Morgan ThermalCeramics

# MATERIAL SAFETY DATA SHEET

| MSDS No: MK203 | Date Prepared: 03/12/1996 | Current Date: 11/01/2011<br>Last Revised: (11/01/2011) |
|---|---|---|

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Group:** MICROPOROUS INSULATION

**Chemical Name:** Mixture

**Intended Use:** Application as a thermal insulation in high temperature environments such as: Industrial furnaces, ovens, boilers and other process equipment in aluminium, iron and steel, glass, automotive, petrochemical, chemical processing, power generation, commercial OEM, fire protection, and fuel cell applications.

**Trade Names:** BTU Block®: Boards, Panel, Flexible, Ladle Liner
FireMaster® FastDoor XL
FireMaster® MarineLite®

**Manufacturer/Supplier:**

| | |
|---|---|
| **Morgan Thermal Ceramics**<br>**Elkhart Facility (PHONE: 574-296-3500)**<br>**2730 Industrial Parkway**<br>**Elkhart, IN 46516** | **Morgan Thermal Ceramics**<br>**Thermal Ceramics Inc.**<br>**P. O. Box 923; Dept. 300**<br>**Augusta, GA 30903-0923**<br>**USA** |

**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.morganthermalceramics.com* or send a request to *MT.NorthAmerica@morganplc.com***

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| COMPONENTS | CAS NUMBER | % BY WEIGHT |
|---|---|---|
| Silica Fume (Amorphous) | Proprietary | 50 - 70 |
| Titanium Dioxide | 13463-67-7 | 20 - 30 |
| Silicon Carbide | 409-21-2 | 0 - 30 |
| Alkaline-Earth Silicate Wool | 436083-99-7 | 0 - 10 |
| Fibrous Glass Filament | 65997-17-3 | 0- 5 |
| Polyester Fiber | NONE | 0- 3 |

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

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

Dust and respirable fibers from this product may aggravate existing chronic lung conditions such as bronchitis, emphysema and asthma.

**POSSIBLE HEALTH EFFECTS**

| | |
|---|---|
| **Target Organs:** | Eyes, skin, lung, nose and/or throat |
| **Primary Entry Route:** | Inhalation |
| **Acute effects:** | Upper respiratory physical irritation. Irritation and inflammation to the eyes on contact and to the skin on prolonged contact. |
| **Chronic effects:** | No known chronic effects from exposure to these products. However, IARC has classified titanium dioxide as possibly carcinogenic (Group 2B) to humans. (See Section 11) |

**Signs and Symptoms of Overexposure:**

| | |
|---|---|
| Eye Contact: | Physical irritation - inflammation |
| Skin Contact: | Physical irritation - rash |
| Ingestion: | May cause temporary irritation to the gastrointestinal tract |
| Inhalation: | Irritation or soreness in throat, nose and respiratory tract |

## 4. FIRST AID MEASURES

**EYE IRRITATION:**
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 IRRITATION:**
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 IRRITATION:**
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.)

**GASTROINTESTINAL IRRITATION:**
Unlikely route of 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 GUIDELINES | | | |
|---|---|---|---|
| *MAJOR COMPONENT* | *OSHA PEL* | *ACGIH TLV* | *MANUFACTURER'S REG* |
| Silica Fume (amorphous) | (80 mg/m$^3$ ÷ % $SiO_2$) or 20 mppcf | 2 mg/m$^3$ | NONE |
| Titanium Oxide | 15 mg/m$^3$ | Not Established | NONE |
| Silicon Carbide | 15 mg/m$^3$ (total dust) 5 mg/m$^3$ (respirable dust) | 10 mg/m$^3$ (inhalable dust) 3 mg/m$^3$ (respirable dust) | NONE |
| Alkaline-Earth Silicate Wool[1] | Not Established | Not Established | 1 f/cc, 8-hr TWA |
| Fibrous Glass Filament | Not Estabished | 1 f/cc, 5 mg/m$^3$ | NONE |

[1] **CAS definition:** Alkaline Earth Silicate (AES) consisting of silica (50-82 wt %), calcia and magnesia (18-43 wt %), alumina, titania and zirconia (less than 6 wt %), and trace oxides. This CAS composition also covers Thermal Ceramics products Calcium-Magnesium-Silicate Wool (CAS no. 329211-92-9) and Calcium-Magnesium-Zirconium-Silicate Wool (CAS no. 308084-09-5).

