



# SAFETY DATA SHEET

## BLUE CUBE OPERATIONS LLC

**Product name:** D.E.H.™ 545 Epoxy Curing Agent

**Issue Date:** 05/25/2015

**Print Date:** 06/01/2015

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.

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## 1. IDENTIFICATION

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**Product name:** D.E.H.™ 545 Epoxy Curing Agent

**Recommended use of the chemical and restrictions on use**

**Identified uses:** Curing agent.

**COMPANY IDENTIFICATION**

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

**Customer Information Number:**

800-258-2436

[SDSQuestion@dow.com](mailto:SDSQuestion@dow.com)

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:** 1 800 424 9300

**Local Emergency Contact:** 800-424-9300

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## 2. HAZARDS IDENTIFICATION

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**Hazard classification**

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Flammable liquids - Category 4

Acute toxicity - Category 4 - Oral

Acute toxicity - Category 4 - Inhalation

Acute toxicity - Category 4 - Dermal

Skin corrosion - Category 1B

Serious eye damage - Category 1

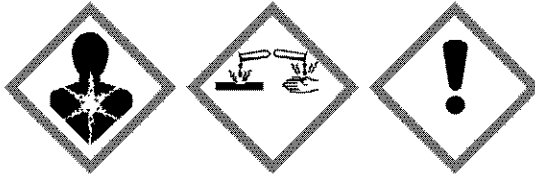
Skin sensitisation - Category 1

Reproductive toxicity - Category 2

Specific target organ toxicity - single exposure - Category 3

**Label elements**

**Hazard pictograms**



Signal word: **DANGER!**

**Hazards**

Combustible liquid.  
Harmful if swallowed, in contact with skin or if inhaled  
Causes severe skin burns and eye damage.  
May cause an allergic skin reaction.  
Causes serious eye damage.  
May cause respiratory irritation.  
Suspected of damaging fertility or the unborn child.

**Precautionary statements**

**Prevention**

Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
Wash skin thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Use only outdoors or in a well-ventilated area.  
Contaminated work clothing should not be allowed out of the workplace.  
Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response**

IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.  
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.  
IF exposed or concerned: Get medical advice/ attention.  
If skin irritation or rash occurs: Get medical advice/ attention.  
Wash contaminated clothing before reuse.  
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

**Storage**

Store in a well-ventilated place. Keep container tightly closed.  
Store in a well-ventilated place. Keep cool.  
Store locked up.

**Disposal**

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

**Other hazards**

no data available

**3. COMPOSITION/INFORMATION ON INGREDIENTS****Chemical nature:** organic components mixture

This product is a mixture.

Component	CASRN	Concentration
Benzyl alcohol	100-51-6	20.0 - 30.0 %
1,3-Benzenedimethanamine	1477-55-0	5.0 - 15.0 %
1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]	110839-13-9	5.0 - 20.0 %
3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)	2855-13-2	5.0 - 10.0 %
Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine	68953-36-6	30.0 - 40.0 %
Bisphenol A	80-05-7	< 3.0 %
Salicylic acid	69-72-7	< 2.0 %
N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine	1760-24-3	< 3.0 %
2,4,6-Tris[(dimethylamino)methyl]phenol	90-72-2	< 2.0 %
Oligomers of Aminoalkylmethoxysilanes	Not Available	< 1.5 %

**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:** Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Seek medical attention if symptoms occur or irritation persists. Wash clothing

before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be immediately available.

**Eye contact:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

**Ingestion:** 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) 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:** Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. 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. Repeated excessive exposure may aggravate preexisting lung disease.

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## **5. FIREFIGHTING MEASURES**

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**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.

**Unsuitable extinguishing media:** Do not use direct water stream. May spread 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: Nitrogen oxides. Carbon monoxide. Carbon dioxide.

**Unusual Fire and Explosion Hazards:** Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

#### **Advice for firefighters**

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. 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.

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal precautions, protective equipment and emergency procedures:** Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep upwind of spill. Ventilate area of leak or spill. 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.

**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:** Contain spilled material if possible. Absorb with materials such as: Sand. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

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## 7. HANDLING AND STORAGE

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**Precautions for safe handling:** Keep away from heat, sparks and flame. 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. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Do not swallow. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

**Conditions for safe storage:** Store in a cool, dry place.

### Storage stability

<b>Storage temperature:</b>	<b>Shelf life: Use within</b>
0 - 30 °C (32 - 86 °F)	24 Month

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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### Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Benzyl alcohol	US WEEL	TWA	10 ppm
1,3-Benzenedimethanamine	ACGIH	C	0.1 mg/m <sup>3</sup>
	ACGIH	C	Absorbed via skin

Bisphenol A

Dow IHG

TWA Inhalable  
fraction and vapor2 mg/m<sup>3</sup>**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 chemical goggles.

