



## MATERIAL SAFETY DATA SHEET

MSDS No: MK203

Date Prepared: 03/12/1996

Current Date: 8/25/2006

Last Revised: (08/21/2006)

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Material Name:** Amorphous Silica Mixture  
**Intended Use:** Industrial Thermal Insulation  
**Trade Names:** BTU Block®: Boards, Panel, Flexible, Ladle Liner

**Manufacturer/Supplier:** Thermal Ceramics  
MIN-K Division (PHONE: 574-296-3500)  
2730 Industrial Parkway  
Elkhart, IN 46516

For Product Stewardship and Emergency Information -  
Hotline: 1-800-722-5681  
Fax: 706-560-4054

For additional MSDSs and to confirm this is the most current MSDS for the product, visit our web page [[www.thermalceramics.com](http://www.thermalceramics.com)]

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT &amp; CAS NUMBER</u>	<u>% BY WEIGHT</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Silica fume (amorphous) 69012-64-2	50 - 70	(80 mg/m <sup>3</sup> ÷ % SiO <sub>2</sub> *) or 20 mppcf	2 mg/m <sup>3</sup>
Titanium dioxide 13463-67-7	20 - 40	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
Calcium-Magnesium-Silicate Mixture <sup>(1)</sup> 329211-92-9	0 - 10	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)	10 mg/m <sup>3</sup> (inhalable dust) 3 mg/m <sup>3</sup> (respirable dust)
<b>OR</b>			
Calcium-Magnesium-Zirconium-Silicate Mixture <sup>(1)</sup> 308084-09-5	0 - 10	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)	10 mg/m <sup>3</sup> (inhalable dust) 3 mg/m <sup>3</sup> (respirable dust)
Fibrous glass filament 65997-17-3	0 - 5	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)	1 f/cc, 5 mg/m <sup>3</sup>
Polyester fiber NONE	0 - 3	Not Established	Not Established

<sup>(1)</sup> May contain alumina, titania and zirconia as minor constituents

\* Percent of crystalline silica

(See Section 8 for Personal Protection Guidelines)

### 3. HAZARDS IDENTIFICATION

- May cause temporary, mild mechanical irritation to the eyes, skin, nose and/or throat.
- Pre-existing skin and respiratory conditions may be aggravated by exposure.

### 4. FIRST AID MEASURES

- Eye Contact:** If the eyes show inflammation due to mechanical irritation, flush with large amounts of water for at least 15 minutes. Do not rub eyes.
- Skin Contact:** If a skin rash develops due to mechanical irritation, wash the affected area gently with soap and water. A skin cream or lotion after washing may be helpful. Do not rub or scratch the exposed skin. Changing into clean clothing is recommended.
- Respiratory Tract:** If irritation or soreness occurs in the nose or throat, this can be alleviated by breathing fresh air. (See Section 8 for additional measures to reduce the occurrence of respiratory tract irritation caused by exposure.)

- If symptoms persist, seek medical attention -

### 5. FIRE FIGHTING MEASURES

- NFPA Unusual Hazards:** None
- Flash Point:** Non-combustible
- Extinguishing Media:** Use extinguishing media appropriate to the surrounding fire.
- Explosion Hazards:** None

### 6. ACCIDENTAL RELEASE MEASURES

- Spill/Leak Procedures:** Avoid creating airborne dust. Provide workers with respirators, if necessary (See Section 8). Follow routine housekeeping procedures. Where possible, use a HEPA vacuum to clean up the spilled material. If sweeping is necessary, use a dust suppressant and place material in closed containers. Do not use compressed air for clean-up. Avoid clean-up procedures that could result in water pollution.

### 7. HANDLING AND STORAGE

- Handling:** Limit use of power tools unless in conjunction with local exhaust. Use hand tools whenever possible. Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.
- Storage:** This product is stable under all conditions of storage. Store in original factory container in a dry area. Keep container closed when not in use. Do not reuse the container.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Limits (CMS):**

OSHA PEL . . . . . Not established

OSHA PNOR . . . . Total dust = 15 mg/m<sup>3</sup>; Respirable dust = 5 mg/m<sup>3</sup>

ACGIH TLV . . . . . None established

ACGIH PNOC . . . Inhalable particulate = 10 mg/m<sup>3</sup>; Respirable particulate = 3 mg/m<sup>3</sup>

Industrial hygiene standards and occupational exposure limits may vary between countries and local jurisdictions. Contact your employer to determine which exposure levels apply to your facility. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection. In the absence of such guidance, the supplier generally recommends the control of CMS wool exposures to 1 fiber/cc or less.