**OTHER OCCUPATIONAL EXPOSURE LEVELS (OEL)**

Industrial hygiene standards and occupational exposure limits vary between countries and local jurisdictions. Check which exposure levels apply to your facility and comply with local regulations. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection.

**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, AES wools begin 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$^3$ 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 $^3$. No animal test reports are available to define the carcinogenic, mutagenic, or reproductive effects.

**Titanium Dioxide**
Titanium dioxide was reclassified by the IARC in 2006 as a "possibly carcinogenic to humans (Group 2B)".
The classification was based on sufficient evidence in experimental animals but inadequate evidence in humans for the carcinogenicity of titanium dioxide. IARC indicated in the monograph that "the studies do not suggest an association between occupational exposure to titanium dioxide as it occurred in recent decades in Western Europe and North America and risk for cancer."
[IARC Monograph (Vol. 93)]

The US National Institute for Occupational Safety and Health (NIOSH) is currently reviewing the available toxicity data on titanium dioxide. On the recent draft Current Intelligence Bulletin (March, 2006), NIOSH recommends exposure limits of 1.5 mg/m3 for fine TiO2 (particle greater than 0.1 um in diameter) and 0.1 ug/m3 for ultrafine particles. The draft document states that the difference in the recommended limits reflect findings from studies, which suggest that ultrafine TiO2 particles may be more potent than fine TiO2 particles at the same mass. It also indicated this may due to the fact, that the ultrafine particles have a greater surface area than the fine particles at the same mass.

**Silicon Carbide**
An animal study showed that, although exposure to silicon carbide alone produced no fibrosis of the lungs, exposure of guinea pigs infected with pulmonary tuberculosis to the extent that extensive fibrosis occurred. Guinea pigs exposed to silicon carbide dust and infected with the tubercle bacteria developed tuberculopneumoconiotic lesions. Miller and Sayers observed that silicon carbide dust administered by intraperitoneal injection to guinea pigs produced no reaction. A study in tungsten carbide industry workers concluded that exposure to silicon carbide was not a hazard unless the exposed workers already had pulmonary tuberculosis.

**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.

**AES Wools**
AES contained in the products listed in the title have been designed to be rapidly cleared from lung tissue. This low biopersistence has been confirmed in many studies on AES using EU protocol ECB/TM/27(rev 7) and the German method specified in TRGS 905 (1999). When inhaled, even at very high doses, they do not accumulate to any level capable of producing a serious adverse biological effect. In lifetime chronic studies there was no exposure-related effect more than would be seen with any "inert" dust. Sub-chronic studies at the highest doses achievable produced at worst a transient mild inflammatory response. Fibers with the same ability to persist in tissue do not produce tumours when injected into the peritoneal cavity of rats.

**Epidemiology:**

TOXICOLOGY HEADING
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

**Waste Management:** 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.

**Method of Disposal:** Landfill

**RCRA:** 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).

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

CERCLA: AES wools contain fibers with an average diameter greater than one micron and thus is not considered a CERCLA hazardous substance.

CAA: AES wools contain fibers with an average diameter greater than one micron and thus is not considered a hazardous air pollutant.

**International Regulations:**

Canada WHMIS: Titanium dioxide is classified as Class D2-A – Materials causing other toxic effects.

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 UPON REMOVAL**

High temperature insulating wool (HTIW) is typically used in insulation applications to keep temperature exposure at 900°C or above in a closed space. The exposure temperature maximum occurs at the hot face surface of the insulation. The heat exposure on the insulation decreases from the hot face to the cold face as the insulation "insulates itself". As a result, only thin layers of the hot face surface of the insulation become devitrified and respirable dust generated during removal operations typically do not contain detectable levels of crystalline silica (CS).

Toxicological evaluation of the effect of the presence of CS in artificially heated HTIW material has not shown any increased toxicity in vitro and in vivo. The results from different factor combinations such as increased brittleness of fibers or micro crystals embedded in the glass structure of the fiber and therefore not biologically available, may explain the lack of toxicological effects. IARC evaluation as provided in Monograph 68 is not relevant since CS is not biologically available in after-service HTIW.