**Skin protection**

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

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Appearance**

<b>Physical state</b>	liquid
<b>Color</b>	Brown
<b>Odor</b>	amine-like
<b>Odor Threshold</b>	No test data available
<b>pH</b>	Not applicable
<b>Melting point/range</b>	Not applicable
<b>Freezing point</b>	No test data available
<b>Boiling point (760 mmHg)</b>	135 °C ( 275 °F) <i>Literature</i>
<b>Flash point</b>	<b>closed cup</b> 75 °C ( 167 °F) <i>Literature</i>
<b>Evaporation Rate (Butyl Acetate = 1)</b>	No test data available
<b>Flammability (solid, gas)</b>	Not Applicable
<b>Lower explosion limit</b>	No test data available

<b>Upper explosion limit</b>	No test data available
<b>Vapor Pressure</b>	10 mmHg at 93 °C (199 °F) <i>Literature</i> (benzyl alcohol)
<b>Relative Vapor Density (air = 1)</b>	No test data available
<b>Relative Density (water = 1)</b>	1.01 at 25 °C (77 °F) <i>Literature</i>
<b>Water solubility</b>	<i>Literature</i> Slightly soluble
<b>Partition coefficient: n-octanol/water</b>	no data available
<b>Auto-ignition temperature</b>	No test data available
<b>Decomposition temperature</b>	No test data available
<b>Dynamic Viscosity</b>	no data available
<b>Kinematic Viscosity</b>	300 - 700 cSt at 25 °C (77 °F) <i>ASTM D 445</i>
<b>Explosive properties</b>	no data available
<b>Oxidizing properties</b>	no data available
<b>Molecular weight</b>	no data available

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

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** no data available

**Chemical stability:** Stable under recommended storage conditions. See Storage, Section 7.

**Possibility of hazardous reactions:** Polymerization will not occur.

**Conditions to avoid:** Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Reaction with carbon dioxide may form an amine carbamate. Smoke may be generated depending on vapor pressure of mixture. Product absorbs carbon dioxide from the air.

**Incompatible materials:** Avoid contact with oxidizing materials. Avoid contact with: Acids. Acrylates. Alcohols. Aldehydes. Halogenated hydrocarbons. Ketones. Nitrites. Avoid contact with metals such as: Brass. Bronze. Copper. Copper alloys.

**Hazardous decomposition products:** Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aromatic compounds. Ammonia. Volatile amines. Hydrocarbons. Phenolics.

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## 11. TOXICOLOGICAL INFORMATION

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*Toxicological information appears 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. Swallowing may result in burns of the mouth and throat.

As product: Single dose oral LD50 has not been determined. Based on information for component(s):  
LD50, Rat, > 1,000 mg/kg Estimated.

**Acute dermal toxicity**

Prolonged or widespread skin contact may result in absorption of potentially harmful amounts.

As product: The dermal LD50 has not been determined. Based on information for component(s):  
LD50, Rabbit, > 1,000 mg/kg Estimated.

**Acute inhalation toxicity**

Excessive exposure may cause irritation to upper respiratory tract (nose and throat). May cause central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Prolonged excessive exposure may cause serious adverse effects, even death. Mist may cause irritation of upper respiratory tract (nose and throat) and lungs.  
The LC50 has not been determined.

**Skin corrosion/irritation**

Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

**Serious eye damage/eye irritation**

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**Sensitization**

Skin contact may cause an allergic skin reaction.  
A component in this mixture has caused allergic skin reactions in humans.  
Contains component(s) which have caused allergic skin sensitization in guinea pigs.  
Contains component(s) which have demonstrated the potential for contact allergy in mice.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

May cause respiratory irritation.  
Route of Exposure: Inhalation  
Target Organs: Respiratory system

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

For the component(s) tested:  
In animals, effects have been reported on the following organs:  
Central nervous system.  
Muscles.  
Thymus.  
Urinary tract.  
Respiratory tract.  
Liver.  
Kidney.  
Gastrointestinal tract.



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

**Carcinogenicity**

No convincing evidence for carcinogenicity of Bisphenol A has been seen in long-term animal studies. Contains component(s) which did not cause cancer in laboratory animals.

**Teratogenicity**

Based on information for component(s): Has caused birth defects in laboratory animals only at doses toxic to the mother. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

**Reproductive toxicity**

Contains component(s) which did not interfere with reproduction in animal studies. Contains component(s) which did not interfere with fertility in animal studies. In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals. Bisphenol A affected reproduction in rats and mice, but only at high exposure levels that exceeded the body's capacity to metabolize and deactivate the chemical. Maintaining exposures below appropriate workplace exposure limits should avoid these and other effects.

