

SAFETY DATA SHEET

Following Regulation 1910.1200

SDS Number: MK223 Date of first issue: 20 November 2018 Date of last revision: 21 February 2022

1 - Identification of product**a - Product identifier used on the label****Tradenames:** BTU-Block Board, BTU-Block Flexible, BTU-Block Ladle Liner, BTU-Block Laminated Board, BTU-Block Panel, FireMaster FastDoor XL, FireMaster Marinelite**b - Other means of identification**

MICROPOROUS INSULATION

c - Recommended use of the chemical and restrictions on use

Application as thermal insulation, heat shields, heat containment, gaskets and expansion joints in industrial furnaces, ovens, kilns, boilers and other process equipment and in the aerospace, automotive and appliance industries, and as passive fire protection systems and firestops. (Please refer to specific technical data sheets for more information)

d - Name, address, and telephone number

| | |
|---|---|
| Morgan Advanced Materials 2730 Industrial Parkway Elkhart, IN 46516 Telephone: 574-296-3500 | Morgan Advanced Materials P. O. Box 923; Dept. 300 Augusta, GA 30903-0923 Telephone: 706-796-4200 |
|---|---|

e - Emergency Phone NumberFor Product Stewardship and Emergency Information:
Hotline - 1-800-722-5681
Fax - 706-560-4054For additional SDSs and to confirm this is the most current SDS for the product, visit our web page www.morganthermalceramics.com or send a request to MT.NorthAmerica@morganplc.com**2 - Hazard Identification****a - Classification of the chemical in accordance with paragraph (d) of §1910.1200****b - Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200****Hazard Pictogram****Signal Words**

Warning

Hazard Statements

Suspected of causing cancer by inhalation.

Precaution Statements

Do not handle until all safety instructions have been read and understood.

Use respiratory protection as required; see Section 8 of the Safety Data Sheet.

If concerned about exposure, get medical advice.

Store in a manner to minimize airborne dust.

Dispose of waste in accordance with local, state and federal regulations.

May cause temporary mechanical irritation to exposed eyes, skin or respiratory tract.

Minimize exposure to airborne dust.

Emergency Overview

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

c - Describe any hazards not otherwise classified that have been identified during the classification process**d - Mixture Rule**

Not applicable.

3 - Composition / Information On Ingredients

a - Composition table

| 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 |

b - Common Name

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

d - Impurities and Stabilizing Additives

Not applicable.

4 - First-Aid measures

a - Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion

Eyes

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

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.)

Gastrointestinal

Unlikely route of exposure.

c - Indication of immediate medical attention and special treatment needed, if necessary

5 - Fire-fighting measures

a - Suitable (and unsuitable) extinguishing media and

Use extinguishing media suitable for type of surrounding fire

c - Special Protective Equipment and Precautions for Firefighters

b - Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

None

6 - Accidental Release Measures

a - Personal precautions, protective equipment, and emergency 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.

b - Methods and materials for containment and cleaning up

Pick up large pieces and dispose in a closed container. Follow precaution stated in above section for clean up.

7 - Handling and storage

a - Precautions for safe handling

Limit the 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.

b - Conditions for safe storage, including any incompatibilities

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.

c - empty containers

Product packaging may contain residue. Do not reuse.

8 - Risk Management Measures / Exposures Controls / Personal Protection

a - OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available

| EXPOSURE GUIDELINES | | | |
|---|--|---|--------------------|
| MAJOR COMPONENT | OSHA PEL | ACGIH TLV | MANUFACTURER'S REG |
| Silica Fume (Amorphous) | (80 mg/m ³ + % SiO ₂) or 20 mppcf | 2mg/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) 3mg/m ³ (respirable dust) | NONE |
| Alkaline-Earth Silicate Wool ⁽¹⁾ | Not Established | Not Established | 1 f/cc, 8-hr TWA |
| Fibrous Glass Filament | Not Established | 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) Ontario Canada OEL: Continuous Filament Glass Fibers = 1 f/cc (F) or 5 mg/m ³ (Inhalable); Silica Fume = 2mg/m ³ . 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. | | | |

b - Appropriate Engineering Controls

It is prudent to reduce exposure to respirable dust 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).

c - Individual protection measures, such as personal protective equipment

PPE - Skin

Wear long-sleeved, loose fitting clothing, gloves and hat as necessary to prevent skin irritation.

