

# SAFETY DATA SHEET



## D.E.H.™ 554 Epoxy Hardener

Version 8.0      Revision Date: 06-24-2021      SDS Number: 101218120      Date of last issue: 06-13-2019  
Date of first issue: 06-24-2021

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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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### SECTION 1. IDENTIFICATION

Product name : D.E.H.™ 554 Epoxy Hardener  
Product code : 000000001000000426

#### Manufacturer or supplier's details

Company name of supplier : BLUE CUBE OPERATIONS LLC  
Address : 190 CARONDELET PLAZA, SUITE 1530  
CLAYTON MO 63105-3467  
Telephone : (844) 238-3445  
E-mail address : INFO@OLIN.COM  
Emergency telephone : +1 800 424 9300  
Local Emergency Contact : 1-800-424-9300  
Identified uses : Used in applications such as:  
For coatings.  
Adhesives.

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### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with 29 CFR 1910.1200

Flammable liquids : Category 4  
Acute toxicity (Oral) : Category 4  
Skin corrosion : Category 1B  
Serious eye damage : Category 1  
Skin sensitization : Sub-category 1A

#### GHS label elements

Hazard pictograms :



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Signal Word : Danger

Hazard Statements : Combustible liquid.  
Harmful if swallowed.  
Causes severe skin burns and eye damage.  
May cause an allergic skin reaction.

Precautionary Statements : **Prevention:**  
P210 Keep away from heat/ sparks/ open flames/ hot surfaces.  
No smoking.  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.  
P305 + P351 + P338 + P310 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/ doctor.  
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
P363 Wash contaminated clothing 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.  
P405 Store locked up.

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

**Other hazards**  
None known.

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### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

#### Components

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Chemical name	CAS-No.	Concentration (% w/w)
3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)	2855-13-2	35 - 55
Benzyl alcohol	100-51-6	40 - 50
5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox	68609-08-5	10 - 20

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 : 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.
- In case of 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.
- 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. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist.

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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.

**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.
- Unsuitable extinguishing media : Do not use direct water stream.  
May spread fire.
- Specific hazards during fire fighting : Container may vent and/or rupture due to fire.  
Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
- 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.  
Ammonia.
- Further information : Keep people away. Isolate fire and deny unnecessary entry.  
Burning liquids may be extinguished by dilution with water.  
Do not use direct water stream. May spread fire.  
Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
- 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.

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### SECTION 6. ACCIDENTAL RELEASE MEASURES

- 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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### SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : Keep away from heat, sparks and flame.  
Do not get in eyes, on skin, on clothing.  
Avoid prolonged or repeated contact with skin.  
Avoid breathing vapor.  
Do not swallow.  
Keep container closed.  
Use with adequate ventilation.  
Wash thoroughly after handling.  
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.  
See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
- Conditions for safe storage : Store in a cool, dry place.  
Do not store in:  
Zinc.  
Aluminum.  
Copper.  
Galvanized containers.
- Recommended storage temperature : -4 - 104 °F / -20 - 40 °C
- Storage period : 24 Months
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### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Ingredients with workplace control parameters

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Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Benzyl alcohol	100-51-6	TWA	10 ppm	US WEEL

**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

**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.

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

**Hand protection**

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

**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.

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Color : colorless, yellow

Odor : Ammoniacal

Odor Threshold : No test data available

pH : Not applicable

Melting point/range : Not applicable

Freezing point : No test data available

Boiling point/boiling range : 383 °F / 195 °C  
Method: Literature

Flash point : 199 °F / 93 °C  
Method: Pensky-Martens Closed Cup ASTM D 93, closed cup

Evaporation rate : No test data available

Flammability (solid, gas) : Not applicable to liquids

Upper explosion limit / Upper flammability limit : No test data available

Lower explosion limit / Lower flammability limit : No test data available

Vapor pressure : 0.07 mbar (68 °F / 20 °C)  
Method: Literature  
(benzyl alcohol)

Relative vapor density : No test data available

Relative density : 0.99  
Method: Literature

Solubility(ies)  
Water solubility : < 10 g/l  
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 : 70 - 90 mPa,s  
Method: Literature

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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.