**Mutagenicity**

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

**Aspiration Hazard**

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

**COMPONENTS INFLUENCING TOXICOLOGY:****Benzyl alcohol****Acute inhalation toxicity**

LC50, Rat, 4 Hour, vapour, 11 mg/l

**1,3-Benzenedimethanamine****Acute inhalation toxicity**

Prolonged excessive exposure may cause serious adverse effects, even death. Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Salivation.

LC50, Rat, 4 Hour, dust/mist, 1.34 mg/l

**1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]****Acute inhalation toxicity**

The LC50 has not been determined.

**3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)****Acute inhalation toxicity**

LC50, Rat, 4 Hour, dust/mist, > 5.01 mg/l

**Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine****Acute inhalation toxicity**

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

**Bisphenol A**

**Acute inhalation toxicity**

The LC50 has not been determined.

**Salicylic acid**

**Acute inhalation toxicity**

The LC50 has not been determined.

**N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine**

**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility. Contains a component(s) which hydrolyzes to methanol. Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death.

As product: The LC50 has not been determined.

**2,4,6-Tris(dimethylamino)methylphenol**

**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation and other effects. Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Excessive exposure may cause lung injury. Effects may be delayed.

The LC50 has not been determined.

**Oligomers of Aminoalkylmethoxysilanes**

**Acute inhalation toxicity**

The LC50 has not been determined.

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**12. ECOLOGICAL INFORMATION**

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*Ecotoxicological information appears in this section when such data is available.*

**Toxicity**

**Benzyl alcohol**

**Acute toxicity to fish**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).  
LC50, Pimephales promelas (fathead minnow), Static, 96 Hour, 460 mg/l, Method Not Specified.

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), 48 Hour, 230 mg/l, OECD Test Guideline 202

**Acute toxicity to algae/aquatic plants**

EC50, Pseudokirchneriella subcapitata (green algae), Static, 72 Hour, Growth rate, 770 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**

EC50, activated sludge, Respiration inhibition, 49 Hour, Respiration rates., 2,100 mg/l, OECD 209 Test

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna, semi-static test, 21 d, 51 mg/l

**1,3-Benzenedimethanamine**

**Acute toxicity to fish**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Leuciscus idus (Golden orfe), 96 Hour, 75 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, 15.2 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

EC50, alga Scenedesmus sp., static test, 72 Hour, Biomass, 12 mg/l, OECD Test Guideline 201 or Equivalent

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 4.7 mg/l

**1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]**

**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).

LL50, Rainbow trout (Oncorhynchus mykiss), static test, 96 Hour, 64 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EL50, Daphnia magna (Water flea), static test, 48 Hour, 1.46 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

EL50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Cell yield inhibition, > 30 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

EC50, activated sludge, aerobic, 3 Hour, Respiration rates., 888.9 mg/l, activated sludge test (OECD 209)

**3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)**

**Acute toxicity to fish**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Leuciscus idus (Golden orfe), semi-static test, 96 Hour, 110 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), Static, 48 Hour, 23 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

EbC50, alga Scenedesmus sp., 72 Hour, Biomass, 37 mg/l

**Toxicity to bacteria**

EC10, Bacteria, 18 Hour, 1,120 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 3 mg/l

**Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine**

**Acute toxicity to fish**

No relevant data found.

**Bisphenol A**

**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, Fathead minnow (Pimephales promelas), 96 Hour, 4.6 mg/l

LC50, Atlantic silverside (Menidia menidia), 96 Hour, 9.4 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), 48 Hour, 10.2 mg/l

EC50, saltwater mysid Mysidopsis bahia, 96 Hour, 1.1 mg/l

**Acute toxicity to algae/aquatic plants**

EC50, Skeletonema costatum, static test, 96 Hour, Growth rate inhibition, 1.1 mg/l

**Toxicity to bacteria**

EC50, Bacteria, 96 Hour, Respiration rates., > 320 mg/l

**Chronic toxicity to fish**

NOEC, Fathead minnow (Pimephales promelas), 164 d, mortality, 0.160 mg/l

NOEC, Pimephales promelas (fathead minnow), 444 d, number of offspring, 0.016 mg/l

NOEC, Cyprinodon variegatus (sheepshead minnow), 116 d, number of offspring, 0.066 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, saltwater mysid Mysidopsis bahia, 28 d, number of offspring, 0.17 mg/l

NOEC, Marisa cornuarietis (Giant Ramshorn Snail), 328 d, growth, 0.025 mg/l

**Salicylic acid**

**Acute toxicity to fish**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, emerald shiner (Notropis atherinoides), 96 Hour, > 150 mg/l, Method Not Specified.

