



MATERIAL SAFETY DATA SHEET

Chemtrec 24-Hour Emergency Telephone

Domestic North America
International

(800)424-9300
(800)527-3887

1. Product and Supplier Identification

Product Name: ORCA BLADE-100 EPOXY RESIN RTM MIX

Product Number: 100150115

Date of Prep: 01/20/2011

Product Type: Epoxy Resin Mix

Supplier: Orca Composites
24 S. Idaho St
Seattle, Wa 98134
(206)782-0660

2. Composition/Information On Ingredients

Hazardous Component		% (w/w)	CAS Number
A	Diglycidyl Ether of Bisphenol A	> 80%	001675-54-3
B	Polymer of epichlorohydrin-polyglycol	< 20%	041638-13-5

3. Hazards Identification

EMERGENCY OVERVIEW:

A - Colorless-yellow liquid to semi-solid. Epoxy odor. Can cause allergic skin reaction.

Component B - Clear liquid. Ether odor. Causes eye irritation. May cause allergic skin reaction.

POTENTIAL HEALTH EFFECTS (See Section-Toxicological Data):

EYE: May cause eye irritation with corneal injury.

SKIN: Has caused allergic skin reactions in humans. Prolonged exposure cause may cause skin irritation. May cause more severe response if confined to skin or skin is abraded (scratched or cut). May cause allergic skin reaction in susceptible individuals. Repeated exposure may cause skin irritation. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts.

INGESTION: Single dose oral toxicity is considered to be low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury.

INHALATION: Elevated temperatures may generate vapor levels sufficient to cause respiratory irritation and other effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:

Except for skin sensitization, repeated exposures to low molecular weight epoxy resins of this type are not anticipated to cause any significant adverse effects.

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CANCER INFORMATION:

Several studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBA)-based epoxy resins. In one of these, a DGEBA-based resin (containing high levels of several impurities, including a known animal skin carcinogen) was reported to produce a weak carcinogenic response in the skin of one of two strains of mice tested. Recent studies have suggested slight increases in two systemic tumor types following repeated application of certain DGEBA-containing resins (or pure DGEBA), although the response was not uniform among practically identical resins. Based on these data, and the other studies which have not shown cancer, the cause effect relationship between DGEBA-treatment and these tumor increases is questionable. Indeed, a recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBA is not classifiable as to its carcinogenicity.

TERATOLOGY (BIRTH DEFECTS):

DGEBA did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally.

REPRODUCTIVE EFFECTS:

In animal studies, has been shown not to interfere with reproduction.

4. First Aid Measures

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts, and watch bands.

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

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES:

FLASH POINT:	A – 485°F (Pensky-Martens Closed Cup ASTM D 93) B – 320°F
METHOD USED:	PMCC, SSTM D-93
AUTOIGNITION TEMPERATURE:	Not applicable.
FLAMMABLE LIMITS: LFL:	Not applicable
UFL:	Not applicable

EXTINGUISHING MEDIA: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC Type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

MEDIA TO BE AVOIDED: Do not use direct water stream, will spread fire.

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. 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. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible, Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and

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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.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Container may rupture from gas generation in a fire situation. Violent stream generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is emitted when burned without sufficient oxygen.

HAZARDOUS COMBUSTION PRODUCTS: Under fire conditions polymers decompose. The smoke may contain polymer fragments of varying compositions in addition to unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Phenolics. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CONTAIN spilled material if possible. Absorb with materials such as: Sand. Polypropylene fiber products. Polyethylene fiber products. Remove residual with soap and hot water. Collect in suitable and properly labeled containers. Residual can be removed with solvent. Solvents are not recommended for clean-up unless the recommended exposure guidelines and safe handling practices for the specific solvent are followed. Consult appropriate solvent Safety Data Sheet for handling information and exposure guidelines. See Section 13. Disposal Considerations, for additional information.

PERSONAL PRECAUTIONS: 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.

7. Handling and Storage

HANDLING: Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Avoid contact with skin and clothing. Wash thoroughly after handling. Avoid use of electric band heaters. Failures of electric band heaters have been reported to cause drums of liquid epoxy resin to explode and catch fire. Application of a direct flame to a container of liquid epoxy resin can also cause explosion and/or fire.

STORAGE: Recommended pumping and storage temperature for bulk shipments is 60°C (140°F). Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure. Keep containers tightly closed when not in use.

Shelf Life: Use within 24 Months

Storage Temperature: 10-27°C

8. Exposure Controls, Personal Protection

EXPOSURE LIMITS: None established.

PERSONAL PROTECTION

EYE/FACE PROTECTION: Use safety glasses.

SKIN 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. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts, and watchbands, should be removed and disposed of properly.

HAND PROTECTION: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL:"). Nitrile. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). **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.

RESPIRATORY PROTECTION: If respiratory irritation is experienced, use an approved air-purifying respirator.

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INGESTION: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

ENGINEERING CONTROLS

VENTILATION: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Form:	Liquid.
Color:	Near Clear / Yellow
Odor:	Mild / Slight ethereal
Flash Point – Closed Cup:	B - 252°C (486°F) Pensky-Martens Closed Cup ASTM D 93
Flammable Limits in Air:	Lower: Not applicable Upper: Not applicable
Auto ignition Temperature:	Not Determined
Vapor Pressure:	B - 5-6 mmHg @ 20C
Boiling Point (760 mmHg):	B - Greater than 225C @ 760 mmHg
Vapor Density (air = 1):	Not Applicable
Specific Gravity (H2O= 1):	A- 1.16 B - 1.14
Viscosity:	B - 30-60 cps @ 25C
Liquid Density:	1.16 g/cm ³ @ 25°C ASTM D445

10. Stability and Reactivity

STABILITY/INSTABILITY: Stable under recommended storage conditions. See Storage, Section 7.

