 1.42

PROTECTIVE EQUIPMENT Hand and eye protection is recommended.

FIRST AID Eyes - flush with water.  
Skin - wash with soap and water.

EXPOSURE EFFECTS Data available indicates excellent experience with  
respect to exposure.

TOXICITY IS TOXIC NA Niosh Listing - NOT TOXIC  
TLV none published LD50

REFERENCES Hine, et al; AMA Archives of Industrial Health 17. 129-44, 1958.

HAZARD-NFPA RATING 3 1 0  
BLUE RED YELLOW WHITE

ENVIRONMENTAL TEST PROCEDURE No data available.

SIGNATURE & TITLE *Donna J. ...* 4/18/72  
Manager, Environmental Control

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

1970 OCCUPATIONAL SAFETY & HEALTH ACT

H-981

# MATERIAL SAFETY DATA SHEET

## SECTION I: MATERIAL AND MANUFACTURER IDENTIFICATION

<b>MANUFACTURER'S NAME</b> HEXCEL CORPORATION, SPECIALTY CHEMICALS		<b>EMERGENCY TELEPHONE NO.</b> 616-772-2193
<b>ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE)</b> 215 N. Centennial St., Zeeland, Michigan 49464		
<b>USUAL NAME AND SYNONYMS</b> N-BENZYL-N,N-DIMETHYLAMINE	<b>TRADE NAME AND SYNONYMS</b> SUMINE 2015	
<b>USUAL FAMILY</b> ARALKYL AMINE	<b>FORMULA</b> $C_9H_{13}N$	
<b>CAS Registry No.</b> 103-83-		

## SECTION II: HAZARDOUS INGREDIENTS\*

PAINTS, PRESERVATIVES/SOLVENTS	%	TLV (UNITS)	ALLOYS AND METALLIC COATINGS	%	TLV (UNITS)
CEMENTS			BASE METAL		
CATALYST			ALLOYS		
CHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES*					
This section is not applicable					

## SECTION III: PHYSICAL DATA

<b>BOILING POINT (°F)</b>	349	<b>SPECIFIC GRAVITY (H<sub>2</sub>O = 1)</b>	0.
<b>VAPOR PRESSURE (mm. Hg.)</b>		<b>PERCENT VOLATILE BY VOLUME (%)</b>	
<b>VAPOR DENSITY (AIR = 1)</b>		<b>EVAPORATION RATE (— = 1)</b>	
<b>SOLUBILITY IN WATER</b>	Slightly Soluble		

**APPEARANCE AND ODOR**      Colorless to light yellow liquid. Aromatic odor.

## SECTION IV: FIRE AND EXPLOSION HAZARD DATA

<b>FLASH POINT (METHOD USED)</b> 135°F. (Cleveland Open Cup)	<b>FLAMMABLE LIMITS</b> High heat or direct flame
<b>EXTINGUISHING MEDIA</b> CO <sub>2</sub> , dry chemical, foam or water spray	
<b>SPECIAL FIRE FIGHTING PROCEDURES</b>	

## USUAL FIRE AND EXPLOSION HAZARDS

None

While Hexcel Corporation believes that the data contained herein are factual and the opinions expressed are those of qualified experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which Hexcel Corporation assumes legal responsibility. They are offered solely for your consideration, investigation, and verification.

## EFFECTS OF OVEREXPOSURE

A skin irritant and sensitizer

## EMERGENCY AND FIRST AID PROCEDURES

In Contact - Remove contaminated clothing and flush all exposed body areas with copious amounts of water. Eye Contact - Flush eyes immediately with copious amounts of water for at least 15 minutes. Seek medical attention.

## SECTION VI: REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

## COMPATIBILITY (MATERIALS TO AVOID)

Acids (reaction generates heat). Strong oxidizing agents.

## HAZARDOUS DECOMPOSITION PRODUCTS

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

Avoid open flame. Remove bulk of material by pumping - incinerate. Absorb on inert material. Use filter aid. Flush spill area with dilute acid solution and water.

