Material Safety Data Sheet
BLUE CUBE OPERATIONS LLC

Product name: D.E.R.™ 671-X75 EPOXY RESIN

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.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: D.E.R.™ 671-X75 EPOXY RESIN

Recommended use of the chemical and restrictions on use
Identified uses: Used in applications such as: Automotive coatings. Can coatings. Coil coatings. Civil engineering. Marine and protective coatings.

COMPANY IDENTIFICATION
BLUE CUBE OPERATIONS LLC
2030 DOW CENTER
MIDLAND MI  48674-0000
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1 800 424 9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>Aromatic</td>
</tr>
</tbody>
</table>
Hazard Summary

WARNING!!
FLAMMABLE LIQUID AND VAPOR.
May cause allergic skin reaction.
May cause eye irritation.
May cause skin irritation.
May be harmful if inhaled.
May cause central nervous system effects; may cause respiratory tract irritation.
Vapor explosion hazard.
Vapors may travel a long distance; ignition and/or flash back may occur.
Stay out of low areas.
Keep upwind of spill.
Isolate area.
Warn public of downwind explosion hazard.
Eliminate ignition sources.
Possible cancer hazard. May cause cancer based on animal data.

Potential Health Effects

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

Skin: 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.
The data presented are for the following material:
Epoxy resin.
Has caused allergic skin reactions when tested in guinea pigs.
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: 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.

Ingestion: Low toxicity if swallowed.
Swallowing may result in gastrointestinal irritation or ulceration.
Based on physical properties, not likely to be an aspiration hazard.

Chronic Exposure: Based on information for component(s):
In animals, effects have been reported on the following organs:
Blood.
Kidney.
Liver.
Lung.
Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans.
Although one early inhalation study on ethylbenzene reported an adverse effect on the testes, recent, more comprehensive studies have not shown this effect.
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. The data presented are for the following material:

Ethylbenzene.

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.

Ethylbenzene has been shown to cause cancer in laboratory animals.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Resin solution
This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
This product is a mixture.

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol, 4,4′-(1-methylethylidene)bis-, polymer with 2,2′-{[(1-methylethylidene)bis(4,1-phenyleneoxy)methylene]bis[oxiran]e} (DGEBPA-b)</td>
<td>25036-25-3</td>
<td>75.0%</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>15.0 - 25.0 %</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>1.0 - 10.0 %</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Description of first aid measures
General advice: 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.

Inhalation: 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.

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.

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. Suitable emergency eye wash facility should be available in work area.
Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: Skin contact may aggravate preexisting dermatitis. 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.

5. FIREFIGHTING 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.

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: 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.

Advice for firefighters

Fire Fighting Procedures: 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 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.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate 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. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. 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. 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.

Methods and materials for containment and cleaning up: Pump with explosion-proof equipment. If available, use foam to smother or suppress. Contain spilled material if possible. Ground and bond all containers and handling equipment. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid prolonged or repeated contact with skin. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. 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. This product is a poor conductor of electricity and can become electrostatically charged, even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur. 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. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Store in original container. Flammable mixtures may exist within the vapor space of containers at room temperature. Keep container tightly closed.

Storage stability

Storage temperature: 2 - 43 °C (36 - 109 °F)
Shelf life: Use within 24 Month

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value/Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>BEI</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>150 ppm</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>435 mg/m³ 100 ppm</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>435 mg/m³ 100 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>BEI</td>
</tr>
</tbody>
</table>

Exposure controls

Engineering controls: 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.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Neoprene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). 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.

Other 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.

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.

The following should be effective types of air-purifying respirators: Organic vapor cartridge.
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
- Physical state: Liquid.
- Color: Yellow

