SAFETY DATA SHEET

D.E.R.® 337-X90 Epoxy Resin

Version	Revision Date:	SDS Number:	Date of last issue: 05-17-2021
12.1	04-03-2023	101198505	Date of first issue: 04-03-2023

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.R.® 337-X90 Epoxy Resin
Product code	:	000000001000002367

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
24-Hour Emergency Contact	:	+1 800 424 9300
Local Emergency Contact	:	1-800-424-9300
Identified uses	:	Used in the adhesives and coatings applications.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	:	Category 3
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Skin sensitization	:	Sub-category 1B
Specific target organ toxicity - repeated exposure (Inhalation)	:	Category 2 (Auditory system)

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : Flammable liquid and vapor.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause damage to organs (Auditory system) through prolonged or repeated exposure if inhaled.

Precautionary Statements :

Prevention:

P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 Get medical advice/ attention if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

Static-accumulating flammable liquid.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]	25036-25-3	> 85 - <= 95
Xylene	1330-20-7	> 5 - <= 10
Ethylbenzene	100-41-4	> 1 - <= 5

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

In case of 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.

In case of eye contact : Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.
Suitable emergency eye wash facility should be available in work area.

If swallowed : Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth unless the person is fully conscious.

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 : First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to physician : Maintain adequate ventilation and oxygenation of the patient. If burn is present, treat as any thermal burn, after decontamination.
Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if

lavage is done.
No specific antidote.
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.
Skin contact may aggravate preexisting dermatitis.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. 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.
Unsuitable extinguishing media	:	Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.
Specific hazards during fire fighting	:	Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9. 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. Carbon monoxide. Carbon dioxide.
Further information	:	Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to pro-

tect 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 fire-fighters : 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.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Evacuate area.
Keep unnecessary and unprotected personnel from entering the area.
Keep personnel out of low areas.
Keep upwind of spill.
Ventilate area of leak or spill.
No smoking in area.
Vapor explosion hazard. Keep out of sewers.
Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion.
For large spills, warn public of downwind explosion hazard.
Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment.
Refer to section 7, Handling, for additional precautionary measures.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Avoid breathing vapor.

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 : Pump with explosion-proof equipment. If available, use foam to smother or suppress.
Ground and bond all containers and handling equipment.
Contain spilled material if possible.
Absorb with materials such as:
Sand.
Polypropylene fiber products.
Polyethylene fiber products.
Collect in suitable and properly labeled containers.

Remove residual with soap and hot water.
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.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	Keep away from heat, sparks and flame. Use only with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Keep container closed. Wash thoroughly after handling. Never use air pressure for transferring product. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically bond and ground all containers and equipment before transfer or use of material. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations.
Conditions for safe storage	:	Flammable mixtures may exist within the vapor space of containers at room temperature. Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container tightly closed.
Recommended storage temperature	:	36 - 109 °F / 2 - 43 °C
Storage period	:	24 Months

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Xylene	1330-20-7	TWA	100 ppm 435 mg/m3	OSHA Z-1
		TWA	100 ppm	ACGIH
		STEL	150 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	OSHA P0
		STEL	150 ppm 655 mg/m3	OSHA P0
Ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	OSHA P0
		STEL	125 ppm 545 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA Z-1

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Xylene	1330-20-7	Methylhippuric acids	Urine	End of shift (As soon as possible after exposure ceases)	1.5 g/g creatinine	ACGIH BEI
Ethylbenzene	100-41-4	Sum of mandelic acid and phenyl glyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	0.15 g/g creatinine	ACGIH BEI

Engineering measures : Use engineering controls to maintain airborne level below exposure limit requirements or guidelines.
If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation.
Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

Filter type : The following should be effective types of air-purifying respirators: Organic vapor cartridge.