## WASTE DISPOSAL METHOD

Incinerate or dispose of in accordance with local and state regulations.

## SECTION VIII: SPECIAL PROTECTION INFORMATION

## RESPIRATORY PROTECTION (SPECIFY TYPE)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (GENERAL) Maximum ventilation	OTHER

## PROTECTIVE GLOVES

Rubber gloves

## EYE PROTECTION

Chemical splash goggles and face shield

## OTHER PROTECTIVE EQUIPMENT

Rubber footwear

## SECTION IX: SPECIAL PRECAUTIONS

## PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in tightly closed drums away from heat and

in well ventilated area.

## ADDITIONAL PRECAUTIONS

Prolonged breathing of its vapor or contact with the skin should be avoided.

08/23/77

DATE

MATERIAL SAFETY DATA SHEET  
ACCEPTED BY D.S.H.A. AS ESSENTIALLY SIMILAR TO D.S.H.A. FORM 20

24-HOUR EMERGENCY TELEPHONE: 406-324-1133 (LOCATED AT OASHLAND, KENTUCKY)

PRODUCT NAME: DIETHYLENE TRIAMINE

DATA SHEET NO: 0003664-001  
LATEST REVISION DATE: 03/76-78067

SECTION I-PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: AMINE

HAZARD CLASSIFICATION: (09) CORROSIVE MATERIAL (173.240)

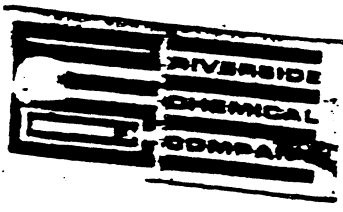
SECTION II-HAZARDOUS COMPONENTS

INGREDIENT	PERCENT	TLV
DIETHYLENE TRIAMINE	100.00%	1 PPM

(1): SKIN ABSORPTION MAY POTENTIALLY CONTRIBUTE TO THE OVERALL EXPOSURE TO THIS MATERIAL. APPROPRIATE MEASURES SHOULD BE TAKEN TO PREVENT ABSORPTION SO THAT THE TLV IS NOT INVALIDATED.

SECTION III-PHYSICAL DATA

PROPERTY	REFINEMENT	MEASUREMENT
INITIAL BOILING POINT	FOR PRODUCT	404.40 DEG F ( 206.88 DEG C @ 760.00 MMHG
VAPOR PRESSURE	FOR PRODUCT	< 1.00 MMHG @ 68.00 DEG F ( 20.00 DEG C
VAPOR DENSITY	AIR = 1	3.5
SPECIFIC GRAVITY		.954 @ 68.00 DEG F ( 20.00 DEG C
PERCENT VOLATILES		100.00 %
EVAPORATION RATE	(IN 90 AC = 1)	.01



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

FLASH POINT(CLOSED CUP) 210.00 DEG F  
188.88 DEG C

LOWER EXPLOSIVE LIMIT (PRODUCT)

1.4

EXTINGUISHING MEDIA: WATER FOG OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, NITROGEN COMPOUNDS, ETC.

SPECIAL FIREFIGHTING PROCEDURES: SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

UNUSUAL FIRE & EXPLOSION HAZARDS: NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

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

THRESHOLD LIMIT VALUE: 1 PPM  
(SKIN)

EFFECTS OF OVEREXPOSURE: FOR PRODUCT

EYES - VAPOR CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION;  
LIQUID CAN CAUSE SEVERE OR PERMANENT EYE DAMAGE.

SKIN - CAUSES SEVERE IRRITATION, BURNS; POSSIBLE SENSITIZATION.  
CAN CAUSE NASAL AND RESPIRATORY IRRITATION AND POSSIBLE ALLERGIC SENSITIZATION.  
SWALLOWING - CAN RESULT IN DAMAGE TO THROAT AND ESOPHAGUS.

FIRST AID:

IF ON SKIN: IMMEDIATELY FLUSH EXPOSED AREA WITH WATER FOR AT LEAST 15 MINUTES,  
GET MEDICAL ATTENTION. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED  
CLOTHING BEFORE RE-USE.  
DISCARD CONTAMINATED SHOES.

