



# Material Safety Data Sheet

The Dow Chemical Company

**Product Name:** D.E.R.\* 323 Epoxy Resin

**Issue Date:** 08/28/2007  
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The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Product and Company Identification

**Product Name**

D.E.R.\* 323 Epoxy Resin

**COMPANY IDENTIFICATION**

The Dow Chemical Company  
2030 Willard H. Dow Center  
Midland, MI 48674  
USA

Customer Information Number:

800-258-2436  
SDSQuestion@dow.com

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:**

989-636-4400

**Local Emergency Contact:**

989-636-4400

## 2. Hazards Identification

**Emergency Overview**

**Color:** Yellow

**Physical State:** Liquid

**Odor:** Mild

**Hazards of product:**

WARNING! May cause allergic skin reaction. May cause eye irritation. May cause skin 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**

**Eye Contact:** May cause eye irritation. Corneal injury is unlikely.

**Skin Contact:** Prolonged or repeated contact may cause skin irritation.

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

**Skin Sensitization:** Has caused allergic skin reactions in humans.

\* Indicates a Trademark

**Inhalation:** Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

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

**Cancer Information:** For the major component(s): 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.

### 3. Composition Information

Component	CAS #	Amount
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25085-99-8	86.0 %
Alkyl(C12-14) glycidyl ether	68609-97-2	14.0 %

### 4. First-aid measures

**Eye Contact:** 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 Contact:** 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.

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

**Ingestion:** No emergency medical treatment necessary.

**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 Measures

**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. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

### Storage

No specific requirements. 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.

<b>Shelf life: Use within</b>	<b>Storage temperature:</b>
24 Months	2 - 43 °C

## 8. Exposure Controls / Personal Protection

### Exposure Limits

None established

### Personal Protection

**Eye/Face Protection:** Use safety glasses.

**Skin Protection:** 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.

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Nitrile/butadiene rubber ("nitrile" or "NBR"). 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:** For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

**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. Local exhaust ventilation may be necessary for some operations.

## 9. Physical and Chemical Properties

<b>Physical State</b>	Liquid
<b>Color</b>	Yellow
<b>Odor</b>	Mild
<b>Flash Point - Closed Cup</b>	176.7 - 190.6 °C (350.1 - 375.1 °F) <i>PMCC, ASTM D93</i>
<b>Flammable Limits In Air</b>	<b>Lower:</b> Not applicable <b>Upper:</b> Not applicable
<b>Autoignition Temperature</b>	Not determined
<b>Vapor Pressure</b>	0.06 mmHg @ 70 °F <i>Literature</i> (alkyl glycidyl ether)
<b>Boiling Point (760 mmHg)</b>	>= 300 °F (>= 300 °F) <i>Literature</i> .
<b>Vapor Density (air = 1)</b>	<i>Literature</i> Not applicable
<b>Specific Gravity (H2O = 1)</b>	1.11 - 1.14 <i>Literature</i>
<b>Freezing Point</b>	Not determined
<b>Melting Point</b>	Not applicable
<b>Solubility in Water (by weight)</b>	<i>Literature</i> Insoluble
<b>pH</b>	Not applicable
<b>Dynamic Viscosity</b>	1,025 - 1,175 cPs @ 25 °C <i>ASTM D445</i>

## 10. Stability and Reactivity

### Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

**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.

**Incompatible Materials:** 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

### Acute Toxicity

#### Ingestion

Based on information for component(s): LD50, Rat > 5,000 mg/kg

#### Skin Absorption

For the major component(s): LD50, Rabbit 20,000 mg/kg

### Sensitization

#### Skin

Has caused allergic skin reactions in humans. For the major component(s): Did not cause allergic skin reactions when tested in mice.

### Repeated Dose Toxicity

Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

### Chronic Toxicity and Carcinogenicity

For the major component(s): 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

For the major component(s): 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

For the major component(s): In animal studies, did not interfere with reproduction.

### Genetic Toxicology

Based on information for component(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

## 12. Ecological Information

### CHEMICAL FATE

Data for Component: **Propane, 2,2-bis[*p*-(2,3-epoxypropoxy)phenyl]-, polymers**

#### 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 cm3/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

Data for Component: **Alkyl(C12-14) glycidyl ether**

**Movement & Partitioning**

No relevant information found.

**Partition coefficient, n-octanol/water (log Pow):** 3.77 Shake flask (OECD 107 Test)

**Persistence and Degradability**

Biodegradation under aerobic static laboratory conditions is moderate (BOD20 or BOD28/ThOD between 10 and 40%).

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method
34.7 %	28 d	OECD 301D Test

**Chemical Oxygen Demand:** 2.09 mg/mg

**ECOTOXICITY**

Data for Component: **Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers**

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

Data for Component: **Alkyl(C12-14) glycidyl ether**

EC50 is above the water solubility.

## 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. Transport Information

**DOT Non-Bulk**

NOT REGULATED

**DOT Bulk**

NOT REGULATED

**IMDG**

NOT REGULATED

**ICAO/IATA**  
NOT REGULATED

*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.*

**15. Regulatory Information****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**

<b>Immediate (Acute) Health Hazard</b>	Yes
<b>Delayed (Chronic) Health Hazard</b>	No
<b>Fire Hazard</b>	No
<b>Reactive Hazard</b>	No
<b>Sudden Release of Pressure Hazard</b>	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

### Revision

Identification Number: 79895 / 1001 / Issue Date 08/28/2007 / Version: 2.1

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

### Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

*The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*