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, use an approved respirator.
Selection of air-purifying or positive-pressure supplied-air will

depend on the specific operation and the potential airborne concentration of the material.
For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.
In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

Hand protection

Remarks	:	Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ('EVAL'). Polyvinyl alcohol ('PVA'). Polyvinyl chloride ('PVC' or 'vinyl'). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ('latex'). Neoprene. Nitrile/butadiene rubber ('nitrile' or 'NBR'). 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.
Eye protection	:	Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.
Skin and body 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid.
Color	:	Yellow
Odor	:	Aromatic
Odor Threshold	:	No test data available
pH	:	No test data available
Melting point/range	:	Not applicable
Freezing point		No test data available
Boiling point/boiling range	:	280 °F / 138 °C Method: Literature (xylene)

Flash point	:	86 °F / 30 °C Method: Literature, closed cup Xylene
Evaporation rate	:	No test data available
Flammability (liquids)	:	Static-accumulating flammable liquid.
Upper explosion limit / Upper flammability limit	:	7 %(V) Method: Literature (xylene)
Lower explosion limit / Lower flammability limit	:	1 %(V) Method: Literature (xylene)
Vapor pressure	:	9.5 mmHg (68 °F / 20 °C) Method: Literature (xylene)
Relative vapor density	:	3.7 Method: Literature (xylene)
Relative density	:	1.10 - 1.14 Method: Literature
Density	:	1.14 g/cm3 (77 °F / 25 °C) Method: ASTM D4052
Solubility(ies)		
Water solubility	:	Insoluble Method: Literature
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No test data available
Decomposition temperature	:	No test data available
Viscosity		
Viscosity, dynamic	:	5,000 - 15,000 mPa,s (77 °F / 25 °C) Method: ASTM D 445
Viscosity, kinematic	:	No test data available
Explosive properties	:	No
Oxidizing properties	:	No
Molecular weight	:	No test data available

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.
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	:	Exposure to elevated temperatures can cause product to decompose. Avoid static discharge.
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. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Remarks: Very low toxicity if swallowed. Swallowing may result in gastrointestinal irritation or ulceration. Remarks: As product: Single dose oral LD50 has not been determined. LD50 (Rat): > 5,000 mg/kg Method: Estimated. Assessment: The substance or mixture has no acute oral toxicity Remarks: Based on information for component(s):
Acute inhalation toxicity	:	Remarks: Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression.

Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

Remarks: As product:
The LC50 has not been determined.

Acute dermal toxicity : Remarks: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Remarks: As product:
The dermal LD50 has not been determined.

LD50 (Rabbit): > 15,400 mg/kg
Method: Estimated.
Remarks: Based on information for component(s):

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: Estimated.
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Single dose oral LD50 has not been determined.
Typical for this family of materials.

Acute inhalation toxicity : Remarks: Vapors are unlikely due to physical properties.
No adverse effects are anticipated from single exposure to dust.
For respiratory irritation:
No data available.

Remarks: The LC50 has not been determined.

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

LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Typical for this family of materials.

Xylene:

Acute oral toxicity : LD50 (Rat): 4,300 mg/kg

Acute inhalation toxicity : LC50 (Rat): 27.5 mg/l
Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

Ethylbenzene:

Acute oral toxicity : LD50 (Rat): 3,500 mg/kg

Acute inhalation toxicity : LC50 (Rat): 17.2 mg/l

Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rabbit): 15,500 mg/kg

Skin corrosion/irritation

Product:

Remarks : Prolonged contact may cause skin irritation with local redness.
Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.
Vapor may cause skin irritation.
May cause drying and flaking of the skin.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

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

Xylene:

Result : Skin irritation
Remarks : Prolonged contact may cause skin irritation with local redness.
Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.
Vapor may cause skin irritation.
May cause drying and flaking of the skin.

Ethylbenzene:

Result : Mild skin irritation
Remarks : Brief contact may cause moderate skin irritation with local redness.
Prolonged contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation

Product:

Remarks : May cause moderate eye irritation.
May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Result : Eye irritation
Remarks : May cause slight eye irritation.