IF IN EYES: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15  
MINUTES, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET IMMEDIATE MEDICAL  
ATTENTION.  
IF PHYSICIAN IS NOT IMMEDIATELY AVAILABLE, CONTINUE FLUSHING WITH WATER.

IF SWALLOWED: DO NOT INDUCE VOMITING. VOMITING WILL CAUSE FURTHER DAMAGE TO  
THE THROAT. DILUTE BY GIVING WATER. GIVE MILK OF MAGNESIA. KEEP WARM,  
QUIET. GET MEDICAL ATTENTION IMMEDIATELY.

CONTINUED ON PAGE: 3

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

HAZARDOUS POLYMERIZATION: CANNOT OCCUR  
STABILITY: STABLE

INCOMPATABILITY: AVOID CONTACT WITH: STRONG OXIDIZING AGENTS (E.G. NITRIC ACID, PERMANGANATES, ETC.), STRONG MINERAL ACIDS (E.G. H<sub>2</sub>SO<sub>4</sub>, HCL, ETC.), CHLORINATED SOLVENTS

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

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

SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS. PREVENT RUN-OFF TO SEWERS, STREAMS, OR OTHER BODIES OF WATER.

WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DESTROY REMAINING MATERIAL BY BURNING IN AN IRON PAN.

LARGE SPILL: DESTROY BY LIQUID INCINERATION WITH OFF-GAS SCRUBBER. MATERIAL COLLECTED ON ABSORBENT MATERIAL MAY BE DEPOSITED IN A POSTED TOXIC SUBSTANCE LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

\*\*\*\*\* SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED \*\*\*\*\*

RESPIRATORY PROTECTION: IF TLV OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE PIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIED CONDITIONS. (SEE YOUR SAFETY EQUIPMENT SUPPLIER).

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS: NEOPRENE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES AND FACE SHIELD (18" MIN.) IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (SEE YOUR SAFETY EQUIPMENT SUPPLIER).

CONTINUED ON PAGE: 4

OTHER PROTECTIVE EQUIPMENT: TO PREVENT SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

\*\*\*\*\* SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS \*\*\*\*\*

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH ASHLAND OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

LAST PAGE—SEE ATTACHMENT PAGE ENCLOSED—LAST PAGE

## DEFINITIONS

### SECTION I PRODUCT IDENTIFICATION

Product Class: General or generic identification

Hazard Classification: Product meets DOT criteria for hazards listed

### SECTION II HAZARDOUS COMPONENTS

A hazardous ingredient is one which meets one or more of the following criteria:

1. It is listed in the annual Registry of Toxic Effects of Chemical Substances, or is known to be toxic within the parameters of that Registry,

and/or

2. It has an OSHA established, 8-hour time-weighted average or acceptable ceiling concentration (c), or an American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Value, and by nature of the product or its known use, is likely to become airborne,

and/or

3. It contributes to one or more of the following hazards of the product:
  - a. Flashpoint below 200° F (cc), or subject to spontaneous heating or decomposition.
  - b. Causes skin burns. (DOT)
  - c. Strong oxidizing agent. (DOT)
  - d. Subject to hazardous polymerization.

Each ingredient meeting one or more of the above criteria is listed in Section II if present at a level greater than one percent. Ingredients which are claimed to be carcinogens, teratogens, mutagens, or causative agents of other reproductive disorders are listed if known or believed to be present, provided that the data supporting such claims is considered valid.

Each hazardous ingredient is listed by chemical, generic, or proprietary name, its level in the product is expressed as 1% or less, 1-10%, 10-30%, 30-60%, or greater than 60%, or by other means.

### SECTION III PHYSICAL DATA

1st Boiling Point: If liquid at 68° F.

Vapor Pressure: If liquid at 68° F or which sublimates.

Vapor Density: For volatile portion of product.