Odor: Aromatic
Odor Threshold: No test data available
pH: No test data available
Melting point/range: Not applicable
Freezing point: Not determined
Boiling point (760 mmHg): 138 °C (280 °F) Literature (xylene)
Flash point: closed cup 34 °C (93 °F) Pensky-Martens Closed Cup ASTM D 93
Evaporation Rate (Butyl Acetate = 1): No test data available
Flammability (solid, gas): Not applicable to liquids
Lower explosion limit: 1.1 % vol Literature (xylene)
Upper explosion limit: 7.0 % vol Literature (xylene)
Vapor Pressure: 9.5 mmHg at 20 °C (68 °F) Literature (xylene)
Relative Vapor Density (air = 1): 3.7 Literature (xylene)
Relative Density (water = 1): 1.09 - 1.10 Literature
Water solubility: Insoluble
Partition coefficient: n-octanol/water: no data available
Auto-ignition temperature: 465 °C (869 °F) Literature (xylene)
Decomposition temperature: No test data available
Dynamic Viscosity: 7,500 - 11,500 mPa.s ASTM D 445
Kinematic Viscosity: No test data available
Explosive properties: no data available
Oxidizing properties: no data available
Molecular weight: No test data available

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

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.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Swallowing may result in gastrointestinal irritation or ulceration.

As product: Single dose oral LD50 has not been determined. LD50, rat, > 2,000 mg/kg Estimated.

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

As product: The dermal LD50 has not been determined. LD50, rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity
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.

For the solvent(s):
LC50, rat, > 4000 ppm

Skin corrosion/irritation
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.

Serious eye damage/eye irritation
May cause slight eye irritation. May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

**Sensitization**
The data presented are for the following material:
Epoxy resin.
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
May cause respiratory irritation.
Route of Exposure: Oral

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Based on information for component(s):
In animals, effects have been reported on the following organs:
Blood.
Kidney.
Liver.
Lung.
Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans.
Although one early inhalation study on ethylbenzene reported an adverse effect on the testes, recent, more comprehensive studies have not shown this effect.

**Carcinogenicity**
Ethylbenzene has been shown to cause cancer in laboratory animals. Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice. Similar epoxy resin did not cause cancer in long-term animal studies.

**Teratogenicity**
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. The data presented are for the following material: Ethylbenzene. 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.

**Reproductive toxicity**
Based on information for component(s): Xylene. In animal studies, did not interfere with reproduction.

**Mutagenicity**
Some similar resins have shown genetic toxicity in in vitro tests, while others have not. The data presented are for the following material: Xylene. Ethylbenzene. In vitro genetic toxicity studies were negative. For the component(s) tested: Animal genetic toxicity studies were negative.

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

No aspiration toxicity classification
Carcinogenicity

<table>
<thead>
<tr>
<th>Component</th>
<th>List</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylbenzene</td>
<td>IARC</td>
<td>Group 2B: Possibly carcinogenic to humans</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>A3: Confirmed animal carcinogen with unknown relevance to humans</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

**Phenol, 4,4’-(1-methyleneb)is-, polymer with 2,2’-(1-methyleneb)is(4,1-phenyleneoxymethylene)bis[oxiran]e (DGEBPA-b)**

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

**Xylene**

**Acute toxicity to fish**
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), semi-static test, 96 Hour, 2.6 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**
IC50, Daphnia magna (Water flea), 24 Hour, 1 - 4.7 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**
ErC50, Pseudokirchneriella subcapitata (Selenastrum capricornutum), Static, 73 Hour, Growth rate, 4.36 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (green algae), 73 Hour, Growth rate, 0.44 mg/l, OECD Test Guideline 201 or Equivalent

**Chronic toxicity to fish**
NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 56 d, mortality, > 1.3 mg/l

**Ethylbenzene**

**Acute toxicity to fish**
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), semi-static test, 96 Hour, 4.2 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), Static, 1 d, 2.2 mg/l

**Acute toxicity to algae/aquatic plants**
EC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth inhibition (cell density reduction), 3.6 - 4.6 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**
EC50, Bacteria, 16 Hour, > 12 mg/l

**Toxicity to soil-dwelling organisms**
LC50, Eisenia fetida (earthworms), 2 d, survival, 0.047 mg/cm²

**Persistence and degradability**

_Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]_ (DGEBPA-b)

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

**Xylene**

**Biodegradability:** Material is expected to be readily biodegradable.  
10-day Window: Pass  
_Biodegradation:_ > 60 %  
_Exposure time:_ 10 d  
_Method:_ OECD Test Guideline 301F or Equivalent

**Theoretical Oxygen Demand:** 3.17 mg/mg

**Biological oxygen demand (BOD)**

<table>
<thead>
<tr>
<th>Incubation Time</th>
<th>BOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 d</td>
<td>37.000 %</td>
</tr>
<tr>
<td>10 d</td>
<td>58.000 %</td>
</tr>
<tr>
<td>20 d</td>
<td>72.000 %</td>
</tr>
</tbody>
</table>

**Photodegradation**

_Test Type:_ Half-life (indirect photolysis)  
_Sensitizer:_ Radicaux OH  
_Atmospheric half-life:_ 19.7 Hour  
_Method:_ Estimated.