Corneal injury is unlikely.
Solid or dust may cause irritation or corneal injury due to mechanical action.

Xylene:

Result : Eye irritation
Remarks : May cause moderate eye irritation.
May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Ethylbenzene:

Result : No eye irritation
Remarks : May cause moderate eye irritation.
Vapor may cause lacrimation (tears).

Respiratory or skin sensitization

Product:

Assessment : The product is a skin sensitizer, sub-category 1B.
Remarks : A component in this mixture has caused allergic skin reactions in humans.
Contains component(s) which have demonstrated the potential for contact allergy in mice.

Remarks : For respiratory sensitization:
No relevant data found.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Assessment : The product is a skin sensitizer, sub-category 1B.
Remarks : For skin sensitization:
Skin contact may cause an allergic skin reaction.

Remarks : For respiratory sensitization:
No relevant data found.

Xylene:

Remarks : For skin sensitization:
No relevant data found.

Remarks : For respiratory sensitization:
No relevant data found.

Ethylbenzene:

Assessment : Does not cause skin sensitization.
Remarks : Did not cause allergic skin reactions when tested in humans.

Remarks : For respiratory sensitization:

No relevant data found.

Germ cell mutagenicity

Product:

Genotoxicity in vitro : Remarks: Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others.
Contains component(s) which were negative in animal genetic toxicity studies.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

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

Xylene:

Genotoxicity in vitro : Remarks: In vitro genetic toxicity studies were negative.
Animal genetic toxicity studies were negative.

Ethylbenzene:

Genotoxicity in vitro : Remarks: In vitro genetic toxicity studies were negative.
Animal genetic toxicity studies were negative.

Carcinogenicity

Product:

Remarks : Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBPA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBPA 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 DGEBPA is carcinogenic.
Ethylbenzene has been shown to cause cancer in laboratory animals. These is no evidence that these findings are relevant to humans.
Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

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

Xylene:

Remarks : Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice.

Ethylbenzene:

Remarks : Ethylbenzene has been shown to cause cancer in laboratory animals. These is no evidence that these findings are relevant to humans.

IARC Group 2B: Possibly carcinogenic to humans
Ethylbenzene 100-41-4

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

Product:

Effects on fertility : Remarks: Contains component(s) which did not interfere with re-production in animal studies.

Effects on fetal development : Remarks: In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation.
Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. In animal inhalation studies, xylene caused toxicity to the fetus but did not cause birth defects.
Resins based on the diglycidyl ether of bisphenol A (DGEBPA) 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.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Effects on fertility : Remarks: No relevant data found.

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

Xylene:

Effects on fertility : Remarks: In animal studies, did not interfere with reproduction.

Effects on fetal development : Remarks: Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. In animal inhalation studies, xylene caused toxicity to the fetus but did not cause birth defects.
Available data are inadequate for evaluation of maternal toxicity.

Ethylbenzene:

Effects on fertility : Remarks: In animal studies, did not interfere with reproduction.
In animal studies, did not interfere with fertility.

Effects on fetal development : Remarks: Has caused birth defects in laboratory animals only at doses toxic to the mother.
Has been toxic to the fetus in lab animals at doses nontoxic to the mother.

STOT-single exposure

Product:

Assessment : Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Components:

Xylene:

Routes of exposure : Inhalation
Target Organs : Respiratory system
Assessment : May cause respiratory irritation.

Ethylbenzene:

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

STOT-repeated exposure

Components:

Ethylbenzene:

Routes of exposure : Inhalation
Target Organs : Auditory system
Assessment : May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Product:

Remarks : Contains component(s) which have been reported to cause effects on the following organs in animals:
Blood.
Kidney.
Liver.
Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans.

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

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

Xylene:

Remarks : In animals, effects have been reported on the following organs:
Blood.
Kidney.
Liver.
Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans.

