



MATERIAL SAFETY DATA SHEET

MSDS No: 105

Date Prepared: 03/01/1988

Revised/Reviewed: 09/21/2001

1. PRODUCT AND COMPANY IDENTIFICATION

Material Name: Crystalline Silica Containing Product
 Common Name: Refractory Castable, Refractory Concrete
 Intended Use: High Temperature Thermal Insulation
 Trade Names: Kaocrete®: 30, 32C, 32C/M, HDHS 50, HDHS 70

Manufacturer/Supplier: THERMAL CERAMICS INC.
 P.O. BOX 923, DEPT. 300
 AUGUSTA, GA 30903-0923
 Product Stewardship Program: 800-722-5681 / FAX: 706-560-4053
 For additional MSDS's, call our automated FAXBACK: 800-329-7444

2. COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENT CAS NUMBER | PERCENT | OSHA PEL | ACGIH TLV |
|---|----------|--|-------------------------------------|
| Crystalline silica - quartz 14808-60-7 | Up to 10 | 0.1 mg/m ³ (respirable) | 0.1 mg/m ³ (respirable) |
| Crystalline silica - cristobalite 14464-46-1 | Up to 16 | 0.05 mg/m ³ (respirable) | 0.05 mg/m ³ (respirable) |
| Silica, amorphous 7631-86-9 | Up to 10 | (80 mg/m ³ + % SiO ₂ **) or 20 mppcf | 10 mg/m ³ |
| Cement, alumina, chemicals 65997-16-2 | Up to 46 | 10 mg/m ³ (total); 5 mg/m ³ (respirable) | 10 mg/m ³ |
| Aluminum oxide 1344-28-1 | Up to 50 | 15 mg/m ³ (total); 5 mg/m ³ (respirable) | 10 mg/m ³ |

NOTES:

** % SiO₂ = percent of crystalline silica

(See Section 8 for Personal Protection Guidelines.)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

** WARNING **

- Cancer hazard by inhalation. [SEE BELOW]
- Dust from this product may aggravate existing chronic lung conditions such as bronchitis, emphysema and asthma.

Possible Health Effects

Target Organs: Eyes, skin, and respiratory system.
 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.

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Chronic effects: Prolonged/repeated inhalation of respirable crystalline silica may cause delayed lung injury (silicosis). [See Section 11 of this MSDS for more information.]

Hazard Classification: The Seventh Annual Report on Carcinogens (1994), prepared by the **National Toxicology Program (NTP)**, classified silica, crystalline (respirable size), as a substance which may reasonably be anticipated to be a carcinogen.

The **International Agency for Research on Cancer (IARC)** has classified crystalline silica inhaled in the form of quartz or cristobalite from occupational sources as carcinogenic to humans (Group 1). This IARC Classification was based on a relatively large number of epidemiological studies that together provide sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica.

The **State of California**, pursuant to Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986, has listed "silica, crystalline (airborne particles of respirable size)" as a material known to the State of California to cause cancer.

Signs and Symptoms of Overexposure:

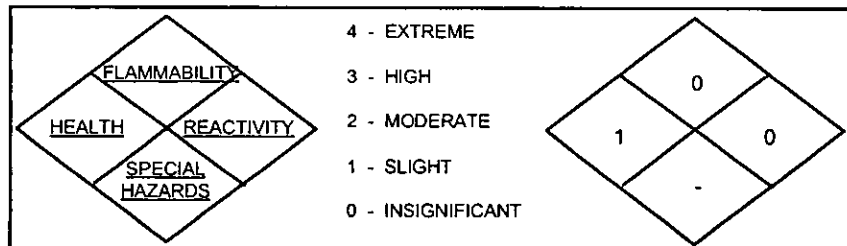
Eye Contact: Physical irritation, laceration.
Skin Contact: Physical irritation.
Ingestion: May cause temporary irritation to the gastrointestinal tract.
Inhalation: Decline in pulmonary function and abnormal chest x-ray.

4. FIRST AID MEASURES

Eye Contact: Flush with large amounts of water for at least 15 minutes. Do not rub eyes.
Skin Contact: Wash affected area gently with soap and water. Skin cream or lotion after washing may be helpful.
Ingestion: Do not induce vomiting; drink plenty of water.
Inhalation: Remove affected person to clean fresh air.

** If any of the symptoms persist, seek medical attention immediately.

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
Protective Equipment: Wear NIOSH approved respirator together with other protective gear appropriate to the surrounding fire.