**Ethylbenzene**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.  
10-day Window: Pass  
_Biodegradation:_ 100 %  
_Exposure time:_ 6 d  
_Method:_ OECD Test Guideline 301E or Equivalent

**Theoretical Oxygen Demand:** 3.17 mg/mg Estimated.

**Chemical Oxygen Demand:** 2.62 mg/mg Dichromate

**Biological oxygen demand (BOD)**
### Incubation Time and BOD

<table>
<thead>
<tr>
<th>Incubation Time</th>
<th>BOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 d</td>
<td>31.5%</td>
</tr>
<tr>
<td>10 d</td>
<td>38.5%</td>
</tr>
<tr>
<td>20 d</td>
<td>45.4%</td>
</tr>
</tbody>
</table>

### Photodegradation
- **Sensitizer:** Radicaux OH
- **Atmospheric half-life:** 55 Hour
- **Method:** Estimated.

### Bioaccumulative Potential

**Phenol, 4,4′-(1-methylethyldiene)bis-, polymer with 2,2′-[1-methylethyldiene]bis(4,1-phenyleneoxymethylene)bis[oxiran]e]** (DGEBA-b)

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

**Xylene**

- **Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
- **Partition coefficient:** n-octanol/water (log Pow): Measured
- **Bioconcentration factor (BCF):** 25.9 Rainbow trout (Salmo gairdneri) Measured

**Ethylbenzene**

- **Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
- **Partition coefficient:** n-octanol/water (log Pow): Measured
- **Bioconcentration factor (BCF):** 15 Fish Measured

### Mobility in Soil

**Phenol, 4,4′-(1-methylethyldiene)bis-, polymer with 2,2′-[1-methylethyldiene]bis(4,1-phenyleneoxymethylene)bis[oxiran]e]** (DGEBA-b)

- In the aquatic environment, material will sink and remain in the sediment.

**Xylene**

- Potential for mobility in soil is medium (Koc between 150 and 500).
- **Partition coefficient (Koc):** 443 Estimated.

**Ethylbenzene**

- Potential for mobility in soil is low (Koc between 500 and 2000).
- **Partition coefficient (Koc):** 518 Estimated.

### 13. DISPOSAL CONSIDERATIONS

**Disposal methods:** 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

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>Resin solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1866</td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Reportable Quantity</td>
<td>Xylene, Ethylbenzene</td>
</tr>
</tbody>
</table>

Classification for SEA transport (IMO-IMDG):

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>RESIN SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1866</td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Transport in bulk</td>
<td>Consult IMO regulations before transporting ocean bulk</td>
</tr>
<tr>
<td>according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code</td>
<td></td>
</tr>
</tbody>
</table>

Classification for AIR transport (IATA/ICAO):

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>Resin solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1866</td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
</tbody>
</table>

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. 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
Fire Hazard
Acute Health Hazard
Chronic Health Hazard

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.

Components
Xylene
Ethylbenzene

Pennsylvania Worker and Community Right-To-Know Act:
The following chemicals are listed because of the additional requirements of Pennsylvania law.

Components
Xylene
Ethylbenzene

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Components
Ethylbenzene

United States TSCA Inventory (US.TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Revision
Identification Number: 101198715 / A476 / Issue Date: 04/16/2015 / Version: 7.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>USA. ACGIH Threshold Limit Values (TLV)</th>
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<tbody>
<tr>
<td>BEI</td>
<td>Biological Exposure Indices</td>
</tr>
<tr>
<td>OSHA Z-1</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term exposure limit</td>
</tr>
<tr>
<td>TWA</td>
<td>8-hour, time-weighted average</td>
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</tbody>
</table>

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

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.