

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION**24-Hour Emergency Phone Number****989-636-4400**

Product: D.E.R. 383 Epoxy Resin

Effective Date: 03/07/08

Date Printed: 03/07/08

MSD: SA00006

Manufactured by:

The Dow Chemical Company

2030 Willard H. Dow Center

Midland, MI 48674

Customer Information:

800-258-2436

2. COMPOSITE / INFORMATION OR INGREDIENTS

CAS# 25085-99-8

Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers

100.0%

3. HEALTH HAZARDS INFORMATION

Emergency Overview:

Color: Yellow

Physical State: Liquid

Odor: Mild

Hazards of product: May cause allergic skin reaction. May cause skin irritation. May cause eye irritation. Isolate area

OSHA Hazard Communication Standard: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200

Potential Health Effects:

Eyes: May cause eye irritation. Corneal injury is unlikely.

Skin: Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin irritation with local redness.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Skin Sensitization: Has caused allergic skin reactions in humans.

Inhalation: Vapors are unlikely due to physical properties.

Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Cancer Information: Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEBA is carcinogenic.

4. FIRST AID INFORMATION

Eyes: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin: Remove material from skin immediately by washing with soap and plenty of water.

Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Ingestion: No emergency medical treatment necessary.

Inhalation: Move person to fresh air; if effects occur, consult a physician

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING INFORMATION

Extinguishing Media:

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Fire Fighting Procedures:

Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS

Special Protective Equipment for Firefighters:

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Unusual Fire and Explosion Hazards:

Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is emitted when burned without sufficient oxygen.

Hazardous Combustion Products

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Phenolics. Carbon monoxide. Carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES**Steps to be Taken if Material is Released or Spilled:**

Contain spilled material if possible. Absorb with materials such as: Sand. Polypropylene fiber products. Polyethylene fiber products. Remove residual with soap and hot water. Collect in suitable and properly labeled containers. Residual can be removed with solvent. Solvents are not recommended for clean-up unless the recommended exposure guidelines and safe handling practices for the specific solvent are followed. Consult appropriate solvent Safety Data Sheet for handling information and exposure guidelines. See Section 13, Disposal Considerations, for additional information.

Personal Precautions:

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Environmental Precautions:

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. HANDLING AND STORAGE**Handling:**

General Handling: Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Avoid

contact with skin and clothing. Wash thoroughly after handling. Avoid use of electric band heaters. Failures of electric band heaters have been reported to cause drums of liquid epoxy resin to explode and catch fire. Application of a direct flame to a container of liquid epoxy resin can also cause explosion and/or fire.

Storage:

Recommended pumping and storage temperature for bulk shipments is 60°C (140°F) Additional storage and handling information on this product may be obtained by calling your Dow sales or customer service contact. Ask for a product brochure.

Shelf life: Use within 24 Months Storage temperature: 2 - 43 °C

8. EXPOSURE CONTROLS / PERSONAL PROTECTIVE EQUIPMENT

Exposure Limits: None established

Eyes: Use safety glasses.

Skin: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Hands: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Nitrile. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: No respiratory protection should be needed.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls:

Ventilation: Good general ventilation should be sufficient for most conditions

9. TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

| | |
|----------------------------------|------------------------------------------------------------|
| Physical Form: | Liquid |
| Color: | Yellow |
| Odor: | Mild |
| Flash Point - Closed Cup: | 252 °C (486 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i> |
| Flammable Limits In Air: | Lower: Not applicable Upper: Not applicable |
| Autoignition Temperature: | Not applicable |
| Vapor Pressure: | < 0.01 mmHg @ 25 °C <i>Literature</i> |
| Boiling Point (760 mmHg): | > 100 °C (> 212 °F) <i>Literature</i> |
| Vapor Density (air = 1): | Not applicable |
| Specific Gravity (H2O = 1): | 1.16 <i>Literature</i> |
| Freezing Point: | Not determined |
| Melting Point: | Not applicable |
| Solubility in Water (by weight): | Insoluble |
| pH: | Not applicable |
| Kinematic Viscosity: | 9,000 - 10,500 mm ² /s @ 25 °C <i>ASTM D445</i> |

10. CHEMICAL STABILITY AND REACTIVITY

Chemical Stability: Stable

Conditions to Avoid: Avoid temperatures above 300°C (572°F) Potentially violent decomposition can occur above 350°C (662°F) Generation of gas

during decomposition can cause pressure in closed systems. Pressure build-up can be rapid

