



MATERIAL SAFETY DATA SHEET (MSDS) SAFETY DATA SHEET (SDS)

MSDS Date: January 10, 2014

1. IDENTIFICATION OF SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

IDENTIFICATION OF PREPARATION: FR408 Prepreg

USE OF PREPARATION: Resin-impregnated woven fiberglass.

COMPANY IDENTIFICATION ISOLA USA Corp.
San Tan II Corporate Center
3100 West Ray Road
Chandler, AZ 85226

PHONE: 480-963-0022
FAX: 800-233-1068

MSDS PREPARED BY: Chemistry & Industrial Hygiene, Inc., (800) 420-9311, on the date shown above.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations of Canada and the MSDS contains all the information required by the Controlled Products Regulations.

EMERGENCY TELEPHONE (24 HOUR): 800-468-1263 (Infotrac)

2. COMPOSITION/INFORMATION ON INGREDIENTS

| MATERIAL | CAS NUMBER | EC NUMBER | PERCENT | Hazard Classification |
|---|-------------|-------------|---------|--|
| Woven Continuous Filament Glass Fiber (E-glass) | 65997-17-3 | 266-046-0 | 35-60 | X _i , R36/37/38 |
| Proprietary Bisphenol A-based Epoxy Resin | Proprietary | Proprietary | 7-13 | X _i , R36/38-43; N, R51/53 |
| Brominated Flame Retardant | 79-94-7 | 201-236-9 | 7-13 | N, R50/53 |
| Non-Hazardous Polymers | Proprietary | Proprietary | 30-50 | Not Classified |

See Section 16 for details on Hazard Classifications.

Information regarding proprietary ingredients is available from the manufacturer upon request.

3. HAZARDS IDENTIFICATION

Canadian WHMIS for the preparation:

Class D, Division 2B – Toxic Material Causing Eye and Skin Irritation and Skin Sensitization

EU PREPARATION CLASSIFICATION (1999/45/EC):

Irritant (X_i), R36/37/38-43;

Dangerous for the Environment (N), R51/53

EMERGENCY OVERVIEW: Inhalation of product particulates or of residual solvent vapors may be harmful. May cause skin sensitization. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS: No information is available on this specific mixture as a whole. The information presented is based on each of the components present at concentrations greater than 1% (0.1 % for hazardous substances other than those classified as X_n, X_i, or category 3 carcinogens, mutagens or toxic for reproduction). Ingestion may cause digestive tract irritation. Exposure to product can produce delayed pulmonary edema. Exposure may also lead to skin, eye, and respiratory tract irritation. This product contains less than one percent total residual solvents (methyl ethyl ketone and/or cyclohexanone). Exposure to residual vapors may cause eye, skin and respiratory tract



POTENTIAL HEALTH EFFECTS (continued)

irritation. Exposure may also have effects on the central nervous system. Animal studies indicate that Methyl Ethyl Ketone may have toxic effects on human reproduction. Exposure to cyclohexanone may cause liver and/or kidney toxicity. Dust generated during routine handling, machining, grinding, or sawing may cause mechanical irritation of skin, eyes, nose, and throat.

Machining, grinding or sawing this material may generate harmful dusts. Continuous filament glass fiber is not considered fibrogenic; however, it is woven from E-Glass fibers which are listed by IARC as "special purpose glass fibers" and designated as "possibility of carcinogenic in humans." See Section 8 for exposure controls.

ROUTES OF ENTRY: Dermal: YES Inhalation: POSSIBLE Ingestion: SLIGHT Injection: POSSIBLE

4. FIRST AID MEASURES

SEEK IMMEDIATE MEDICAL ATTENTION IF IRRITATION OCCURS.

INHALATION: Remove the person to fresh air. Treat respiratory distress as appropriate (artificial respiration, etc.) Provide oxygen if necessary. If not breathing, give mouth-to-mouth resuscitation and seek immediate medical attention.

EYES: Immediately flush eyes with large amounts of temperate water for a minimum of 15 minutes. Consult an ophthalmologist for a more detailed medical evaluation.

SKIN: Remove contaminated clothing. Wash skin thoroughly with mild soap and room temperature running water. DO NOT rub or scratch irritated areas, as this may force fibers into the skin. See immediate medical attention if irritation continues.

INGESTION: Not expected to be a significant route of exposure based on expected use. If ingestion occurs, seek immediate medical attention.