Ethylbenzene:

Remarks : In animals, effects have been reported on the following organs:
May cause hearing loss based on animal data.
Kidney.
Liver.
Lung.
Although one early inhalation study on ethylbenzene reported an adverse effect on the testes, recent, more comprehensive studies have not shown this effect.

Aspiration toxicity

Product:

No aspiration toxicity classification

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

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

Xylene:

May be fatal if swallowed and enters airways.

Ethylbenzene:

Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Toxicity to fish : Remarks: 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).

LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l

Exposure time: 96 h
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.8 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic plants : ErC50 (Scenedesmus capricornutum (fresh water algae)): 11 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.3 mg/l
End point: number of offspring
Exposure time: 21 d
Test Type: semi-static test

MATC (Maximum Acceptable Toxicant Level) (Daphnia magna (Water flea)): 0.55 mg/l
End point: number of offspring
Exposure time: 21 d
Test Type: semi-static test

Toxicity to microorganisms : IC50 (Bacteria): > 42.6 mg/l
Exposure time: 18 h

Xylene:

Toxicity to fish : Remarks: 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).

LC50 (Oncorhynchus mykiss (rainbow trout)): 2.6 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other aquatic invertebrates : IC50 (Daphnia magna (Water flea)): 1 - 4.7 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (algae)): 4.36 mg/l
End point: Growth rate
Exposure time: 73 h
Test Type: Static
Method: OECD Test Guideline 201 or Equivalent

NOEC (Pseudokirchneriella subcapitata (green algae)): 0.44 mg/l
End point: Growth rate
Exposure time: 73 h
Method: OECD Test Guideline 201 or Equivalent

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): > 1.3 mg/l
End point: mortality
Exposure time: 56 d

Test Type: flow-through

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

Ethylbenzene:

Toxicity to fish : Remarks: 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).

LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.2 mg/l
Exposure time: 1 d
Test Type: Static

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 3.6 - 4.6 mg/l
End point: Growth inhibition (cell density reduction)
Exposure time: 72 h
Method: OECD Test Guideline 201 or Equivalent

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (water flea)): < 1 mg/l
Exposure time: 7 d
Test Type: semi-static test

Toxicity to microorganisms : EC50 (Bacteria): > 12 mg/l
Exposure time: 16 h

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): 0.047 mg/cm2
Exposure time: 2 d
End point: survival

Persistence and degradability

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Biodegradability : Remarks: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

aerobic
Result: Not biodegradable
Biodegradation: 12 %
Exposure time: 28 d
Method: OECD Test Guideline 302B or Equivalent
Remarks: 10-day Window: Not applicable

ThOD	:	2.35 mg/mg
Photodegradation	:	Test Type: Half-life (indirect photolysis) Sensitizer: OH radicals Rate constant: 6.69E-11 cm3/s Method: Estimated.

Xylene:

Biodegradability	:	Result: Readily biodegradable. Remarks: Material is expected to be readily biodegradable. aerobic Biodegradation: > 60 % Exposure time: 10 d Method: OECD Test Guideline 301F or Equivalent Remarks: 10-day Window: Pass
Biochemical Oxygen Demand (BOD)	:	37.000 % Incubation time: 5 d Method: DOW Test 58.000 % Incubation time: 10 d Method: DOW Test 72.000 % Incubation time: 20 d Method: DOW Test
ThOD	:	3.17 mg/mg
Photodegradation	:	Test Type: Half-life (indirect photolysis) Sensitizer: OH radicals Concentration: 1,500,000 1/cm3 Rate constant: 6.5E-12 cm3/s Method: Estimated.

Ethylbenzene:

Biodegradability	:	Result: Readily biodegradable. Remarks: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. aerobic Biodegradation: 100 % Exposure time: 6 d Method: OECD Test Guideline 301E or Equivalent Remarks: 10-day Window: Pass
Biochemical Oxygen Demand (BOD)	:	31.5 % Incubation time: 5 d 38.5 % Incubation time: 10 d

45.4 %
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 2.62 mg/mg
Method: Estimated.