High concentrations of fibers and other dusts may be generated when after-service products are mechanically disturbed during removal. Therefore, ECFIA and RCFC recommend:

a) Controlled measures are taken to reduce dust emissions and
b) All personnel directly involved wear an appropriate respirator to minimize and comply with local regulatory limits.

For more information, call the Morgan Thermal Ceramics Product Stewardship Hotline (800-722-5681).

**HMIS Hazard Rating:**

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

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

* See section 3 of the MSDS for possible chronic health effects.

**SARA Title III Hazard Categories:**

| | | | |
|---|---|---|---|
| **Acute Health:** | No | **Pressure Hazard:** | No |
| **Chronic Health:** | Yes | **Reactivity Hazard:** | No |
| **Fire Hazard:** | No | | |

**Morgan Thermal Ceramics:** www.morganthermalceramics.com

**DEFINITIONS:**

| | |
|---|---|
| **ACGIH:** | American Conference of Governmental Industrial Hygienists |
| **ADR:** | Carriage of Dangerous Goods by Road (International Regulation) |
| **CAA:** | Clean Air Act |
| **CAS:** | Chemical Abstracts Service |
| **CERCLA:** | Comprehensive Environmental Response, Compensation and Liability Act |
| **DSL:** | Domestic Substances List |
| **EPA:** | Environmental Protection Agency |
| **EU:** | European Union |
| **f/cc:** | Fibers per cubic centimeter |
| **HEPA:** | High Efficiency Particulate Air |
| **HMIS:** | Hazardous Materials Identification System |
| **IARC:** | International Agency for Research on Cancer |
| **IATA:** | International Air Transport Association |
| **IMDG:** | International Maritime Dangerous Goods Code |
| **mg/m³:** | Milligrams per cubic meter of air |
| **mmpcf:** | Million particles per cubic meter |
| **NFPA:** | National Fire Protection Association |
| **NIOSH:** | National Institute for Occupational Safety and Health |
| **OSHA:** | Occupational Safety and Health Administration |
| **29 CFR 1910.134 & 1926.103:** | OSHA Respiratory Protection Standards |
| **29 CFR 1910.1200 & 1926.59:** | OSHA Hazard Communication Standards |
| **PEL:** | Permissible Exposure Limit (OSHA) |
| **PIN:** | Product Identification Number |
| **PNOC:** | Particulates Not Otherwise Classified |
| **PNOR:** | Particulates Not Otherwise Regulated |
| **PSP:** | Product Stewardship Program |
| **RCFC:** | Refractory Ceramic Fibers Coalition |
| **RCRA:** | Resource Conservation and Recovery Act |
| **REG:** | Recommended Exposure Guideline (RCFC) |
| **REL:** | Recommended Exposure Limit (NIOSH) |
| **RID:** | Carriage of Dangerous Goods by Rail (International Regulations) |
| **SARA:** | Superfund Amendments and Reauthorization Act |
| **SARA Title III:** | Emergency Planning and Community Right to Know Act |
| **SARA Section 302:** | Extremely Hazardous Substances |
| **SARA Section 304:** | Emergency Release |
| **SARA Section 311:** | MSDS/List of Chemicals and Hazardous Inventory |
| **SARA Section 312:** | Emergency and Hazardous Inventory |
| **SARA Section 313:** | Toxic Chemicals and Release Reporting |
| **STEL:** | Short Term Exposure Limit |
| **SVF:** | Synthetic Vitreous Fiber |
| **TDG:** | Transportation of Dangerous Goods |
| **TLV:** | Threshold Limit Value (ACGIH) |
| **TSCA:** | Toxic Substances Control Act |
| **TWA:** | Time Weighted Average |
| **WHMIS:** | Workplace Hazardous Materials Information System (Canada) |

**Revision Summary:**

**Company's logo:** Rebranded.
**Section 1:** *Product "FireMaster MarineLite" added (previously listed on MSDS # 409).
*Manufacturer's company name and e-mail addresses changed.
**Sections 1 - 16:** Revised.

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