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### SECTION 10. STABILITY AND REACTIVITY

Reactivity : No data available  
Chemical stability : Unstable at elevated temperatures.  
Possibility of hazardous reactions : Polymerization will not occur.  
Conditions to avoid : Avoid temperatures above 250°C (482°F)  
Exposure to elevated temperatures can cause product to decompose.  
Incompatible materials : Avoid contact with:  
Strong acids.  
Strong oxidizers.  
Avoid contact with metals such as:  
Aluminum.  
Zinc.  
Copper.  
Galvanized metals.  
Avoid unintended contact with:  
Halogenated hydrocarbons.  
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:  
Ammonia.  
Nitrogen oxides.

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### SECTION 11. TOXICOLOGICAL INFORMATION

#### Acute toxicity

##### Product:

Acute oral toxicity : Remarks: Low toxicity if swallowed.  
Swallowing may result in gastrointestinal irritation or ulceration.  
Swallowing may result in burns of the mouth and throat.

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Remarks: As product:  
Single dose oral LD50 has not been determined.

LD50 (Rat): > 1,000 mg/kg  
Method: Estimated.

Remarks: Based on information for component(s):

Acute inhalation toxicity : Remarks: 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.

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): > 5,000 mg/kg  
Method: Estimated.

Remarks: Based on information for component(s):

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

Acute oral toxicity : LD50 (Rat): 1,030 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.01 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg  
Symptoms: No deaths occurred at this concentration.  
Assessment: The substance or mixture has no acute dermal toxicity

**Benzyl alcohol:**

Acute oral toxicity : LD50 (Rat, male): 1,620 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 4.178 mg/l  
Exposure time: 4 h  
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg  
Symptoms: No deaths occurred at this concentration.

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Assessment: The substance or mixture has no acute dermal toxicity

### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Acute oral toxicity : Remarks: Oral LD50 has not been determined due to corrosivity.

Acute inhalation toxicity : Remarks: The LC50 has not been determined.

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

### **Skin corrosion/irritation**

#### **Product:**

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

#### **Components:**

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

Result : Causes burns.

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

Remarks : Classified as corrosive to the skin according to DOT guidelines.

#### **Benzyl alcohol:**

Remarks : Brief contact is essentially nonirritating to skin. Prolonged contact may cause skin irritation with local redness. May cause tingling/numbness in exposed areas (paresthesia).

### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Result : Causes burns.

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

### **Serious eye damage/eye irritation**

#### **Product:**

Remarks : May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Vapor may cause lacrimation (tears).

#### **Components:**

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

Result : Corrosive

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

### **Benzyl alcohol:**

Remarks : May cause moderate eye irritation.  
May cause corneal injury.  
Effects may be slow to heal.  
Vapor may cause lacrimation (tears).

### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox:**

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

### **Respiratory or skin sensitization**

#### **Product:**

Assessment : The product is a skin sensitizer, sub-category 1A.  
Remarks : A component in this mixture has caused allergic skin reactions in humans.  
Contains component(s) which have caused allergic skin sensitization in guinea pigs.  
Remarks : For respiratory sensitization:  
No relevant information found.

#### **Components:**

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

Assessment : The product is a skin sensitizer, sub-category 1A.  
Remarks : Skin contact may cause an allergic skin reaction.  
Has caused allergic skin reactions when tested in guinea pigs.  
Has caused allergic skin reactions in humans.  
Remarks : For respiratory sensitization:  
No relevant data found.

### **Benzyl alcohol:**

Remarks : For skin sensitization:  
No relevant data found.  
Remarks : For respiratory sensitization:  
No relevant data found.

### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox:**

Assessment : The product is a skin sensitizer, sub-category 1A.  
Remarks : Has caused allergic skin reactions when tested in guinea pigs.

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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. Genetic toxicity studies in animals were negative for component(s) tested.

#### Components:

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

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

##### **Benzyl alcohol:**

Genotoxicity in vitro : Remarks: In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

##### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

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

### Carcinogenicity

#### Product:

Remarks : Contains component(s) which did not cause cancer in laboratory animals.

#### Components:

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

Remarks : No relevant data found.

##### **Benzyl alcohol:**

Remarks : Did not cause cancer in laboratory animals.

##### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Remarks : No relevant data found.

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

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

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**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: No relevant data found.

Effects on fetal development            :    Remarks: Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.  
Contains component(s) which did not cause birth defects in laboratory animals.