Incompatibility (Material to avoid): Avoid contact with oxidizing materials. Avoid contact with: Acids. Bases. Avoid unintended contact with amines

Hazardous Polymerization: Will not occur by itself. Masses of more than one pound (0.5 kg) of product plus an aliphatic amine will cause irreversible polymerization with considerable heat build-up

Thermal Decomposition: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water

11. TOXICOLOGICAL INFORMATION

Skin Absorption: LD50, Rabbit 20,000 mg/kg

Sensitization – Skin: Has caused allergic skin reactions in humans. Did not cause allergic skin reactions when tested in mice.

Repeated Dose Toxicity: Except for skin sensitization, repeated exposures to low molecular weight epoxy resins of this type are not anticipated to cause any significant adverse effects

Chronic Toxicity and Carcinogenicity: Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEBA is carcinogenic

Developmental Toxicity: Resins based on the diglycidyl ether of bisphenol A (DGEBA) did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally

Reproductive Toxicity: In animal studies, did not interfere with reproduction

Genetic Toxicology: In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative

12. ECOLOGICAL INFORMATION

Movement & Partitioning: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): < 6.94E-09 atm*m³/mole; 25 °C Estimated

Partition coefficient, soil organic carbon/water (Koc): 1,800 - 4,400 Estimated

Persistence and Degradability: Biodegradation under aerobic laboratory conditions is below detectable limits (BOD₂₀ or BOD₂₈/ThOD < 2.5%).

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 6.69E-11 cm ³ /s | 1.92 h | Estimated |

OECD Biodegradation Tests:

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 12 % | 28 d | OECD 302B Test |

Biological oxygen demand (BOD):

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|---------|--------|
| | | < 2.5 % | |

Theoretical Oxygen Demand: 2.35 mg/mg

ECOTOXICITY: Material is moderately toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ between 1 and 10 mg/L in most sensitive species tested). Toxicity to aquatic species occurs at concentrations above

material's water solubility.

Fish Acute & Prolonged Toxicity: LC50, fathead minnow (*Pimephales promelas*), 96 h: 3.1 mg/l

Aquatic Invertebrate Acute Toxicity: EC50, water flea *Daphnia magna*, 48 h, immobilization: 1.4 - 1.7 mg/l

Toxicity to Micro-organisms: IC50; bacteria, Growth inhibition, 18 h: > 42.6 mg/l

13. DISPOSAL CONSIDERATIONS

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989- 832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

14. TRANSPORTATION INFORMATION

DOT Non-Bulk: NOT REGULATED

DOT Non-Bulk: NOT REGULATED

IMDG: NOT REGULATED

ICAO/IATA: NOT REGULATED

15. REGULATORY INFORMATION: NA

OSHA Hazard Communication Standard: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard: Yes

Delayed (Chronic) Health Hazard: No

Fire Hazard: No

Reactive Hazard: No

Sudden Release of Pressure Hazard: No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

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

European Inventory of Existing Commercial Chemical Substances (EINECS) Components of this product are not listed on EINECS because they are polymers or "no-longer polymers" marketed before the enforcement of the 7th Amendment to Directive 67/548/EEC.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Remarks:

Liquid Epoxy Resins (LERs) are made by reacting bisphenol A and epichlorohydrin. Dow uses both CAS No. 25085-99-8 and 25068-38-6 for its LERs. Other manufacturers use CAS No. 25068-38-6 for their LERs. Accordingly, LER manufacturers consider that derivatives of LERs may be described using either CAS number as a starting material.

16. OTHER INFORMATION: NA

Hazard Rating System: NFPA

Health: 1

Fire: 1

Reactivity: 1

Recommended Uses and Restrictions: Used in the adhesives and plastics industry.

The information presented herein is based on data considered to accurately reflect the scientific evidence used in making the hazard determination and is accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the foregoing data and safety information. In addition, the vendor assumes no liability for any loss, damage or injury of any type that may result from or arise out of the use of the product, from any failure to adhere to the recommended practices, from reliance on the scientific evidence used in formulating this assessment, or from any hazards inherent in the nature of the product. No responsibility is assumed by the vendor for any damage or injury from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.