**Engineering Controls:**

It is prudent to reduce exposure to respirable dusts to the lowest attainable level through the use of engineering controls such as ventilation and dust collection devices. Effective technologies to control respirable dust are available. These include local exhaust ventilation, point of generation dust collection, down draft workstations, emissions controlling tool designs and materials handling equipment. For further information call the Thermal Ceramics' Product Stewardship Hotline: (800-722-5681).

#### **Personal Protection Equipment:**

**Skin Protection:** Wear long-sleeved, loose fitting clothing, gloves and hat as necessary to prevent skin irritation.  
**Eye Protection:** Wear goggles/safety glasses with sideshields  
**Respiratory Protection:** When it is not possible to reduce respirable dust exposures through engineering controls, employees are encouraged to use good work practices together with respiratory protection. Comply with OSHA Respiratory Protection Standards, 29 CFR 1910.134 and 29 CFR 1926.103.

## **9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance:	Molded fibrous sheet or form		
Chemical Family:	Mixture		
Vapor Pressure:	Not applicable	Vapor Density:	Not applicable
Boiling Point:	Not applicable	Specific Gravity Range:	Not applicable
Melting Point:	>2000°F (1093°C)	Volatile by Volume (%):	0
Water Solubility (%):	Slight	pH:	Not applicable

## **10. STABILITY AND REACTIVITY**

**Hazardous Polymerization:** Will not occur  
**Chemical Incompatibilities:** Avoid contact with strong acids.  
**Hazardous Decomposition Products:** Upon heating above 1650°F (900°C) for sustained periods, this amorphous material begins to transform to mixtures of amorphous and crystalline phases. (See Section 16 for additional information.)

## **11. TOXICOLOGICAL INFORMATION**

#### **Toxicology:**

##### **Silica, amorphous**

Toxic effects described in animals from single inhalation exposures of amorphous silica include upper respiratory irritation, lung congestion, bronchitis, and emphysema. Repeated inhalation exposures at concentration of 50 or 150 mg/m<sup>3</sup> produced increased lung weights and lung changes. No progressive pulmonary fibrosis was seen and the observed lung changes were reversible. No adverse effects were observed in this study at 10 mg/m<sup>3</sup>. No animal test reports are available to define the carcinogenic, mutagenic, or reproductive effects.

##### **Titanium dioxide**

The International Agency for Research on Cancer (IARC) categorized titanium dioxide as a substance not classifiable with respect to human carcinogenicity (Group 3). ACGIH also put this chemical in the category of A4- Not classifiable as a human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which can not be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the classification categories. However, NIOSH in one of the OSHA rule making testified that exposure to titanium dioxide is associated with "a risk of cancer... The incidence of tumors in animals exposed to titanium dioxide meets the... criteria for...potential occupational carcinogen."

##### **Fibrous Glass Filament (non-respirable)**

IARC in June, 1987, categorized fiberglass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC as insufficient to classify fiberglass continuous filament as a possible, probable, or confirmed cancer causing material.

CMS wools have been tested for their biopersistence using methods devised by the European Union. The results from these studies exonerate CMS wools from carcinogen classification under the criteria listed in Nota Q of European Directive 97/69/EU.

In a lifetime carcinogenicity test, rats were exposed by inhalation for two years (5 days a week; 6 hours a day) to CMS fibers at 200 WHO fibers/ml. There was neither fibrosis nor carcinogenic response; only reversible cellular changes were seen. Further, subchronic inhalation studies on rats with CMS fibers at concentrations of 150 fibers (>20 µm long) per ml for 90 days with follow up to 1 year showed neither inflammation nor cell proliferation. All parameters studied returned rapidly to baseline levels on cessation of exposure.

After service, CMS wools can contain various crystalline phases including some forms of silica. (See Section 16.) Samples of CMS fibers kept at 1000°C for 2 weeks were not cytotoxic to macrophage-like cells at concentrations up to 320 µg/cm<sup>2</sup>. In the same test, samples of pure crystalline quartz were significantly active at 20 µg/cm<sup>2</sup>.