#### Components:

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

Effects on fertility                            :    Remarks: No relevant data found.

Effects on fetal development            :    Remarks: Did not cause birth defects in laboratory animals.

##### **Benzyl alcohol:**

Effects on fertility                            :    Remarks: No relevant data found.

Effects on fetal development            :    Remarks: Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

##### **5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox:**

Effects on fertility                            :    Remarks: No relevant data found.

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

### STOT-single exposure

#### Product:

Assessment                                    :    Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.

#### Components:

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

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

##### **Benzyl alcohol:**

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

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**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

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

**Repeated dose toxicity****Product:**

Remarks : Contains component(s) which have been reported to cause effects on the following organs in animals:  
Central nervous system.  
Muscles.  
Thymus.  
Urinary tract.  
Respiratory tract.  
Liver.

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

Remarks : In animals, effects have been reported on the following organs:  
Respiratory tract.

**Benzyl alcohol:**

Remarks : In animals, effects have been reported on the following organs after inhalation:  
Central nervous system.  
Muscles.  
Thymus.  
Urinary tract.  
Based on available data, repeated exposures to small amounts are not anticipated to cause significant adverse effects.

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Remarks : In animals, effects have been reported on the following organs:  
Liver.

**Aspiration toxicity****Product:**

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

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

Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

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**Benzyl alcohol:**

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

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox:**

Based on available information, aspiration hazard could not be determined.

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine):**

Toxicity to fish : Remarks: 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)): 110 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)): 23 mg/l  
 Exposure time: 48 h  
 Test Type: static test  
 Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : EbC50 (alga Scenedesmus sp.): 37 mg/l  
 End point: Biomass  
 Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3 mg/l  
 End point: number of offspring  
 Exposure time: 21 d

Toxicity to microorganisms : EC10 (Bacteria): 1,120 mg/l  
 Exposure time: 18 h  
 Test Type: Static

**Benzyl alcohol:**

Toxicity to fish : Remarks: 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)): 460 mg/l  
 Exposure time: 96 h  
 Test Type: Static  
 Method: Method Not Specified.

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 230 mg/l

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aquatic invertebrates		Exposure time: 48 h Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 770 mg/l End point: Growth rate Exposure time: 72 h Test Type: Static Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna): 51 mg/l Exposure time: 21 d Test Type: semi-static test Method: OECD Test Guideline 211 GLP: yes
Toxicity to microorganisms	:	EC50 (activated sludge): 2,100 mg/l End point: Respiration rates. Exposure time: 49 h Test Type: Respiration inhibition Method: OECD 209 Test

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox:**

Toxicity to fish	:	Remarks: 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).  LL50 (Rainbow trout (Oncorhynchus mykiss)): 70.7 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (water flea Daphnia magna): 11.1 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EL50 (Pseudokirchneriella subcapitata (green algae)): 79.4 mg/l End point: Growth inhibition (cell density reduction) Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l End point: Respiration rates. Exposure time: 3 h Test Type: aerobic Method: activated sludge test (OECD 209)



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**Ecotoxicology Assessment**

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

**Persistence and degradability****Components:****3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine):**

Biodegradability : Result: Not biodegradable.  
Remarks: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

aerobic  
Concentration: 10 mg/l  
Biodegradation: 8 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301A or Equivalent  
Remarks: 10-day Window: Fail

aerobic  
Concentration: 10.1 mg/l  
Biodegradation: 42 %  
Exposure time: 3 h  
Method: OECD Test Guideline 303A or Equivalent  
Remarks: 10-day Window: Not applicable

ThOD : 3.38 mg/mg

Photodegradation : Test Type: Half-life (indirect photolysis)  
Sensitizer: OH radicals  
Rate constant: 8.472E-11 cm<sup>3</sup>/s  
Method: Estimated.

**Benzyl alcohol:**

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

Inoculum: activated sludge, domestic (adaptation not specified)  
Concentration: 100 mg/l  
Biodegradation: 92 - 96 %  
Exposure time: 14 d  
Method: OECD Test Guideline 301C or Equivalent  
Remarks: 10-day Window: Not applicable

ThOD : 2.52 mg/mg

Photodegradation : Test Type: Half-life (indirect photolysis)  
Sensitizer: OH radicals  
Rate constant: 8.25E-12 cm<sup>3</sup>/s

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Method: Estimated.