PPE - Eye

Wear goggles/safety glasses with sideshields

PPE – Respiratory

When engineering and/or administrative controls are insufficient to maintain workplace concentrations below the PEL/REG or OEL, the use of appropriate respiratory protection, pursuant to the requirements of OSHA Standards 29 CFR 1910.134 and 29 CFR 1926.103, is recommended. A NIOSH certified respirator with a filter efficiency of at least 95% should be used. The 95% filter efficiency recommendation is based on NIOSH respirator selection logic sequence for exposure to particulates. Selection of filter efficiency (i.e. 95%, 99% or 99.97%) depends on how much filter leakage can be accepted and the concentration of airborne contaminants. Other factors to consider are the NIOSH filter series N, R or P. (N) Not resistant to oil, (R) Resistant to oil and (P) oil Proof. These recommendations are not designed to limit informed choices, provided that respiratory protection decisions comply with 29 CFR 1910.134.

The evaluation of workplace hazards and the identification of appropriate respiratory protection is best performed , on a case by case basis, by a qualified industrial hygienist.

9 - Physical and chemical properties

| | |
|---|------------------------------|
| a - Appearance | Molded fibrous sheet or form |
| b - Odor | Not applicable |
| c - Odor Threshold | Not applicable |
| e - pH | Not applicable |
| d - Melting Point | >2000°F (1093°C) |
| f - Initial Boiling Point/Range | Not applicable |
| g - Flashpoint | Not applicable |
| h - Evaporation Rate | Not applicable |
| i - Flammability | Not applicable |
| j - Upper/Lower Flammability or Explosive Limits | Not applicable |
| k - VAPOR PRESSURE | Not applicable |
| l - VAPOR DENSITY | Not applicable |
| m - Solubility | Slight |
| n - Relative Density | Not applicable |
| o - Partition Coefficient: n-Octanol/water | Not applicable |
| p - Auto-ignition temperature | Not applicable |
| q - Decomposition Temperature | Not applicable |
| r - Viscosity | Not applicable |

10 - Stability and Reactivity

a - Reactivity

None.

b - Chemical Stability

Stable under conditions of normal use.

c - Possibility of Hazardous Reaction

None

d - Conditions to Avoid

None

e - Incompatible Materials

Avoid contact with strong acids

f - 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.

11 - Toxicological information

a - TOXICOKINETICS, METABOLISM AND DISTRIBUTION

b - Acute Toxicity

c - Epidemiology

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

d - 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/m³ 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/m³. 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 µm in diameter) and 0.1 µg/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 be 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.

International Agency for Research on Cancer and National Toxicology Program

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.

The IARC classification are based on very specific evidence showing that high concentrations of pigment-grade (powdered) and ultrafine titanium dioxide dust caused respiratory tract cancer in rats exposed by inhalation and intratracheal instillation.

12 - Ecological information

These products are not reported to have any ecotoxicity effects.

c - Bioaccumulative potential

No information for the product.

d - Mobility in soil

No information for the product.

e - Other adverse effects (such as hazardous to the ozone layer)

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

13 - Disposal Considerations

Waste Management and Disposal

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.

Additional information

This product, as manufactured, is not classified as a listed or characteristic hazardous waste according to U. S. Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under U. S. 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

a - UN number.

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

b - UN proper shipping name

Not applicable.

c - Transport hazard class(es)

Not applicable.

d - Packing group, if applicable

Not applicable.

e - Environmental hazards (e.g., Marine pollutant (Yes/No))

No.

f - Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

Not regulated.

g - Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

Not applicable.

International

INTERNATIONAL

Canadian TDG Hazard Class & PIN: Not regulated
Not classified as dangerous goods under ADR (road), RID (train), IATA (air) or IMDG (ship).

15 - Regulatory information

15.1 - United States Regulations

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

15.2 - International Regulations

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

initial statement

Devitrification

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.

Product Stewardship Program

Morgan Thermal Ceramics www.morganthermalceramics.com

HMIS HAZARD RATING

TECHNICAL DATA SHEETS

Wendy: Please insert TDSs

Revision Summary

In May 2015 this SDS has been updated to GHS format in conformance with US OSHA HCS 2012 (29CFR 1910.1200) and Canada Hazardous Products Act and the Hazardous Products Regulations.

MSDS prepared by

SDS Prepared By: MORGAN 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 Safety Data Sheet. Employers may use this SDS 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 SDS. Therefore, given the summary nature of this document, Morgan 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.