



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

MSDS Date: January 10, 2015

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

**IDENTIFICATION OF PREPARATION:** G200 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., (800) 420-9311

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. HAZARDS IDENTIFICATION

**GHS Classification for the preparation: WARNING**

Skin irritation/corrosion Category 2 – Causes skin irritation; P264, P280, P302 + P352, P332 + P313, P362  
Eye irritation/serious eye damage Category 2B – Causes eye irritation; P264, P305 + P351 + P338, P337 + P313  
Hazardous to the aquatic environment Chronic Category 1 – Very toxic to aquatic life with long lasting effects;  
P273, P391, P501

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

**EU PREPARATION CLASSIFICATION (1999/45/EC):** Dangerous for the Environment (N), R50/53

**EMERGENCY OVERVIEW:** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Dust generated during routine handling, machining, grinding, or sawing of this material may cause mechanical irritation of the skin, eyes and upper respiratory tract. Copper in powder form is capable of creating a dust explosion.

**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<sub>n</sub>, X<sub>i</sub>, or as category 3 carcinogens, mutagens, or toxic for reproduction). 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. Prolonged or repeated exposure may cause dermatitis. See Section 8 for exposure controls.

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

Dermal: POSSIBLE      Inhalation: YES      Ingestion: POSSIBLE      Injection: POSSIBLE



### 3. 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   | N, R50/53                  |
| Non-Hazardous Cured Resin  | Proprietary | Proprietary | 30-60   | Not Applicable             |

See Section 16 for details on Hazard Classifications.

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

### 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 eyes, skin and respiratory tract, chills, muscle ache, nausea, fever, dry throat, cough, weakness, discoloration of the skin and hair, metallic or sweet taste and/or difficulty breathing.

### 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Carbon dioxide, foam, dry chemical powder. If using a fire extinguisher, make sure that it is an NFPA Class B extinguisher (e.g. label rating will read AB, ABC, BC, etc.).

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

### 6. ACCIDENTAL RELEASE MEASURES

**GENERAL:** Sweep or scrape into approved container for proper disposal. See Section 13 for Disposal Considerations.

### 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><br>Total Dust (PNOR) <sup>(f)</sup><br>5 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup><br>Respirable Fraction <sup>(g)</sup> | 1 f/cc <sup>(h)</sup> TWA <sup>(e)</sup> Fibers <sup>(i)</sup><br>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><br>5 mg/m <sup>3</sup> TWA <sup>(e)</sup><br>Total Fibrous Glass |
| Copper  | 0.1 mg/m <sup>3(d)</sup> TWA <sup>(e)</sup> Fume<br>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<br>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<br>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 (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 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, or other appropriate engineering controls, 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 Determined                   |
| Solubility in Water:                           | Not Determined                   |
| Partition Coefficient:                         | Not Applicable                   |
| Viscosity of Solution:                         | Not Applicable                   |
| Vapor density (Air=1.0):                       | Not Applicable                   |
| Percent Volatility:                            | Not Applicable                   |
| Total Volatile Organic Compounds (TVOC) (G/L): | Not Applicable                   |

## 10. STABILITY AND REACTIVITY

**CONDITIONS TO AVOID:** Exposure to air and moisture. Dust generation. Incompatible materials. This material is stable under expected conditions of use. Hazardous polymerization will not occur.

**INCOMPATIBLE MATERIALS:** Strong acids, strong oxidizers, strong bases, sodium azide, acetylene, light metals, rubber, plastic.

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

## 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 eyes, skin and respiratory tract, 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: LD<sub>50</sub> data not available in sources utilized.

Intratracheal lethal dose in mice > 20 mg/kg

### COPPER

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 or skin and hair discoloration. Ingestion may cause abdominal pain, nausea or vomiting.

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

Target Organs: Eyes, skin, respiratory system, liver, kidneys

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

Toxicity Data: Mouse-Intraperitoneal LD<sub>50</sub> 0.7 mg/kg

## 12. ECOLOGICAL INFORMATION

**NO DATA AVAILABLE ON THE SPECIFIC MIXTURE.**

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

Information not available in sources utilized.

### COPPER

Ecotoxicity: LC<sub>50</sub>(96h) 52-150 µg/l Rainbow Trout  
LC<sub>50</sub>(48h) 24-101 µg/l Daphnia Magna  
LC<sub>50</sub>(72h) 62.3 µg/l Green Algae

Mobility: Insoluble in water.

Persistence and Degradability: Information not available in sources utilized.

Bioaccumulation Potential: Information not available in sources utilized.



### 13. DISPOSAL CONSIDERATIONS

**GENERAL:** Follow all applicable local, national, 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

**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) or the Non-Domestic Substances List (NDSL).

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

**ADDITIONAL OCCUPATIONAL EXPOSURE LIMITS:**

See Section 8 for OSHA, ACGIH and NIOSH OELs.

