



SAFETY DATA SHEET

BLUE CUBE OPERATIONS LLC

Product name: D.E.H.™ 82 Epoxy Hardener

Issue Date: 03/30/2016

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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.

1. IDENTIFICATION

Product name: D.E.H.™ 82 Epoxy Hardener

Recommended use of the chemical and restrictions on use

Identified uses: Industrial powder coating applications.

COMPANY IDENTIFICATION

BLUE CUBE OPERATIONS LLC
190 CARONDELET PLAZA, SUITE 1530
CLAYTON MO 63105-3467
UNITED STATES

Customer Information Number:

+1 844-238-3445
INFO@OLINBC.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 1 800 424 9300

Local Emergency Contact: 1 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

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

Combustible dust

Carcinogenicity - Category 2

Reproductive toxicity - Category 1B

Specific target organ toxicity - single exposure - Category 3

Label elements

Hazard pictograms



Signal word: **DANGER!**

Hazards

May form combustible dust concentrations in air.
 May cause respiratory irritation.
 Suspected of causing cancer.
 May damage 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.
 Ground/bond container and receiving equipment.
 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
 Take precautionary measures against static discharge.
 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
 IF exposed or concerned: Get medical advice/ attention.

Storage

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

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxiran]e] (DGEbPA-b	25036-25-3	65.0 - 70.0 %
Bisphenol A	80-05-7	24.0 - 29.0 %
2-Methylimidazole	693-98-1	3.3 - 3.7 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

Skin contact: Wash off with plenty of water.

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.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) 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: 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.

Unsuitable extinguishing media: No data available

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: Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct waterstream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.

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). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. 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: Remove all sources of ignition. Use non-sparking tools in cleanup operations. Contain spilled material if possible. Material can create slippery conditions. Clean up promptly by sweeping or vacuum. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Keep container closed. Use with adequate ventilation. Avoid breathing dust. Wash thoroughly after handling. No smoking, open flames or sources of ignition in handling and storage area. Electrically ground and bond all equipment. Good housekeeping and controlling of dusts are necessary for safe handling of product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store indoors. Material will sinter if stored for long periods above 30°C. Shelf life begins from date of manufacture. Minimize sources of ignition, such as static build-up, heat, spark or flame.

Storage stability

Storage temperature: < 25 °C (< 77 °F) **Shelf life: Use within**
12 Month

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Bisphenol A	Dow IHG	TWA Inhalable fraction and vapor	2 mg/m ³

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

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

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

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, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Flakes
Color	White
Odor	Ester.
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	Not applicable
Freezing point	Not applicable
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup (decomposes prior to flashing)
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	May form combustible dust concentrations in air.
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	1.16 <i>Literature</i>
Water solubility	<= 4 % at 20 °C (68 °F) <i>Literature</i>
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	Not applicable
Decomposition temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	No test data available
Oxidizing properties	No test data available
Softening point	83 - 90 °C (181 - 194 °F) <i>ASTM D3104</i>
Molecular weight	No 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: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Avoid static discharge.

Incompatible materials: Avoid contact with: Acid chlorides. Acids. Bases. Oxidizers.

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: Phenolics.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity

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

As product: The dermal LD50 has not been determined. Based on information for component(s):

LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. Dust may cause irritation to upper respiratory tract (nose and throat).

The LC50 has not been determined.

Skin corrosion/irritation

Essentially nonirritating to skin.

Serious eye damage/eye irritation

Essentially nonirritating to eyes.

Sensitization

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
Relevant data not available.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Liver effects and questionable kidney and bladder effects were observed in animals fed bisphenol A. For the minor component(s):
In animals, effects have been reported on the following organs:
Adrenal gland.
Spleen.
Thyroid.
Female reproductive organs.

Carcinogenicity

For the minor component(s) Has caused cancer in laboratory animals. Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEbPA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEbPA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEbPA is carcinogenic.

Teratogenicity

Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother. Contains component(s) which caused birth defects in lab animals at doses nontoxic to the mother.

Reproductive toxicity

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

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

Aspiration Hazard

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

COMPONENTS INFLUENCING TOXICOLOGY:

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

Acute inhalation toxicity

The LC50 has not been determined.

Bisphenol A

Acute inhalation toxicity

The LC50 has not been determined.

2-Methylimidazole**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause adverse effects.

The LC50 has not been determined.

Carcinogenicity**Component****2-Methylimidazole****List**

IARC

Classification

Group 2B: Possibly carcinogenic to humans

12. ECOLOGICAL INFORMATION

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

Toxicity**Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(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.

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* (marine diatom), 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

2-Methylimidazole

Acute toxicity to fish

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50, Pimephales promelas (fathead minnow), 96 Hour, 286 mg/l

Persistence and degradability

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

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

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

2-Methylimidazole

Biodegradability: No relevant information found.

Bioaccumulative potential

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

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

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

2-Methylimidazole

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient: n-octanol/water(log Pow): 0.24 Measured

Mobility in soil**Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane] (DGEBA-b**

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

Bisphenol A

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

Partition coefficient(Koc): 636 - 931 Measured

2-Methylimidazole

Partition coefficient(Koc): 1 - 16 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

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Bisphenol A)
UN number	UN 3077
Class	9
Packing group	III
Marine pollutant	Bisphenol A
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, solid, n.o.s.(Bisphenol A)
UN number	UN 3077
Class	9
Packing group	III

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

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	CASRN
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:

Components	CASRN
3-Aminomethyl-3,5,5-trimethylcyclohexylamine (isophoronediamine)	2855-13-2
Diaminocyclohexane, (1,2-)	694-83-7
2,4,6-Tris[(dimethylamino)methyl]phenol	90-72-2

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	CASRN
2-Methylimidazole	693-98-1

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	CASRN
Bisphenol A	80-05-7

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.

16. OTHER INFORMATION

Other information

Explanation of difference in environmental hazardousness between hazardous substance and hazardous goods labeling:

With hazardous goods, the transitional provisions for land and sea transport will be used up to the end of 2013. For this reason, hazardous goods labeling as environmentally hazardous for ADR/RID/ADN and IMDG code will only come into effect on January 1, 2014.

Hazard Rating System**NFPA**

Health	Fire	Reactivity
1	0	0

Revision

Identification Number: 101199627 / A476 / Issue Date: 03/30/2016 / Version: 8.0

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

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	Time Weighted Average (TWA):

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.