



Material Safety Data Sheet

The Dow Chemical Company

Product Name: D.E.H.* 87 EPOXY CURING AGENT

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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.H.* 87 EPOXY CURING AGENT

COMPANY IDENTIFICATION

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

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: Flakes

Odor: Ester

Hazards of product:

No significant immediate hazards for emergency response are known.

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: Essentially nonirritating to eyes.

Skin Contact: Essentially nonirritating to skin.

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

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. Dust may cause irritation to upper respiratory tract (nose and throat).

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Effects of Repeated Exposure: Liver effects and questionable kidney and bladder effects were observed in animals fed bisphenol A.

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.

Birth Defects/Developmental Effects: The data presented are for the following material: Bisphenol A. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

3. Composition Information

Component	CAS #	Amount
Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]e] (DGEBA-based polymer)	25036-25-3	84.0 - 90.0 %
Bisphenol A	80-05-7	10.0 - 16.0 %

4. First-aid measures

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

Skin Contact: Wash skin with plenty of water.

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.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

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

Suitable extinguishing media

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

Special hazards arising from the substance or mixture

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: Phenolic compounds. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct water stream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires. 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.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

Methods and materials for containment and cleaning up: Sweep up. Contain spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Good housekeeping and controlling of dusts are necessary for safe handling of product.

Storage

Store in a dry place. Store indoors. Material will sinter if stored for long periods above 30°C. Shelf life begins from date of manufacture.

Shelf life: Use within	Storage temperature:
12 Months	< 25 °C
	< 77 °F

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Bisphenol A	Dow IHG	TWA Inhalable fraction and vapor	5 mg/m ³ D-SEN

A D-SEN notation following the exposure guideline refers to the potential to produce dermal sensitization, as confirmed by human or animal data.

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: No precautions other than clean body-covering clothing should be needed.

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

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

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance

Physical State	Flakes
Color	Yellow
Odor	Ester
Odor Threshold	No test data available
pH	Not applicable
Melting Point	Not applicable
Freezing Point	Not applicable
Boiling Point (760 mmHg)	Not applicable.
Flash Point - Closed Cup	Not applicable, (decomposes prior to flashing)
Evaporation Rate (Butyl Acetate = 1)	no data available
Flammability (solid, gas)	No data available
Flammable Limits In Air	Lower: Not applicable Upper: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air = 1)	Not applicable
Specific Gravity (H₂O = 1)	1.16 <i>Literature</i>
Solubility in water (by weight)	2 % @ 20 °C
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.

Autoignition Temperature	Not applicable
Decomposition Temperature	No test data available
Dynamic Viscosity	not applicable
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available
Softening point/range:	96 - 102 °C (205 - 216 °F) <i>ASTM D3104</i>

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

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

Possibility of hazardous reactions

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.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with: Acids. Bases. Avoid unintended contact with amines.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, rat > 2,000 mg/kg

Dermal

As product: The dermal LD50 has not been determined. Based on information for component(s): Estimated. LD50, rabbit > 2,000 mg/kg

Eye damage/eye irritation

Essentially nonirritating to eyes.

Skin corrosion/irritation

Essentially nonirritating to skin.

Sensitization

Skin

Did not cause allergic skin reactions when tested in guinea pigs.

Repeated Dose Toxicity

Liver effects and questionable kidney and bladder effects were observed in animals fed bisphenol A.

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

The data presented are for the following material: Bisphenol A. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

No relevant data found.

Genetic Toxicology

The data presented are for the following material: Bisphenol A. In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative.

12. Ecological Information

Toxicity

Data for Component: **Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]e (DGEbPA-based polymer)**

Not expected to be acutely toxic, but may cause adverse effects by physical/mechanical means.

Data for Component: **Bisphenol A**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, *Oncorhynchus mykiss* (rainbow trout), static, 96 h: 3 - 5 mg/l

LC50, *Pimephales promelas* (fathead minnow), static, 96 h: 4.6 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, *Daphnia magna* (Water flea), static test, 48 h, immobilization: 3.9 mg/l

Aquatic Plant Toxicity

EC50, *Skeletonema costatum*, static test, Growth rate inhibition, 96 h: 1.1 mg/l

Toxicity to Micro-organisms

EC50; Bacteria, static test, 96 h: > 320 mg/l

Fish Chronic Toxicity Value (ChV)

Fish, 60 d, growth, NOEC:0.355 mg/l, LOEC:1.82 mg/l

Fish, 60 d, survival, NOEC:1.82 mg/l

Pimephales promelas (fathead minnow), 444 d, NOEC:0.016 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, NOEC: > 3.146 mg/l,

LOEC: > 3.146 mg/l

Persistence and Degradability

Data for Component: **Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]e (DGEbPA-based polymer)**

Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Data for Component: **Bisphenol A**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
93.1 %	28 d	OECD 301F Test	pass
87 - 95 %	28 d	OECD 302A Test	Not applicable

Theoretical Oxygen Demand: 2.52 mg/mg

Bioaccumulative potential

Data for Component: **Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]e (DGEbPA-based polymer)**

Bioaccumulation: In the terrestrial environment, material is expected to remain in the soil.

Data for Component: **Bisphenol A**

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).

Partition coefficient, n-octanol/water (log Pow): 3.4 Shake flask (OECD 107 Test)

Bioconcentration Factor (BCF): 5.1 - 13.3; Cyprinus carpio (Carp); Measured

Mobility in soilData for Component: **Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane] (DGEbPA-based polymer)**

Mobility in soil: In the aquatic environment, material will sink and remain in the sediment.

Data for Component: **Bisphenol A**

Mobility in soil: Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient, soil organic carbon/water (Koc): 636 - 931 Measured

Henry's Law Constant (H): 3.12E-07 Pa*m³/mole.; 25 °C Estimated.

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. AS YOUR SUPPLIER, WE HAVE 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.

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 not 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	No
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

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Bisphenol A	80-05-7	10.0 - 16.0 %

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

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Bisphenol A	80-05-7	10.0 - 16.0 %

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.

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

16. Other Information

Recommended Uses and Restrictions

Identified uses

Industrial powder coating applications.

Revision

Identification Number: 50492 / 1001 / Issue Date 08/09/2013 / Version: 3.0

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.