SYMPTOMS OF EXPOSURE: May include irritation of the skin, eyes, and respiratory tract, nausea, vomiting, drowsiness, dizziness, headache, nausea, diarrhea, abdominal pain, burning sensation, cough, sore throat and/or an allergic skin reaction.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, alcohol-resistant foam or dry chemical powder. Water may be ineffective as an extinguishing medium, but can be used to cool fire-exposed containers. If using a fire extinguisher, make sure that it is an NFPA Class B extinguisher (e.g. label rating will read AB, ABC or BC).

FIRE FIGHTING EQUIPMENT: Wear full bunker gear including a positive pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

GENERAL: Under conditions of inadequate ventilation, explosive vapor concentrations may form. Avoid contact with skin, eyes or clothing. Sweep or scrape into approved container for proper disposal. Avoid generating dusty conditions. See Section 13 for Disposal Considerations.

7. HANDLING AND STORAGE

HANDLING: May contain residual volatile organic compounds. Avoid contact with eyes, skin and clothing. Do not eat drink or smoke while handling this product. Use only in a well ventilated area. Avoid inhalation and ingestion. The use of appropriate gloves is recommended to minimize the potential for skin contact (See Section 8). Provide adequate ventilation to minimize exposure. Provide proper NIOSH- or local authority-approved respirators if exposure limits are exceeded. Wash thoroughly after handling this product.



HANDLING AND STORAGE (continued)

STORAGE: Store in a tightly closed container in a cool, dry area. Avoid contact with incompatible materials. Keep from ignition sources, such as sparks and flames. NO SMOKING.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| MATERIAL | EXPOSURE LIMITS* | | |
|---|---|--|--|
| | OSHA PEL ^(a) | ACGIH TLV ^(b) | NIOSH REL ^(c) |
| Woven continuous filament glass fibers (including special purpose glass fibers) | 15 mg/m ^{3(d)} TWA ^(e) Total Dust (PNOR) ^(f) 5 mg/m ^{3(d)} TWA ^(e) Respirable Dust ^(g) | 1 f/cc ^(h) TWA ^(e) Fibers ⁽ⁱ⁾ 5 mg/m ^{3(d)} TWA ^(e) Inhalable Dust ^(g) | 3 f/cc ^(h) TWA ^(e) Fibers ⁽ⁱ⁾ 5 mg/m ^{3(d)} TWA ^(e) Total Fibrous Glass |
| Proprietary Bisphenol A-based Epoxy Resin | None Established | None Established | None Established |
| Brominated Flame Retardant | None Established | None Established | None Established |

*See Section 15 for additional Occupational Exposure Limits (OELs).

(a) U.S. Department of Labor, Occupational Safety and Health Administration, permissible exposure limit (PEL); (b) American Conference of Governmental Industrial Hygienists', threshold limit value (TLV); (c) National Institute for Occupational Safety and Health, recommended exposure limit (REL); (d) milligrams per cubic meter; (e) time-weighted average over an 8-hour day, 40-hour work week for OSHA PELs and ACGIH TLVs, or up to a 10-hour day, during a 40-hour work week for NIOSH RELs; (f) Particulates Not Otherwise Regulated (PNOR); (g) particles in the size range that are hazardous when deposited in the gas-exchange region of the lungs. (h) fibers per cubic centimeter; (i) Respirable fibers longer than 5 microns and having an aspect ratio of $\geq 3:1$.

ENGINEERING CONTROLS:

Use local exhaust to minimize exposures and maintain airborne dust and vapor concentrations below occupational exposure limits, especially where heating or machining/grinding/sawing operations occur.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION: In the absence of adequate general or local ventilation, or other appropriate engineering controls, use a NIOSH- or local authority-approved respirator appropriate for the contaminant if exposure limits are exceeded. Consult an industrial hygienist for assistance as needed.

SKIN PROTECTION: Avoid skin contact! Use impervious gloves, and splash-resistant clean body-covering clothing to minimize exposure. Due to the combination of chemical ingredients, an industrial hygienist should be consulted to select appropriate glove material for specific product application. Wash contaminated clothing before reuse.

EYE PROTECTION: Use chemical resistant goggles when handling, and safety glasses or a face shield when machining, grinding or sawing.

