

MATERIAL SAFETY DATA SHEET

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Section 1- Product Name

Material Name: Aluminum-Silicate Cement Bonded Castable
Intended Use: Refractory Material
Product Name: Hi-Strength Coarse 27 -3/4 TA
Brand Code: MIX1558

Section 2- Composition And Information On Hazardous Ingredients

| Ingredient | CAS No. | % Weight | OSHA PEL | ACGIH TLV | SEC 313 |
|----------------------------|----------------|-----------------|---|------------------------------------|----------------|
| Alumina | 1344-28-1 | 10-30 | 15 mg/m ³ Total dust 5 mg/m ³ Respirable | 10 mg/m ³ (2) | No |
| Crystalline Silica (Total) | Not Applicable | 10-25 | Not Applicable | 0.025 mg/m ³ Respirable | No |
| Cristobalite | 14464-46-1 | | 0.33 mg/m ³ Respirable 0.83 mg/m ³ Total | | |
| Tridymite | 15468-32-3 | | 0.33 mg/m ³ Respirable 0.83 mg/m ³ Total | Not Applicable | |
| Quartz | 14808-60-7 | | 0.66 mg/m ³ Respirable 1.66 mg/m ³ Total | 0.025 mg/m ³ Respirable | |
| Calcium Aluminate Cement | 12042-68-1 | 10-30 | Not Established (3) | Not Established (4) | No |

Notes: (1) The PEL and TLV values shown above are 8-hour time-weighted averages, unless otherwise specified. (2) The TLV value is for particulate matter containing no asbestos and <1% crystalline silica. (3) Particulates not otherwise regulated – 15mg/m³ total dust, and 5 mg/m³ respirable dust. (4) Particles not otherwise specified – ACGIH believes that biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below 3 mg/m³ respirable particles.

Section 3- Hazards Identification

Emergency Overview: No unusual fire or spill hazard. Dust may be irritating to skin, eyes, and mucous membranes.

Primary Route(s) of Entry for Particulate: **Eye:** Yes **Skin:** Yes **Inhalation:** Yes **Ingestion:** No

Potential Adverse Health Effects:

| | |
|-----------------|---|
| Acute: | Eye: May irritate and/or abrade eyes |
| | Skin: May irritate Skin |
| | Inhalation: Dust of this product may be irritating to respiratory tract. |
| Chronic: | Eye: None known |
| | Skin: None known |
| | Inhalation: Prolonged or repeated inhalation of dusts of this product in excess of the stated PEL or TLV may cause lung disease (Silicosis). According to the International Agency for Research on Cancer (IARC), there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz or cristobalite from occupational sources. |

Carcinogenicity: Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1, IARC, NTP).

California Proposition 65: This product contains crystalline silica, a chemical known to the State of California to cause cancer.

Signs and Symptoms of Overexposure: Coughing can result from overexposure to dust.

Medical Conditions Generally Aggravated by Exposure to Particles: Pre-existing diseases or other conditions of the lungs, skin, eyes, and mucous membranes.

Section 4- First Aid Measures

Eye Contact: Flush product from eyes using large amounts of water, if irritation continues, seek medical attention.

Skin Contact: Wash product from skin using soap and water, if irritation continues, seek medical attention.

Inhalation: If exposed to excessive levels of dust remove victim to fresh air. Seek medical attention if coughing or other symptoms persist.

Ingestion: As shipped, product is not likely to be ingested, but if it occurs, do not induce vomiting. Seek medical attention.

Section 5- Fire Fighting Measures

Flash Point: Not Applicable

Flammable Limits: Not Applicable

LEL: Not Applicable

UEL: Not Applicable

Product Name: Hi-Strength Coarse 27 -3/4 TA

Date: 08/16/07

Autoignition Temperature: Not Applicable

Extinguishing Media: As appropriate for surrounding fire.

Fire Fighting Instructions: As appropriate for surrounding fire.