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6. ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedures: Avoid creating airborne dust. Follow routine housekeeping procedures. Vacuum only with HEPA filtered equipment. If sweeping is necessary, use a dust suppressant and place material in closed containers. Do not use compressed air for clean-up. Personnel should wear gloves, goggles and approved respirator. 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use engineering controls such as ventilation and dust collection devices to reduce airborne particulate concentrations to the lowest attainable level.

Respiratory Protection: When it is not possible or feasible to reduce airborne crystalline silica or particulate levels below the PEL through engineering controls, or until they are installed, employees are encouraged to use good work practices together with respiratory protection. Before providing respirators to employees (especially negative pressure type), employers should 1) monitor for airborne crystalline silica and/or dust concentrations using appropriate NIOSH analytical methods and select the respiratory protection based upon the results of that monitoring, 2) have the workers evaluated by a physician to determine the workers' ability to wear respirators, and 3) implement respiratory protection training programs. Use NIOSH certified respirators, in compliance with OSHA Respiratory Protection Standard 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.

Recommended Respiratory Protection When Handling Crystalline Silica Products

• AS PRODUCED AND AFTER SERVICE

| <u>CONCENTRATION</u> | <u>RESPIRATOR</u> |
|--------------------------------|---|
| Up to PEL | Disposable particulate respirator (N, R, or P, 95 rated) or half mask air purifying respirator with high efficiency (P100) filter cartridges. |
| > 1 to 10 times PEL | Half-mask, air-purifying respirator with high efficiency particulate air (HEPA) or P100 rated filter cartridges. |
| > 10 to 50 times PEL | Full facepiece air-purifying respirator with HEPA or P100 rated filter cartridges or powered air-purifying respirator (PAPR) with HEPA or P100 rated filter cartridges. |
| > 50 times PEL | Full facepiece positive pressure supplied air respirator. |

NOTE: For unknown exposures or when working with other contaminants, consult an industrial hygienist for air monitoring and respirator selection.

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Protective Clothing: Wear full body clothing, gloves, hat, and eye protection. Wash work clothes separately from other clothing. Rinse washer after use. If you take work clothing home, it is recommended you vacuum your clothes with a HEPA filtered vacuum before leaving the work area.

Eye Protection: Goggles/safety glasses with sideshields should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-----------------------|--|-------------------------|----------------|
| Appearance: | Coarse aggregate with fine powder matrix; no odor. | | |
| Chemical Family: | Refractory concrete | | |
| Vapor Pressure: | Not applicable | Vapor Density: | Not applicable |
| Boiling Point: | Not applicable | Specific Gravity Range: | Not applicable |
| Melting Point: | Up to 3400°F | Volatile by Volume (%): | Not applicable |
| Water Solubility (%): | Not soluble in water | pH: | Not applicable |

10. STABILITY AND REACTIVITY

Hazardous Polymerization: Will not occur

Chemical Incompatibilities: Powerful oxidizers; fluorine, manganese trioxide, oxygen disulfide

Hazardous Decomposition Products: None

11. TOXICOLOGICAL INFORMATION

Epidemiology: - Crystalline silica
Results of several epidemiology studies have indicated that diseases which may be caused by the uncontrolled inhalation of crystalline silica include silicosis, pulmonary tuberculosis or industrial bronchitis. In evaluating crystalline silica as a cancer risk, the International Agency for Research on Cancer (IARC) reviewed several studies from different industries and concluded that crystalline silica from occupational sources inhaled in the form of quartz or cristobalite is carcinogenic to humans (Group 1) [IARC Monograph; Vol. 68; June 1997]. However, in reaching its conclusion, IARC stated that the carcinogenicity in humans could not be found in all industries reviewed and that carcinogenicity might be dependent on inherent characteristics of crystalline silica or on external factors affecting biological activity (e.g., cigarette smoking) or distribution of its polymorphs.

Toxicology: - Crystalline silica
There is sufficient evidence of carcinogenicity of respirable silica in experimental animals (IARC Monograph; Vol. 42; 1987 and IARC Monograph; Vol. 68; 1997). Inhalation and intratracheal installation of crystalline silica in rats caused lung cancer; however, studies in other species such as mice and hamsters caused no lung cancer. Crystalline silica also caused fibrosis in rats and hamsters in several inhalation and intratracheal installation studies.