WORK/HYGIENE PRACTICES: Good personal hygiene should be exercised by all users of this product to minimize potential dermal and inhalation exposures.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|------------------------------|---------------------------------------|
| Appearance: | Resin impregnated woven glass fibers |
| Odor: | Not Applicable |
| Odor Threshold: | Not Applicable |
| Boiling Point: | Not Applicable |
| Flash Point: | Not Applicable |
| Auto-ignition Temperature: | Not Determined |
| Lower Explosive Limit (LEL): | Not Applicable Under Foreseeable Uses |

PHYSICAL AND CHEMICAL PROPERTIES (continued)

| | |
|--|---|
| Upper Explosive Limit (UEL): | Not Applicable Under Foreseeable Uses |
| Vapor Pressure: | Not Applicable |
| Specific Gravity: | Not Applicable |
| Total Volatile Organic Compounds (TVOC) (G/L): | Not Applicable |
| Solubility in Water: | Not Applicable |
| Partition Coefficient: | Not Applicable |
| Viscosity of Solution: | Not Applicable |
| Vapor density (Air=1.0): | Not Applicable |
| Percent Volatility: | Less than 1% Volatile Organic Compounds |

10. STABILITY AND REACTIVITY

This material is stable under expected conditions of use, handling and storage.

CONDITIONS TO AVOID: Avoid exposure to excessive heat, flames, sparks and other ignition sources as well as moist air and water. Avoid extremes of temperature. Hazardous polymerization will not occur. Avoid contact with incompatible materials. Avoid excessive dust generation.

INCOMPATIBLE MATERIALS: Strong acids, strong bases, strong oxidizers, amines and mercaptans.

HAZARDOUS DECOMPOSITION: Dense smoke, acrid vapors and fumes, aliphatic and aromatic hydrocarbons of variable composition, bromine, CO_x, hydrogen bromide.

EXOTHERMIC REACTION FIGHTING PROCEDURES: Dissipate heat by spreading material apart and dousing with water. Contain vapors with local exhaust.

11. TOXICOLOGICAL INFORMATION

NO DATA AVAILABLE ON THE SPECIFIC MIXTURE.

CONTINUOUS FILAMENT GLASS FIBERS

NIOSH RTECS No.: LK3651000

Acute Effects of Overexposure: Exposure to dust may cause irritation to the eyes, skin and respiratory system, and may cause difficulty breathing.

Chronic Effects of Overexposure: Repeated or prolonged contact with skin may cause dermatitis. Tumors have been detected in experimental animals but may not be relevant to humans.

Target Organs: Eyes, skin, respiratory system.

Carcinogenicity: ACGIH A4, IARC Group 3

Special purpose glass fibers (E-Glass): ACGIH A3, IARC Group 2B

Toxicity Data: LD₅₀ data not available in sources utilized.

Mouse-Intratracheal Lethal Dose > 20 mg/kg

PROPRIETARY BISPHENOL A-BASED EPOXY RESIN

NIOSH RTECS No.: Not Listed.

Acute Effects of Overexposure: May include irritation of the eyes and skin.

Chronic Effects of Overexposure: Repeated or prolonged exposure may cause skin sensitization.

Target Organs: Eyes, skin.

Carcinogenicity: IARC Group 3

Toxicity Data: Rat-Oral LD₅₀ > 2,400 mg/kg

Rabbit-Dermal LD₅₀ = 6,000 mg/kg



TOXICOLOGICAL INFORMATION (continued)

BROMINATED FLAME RETARDANT

NIOSH RTECS No.: SM0894500

Acute Effects of Overexposure: Causes eye, skin and respiratory tract irritation. May cause digestive tract irritation.

Chronic Effects of Overexposure: Adverse reproductive effects have occurred in experimental animals.

Target Organs: Eyes, skin, respiratory system, digestive system.

Carcinogenicity: Not listed as a carcinogen by IARC, ACGIH, NTP, OSHA, or NIOSH.

Toxicity Data:
Rat-Oral LD₅₀ > 5,000 mg/kg
Rabbit-Dermal LD₅₀ > 2,000 mg/kg
Rat-Inhalation LC₅₀ > 2,550 mg/m³/2h

12. ECOLOGICAL INFORMATION

NO DATA AVAILABLE ON THE SPECIFIC MIXTURE.

CONTINUOUS FILAMENT GLASS FIBERS (E-GLASS)

Information not available in sources utilized.

PROPRIETARY BIPHENOL A-BASED EPOXY RESIN

Ecotoxicity: LC₅₀(96h) 2.4 mg/l Rainbow Trout
LC₅₀(24h) 3.6 mg/l Daphnia Magna

Mobility: Practically insoluble in water.

Persistence and Degradability: Not readily biodegradable.

Bioaccumulation Potential: No information available in sources utilized.

