

## MATERIAL SAFETY DATA SHEET

<b>MSDS No:</b> 354	<b>Date Prepared:</b> 10/05/1994	<b>Current Date:</b> 4/12/2006 <b>Last Revised:</b> (04/10/2006)
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### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Group:** ALKALINE EARTH SILICATE (AES) WOOL PRODUCT

**Chemical Name:** Calcium-Magnesium-Silicate Wool (SW 607) *or* Calcium-Magnesium-Zirconium-Silicate Wool (SW 612)

**Synonyms:** CMS, Synthetic Vitreous Fiber (SVF), Man-made Vitreous Fiber (MMVF), Man-made Mineral Fiber (MMMMF)

**Trade Names:** Superwool™ (\*) Boards; V/F Shapes; CALSIMAG® CSM Boards

**Manufacturer/Supplier:** Thermal Ceramics Inc.  
P. O. Box 923; Dept. 300  
Augusta, GA 30903-0923

**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)] or call our automated  
FaxBack: 1-800-329-7444**

\* Superwool™ is a trademark of The Morgan Crucible Company plc

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT &amp; CAS NUMBER</u>	<u>% BY WEIGHT</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Calcium-Magnesium-Silicate Mixture <sup>(1)</sup> 329211-92-9 (SW 607)	65 - 85	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)
<i>or</i>			
Calcium-Magnesium-Zirconium-Silicate Mixture <sup>(1)</sup> 308084-09-5 (SW 612)	65 - 85	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)
Silica, Amorphous 7631-86-9	10 - 25	(80 mg/m <sup>3</sup> / % crystalline silica) or 20 mppcf	10 mg/m <sup>3</sup> (inhalable dust) 3 mg/m <sup>3</sup> (respirable dust)
Starch 9005-25-8	2 - 10	15 mg/m <sup>3</sup> (total dust) or 5 mg/m <sup>3</sup> (respirable dust)	10 mg/m <sup>3</sup> (inhalable dust) 3 mg/m <sup>3</sup> (respirable dust)

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

**(See Section 8 "Exposure Controls / Personal Protection" for exposure 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

#### RESPIRATORY TRACT (nose and throat) IRRITATION

If respiratory tract irritation develops, move the person to a dust free location. See Section 8 for additional measures to reduce or eliminate exposure.

#### EYE IRRITATION

If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.

#### SKIN IRRITATION

If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.

#### GASTROINTESTINAL IRRITATION

If gastrointestinal tract irritation develops, move the person to a dust free environment.

- If symptoms persist, seek medical attention. -

#### NOTE TO PHYSICIANS

Skin and respiratory effects are the result of temporary, mild mechanical irritation; fiber exposure does not result in allergic manifestations.

### 5. FIRE FIGHTING MEASURES

NFPA Codes: Flammability: 0 , Health: 1 , Reactivity: 0 , Special: 0

NFPA Unusual Hazards: None

Flammable Properties: None

Flash Point: None

Hazardous Decomposition Products: None

Unusual Fire and Explosion Hazard: None

Extinguishing Media: Use extinguishing media suitable for type of surrounding fire.

### 6. ACCIDENTAL RELEASE MEASURES

#### SPILL PROCEDURES

Avoid creating airborne dust. Dust suppressing cleaning methods such as wet sweeping or vacuuming should be used to clean the work area. If vacuuming, the vacuum should be equipped with a HEPA filter. Compressed air or dry sweeping should not be used for cleaning.

### 7. HANDLING AND STORAGE

#### STORAGE

Store in original factory container in a dry area. Keep container closed when not in use.

**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.

**EMPTY CONTAINERS**

Do not reuse the container.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****MANUFACTURER'S RECOMMENDATION**

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. Industrial hygiene standards and occupational exposure limits may vary between countries, state 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 manufacturer generally recommends the control of CMS wool exposures to 1 fiber/cc or less.

