

SAFETY DATA SHEET



D.E.N.® 439 Epoxy Novolac

Version	Revision Date:	SDS Number:	Date of last issue: 06-12-2019
7.0	05-04-2021	101201643	Date of first issue: 05-04-2021

BLUE CUBE OPERATIONS LLC 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.

SECTION 1. IDENTIFICATION

Product name : D.E.N.® 439 Epoxy Novolac

Product code : 000000001000001908

Manufacturer or supplier's details

Company name of supplier : BLUE CUBE OPERATIONS LLC

Address : 190 CARONDELET PLAZA, SUITE 1530
CLAYTON MO 63105-3467

Telephone : (844) 238-3445

E-mail address : INFO@OLIN.COM

Emergency telephone : +1 800 424 9300

Local Emergency Contact : 1-800-424-9300

Identified uses : Used in applications such as:
Casting.
Tooling.
Composites.
Coil coatings.
Marine and protective coatings.
Potting and encapsulation.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

This product is not hazardous per the Globally Harmonized System of Classification and Labelling (GHS).

GHS label elements

This product is not hazardous per the Globally Harmonized System of Classification and Labelling (GHS).

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

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Substance name : Phenol, formaldehyde glycidyl ether polymer

CAS-No. : 28064-14-4

Components

Chemical name	CAS-No.	Concentration (% w/w)
Phenol, formaldehyde glycidyl ether polymer	28064-14-4	100

SECTION 4. FIRST AID MEASURES

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

In case of skin contact : Wash off with plenty of water.

In case of 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.

If swallowed : 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)any additional important symptoms and effects are described in Section 11: Toxicology Information.

Protection of first-aiders : If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water fog or fine spray.
Dry chemical fire extinguishers.
Carbon dioxide fire extinguishers.
Foam.

Specific hazards during fire fighting : Container may rupture from gas generation in a fire situation. 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.

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.

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- Carbon monoxide.
Carbon dioxide.
- Further information : 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 waterstream. Use fine water spray or foam. 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. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires. Move container from fire area if this is possible without hazard.
- Special protective equipment for fire-fighters : Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
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SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Spilled material may cause a slipping hazard. 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. See SECTION 13, Disposal Considerations, for information regarding the disposal of contained spills.
- 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.
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SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : Good housekeeping and controlling of dusts are necessary for safe handling of product.
- Conditions for safe storage : No specific requirements.
- Recommended storage temperature : 36 - 109 °F / 2 - 43 °C
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perature

Storage period : 24 Months

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters**

Contains no substances with occupational exposure limit values.

Engineering measures : 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.

Personal protective equipment

Respiratory protection : Under intended handling conditions, no respiratory protection should be needed.

Hand protection

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

Eye protection : Use safety glasses (with side shields).
If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Viscous liquid

Color : Yellow

Odor : Ether

Odor Threshold : No test data available

pH : Not applicable

Melting point/range : Not determined

Freezing point : Not applicable

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Softening point	118 - 136 °F / 48 - 58 °C Method: ASTM D3104
Boiling point/boiling range	: >= 473 °F / >= 245 °C Method: Literature
Flash point	: 424 °F / 218 °C Method: Pensky-Martens Closed Cup ASTM D 93, closed cup
Evaporation rate	: No test data available
Flammability (solid, gas)	: No
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapor pressure	: <= 20 mmHg (68 °F / 20 °C) Method: Literature
Relative vapor density	: Not applicable
Relative density	: 1.22 Method: Literature
Density	: 1.22 g/cm ³ (77 °F / 25 °C) Method: ASTM D4052
Solubility(ies) Water solubility	: < 10 g/l (77 °F / 25 °C) Method: Literature
Autoignition temperature	: Not applicable (decomposes prior to ignition)
Decomposition temperature	: No test data available
Viscosity Viscosity, dynamic	: Not applicable
Explosive properties	: No data available
Oxidizing properties	: No data available
Molecular weight	: Not determined
Particle size	: Not determined

Note: These are the Reference Points for these Physical Properties listed above, unless otherwise noted in their respective Physical Property value information: Boiling Point at 760 mmHg; Evaporation Rate Butyl Acetate = 1; Relative Vapor Density Air = 1; and Relative Density Water = 1.

