



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

MSDS Date: June 26, 2006

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

**IDENTIFICATION OF PREPARATION:** DE104 Laminate

**USE OF PREPARATION:** Cured resin-impregnated woven fiberglass and copper laminate.

**COMPANY IDENTIFICATION** ISOLA USA Corp. **PHONE:** 480-963-0022  
San Tan II Corporate Center **FAX:** 800-233-1068  
3100 West Ray Road  
Chandler, AZ 85226

**MSDS PREPARATION BY:** Chemistry & Industrial Hygiene, Inc., (303)420-8242

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations 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 CLASSIFICATIONS
Continuous filament glass fibers (cured within the resin matrix)	65997-17-3	266-046-0	30-60	X <sub>i</sub> , R36/37/38
Copper Foil	7440-50-8	231-159-6	10-30	Not Applicable
Non-Hazardous Cured Resin	Proprietary	Proprietary	30-60	Not Applicable

Hazard Classifications: X<sub>i</sub>=Irritant, R36/37/38-Irritating to eyes, respiratory system and skin

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

### 3. HAZARDS IDENTIFICATION

**CANADIAN WHMIS FOR THE PREPARATION:** Not a Controlled Product.

**EU PREPARATION CLASSIFICATION (1999/45/EC):** Not a Dangerous Preparation.

**EMERGENCY OVERVIEW:** Dust generated during routine handling, machining, grinding, or sawing of this material may cause mechanical irritation of the skin, eyes and upper respiratory tract.

**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 carcinogens). 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." Inhalation of copper fumes, while not expected to occur under typical conditions of use, may cause metal fume fever. See Section 8 for exposure controls.

**ROUTES OF ENTRY (during machining, grinding, or sawing):**

Dermal: POSSIBLE    Inhalation: YES    Ingestion: POSSIBLE    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.

**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 soap and tepid water.

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

**SYMPTOMS OF EXPOSURE:** May include irritation of the skin, eyes, and upper respiratory tract.

#### 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Carbon dioxide, foam, dry chemical, water.

**FIRE FIGHTING EQUIPMENT:** Wear full bunker gear including a positive pressure self-contained breathing apparatus in any closed place.

#### 6. ACCIDENTAL RELEASE MEASURES

**GENERAL:** Sweep or scrape into approved container for proper disposal.

#### 7. HANDLING AND STORAGE

**HANDLING:** Cured composite parts and resins are solid articles and do not pose a health hazard as shipped.

**STORAGE:** Store at room temperature. Avoid contact with incompatible materials.

#### 8. EXPOSURE CONTROLS /PERSONAL PROTECTION

MATERIAL	EXPOSURE LIMITS*		
	OSHA PEL <sup>(a)</sup>	ACGIH TLV <sup>(b)</sup>	NIOSH REL <sup>(c)</sup>
Continuous filament glass fibers (including special purpose glass fibers)	15 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Total Dust (PNOR) <sup>(f)</sup> 5 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Respirable Dust <sup>(g)</sup>	1 f/cc <sup>(h)</sup> TWA <sup>(e)</sup> Fibers <sup>(i)</sup> 5 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Inhalable Dust <sup>(g)</sup>	3 f/cc <sup>(h)</sup> TWA <sup>(e)</sup> Fibers <sup>(i)</sup> 5 mg/m <sup>3</sup> TWA <sup>(e)</sup> Respirable Dust <sup>(g)</sup>
Copper	0.1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Fume 1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Dust/Mist	0.2 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Fume 1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Dust/Mist	0.1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Fume 1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Dust/Mist

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

(a) U.S. Department of Labor, Occupational Safety and Health Administration, permissible exposure limit; (b) American Conference of Governmental Industrial Hygienists', threshold limit value; (c) National Institute for Occupational Safety and Health, recommended exposure limit; (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; (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  $\geq 3:1$ .

## EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

### ENGINEERING CONTROLS:

Use local exhaust when machining, grinding or sanding to minimize exposures and maintain airborne dust and fiber concentrations below occupational exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION: In the absence of adequate general or local ventilation, use a NIOSH- or local authority-approved respirator with at least an N95 filter if exposure limits are exceeded.

SKIN PROTECTION: Wear gloves during prolonged contact to avoid skin irritation from dust.

EYE PROTECTION: Use safety glasses or a face shield when machining, grinding or sawing this material.

WORK/HYGIENE PRACTICES: Good personal hygiene should be exercised by all users of this product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Reinforced resin/copper laminate
Odor:	Not Applicable
Odor Threshold:	Not Applicable
Boiling Point:	Not Applicable
Flash Point:	Not Applicable
Auto-ignition Temperature:	Not Applicable
Lower Explosive Limit (LEL):	Not Applicable
Upper Explosive Limit (UEL):	Not Applicable
Vapor Pressure:	Not Applicable
Specific Gravity:	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 of Solution:	Typically Less Than 1%
Total Volatile Organic Compounds (TVOC) (G/L):	Not applicable

## 10. STABILITY AND REACTIVITY

**CONDITIONS TO AVOID**: This material is stable under expected conditions of use, avoid incompatible materials. Hazardous polymerization will not occur.

**INCOMPATIBLE MATERIALS**: Strong acids, strong oxidizers, light metals, rubber, plastic.

**HAZARDOUS DECOMPOSITION**: Dense smoke, acrid vapors and fumes, hydrocarbons of variable composition, CO<sub>x</sub>, NO<sub>x</sub>.



## 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 skin, eyes, and respiratory system.

Effects Chronic 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.

Carcinogenicity: ACGIH A4, IARC Group 3

Special purpose glass fibers: ACGIH A3, IARC Group 2B

Toxicity Data: No data available

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NIOSH RTECS No.: GL5325000

Acute Effects of Overexposure: Exposure to dust may cause cough, headache, shortness of breath, and eye, skin and respiratory irritation. Exposure to fumes may cause metal fume fever.

Chronic Effects of Overexposure: Long-term exposures may cause skin sensitization, and respiratory, liver and kidney effects.

Carcinogenicity: No known effects

Toxicity Data: IPR-MUS LD<sub>50</sub> 0.07 mg/kg

## 12. ECOLOGICAL INFORMATION

NO DATA AVAILABLE ON THE SPECIFIC MIXTURE.

### CONTINUOUS FILAMENT GLASS FIBERS (E-GLASS)

No available data.

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Ecotoxicity: Copper and its salts are highly poisonous to marine invertebrates, fungi and seaweed.

Mobility: Low in soil.

Persistence and Degradability: Not biodegradable. Water soluble.

Bioaccumulation Potential: Extent unknown, long half-life.

## 13. DISPOSAL CONSIDERATIONS

**GENERAL:** Follow all applicable local, national, territorial, and international regulations. This material is regulated as a hazardous waste under the US EPA Resource Conservation and Recovery Act (RCRA). Storage, disposal, treatment, and transportation of this material are regulated by the USEPA. 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

**EPA Toxic Substances Control Act (TSCA) Status:** All of the components of this product are listed on the TSCA inventory.

**Canadian Environmental Protection Act:** All of the components of this product are listed on the Canadian Domestic Substances List (DSL).

**European Inventory of Existing Commercial Chemical Substances (EINECS):** All of the components of this product are listed on the EINECS inventory.

### ADDITIONAL OCCUPONAL EXPOSURE LIMITS (OELs)

See Section 8 for OSHA, ACGIH and NIOSH OELs.