**ENGINEERING CONTROLS**

Use feasible engineering controls such as local exhaust ventilation, point of generation dust collection, down draft work stations, emission controlling tool designs, and materials handling equipment designed to minimize airborne fiber emissions.

**PERSONAL PROTECTION EQUIPMENT****Skin Protection**

Wear gloves, head coverings and full body clothing as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed work clothing home. If soiled work clothing must be taken home, employers should ensure employees are trained on the best practices to minimize or avoid non-work dust exposure (e.g., vacuum clothes before leaving the work area, wash work clothing separately, rinse washer before washing other household clothes, etc.).

**Eye Protection**

Wear safety glasses with side shields or other forms of eye protection in compliance with appropriate OSHA standards to prevent eye irritation. The use of contact lenses is not recommended, unless used in conjunction with appropriate eye protection. Do not touch eyes with soiled body parts or materials. If possible, have eye-washing facilities readily available where eye irritation can occur.

**Respiratory Protection**

When it is not possible or feasible 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, for the particular hazard or airborne concentrations to be encountered in the work environment. For the most current information on respirator selection, contact your supplier.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**ODOR AND APPEARANCE:**

Fibrous boards or shapes, various colors

**CHEMICAL FAMILY:**

Calcium, Magnesium, Silicate Mixture

**BOILING POINT:**

Not Applicable

**WATER SOLUBILITY (%):**

Slight

**MELTING POINT:**

1260°C (2300°F)

**SPECIFIC GRAVITY RANGE:**

2.5 - 3.0

**VAPOR PRESSURE:**

Not Applicable

**pH:**

Not Applicable

**VAPOR DENSITY (Air = 1):**

Not Applicable

**% VOLATILE:**

Not Applicable

**MOLECULAR FORMULA:**

Not Applicable

## 10. STABILITY AND REACTIVITY

<b>CHEMICAL STABILITY:</b>	Stable under conditions of normal use
<b>CHEMICAL INCOMPATIBILITIES:</b>	Avoid contact with strong acids.
<b>CONDITIONS TO AVOID:</b>	None
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Upon heating above 1650°F (900°C) for substantial periods, this amorphous material begins to transform to mixtures of amorphous and crystalline phases. (See Section 16 for additional information.) Oxides of carbon and trace of ammonia may release from starch during initial heating of this product.
<b>HAZARDOUS POLYMERIZATION:</b>	Not applicable

## 11. TOXICOLOGICAL INFORMATION

### TOXICOLOGY

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 Commission 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 may contain crystalline phases including some forms of silica. (See Section 16) However, CMS fibers heated to 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>.

**Silica, Amorphous:** Toxic effects found in animals following a single inhalation exposure to amorphous silica include upper respiratory irritation, lung congestion, bronchitis and emphysema. Repeated inhalation exposures at concentrations of 50 to 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 have been found which define carcinogenic, mutagenic or reproductive effects.

### EPIDEMIOLOGY

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

### NOTE

Superwool products are members of a family of materials whose properties are distinct in several ways from other man-made mineral fibers. In October 2001 IARC re-reviewed Man-Made Vitreous Fibers and "elected not to make an overall evaluation of the newly developed fibers" [such as CMS wool] but recognized that "those that have been tested appear to have low carcinogenic potential in experimental animals."

While CMS wool is an inert material that does not react with the skin, exposures may cause temporary mild 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.

## 12. ECOLOGICAL INFORMATION

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

**13. DISPOSAL INFORMATION****WASTE MANAGEMENT**

To prevent waste materials becoming airborne, a covered container or plastic bagging is recommended.

**RCRA**

CMS wool, as manufactured, is not classified as a hazardous waste according to Federal regulations (40 CFR 261). As manufactured, CMS wool was tested using EPA's Toxicity Characteristics Leaching Procedure (TCLP). Results showed there were no detectable contaminants or detectable leachable contaminants that exceeded the regulatory levels. Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator's responsibility to properly characterize a waste material, to determine if it is a "hazardous" waste. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.