**NOTE:** Neither the International Agency for Research on Cancer (IARC) nor the National Toxicology Program or any other U.S. regulatory or classification entity has evaluated CMS wool. Superwool products are members of a family of materials the properties of which are distinct in several ways from other man-made mineral fibers. Superwool products were developed after IARC evaluated other man-made mineral fibers (IARC Monograph Vol. 43, 1988) and classified some of them as possible human carcinogens.

While CMS Wool is an inert material which does not react with the skin, exposures may cause temporary mechanical irritation to the eyes, skin, nose and/or throat (for First Aid Measurers, see Section 4). Proper handling practices and the use of protective clothing (see Section 8) can minimize irritation.

#### Epidemiology:

This material has not been the subject of an epidemiology study.

## 12. ECOLOGICAL INFORMATION

No adverse effects of this material on the environment are anticipated.

## 13. DISPOSAL INFORMATION

<b>Waste Management:</b>	To prevent waste materials becoming airborne, a covered container or plastic bagging is recommended. Comply with federal, state and local regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate, or otherwise inappropriate.		
<b>Method of Disposal:</b>	Landfill		
<b>RCRA:</b>	If discarded in its purchased form, this product would not be hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24).		
<b>European Union:</b>	Waste from this product is not classified as "hazardous" or "special" under European Union regulations. Disposal is permitted at landfills licensed for industrial waste.		

## 14. TRANSPORT INFORMATION

#### Department of Transportation (DOT):

Hazard Class:	Not regulated
Labels:	Not applicable
Placards:	Not applicable
Bill of Lading:	Product name

United Nations (UN) Number:	Not applicable
North America (NA) Number:	Not applicable

#### International:

**MSDS No: MK203**

**Date Prepared: 03/12/1996**

**Current Date: 8/25/2006**

**Last Revised: (08/21/2006)**

Not classified as dangerous goods under ADR (road), RID (train), IATA (air) or IMDG (ship).

## 15. REGULATORY INFORMATION

### United States Regulations:

**SARA Title III:** This product does not contain any substances reportable under Sections 302, 304, 313 (40 CFR 372). Sections 311 and 312 apply.

**OSHA:** Comply with Hazard Communication Standards 29 CFR 1910.1200 and 29 CFR 1926.59 and Respiratory Protection Standards 29 CFR 1910.134 and 29 CFR 1926.103.

**TSCA:** All substances contained in this product are listed in the TSCA Chemical Inventory.

**CERCLA:** CMS wool contains fibers with an average diameter greater than one micron and thus is not considered a CERCLA hazardous substance.

**CAA:** CMS wool contains fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

### International Regulations:

**Canada WHMIS:** No Canadian Workplace Hazardous Materials Information System categories apply to this product.

**Canadian EPA:** All substances in this product are listed, as required, on the Domestic Substance List (DSL).

**European Union:** These products are exonerated from any carcinogenic classification in the countries of the European Union under the provisions of Nota Q of the European Commission Directive 97/69/EC.

## 16. OTHER INFORMATION

### ***Precautionary Measures to be Taken After Service and Upon Removal:***

As manufactured, Superwool is a CMS wool. Upon heating above 1650°F (900°C), these amorphous materials begin to transform to mixtures of amorphous and crystalline phases. Removal of these products after service may generate respirable dust containing small amounts of crystalline silica.

IARC's evaluation for crystalline silica states "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)" and additionally notes "carcinogenicity in humans was not detected in all industrial circumstances studied" (IARC Monograph Vol. 68, 1997). When tested, devitrified Superwool products have not shown any silica-like activity in *in vitro* studies (see Section 11).

OSHA has set different PELs for different forms of silica. The content of silica in devitrified Superwool products is such that controlling fiber exposure, as detailed in Section 8 (above) will simultaneously ensure compliance with any applicable PELs for silica.

Ventilation and respiratory protection should be provided in compliance with OSHA standards. The evaluation of workplace hazards and, if necessary, the identification of appropriate respiratory protection is best performed by qualified Industrial Hygienists. For more information, call the Thermal Ceramics Product Stewardship Hotline (800-722-5681).