Conditions to Avoid: Avoid temperatures above 300°C (572°F) potentially violent decomposition can occur above 350°C (662°F). Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

INCOMPATIBLE MATERIALS: Avoid contact with oxidizing materials. Avoid contact with: Acids. Bases. Avoid unintended contact with amines.

HAZARDOUS POLYMERIZATION: Will not occur by itself. Masses of more than one pound (0.5 kg) of product plus an aliphatic amine will cause irreversible polymerization with considerable heat build-up.

THERMAL DECOMPOSITION: Decomposition products depend upon temperature, air supply and the presence of other materials. Gasses are released during decomposition. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water. Refer to section labeled FIRE FIGHTING MEASURES for hazardous combustion products.

11. Toxicological Information

A - Diglycidyl Ether of Bisphenol A

ACUTE TOXICITY

Ingestion:	LD50, Rat >5,000 mg/kg
Skin Absorption:	LD50, Rabbit 20,000 mg/kg

SENSITIZATION

Skin: Has caused allergic skin reactions in humans. Did not cause allergic skin reactions when tested in mice.

Repeated Dose Toxicity: Except for skin sensitization, repeated exposures to low molecular weight epoxy resins of this type are not anticipated to cause any significant adverse effects.

Chronic Toxicity and Carcinogenicity: Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBA 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 DGEBA is carcinogenic.

DEVELOPMENTAL TOXICITY

Resins based on the diglycidyl ether of bisphenol A (DGEBA) did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally.

REPRODUCTIVE TOXICITY

In animal studies, did not interfere with reproduction.

GENETIC TOXICOLOGY

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

B - Polymer of epichlorohydrin-polyglycol

SKIN: The LD50 for skin absorption in rabbits is >2000 mg/kg.

INGESTION: The oral LD50 for rats is >2000 mg/kg.

MUTAGENICITY: In vitro mutagenicity tests have been positive.

12. Ecological Information

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): < 6.94E-09 atm*m3/mole; 25°C Estimated

Partition coefficient, soil organic carbon/water (Koc): 1,800 – 4,400 Estimated 1,800 – 4,400 Estimated.

Persistence and Degradability

A - Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Indirect Photo degradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.69E-11 cm3/s	1.92 h	Estimated

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

Biodegradation reached in CO2 Evolution Test (Modified SturmTest, OECD Test No. 301B) after 28 day: 8-27%.

Biodegradation reached in Modified Zahn-Wellens/EMPA Test (OECD Test No. 302B) after 28 days: 7%.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
12%	28 d	OECD 302B Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
		< 2.5%	

Theoretical Oxygen Demand: 2.35 mg/mg

Exotoxicity

A - Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in most sensitive species tested). Toxicity to aquatic species occurs at concentrations above material's water solubility.

B - Material is slightly toxic to fish on an acute basis (LC50 between 10 and 100 mg/L). Material is slightly toxic to aquatic invertebrates on an acute basis (LC50 between 10 and 100 mg/L).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas), 96 h: 3.1 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, 48 h, immobilization: 1.4 – 1.7 mb/l

Toxicity to Micro-organisms

IC50: bacteria, Growth inhibition, 18 h: > 42.6 mg/l

Aquatic Invertebrates Chronic Toxicity Value: ChV Value mg/l

Species	Test Type	Endpoint	Exposure Time
Water Flea		number of offspring	21 d
Daphnia magna			

0.55 mg/l

13. Disposal Considerations

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. DOW HAS 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 Non-Bulk: NOT REGULATED

DOT Bulk: NOT REGULATED

IMDG: NOT REGULATED

ICAO/IATA: NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirement/information relating to this product. 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

A - Diglycidyl Ether of Bisphenol A

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

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313: To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-to-Know Act): Pennsylvania Hazardous Substances List and/or **Pennsylvania Environmental Hazardous Substance List:** To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-to-Know Act): Pennsylvania Special Hazardous Substances List: To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986): 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.

US Toxic Substances Control Act: All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

European Inventory of Existing Commercial Chemical Substances (EINECS): The components of this product are on the EINECS inventory or are exempt from inventory requirements.

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

B - Polymer of epichlorohydrin-polyglycol

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

D2B - eye or skin irritant

D2B - skin sensitizer

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14):

COMPONENT: POLYMER OF EPICHLOROHYDRIN-POLYGLYCOL

CAS#: 041638-13-5

AMOUNT (%w/w): 20%

16. Other Information

Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure.

HMIS Rating: Health – 1 / Flammability – 1 / Physical Hazard – 2

Recommended Uses and Restrictions

Composites. Casting. Civil engineering. Tooling. Used in applications such as: Photocure industrial coating. Marine and protective coatings. Adhesives. Potting and encapsulation.

Preparation Date: January 27, 2011

Prepared by: Orca Composites

Comments: This Material Safety Data Sheet was prepared using information provided by Orca Composites and Fiberlay Inc.

Revisions: None

W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Orca Composites does not assume responsibility for any results obtained by persons over whose methods Orca Composites has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any of Orca Composites products. In light of the foregoing, Orca Composites specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Orca Composites products. Orca Composites further disclaims any liability for consequential or incidental damages of any kind, including lost profits.