BROMINATED FLAME RETARDANT

Ecotoxicity: LC₅₀(96h) 0.40 mg/l Rainbow Trout
LC₅₀(96h) 0.54 mg/l Fathead Minnow
LC₅₀(48h) 0.96 mg/l Daphnia Magna

Mobility: Low water solubility.

Persistence and Degradability: Not readily biodegradable.

Bioaccumulation Potential: Bioconcentration potential in aquatic organisms is considered moderate to high.

13. DISPOSAL CONSIDERATIONS

GENERAL: Follow all applicable local, national, provincial, territorial, and international regulations. As supplied, this material is not regulated as a hazardous waste under the US EPA Resource Conservation and Recovery Act (RCRA). Refer to the European Waste Catalog (EWC) for appropriate waste code(s).

14. TRANSPORT INFORMATION

Not regulated by US DOT, ICAO/IATA, RID/ADR, IMDG, Canada TDG

15. REGULATORY INFORMATION

CANADIAN ENVIRONMENTAL PROTECTION ACT: All of the components of this product are listed on the Canadian Domestic Substances List (DSL).

EPA TOXIC SUBSTANCES CONTROL ACT (TSCA) STATUS: All of the components of this product are listed on the TSCA inventory.



REGULATORY INFORMATION (continued)

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS): All of the components of this product are listed on the EINECS inventory, are no longer polymers (NLP), or are polymer exempt.

ADDITIONAL OCCUPATIONAL EXPOSURE LIMITS (OELs). There are currently no international OELs for the Proprietary Bisphenol A-based Epoxy Resin or the Brominated Flame Retardant. See Section 8 for OSHA, ACGIH and NIOSH OELs.

| Country | CONTINUOUS FILAMENT GLASS FIBERS (based on mineral wool) |
|--|--|
| Arab Republic of Egypt | Not Listed |
| Australia | Not Listed |
| Austria | Not Listed |
| Belgium | Not Listed |
| Canada | |
| -Alberta | 1.0 f/cc 8-hour OEL |
| -British Columbia | 1 f/cc 8-hour TWA 5 mg/m ³ 8-hour TWA Inhalable Dust |
| -Manitoba, New Brunswick, Nova Scotia, Prince Edward Island | See ACGIH TLV |
| -Northwest Territory | 3 f/cc 8-hour OEL 5 mg/m ³ 8-hour OEL (Total Mass) |
| -Ontario | 1 f/cc TWAEV 5 mg/m ³ TWAEV Inhalable Dust |
| -Quebec | 10 mg/m ³ VEMP (8-hour OEL) |
| -Saskatchewan | Not Listed |
| -Yukon Territory | 10 mg/m ³ 8-hour OEL |
| Denmark | Not Listed |
| Finland | Not Listed |
| France | Not Listed |
| Germany | Not Listed |
| Hungary | Not Listed |
| India | Not Listed |
| Italy | Not Listed |
| Japan | Not Listed |
| Mexico | Not Listed |
| The Netherlands | 2 fibers/cm ³ MAC-TGG Respirable Dust |
| New Zealand | Not Listed |
| Norway | Not Listed |
| The Philippines | Not Listed |
| Poland | Not Listed |
| Russia | Not Listed |
| Sweden | Not Listed |
| Switzerland | Not Listed |
| Thailand | Not Listed |
| United Kingdom | Not Listed |



REGULATORY INFORMATION (continued)

| | |
|--|---------------|
| Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam | See ACGIH TLV |
|--|---------------|

16. OTHER INFORMATION

HAZARD CLASSIFICATIONS:

X_i=Irritant

N=Dangerous to the environment

R-PHRASES:

R36/38-Irritating to eyes and skin

R36/37/38-Irritating to eyes, respiratory system and skin

R43-May cause sensitization by skin contact

R50/51-Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

R51/53-Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Current MSDS Revision Date: January 10, 2014

Previous MSDS Date(s): February 12, 2010; January 13, 2009; January 19, 2007; November 7, 2005; February 1, 2002; December 7, 1998

NOTE: This product contains partially cured resin(s). Curing should only be performed in well-ventilated or closed systems. In accordance with good industrial hygiene practices, handle with care and avoid unnecessary personal contact.

DISCLAIMER: The information contained in this MSDS relates specifically to the product as a whole and may not be valid if used in combination with other materials or in any specified process. The information on FR408 is accurate to the best of our knowledge but does not purport to be all inclusive and should only be used as a general guide. It is the user's responsibility to ensure that the product will be suitable for particular usage. The user assumes all responsibility for compliance with applicable Federal, State and Local Regulations. We do not accept liability for damage or loss that may occur from the use of this information.