ThOD : 3.17 mg/mg
Method: Estimated.

Photodegradation : Sensitizer: OH radicals
Rate constant: 7.1E-12 cm3/s
Method: Estimated.

Bioaccumulative potential

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Partition coefficient: n-octanol/water : Remarks: No relevant data found.

Xylene:

Bioaccumulation : Species: Rainbow trout (Salmo gairdneri)
Bioconcentration factor (BCF): 25.9
Method: Measured

Partition coefficient: n-octanol/water : log Pow: 3.12
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Ethylbenzene:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 15
Method: Measured

Partition coefficient: n-octanol/water : log Pow: 3.15
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Distribution among environmental compartments : Remarks: In the terrestrial environment, material is expected to remain in the soil.
In the aquatic environment, material will sink and remain in the sediment.

Xylene:

Distribution among environmental compartments : Koc: 443
Method: Estimated.
Remarks: Potential for mobility in soil is medium (Koc between 150 and 500).

Ethylbenzene:

Distribution among environmental compartments : Koc: 518
Method: Estimated.
Remarks: Potential for mobility in soil is low (Koc between 500 and 2000).

Other adverse effects

Components:

Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Xylene:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ethylbenzene:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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

UNRTDG

UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION
Class	:	3
Packing group	:	III
Labels	:	3

IATA-DGR

UN/ID No.	:	UN 1866
Proper shipping name	:	Resin solution
Class	:	3
Packing group	:	III
Labels	:	Flammable Liquids
Packing instruction (cargo aircraft)	:	366
Packing instruction (passenger aircraft)	:	355

IMDG-Code

UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION (Epoxy resin)
Class	:	3
Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	yes
Remarks	:	Stowage category A

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

UN/ID/NA number	:	UN 1866
Proper shipping name	:	Resin solution
Class	:	3
Packing group	:	III
Labels	:	FLAMMABLE LIQUID
ERG Code	:	127
Marine pollutant	:	no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

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 : Flammable (gases, aerosols, liquids, or solids)
Hazard not otherwise classified (physical hazards)
Respiratory or skin sensitization
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Xylene	1330-20-7	> 5 - <= 10 %
Ethylbenzene	100-41-4	> 1 - <= 5 %

US State Regulations

Pennsylvania Right To Know

Xylene	1330-20-7
Ethylbenzene	100-41-4
Toluene	108-88-3

California Prop. 65

WARNING: This product can expose you to chemicals including Ethylbenzene, Benzene, which is/are known to the State of California to cause cancer, and
Toluene, Benzene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Xylene	1330-20-7
Ethylbenzene	100-41-4

International Regulations

Montreal Protocol : 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:

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.

AIIC : 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.

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.

NZIoC : All intentional components are listed on the inventory, are exempt, or are supplier certified.

CH INV : All intentional components are listed on the inventory, are exempt, or are supplier certified.

TECI : On the inventory, or in compliance with the inventory

TSCA list

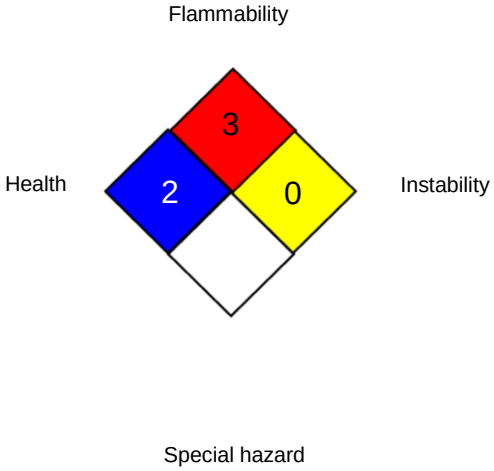
No substances are subject to a Significant New Use Rule.

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

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; 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; TECI - Thailand Existing Chemicals 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

Revision Date : 04-03-2023

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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