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Biodegradability : Result: Not biodegradable.  
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  
Inoculum: activated sludge  
Concentration: 14 mg/l  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F or Equivalent  
Remarks: 10-day Window: Fail

**Bioaccumulative potential****Components:****3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine):**

Partition coefficient: n-octanol/water : log Pow: 0.79  
Method: Measured  
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Benzyl alcohol:**

Partition coefficient: n-octanol/water : log Pow: 1.10  
Method: Measured  
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Partition coefficient: n-octanol/water : log Pow: 3.6 (77 °F / 25 °C)  
pH: 7  
Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

**Mobility in soil****Components:****3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine):**

Distribution among environmental compartments : Koc: 340  
Method: Estimated.  
Remarks: 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 impor-

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tant fate process.

**Benzyl alcohol:**

Distribution among environmental compartments : Koc: 16  
 Method: Estimated.  
 Remarks: 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.

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

Distribution among environmental compartments : Koc: > 5000  
 Method: OECD 121: HPLC Method  
 Remarks: Expected to be relatively immobile in soil (Koc > 5000).

**Other adverse effects****Components:****3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine):**

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

**Benzyl alcohol:**

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).

**5-Amino-1,3,3-trimethylcyclohexanemethanamine reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[ox]:**

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.

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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 2289
Proper shipping name	: ISOPHORONEDIAMINE SOLUTION
Class	: 8
Packing group	: III
Labels	: 8

**IATA-DGR**

UN/ID No.	: UN 2289
Proper shipping name	: Isophoronediamine solution
Class	: 8
Packing group	: III
Labels	: Corrosive
Packing instruction (cargo aircraft)	: 856
Packing instruction (passenger aircraft)	: 852

**IMDG-Code**

UN number	: UN 2289
Proper shipping name	: ISOPHORONEDIAMINE SOLUTION
Class	: 8
Packing group	: III
Labels	: 8
EmS Code	: F-A, S-B
Marine pollutant	: no
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 2289
Proper shipping name	: Isophoronediamine SOLUTION
Class	: 8
Packing group	: III
Labels	: CORROSIVE
ERG Code	: 153
Marine pollutant	: no

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**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****EPCRA - Emergency Planning and Community Right-to-Know****SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

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

**SARA 311/312 Hazards** : Flammable (gases, aerosols, liquids, or solids)  
Acute toxicity (any route of exposure)  
Skin corrosion or irritation  
Serious eye damage or eye irritation  
Respiratory or skin sensitization

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**US State Regulations****Pennsylvania Right To Know**

Benzyl alcohol 100-51-6

**California Prop. 65**

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

**International Regulations**

Montreal Protocol : Not applicable

Rotterdam Convention (Prior Informed Consent) : Not applicable

Stockholm Convention (Persistent Organic Pollutants) : Not applicable

**The ingredients of this product are reported in the following inventories:**

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

DSL : All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

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

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

ENCS : All intentional components are listed on the inventory, are

# SAFETY DATA SHEET



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

### TSCA list

No substances are subject to a Significant New Use Rule.

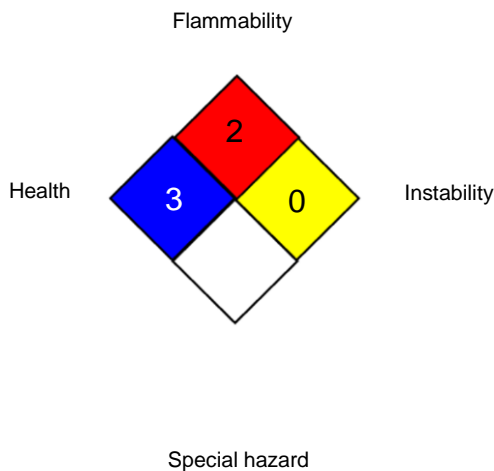
No substances are subject to TSCA 12(b) export notification requirements.

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## SECTION 16. OTHER INFORMATION

### Further information

#### NFPA 704:



### Full text of other abbreviations

US WEEL : USA. Workplace Environmental Exposure Levels (WEEL)  
US WEEL / TWA : 8-hr TWA

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

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