### HMIS Hazard Rating:

**HMIS Acute Health:** 1  
**HMIS Flammable:** 0  
**HMIS Reactivity:** 0  
**HMIS Personal Protective:** To be determined by user

### SARA Title III Hazard Categories:

<b>Acute Health:</b>	Yes	<b>Pressure Hazard:</b>	No
<b>Chronic Health:</b>	No	<b>Reactivity Hazard:</b>	No
<b>Fire Hazard:</b>	No		

### DEFINITIONS:

<b>ACGIH:</b>	American Conference of Governmental Industrial Hygienists
<b>ADR:</b>	Carriage of Dangerous Goods by Road (International Regulation)
<b>CAA:</b>	Clean Air Act
<b>CAS:</b>	Chemical Abstracts Service
<b>CERCLA:</b>	Comprehensive Environmental Response, Compensation and Liability Act
<b>DSL:</b>	Domestic Substances List
<b>EPA:</b>	Environmental Protection Agency
<b>EU:</b>	European Union
<b>f/cc:</b>	Fibers per cubic centimeter
<b>HEPA:</b>	High Efficiency Particulate Air
<b>HMIS:</b>	Hazardous Materials Identification System
<b>IARC:</b>	International Agency for Research on Cancer
<b>IATA:</b>	International Air Transport Association
<b>IMDG:</b>	International Maritime Dangerous Goods Code
<b>mg/m<sup>3</sup>:</b>	Milligrams per cubic meter of air
<b>mmpcf:</b>	Million particles per cubic meter
<b>NFPA:</b>	National Fire Protection Association
<b>NIOSH:</b>	National Institute for Occupational Safety and Health
<b>OSHA:</b>	Occupational Safety and Health Administration
<b>29 CFR 1910.134 &amp; 1926.103:</b>	OSHA Respiratory Protection Standards
<b>29 CFR 1910.1200 &amp; 1926.59:</b>	OSHA Hazard Communication Standards
<b>PEL:</b>	Permissible Exposure Limit (OSHA)
<b>PIN:</b>	Product Identification Number
<b>PNOC:</b>	Particulates Not Otherwise Classified
<b>PNOR:</b>	Particulates Not Otherwise Regulated
<b>PSP:</b>	Product Stewardship Program
<b>RCFC:</b>	Refractory Ceramic Fibers Coalition
<b>RCRA:</b>	Resource Conservation and Recovery Act
<b>REG:</b>	Recommended Exposure Guideline (RCFC)
<b>REL:</b>	Recommended Exposure Limit (NIOSH)
<b>RID:</b>	Carriage of Dangerous Goods by Rail (International Regulations)
<b>SARA:</b>	Superfund Amendments and Reauthorization Act
<b>SARA Title III:</b>	Emergency Planning and Community Right to Know Act
<b>SARA Section 302:</b>	Extremely Hazardous Substances
<b>SARA Section 304:</b>	Emergency Release
<b>SARA Section 311:</b>	MSDS/List of Chemicals and Hazardous Inventory
<b>SARA Section 312:</b>	Emergency and Hazardous Inventory
<b>SARA Section 313:</b>	Toxic Chemicals and Release Reporting
<b>STEL:</b>	Short Term Exposure Limit
<b>SVF:</b>	Synthetic Vitreous Fiber
<b>TDG:</b>	Transportation of Dangerous Goods
<b>TLV:</b>	Threshold Limit Value (ACGIH)
<b>TSCA:</b>	Toxic Substances Control Act
<b>TWA:</b>	Time Weighted Average
<b>WHMIS:</b>	Workplace Hazardous Materials Information System (Canada)

**Revision Summary:** Section 1: Min-K area code changed to 574. Faxback information removed.

**MSDS Prepared By:** THERMAL CERAMICS ENVIRONMENTAL, HEALTH & SAFETY DEPARTMENT

#### **DISCLAIMER**

The information presented herein is presented in good faith and believed to be accurate as of the effective date of this Material Safety Data Sheet. Employers may use this MSDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of the product. This summary of the relevant data reflects professional judgment; employers should note that information perceived to be less relevant has not been included in this MSDS. Therefore, given the summary nature of this document, Thermal Ceramics does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.