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NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
Chemical stability	: Stable under recommended storage conditions. See Storage, Section 7.
Possibility of hazardous reactions	: 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	: Avoid temperatures above 300 °C Potentially violent decomposition can occur above 350 °C Generation of gas during decomposition can cause pressure in closed systems.
Incompatible materials	: Avoid contact with oxidizing 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. Gases are released during decomposition. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water.

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity****Components:****Phenol, formaldehyde glycidyl ether polymer:**

Acute oral toxicity	: Remarks: 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. LD50 (Rat): > 2,000 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	: Remarks: Vapors are unlikely due to physical properties. No adverse effects are anticipated from single exposure to dust.

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Remarks: The LC50 has not been determined.

Acute dermal toxicity : Remarks: The dermal LD50 has not been determined.

LD50 (Rabbit): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: For similar material(s):

Skin corrosion/irritation**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Result : No skin irritation
Remarks : Essentially nonirritating to skin.

Serious eye damage/eye irritation**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Result : No eye irritation
Remarks : May cause slight temporary eye irritation.
Corneal injury is unlikely.
Solid or dust may cause irritation or corneal injury due to mechanical action.

Respiratory or skin sensitization**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Remarks : For skin sensitization:
No relevant data found.

Remarks : For respiratory sensitization:
No relevant data found.

Germ cell mutagenicity**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Genotoxicity in vitro : Remarks: Some similar resins have shown genetic toxicity in in vitro tests, while others have not.

Carcinogenicity**Components:****Phenol, formaldehyde glycidyl ether polymer:**

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Remarks : Similar epoxy resin did not cause cancer in long-term animal studies.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Effects on fertility : Remarks: No relevant data found.

Effects on fetal development : Remarks: No relevant data found.

STOT-single exposure**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Repeated dose toxicity**Components:****Phenol, formaldehyde glycidyl ether polymer:**

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

Aspiration toxicity**Components:****Phenol, formaldehyde glycidyl ether polymer:**

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

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****Phenol, formaldehyde glycidyl ether polymer:**

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

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Persistence and degradability**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Biodegradability : Remarks: No appreciable biodegradation is expected.

Bioaccumulative potential**Components:****Phenol, formaldehyde glycidyl ether polymer:**

Partition coefficient: n-octanol/water : Remarks: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil**Product:**

Distribution among environmental compartments : Remarks: No relevant data found.

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : 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.

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.

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

SECTION 14. TRANSPORT INFORMATION**International Regulations**

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UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION**EPCRA - Emergency Planning and Community Right-to-Know****SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.**US State Regulations****Pennsylvania Right To Know**

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

California Prop. 65

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.

International Regulations

Montreal Protocol (Ozone Depleting Substances) : Not applicable

Rotterdam Convention (Prior Informed Consent) : Not applicable

Stockholm Convention (Persistent Organic Pollutants) : Not applicable

The ingredients of this product are reported in the following inventories:**CH INV** : All intentional components are listed on the inventory, are exempt, or are supplier certified.**DSL** : All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

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AICS	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
NZIoC	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
ENCS	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
ISHL	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
KECI	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
PICCS	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
IECSC	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
TCSI	:	All intentional components are listed on the inventory, are exempt, or are supplier certified.
TSCA	:	All substances listed as active on the TSCA Inventory or are not required to be listed.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Further information

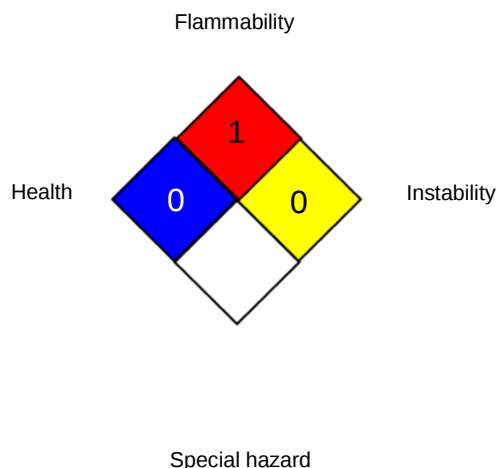
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NFPA 704:



Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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BLUE CUBE OPERATIONS LLC 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.

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