LC50, Leuciscus idus (Golden orfe), static test, 48 Hour, 90 mg/l, Method Not Specified.

**Acute toxicity to aquatic invertebrates**

LC50, Daphnia magna (Water flea), 24 Hour, 105 - 230 mg/l, Method Not Specified.

**Toxicity to bacteria**

EC50, activated sludge, 3 Hour, > 3,200 mg/l, OECD 209 Test

**N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine**

**Acute toxicity to fish**

Contains a component(s) which hydrolyzes to methanol.

LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 168 mg/l  
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 100 mg/l  
LC50, Lepomis macrochirus (Bluegill sunfish), 96 Hour, > 100 mg/l

**Acute toxicity to aquatic invertebrates**

LC50, Daphnia magna (Water flea), 48 Hour, 87.4 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 8.8 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

EC50, Bacteria, 18 Hour, 435 mg/l

**Toxicity to Above Ground Organisms**

Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).

**2,4,6-Tris[(dimethylamino)methyl]phenol**

**Acute toxicity to fish**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms.

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 180 - 240 mg/l, Method Not Specified.

**Acute toxicity to algae/aquatic plants**

ErC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 84 mg/l, OECD Test Guideline 201 or Equivalent

**Oligomers of Aminoalkylmethoxysilanes**

**Acute toxicity to fish**

No relevant data found.

**Persistence and degradability**

**Benzyl alcohol**

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

10-day Window: Not applicable

**Biodegradation:** 92 - 96 %

**Exposure time:** 14 d

**Method:** OECD Test Guideline 301C or Equivalent

**Theoretical Oxygen Demand:** 2.52 mg/mg

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 1.296 d

**Method:** Estimated.

**1,3-Benzenedimethanamine**

**Biodegradability:** Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability). 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.

10-day Window: Not applicable

**Biodegradation:** 22 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 302C or Equivalent

10-day Window: Fail

**Biodegradation:** 49 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

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

#### **Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 0.15 d

**Method:** Estimated.

#### **1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]**

**Biodegradability:** Material is not readily biodegradable according to OECD/EEC guidelines.

10-day Window: Fail

**Biodegradation:** 0 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F or Equivalent

#### **3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)**

**Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail

**Biodegradation:** 8 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301A or Equivalent

10-day Window: Not applicable

**Biodegradation:** 42 %

**Exposure time:** 3 Hour

**Method:** OECD Test Guideline 303A or Equivalent

**Theoretical Oxygen Demand:** 3.38 mg/mg

#### **Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 0.126 d

**Method:** Estimated.

#### **Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine**

**Biodegradability:** No relevant data found.

#### **Bisphenol A**

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

10-day Window: Pass

**Biodegradation:** 93.1 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F or Equivalent

10-day Window: Not applicable

**Biodegradation:** 87 - 95 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 302A or Equivalent

**Theoretical Oxygen Demand:** 2.52 mg/mg

#### **Photodegradation**

**Test Type:** Half-life (direct photolysis)

**Method:** Measured

#### **Salicylic acid**

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

10-day Window: Not applicable

**Biodegradation:** 88.1 %

**Exposure time:** 14 d

**Method:** OECD Test Guideline 301C or Equivalent

**Theoretical Oxygen Demand:** 1.62 mg/mg

#### **Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 0.823 d

**Method:** Estimated.

#### **N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine**

**Biodegradability:** Chemical degradation (hydrolysis) is expected in the environment. Contains a component(s) which hydrolyzes to methanol. 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.

10-day Window: Fail

**Biodegradation:** 39 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301A or Equivalent

**Theoretical Oxygen Demand:** 2.39 mg/mg Estimated.

**Chemical Oxygen Demand:** 1.76 mg/mg Estimated.

#### **Biological oxygen demand (BOD)**

Incubation Time	BOD
5 d	23 %
10 d	30 %
20 d	29 %

**Stability in Water (1/2-life)**

Hydrolysis, half-life, 0.025 Hour, pH 7

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 0.088 d

**Method:** Estimated.

**2,4,6-Tris(dimethylamino)methylphenol**

**Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail

**Biodegradation:** 4 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301D or Equivalent

**Theoretical Oxygen Demand:** 3.01 mg/mg

**Oligomers of Aminoalkylmethoxysilanes**

**Biodegradability:** No relevant data found.

**Bioaccumulative potential****Benzyl alcohol**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 1.10 Measured

**1,3-Benzenedimethanamine**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 0.18 OECD Test Guideline 107 or Equivalent