Specific Gravity: If specific gravity of product is not known, indicated as  $< 1$ ,  $= 1$ ,  $> 1$ .

Percent Volatiles: Percentage of material with initial boiling point below 425° F.

Evaporation Rate: Indicated as faster or slower than ethyl ether, unless otherwise stated.

### SECTION IV FIRE AND EXPLOSION HAZARDS

Flash Point: Closed Cup

Lower Explosion Limit: Indicated for component with lowest value

Hazardous Decomposition Products: Known hazardous products resulting from heating, burning, etc., or reacted raw materials which may arise through heating, burning, etc.

Special Firefighting Procedures: Indicates equipment to protect fireman from toxic products of combustion or if water is not to be used.

Unusual Fire & Explosion Hazards: Hazards not covered by other sections of this report are shown here.

### SECTION V HEALTH HAZARD DATA

Threshold Limit Value: OSHA established value-if none available, adopted value

Effects of Overexposure: Given in general terms; local and systemic effects to the eyes, skin, if material is ingested, if material is inhaled, unless not applicable due to physical form of product.

Emergency First Aid Procedures: Emergency procedures for eye contact, ingestion, or inhalation, unless not applicable due to the physical form of product.

### SECTION VI REACTIVITY DATA

Hazardous Polymerization: Conditions to avoid hazardous polymerization resulting in a large release of energy.

Stability: Conditions to avoid if unstable under normal circumstances.

Incompatibility: Materials to avoid.

### SECTION VII SPILL OR LEAK PROCEDURES

Reasonable precautions to be taken and the methods of clean-up to be used in the event of spillage of the product. Consult state and local regulations for accepted procedures.

### SECTION VIII PROTECTIVE EQUIPMENT TO BE USED

This section indicates protective equipment to be used when handling the product

### SECTION IX SPECIAL PRECAUTIONS OR OTHER COMMENTS

This section is to cover any relevant points not previously mentioned.

SECTION I Omicron Chemicals, Inc.

78 Bald Eagle, Hackettstown, N.J. 07840

Emergency telephone --- 201/852-1227

Trade/Chemical name --- ~~Cyanidamide~~ or Cyanoguanidine  $\left( \text{CN-NH-C-NH}_2 \right)$   
CAS/TOSCA #461-58-5 NH

SECTION II --- No hazardous ingredients

SECTION III (Physical data)

Melting Point --- 211°C.

Boiling Point --- none, product decomposes

Vapor pressure -- practically nil @ 760 mm. mercury

Solubility in water -- 3.46 gms./100 gms. water @ 20°C.

Specific Gravity -- 1.403 (20/4)

Evaporation rate -- practically nil

Appearance/odor --- slightly ammoniacal white powder

Percent volatile by volume -- 0% @ 70°F.

SECTION IV (Fire and Explosion hazard data)

DOT category --- not regulated

Flash point --- if any, above 400°F.

Extinguishing media --- water, carbon dioxide, or alcohol foam

Special fire fighting procedures -- use self-contained breathing app.

Unusual fire and explosion hazards --- none known

SECTION V (Health Hazard data)

Effects of over-exposure -- none known, product considered to be practically non-toxic...ipr-rbt LD<sub>50</sub> 300 mg/kg.; ipr-mus 400 mg/kg.  
Emergency and first-aid procedures --- in case of contact, immediately flush eyes or skin with plenty of water. For eyes, call physician.  
Remove and wash contaminated clothing. If swallowed, drink copious amount of water...try to induce vomiting.

SECTION VI (Reactivity data)

Stability --- very good; stable to 400°F.

Conditions to avoid --- none known

Incompatibility (mat'ls to avoid) -- none known

Hazardous decomposition products -- none known

Hazardous polymerization -- will not occur

SECTION VII (Spill /leak procedures) -- same as emergency aid.

Waste disposal methods -- none needed.

SECTION VII and IX

Avoid breathing. Local ventilation required, face shield not required.  
Handling precautions -- no gloves or goggles required, but they are recommended. Keep containers covered to minimize water pick-up.