	<b>Continuous filament glass fibers (based on mineral wool)</b>	<b>Copper</b>
Arab Republic of Egypt	Not Listed	0.1 mg/m <sup>3</sup> TWA Fume
Australia	0.5 f/cc TWA Fibers 2 mg/m <sup>3</sup> TWA Dust	0.2 mg/m <sup>3</sup> TWA Fume 1 mg/m <sup>3</sup> TWA Dust
Austria	0.5 f/cc TWA Fibers	MAK 0.1 mg/m <sup>3</sup> Fume MAK 1 mg/m <sup>3</sup>
Belgium	Not Listed	0.2 mg/m <sup>3</sup> TWA Fume 1 mg/m <sup>3</sup> TWA Dust
Denmark	1 f/cc TWA Fibers, Carcinogen	0.1 mg/m <sup>3</sup> TWA
Finland	10 mg/m <sup>3</sup> TWA Dust	0.2 mg/m <sup>3</sup> TWA Fume 1 mg/m <sup>3</sup> TWA Dust
France	1 f/cc TWA Fibers	0.2 mg/m <sup>3</sup> VME Fume 1 mg/m <sup>3</sup> VME Dust 2 mg/m <sup>3</sup> STEL Dust
Germany	0.25 f/cc TWA (Non-exonerated Fibers) 6 mg/m <sup>3</sup> TWA Dust	MAK 0.1 mg/m <sup>3</sup> Fume MAK 1 mg/m <sup>3</sup> Dust
Hungary	Not Listed	0.2 mg/m <sup>3</sup> TWA 0.4 mg/m <sup>3</sup> STEL Dust
India	Not Listed	0.2 mg/m <sup>3</sup> TWA Fume
Italy	<1 f/cc TWA Fibers 5 mg/m <sup>3</sup> TWA Dust	Not Listed
Japan	2.9 mg/m <sup>3</sup> Dust (administrative control level)	Not Listed
The Netherlands	2 f/cc TWA Fibers	MAC-TGG 1 mg/m <sup>3</sup> Dust
Norway	1 f/cc TWA Fibers	0.1 mg/m <sup>3</sup> TWA Fume
The Philippines	Not Listed	1 mg/m <sup>3</sup> TWA Fume
Poland	Not Listed	MAC 0.1 mg/m <sup>3</sup> TWA Fume MAC 0.3 mg/m <sup>3</sup> STEL Fume MAC 1 mg/m <sup>3</sup> TWA Dust MAC 2 mg/m <sup>3</sup> STEL Dust
Russia	Not Listed	STEL 0.5 ppm (1 mg/m <sup>3</sup> )(Dust)
Sweden	1 f/cc TWA Fibers	NGV 0.2 mg/m <sup>3</sup> (Resp. Dust) NGV 1 mg/m <sup>3</sup> (Total Dust)



**ADDITIONAL OELs (continued)**

	<b>Continuous filament glass fibers (based on mineral wool)</b>	<b>Copper</b>
Switzerland	0.5 f/cc Fibers	0.1 mg/m <sup>3</sup> MAK Week Fume 0.1 mg/m <sup>3</sup> KZG Week Fume 1 mg/m <sup>3</sup> MAK Week 1 mg/m <sup>3</sup> KZG Week
Thailand	Not Listed	0.1 mg/m <sup>3</sup> TWA Fume 1 mg/m <sup>3</sup> TWA
Turkey	Not Listed	1000 ppm TWA
United Kingdom	2 f/cc TWA Fibers 5 mg/m <sup>3</sup> TWA Dust	0.2 mg/m <sup>3</sup> TWA Fume 1 mg/m <sup>3</sup> TWA Dust/Mist 2 mg/m <sup>3</sup> STEL Dust/Mist 1 mg/m <sup>3</sup> TWA Week 3 mg/m <sup>3</sup> STEL Week
Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam	Not Listed	Use the ACGIH TLV of 0.2 mg/m <sup>3</sup> TWA Fume

**SOURCE:** The Registry of Toxic Effects of Chemical Substances (RTECS), National Institute for Occupational Safety and Health (NIOSH).

**16. OTHER INFORMATION**

**Current MSDS Date:** June 26, 2006

**Previous MSDS Date(s):** New

**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 DE104 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.