12. ECOLOGICAL INFORMATION

Adverse effects of this material on the environment are not 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. Method of disposal: Landfill. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate, or otherwise inappropriate.

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RCRA: If discarded in its purchased form, this product would not be a 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).

14. TRANSPORT INFORMATION

Department of Transportation (D.O.T.):

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

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. Components of this product are considered to be hazardous as defined by the OSHA Hazard Communication Standard.

TSCA: All substances contained in this product are listed in the TSCA Chemical Inventory [Section 8(b)].

California: Listed as "Silica, crystalline (airborne particles of respirable size)" Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986: Known to the State of California to cause cancer.

Other States: Crystalline silica products are not known to be regulated by states other than California; however, state and local OSHA and EPA regulations may apply to these products. Contact your local agency if in doubt.

International Regulations

Canadian WHMIS: Class D-2A Materials Causing Other Toxic Effects
Canadian EPA: All substances in this product are listed, as required, on the Domestic Substance List (DSL).

16. OTHER INFORMATION

Precautionary Measures to be Taken After Service and Upon Removal:

Amorphous silica may transform to crystalline silica when subjected to temperatures exceeding 1800° F. Therefore, the content of crystalline silica may be higher than originally stated in Section 2. Users should observe good industrial hygiene and work practices to reduce employees' exposure when handling after service products.

HMIS Hazard Rating:

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

HMIS Personal Protective: To be supplied by user depending upon use

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

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SARA Title III Hazard Categories:

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

Definitions:

ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service Registry Number
EPA: Environmental Protection Agency
f/cc: Fibers per cubic centimeter
HEPA: High Efficiency Particulate Air
HMIS: Hazardous Materials Identification System
mg/m³: Milligrams per cubic meter of air
mppcf: Million particles per cubic meter
MSHA: Mine Safety and Health Administration
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration
RCRA: Resource Conservation and Recovery Act
SARA: Superfund Amendments and Reauthorization Act
Title III: Emergency Planning and Community Right to Know Act
...Section 302: Extremely Hazardous Substances
...Section 304: Emergency Release
...Section 311: MSDS/List of Chemicals
...Section 312: Emergency and Hazardous Inventory
...Section 313: Toxic Chemicals Release Reporting
STEL: Short-Term Exposure Limit
TCLP: Toxicity Characteristics Leaching Procedures (EPA)
TLV: Threshold Limit Values (ACGIH)
TSCA: Toxic Substance Control Act
WHMIS: Workplace Hazardous Materials Information System (Canada)
29 CFR 1910.134 & 1926.103: OSHA Respiratory Protection Standard
29 CFR 1910.1200 & 1926.59: OSHA Hazard Communications Standard

Revisions: Replaces revision 06/01/98.
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Reasonable care has been taken in the preparation of the information contained in this Material Safety Data Sheet and is given in good faith. However, Thermal Ceramics Inc. assumes no responsibility as to the accuracy or suitability of such information and no warranty, expressed or implied, is made.

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PRODUCT SAFETY INFORMATION

CRYSTALLINE SILICA CONTAINING PRODUCT (Quartz CAS #14808-60-7 And/Or Cristobalite CAS #14464-46-1)

WARNING:

- This product contains crystalline silica, which has been identified by the International Agency for Research on Cancer (IARC) as a known carcinogen to humans.

Avoid breathing particulates and dust

RISKS:

- Possible cancer hazard by inhalation.
- May cause silicosis (lung disease) by inhalation.
- May cause temporary mechanical irritation to eyes, skin, nose and/or throat.

PRECAUTIONARY MEASURES:

- Minimize airborne particulates and dust with engineering controls.
- Wear a NIOSH certified respirator.
- Wear long sleeved, loose-fitting clothing, eye protection, and gloves.
- Wash work clothing separately and rinse washing machine after use.

FIRST AID MEASURES:

Eyes: Flush with water.
Skin: Wash with soap and warm water.
Ingestion: Unlikely route of exposure.
Inhalation: Remove to fresh clean air.

If any of the above irritations persist, seek medical attention.

FOR ADDITIONAL PRODUCT INFORMATION AND WORK PRACTICES, REFER TO THE
MATERIAL SAFETY DATA SHEET (MSDS).

THERMAL CERAMICS INC.
P.O. BOX 923 DEPT. 300
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Canadian WHMIS Class D-2A: Material causing other toxic effects.

Label No: 2-0895 (Rev. 12/2000)