**14. TRANSPORT INFORMATION****U.S. DEPARTMENT OF TRANSPORTATION (DOT)**

Hazard Class:	Not regulated	United Nations (UN) Number:	Not applicable
Labels:	Not applicable	North America (NA) Number:	Not applicable
Placards:	Not applicable		
Bill of Lading:	Product name		

**INTERNATIONAL**

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:** CMS wools have been assigned two CAS numbers; however, they are not required to be listed on the TSCA 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.

**States:** CMS wools are not known to be regulated by any State. If in doubt, contact your local regulatory agency.

**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

### **SUPERWOOL™ DEVITRIFICATION**

As produced, Superwools™ are vitreous (glassy) AES Wools that do not contain crystalline silica. Continued exposure to elevated temperatures (>900°C) may cause these materials to form crystalline phases, including crystalline silica. The occurrence and extent of crystalline silica formation is dependent on the duration and temperature of exposure, CMS Wool chemistry and/or the presence of fluxing agents. The presence of crystalline silica can be confirmed only through laboratory analysis of the "hot face" fiber. If crystalline silica is present, follow appropriate hygiene standards and national regulations.

Devitrified, after-service Superwool™, containing crystalline silica, has shown no adverse reactions in toxicity assays (See Section 11). These findings are consistent with IARC's evaluation, which 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. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." (IARC Monograph Vol. 68, 1997).

Respirable dust from devitrified Superwool™ products can be controlled with ventilation, dust collectors or respiratory protection as detailed in Section 8 (above). 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).

### **PRODUCT STEWARDSHIP PROGRAM**

Morgan Thermal Ceramics has established a program to provide customers with up-to-date information regarding the proper use and handling of Superwool™. If you would like more information about this program, please call your local supplier or visit one of the following web sites.

Thermal Ceramics - Global  
Refractory Ceramic Fibers Coalition (USA)  
ECFIA (Europe)

[www.thermalceramics.com](http://www.thermalceramics.com)  
[www.RCFC.net](http://www.RCFC.net)  
[www.ecfia.org](http://www.ecfia.org)

### **LABELING**

As product information labels may be required on Superwool™ packages, check local destination regulations before shipping.

### **HMIS HAZARD RATING**

**HMIS Health:** 1  
**HMIS Flammable:** 0  
**HMIS Reactivity:** 0

**HMIS Personal Protective:** To be determined by user

**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 Registry Number
<b>CERCLA:</b>	Comprehensive Environmental Response, Compensation and Liability Act
<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>mppcf:</b>	Million particles per cubic meter
<b>MSHA:</b>	Mine Safety and Health Administration
<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>PEL:</b>	Permissible Exposure Limit
<b>PNOC:</b>	Particulates Not Otherwise Classified
<b>PNOR:</b>	Particulates Not Otherwise Regulated
<b>RCRA:</b>	Resource Conservation and Recovery Act
<b>RID:</b>	Carriage of Dangerous Goods by Rail (International Regulation)
<b>SARA:</b>	Superfund Amendments and Reauthorization Act
<b>Title III:</b>	Emergency Planning and Community Right to Know Act
<b>...Section 302:</b>	Extremely Hazardous Substances
<b>...Section 304:</b>	Emergency Release
<b>...Section 311:</b>	MSDS/List of Chemicals
<b>...Section 312:</b>	Emergency and Hazardous Inventory
<b>...Section 313:</b>	Toxic Chemicals Release Reporting
<b>STEL:</b>	Short-Term Exposure Limit
<b>TCLP:</b>	Toxicity Characteristics Leaching Procedures (EPA)
<b>TLV:</b>	Threshold Limit Values (ACGIH)
<b>TSCA:</b>	Toxic Substance Control Act
<b>WHMIS:</b>	Workplace Hazardous Materials Information System (Canada)
<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

**Revision Summary:** Section 1: Product CALSIMAG® CSM Boards added.

**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.