**Bioconcentration factor (BCF):** < 3 Cyprinus carpio (Carp) 42 d Measured

**1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 3.6 at 25 °C

**Bioconcentration factor (BCF):** 4.77 Fish. Estimated.

**3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 0.79 Measured

**Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine**

**Bioaccumulation:** No relevant data found.

**Bisphenol A**



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

**Partition coefficient: n-octanol/water(log Pow):** 3.4 at 21.5 °C OECD Test Guideline 107 or Equivalent

**Bioconcentration factor (BCF):** 5.1 - 13.3 Cyprinus carpio (Carp) 42 d

#### **Salicylic acid**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 2.26 Measured

#### **N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine**

**Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility.

**Partition coefficient: n-octanol/water(log Pow):** -1.67 Estimated.

#### **2,4,6-Tris[(dimethylamino)methyl]phenol**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 0.77 Estimated.

**Bioconcentration factor (BCF):** 3 Estimated.

#### **Oligomers of Aminoalkylmethoxysilanes**

**Bioaccumulation:** No relevant data found.

#### **Mobility in soil**

##### **Benzyl alcohol**

Potential for mobility in soil is very high (Koc between 0 and 50).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** 16 Estimated.

##### **1,3-Benzenedimethanamine**

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

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** 910 Estimated.

##### **1,3-Benzenedimethanamine, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]**

Expected to be relatively immobile in soil (Koc > 5000).

**Partition coefficient(Koc):** > 5000 OECD 121: HPLC Method

Adsorption/SoilSoil

##### **3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)**

Potential for mobility in soil is medium (Koc between 150 and 500).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** 340 Estimated.

##### **Fatty Acids, Tall-Oil, reaction products with Tetraethylenepentamine**

No relevant data found.

##### **Bisphenol A**

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

**Partition coefficient(Koc):** 636 - 931 Measured

#### **Salicylic acid**

Potential for mobility in soil is very high (Koc between 0 and 50).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** 24 Estimated.

#### **N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine**

Expected to be relatively immobile in soil (Koc > 5000).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** > 5000 Estimated.

#### **2,4,6-Tris(dimethylamino)methylphenol**

Expected to be relatively immobile in soil (Koc > 5000).

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient(Koc):** 15130 Estimated.

#### **Oligomers of Aminoalkylmethoxysilanes**

No relevant data found.

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### **13. DISPOSAL CONSIDERATIONS**

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**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.

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### **14. TRANSPORT INFORMATION**

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#### **DOT**

<b>Proper shipping name</b>	Amines, liquid, corrosive, n.o.s.(isophoronediamine, 1,3-benzenedimethanamine)
<b>UN number</b>	UN 2735
<b>Class</b>	8
<b>Packing group</b>	II

#### **Classification for SEA transport (IMO-IMDG):**

<b>Proper shipping name</b>	AMINES, LIQUID, CORROSIVE, N.O.S.(isophoronediamine, 1,3-benzenedimethanamine)
<b>UN number</b>	UN 2735

<b>Class</b>	8
<b>Packing group</b>	II
<b>Marine pollutant</b>	No
<b>Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code</b>	Consult IMO regulations before transporting ocean bulk

**Classification for AIR transport (IATA/ICAO):**

<b>Proper shipping name</b>	Amines, liquid, corrosive, n.o.s. (isophoronediamine, 1,3-benzenedimethanamine)
<b>UN number</b>	UN 2735
<b>Class</b>	8
<b>Packing group</b>	II

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.

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## 15. REGULATORY INFORMATION

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**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.

<b>Components</b>	<b>CASRN</b>
Bisphenol A	80-05-7

**Pennsylvania Worker and Community Right-To-Know Act:**

The following chemicals are listed because of the additional requirements of Pennsylvania law:

<b>Components</b>	<b>CASRN</b>
Benzyl alcohol	100-51-6
1,3-Benzenedimethanamine	1477-55-0

**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 birth defects or other reproductive harm.

**Components**

Methanol

**CASRN**

67-56-1

**United States TSCA Inventory (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.

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**16. OTHER INFORMATION**


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**Hazard Rating System****NFPA**

Health	Fire	Reactivity
3	2	0

**Revision**

Identification Number: 101206075 / A476 / Issue Date: 05/25/2015 / Version: 4.0

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

**Legend**

Absorbed via skin	Absorbed via skin
ACGIH	USA. ACGIH Threshold Limit Values (TLV)
C	Ceiling limit
Dow IHG	Dow Industrial Hygiene Guideline
TWA	8-hr TWA
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

**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.