| Country   | Continuous filament glass fibers<br>(based on mineral wool)        | Copper   |
|---|--|--|
| Arab Republic of Egypt  | Not Listed   | 0.1 mg/m <sup>3</sup> TWA Fume   |
| Australia   | Not Listed   | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust   |
| Austria   | Not Listed   | 0.1 mg/m <sup>3</sup> MAK Fume<br>1 mg/m <sup>3</sup> MAK  |
| Belgium   | Not Listed   | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust   |
| Canada  |  |  |
| -Alberta  | 1.0 f/cc 8-hour OEL  | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA OEL Dust<br>0.6 mg/m <sup>3</sup> STEL OEL Fume<br>2 mg/m <sup>3</sup> STEL OEL Dust |
| -British Columbia, Manitoba,<br>New Brunswick, Nova Scotia,<br>Prince Edward Island | 1 f/cc 8-hour TWA<br>5 mg/m <sup>3</sup> 8-hour TWA Inhalable Dust | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust   |
| -Northwest Territory  | 3 f/cc 8-hour OEL<br>5 mg/m <sup>3</sup> 8-hour OEL (total mass)   | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust   |
| -Ontario  | 1 f/cc TWAEV<br>5 mg/m <sup>3</sup> TWAEV Inhalable Dust           | 0.2 mg/m <sup>3</sup> TWAEV Fume<br>1 mg/m <sup>3</sup> TWAEV Dust   |
| -Quebec   | 10 mg/m <sup>3</sup> VEMP (8-hour OEL)                             | 0.2 mg/m <sup>3</sup> VEMP (8-hour OEL)<br>Fume  |



**ADDITIONAL OELs (continued)**

| Country          | Continuous filament glass fibers<br>(based on mineral wool) | Copper   |
|------------------|---|--|
| -Saskatchewan    | Not Listed  | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA OEL Dust<br>0.6 mg/m <sup>3</sup> STEL OEL Fume<br>2 mg/m <sup>3</sup> STEL OEL Dust     |
| -Yukon Territory | 10 mg/m <sup>3</sup> 8-hour OEL                             | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust<br>0.2 mg/m <sup>3</sup> STEL Fume<br>2 mg/m <sup>3</sup> STEL Dust                 |
| Denmark          | Not Listed  | 0.1 mg/m <sup>3</sup> TWA  |
| Finland          | Not Listed  | 1 mg/m <sup>3</sup> TWA Dust   |
| France           | Not Listed  | 0.2 mg/m <sup>3</sup> VME Fume<br>1 mg/m <sup>3</sup> VME Dust<br>2 mg/m <sup>3</sup> STEL Dust  |
| Germany          | Not Listed  | 0.1 mg/m <sup>3</sup> MAK Fume<br>1 mg/m <sup>3</sup> MAK Dust   |
| Hungary          | Not Listed  | 0.2 mg/m <sup>3</sup> TWA<br>0.4 mg/m <sup>3</sup> STEL Dust   |
| India            | Not Listed  | 0.2 mg/m <sup>3</sup> TWA Fume   |
| Italy            | Not Listed  | Not Listed   |
| Japan            | Not Listed  | Not Listed   |
| The Netherlands  | 2 f/cm <sup>3</sup> MAC-TGG Respirable Dust                 | 0.2 mg/m <sup>3</sup> MAC-TGG Fume<br>1 mg/m <sup>3</sup> MAC-TGG Dust   |
| Norway           | Not Listed  | 0.1 mg/m <sup>3</sup> TWA Fume   |
| The Philippines  | Not Listed  | 1 mg/m <sup>3</sup> TWA Fume   |
| Poland           | Not Listed  | 0.1 mg/m <sup>3</sup> MAC TWA Fume<br>0.3 mg/m <sup>3</sup> MAC STEL Fume<br>1 mg/m <sup>3</sup> MAC TWA Dust<br>2 mg/m <sup>3</sup> MAC STEL Dust |
| Russia           | Not Listed  | 0.5 ppm (1 mg/m <sup>3</sup> ) STEL Dust   |
| Sweden           | Not Listed  | 0.2 mg/m <sup>3</sup> NGV Resp. Dust<br>1 mg/m <sup>3</sup> NGV Total Dust   |
| Switzerland      | Not Listed  | 0.1 mg/m <sup>3</sup> MAK Week Fume<br>0.2 mg/m <sup>3</sup> KZG Week Fume<br>1 mg/m <sup>3</sup> MAK Week<br>1 mg/m <sup>3</sup> KZG Week         |
| Thailand         | Not Listed  | 0.1 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA  |
| Turkey           | Not Listed  | Not Listed   |



**ADDITIONAL OELs (continued)**

| Country   | Continuous filament glass fibers<br>(based on mineral wool) | Copper   |
|---|---|--|
| United Kingdom  | Not Listed  | 0.2 mg/m <sup>3</sup> TWA Fume<br>1 mg/m <sup>3</sup> TWA Dust/Mist<br>2 mg/m <sup>3</sup> STEL Dust/Mist<br>1 mg/m <sup>3</sup> TWA Week<br>3 mg/m <sup>3</sup> STEL Week |
| Argentina, Bulgaria, Colombia,<br>Jordan, Korea, New Zealand,<br>Singapore, Vietnam | See ACGIH TLV   | See ACGIH TLV  |

**16. OTHER INFORMATION**

**HAZARD CLASSIFICATIONS:**

X<sub>i</sub>=Irritant

N=Dangerous for the Environment

**R-PHRASES:**

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

R50/53-Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Precautionary Statements:**

P264 – Wash hands thoroughly after handling.

P273 – Avoid release to the environment.

P280 – Wear protective gloves.

P302 + P352 – IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332 + P313 – If skin irritation occurs: Get medical advice/attention.

P337 + P313 – If eye irritation persists: Get medical advice/attention.

P362 – Take off contaminated clothing and wash before reuse.

P391 – Collect spillage.

P501 – Dispose contents/container in accordance with local, national, provincial, territorial, and international regulations.

**Current MSDS Revision Date:** January 10, 2015

**Previous MSDS Date(s):** January 10, 2012, January 13, 2009, August 25, 2005

**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 G200 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.