Fire Fighting Equipment: Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus (SCBA) and full protective clothing (bunker gear) when fighting fires.

Hazardous Combustion Products: None

Flame Propagation or Burning Rate of Solid Material: Not Applicable

Flammability Classification (As defined by 29 CFR 1910.1200): Not Flammable

Section 6- Accidental Release Measures

If dusts are generated during the spill, these should be collected by gently sweeping the material into a dust pan or collecting with a vacuum device. All personnel engaged in cleanup operations should adhere to the instructions outlined in section 8 for personal protection. Disposal of wastes from cleanup operations should be carried out in accordance to the guidelines outlined in Section 13.

Section 7- Handling And Storage

Handling: Avoid direct contact with product or dust from product by wearing protective clothing, using approved respiratory protection, and wearing gloves of the impermeable type.

Storage: The product should be stored in a dry location. Pallet protection such as shrink-wrap or stretch-wrap should be kept in place until the product is required for installation.

Section 8- Exposure Control/Personal Protection

Engineering Controls: Process enclosures, local exhaust ventilation, or other engineering process controls may be necessary to keep any air contaminants associated with this product within their TLV's. This is particularly true if the user operation generates dust, vapors, or mist.

Respiratory Protection: Since this product is a proprietary mixture of unique ingredients, it does not have an established limit for airborne concentration (PEL or TLV), which workers can routinely be exposed to without suffering adverse health effects. This MSDS is prepared to alert customers and other users to the various components of the product and their relative quantity and toxicity in the product as provided. The user must review his/her own circumstances and then determine what is required to establish a respiratory protection program that meets OSHA 1910.134 requirements. If workplace conditions warrant respiratory protection, use MSHA/NIOSH approved units as listed in the current 29 CFR 1910.134 for the existing conditions. Some type or respiratory protection is recommended even for the best conditions. Actual respirator selection should be made after consultation with a competent health and safety professional.

Eye Protection: Industrial-type safety glasses offer some protection, goggles offer more.

Protective Gloves: Use as needed to prevent direct skin contact.

Other Protective Clothing or Equipment: Wear clothing designed to limit direct exposure to product, or dust, vapors, or mist associated with product. If clothing becomes contaminated, it should be laundered before wearing again. Maintain good personal hygiene. Wash hands thoroughly before eating or drinking.

Section 9- Physical and Chemical Properties

| | |
|---|---|
| Appearance: Granular mixture | Vapor Pressure: Not Applicable |
| Odor: Earthy Odor | Vapor Density: Not Applicable |
| Water solubility: Slight | pH: Not Determined |
| Density (H₂O=1): 2.5 | Boiling Point: Not Applicable |
| % Volatile (By Weight @ 1800°F): 0 | Melting Point: Greater than 2500°F |

Section 10- Stability And Reactivity

Chemical Stability: This product is stable under normal conditions of shipping, storage, and installation.

Conditions to avoid: None

Incompatible Materials: None

Hazardous Decomposition: None

Hazardous Polymerization: None

Reactivity: Hydraulic Setting

Section 11- Toxicological Information

| | LD₅₀ | LC₅₀ |
|----------------------------|------------------------|------------------------|
| Alumina | No Data | No Data |
| Crystalline Silica (Total) | | |
| Cristobalite | No Data | No Data |
| Tridymite | No Data | No Data |
| Quartz | No Data | No Data |
| Calcium Aluminate Cement | No Data | No Data |
| Target Organs | | |
| Alumina | Respiratory | |
| Crystalline Silica (Total) | | |

| | |
|----------------------------|--|
| Cristobalite | Respiratory |
| Tridymite | Respiratory |
| Quartz | Respiratory |
| Calcium Aluminate Cement | No Data |
| Long Term Toxicity | |
| Alumina | No Data |
| Crystalline Silica (Total) | |
| Cristobalite | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Tridymite | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Quartz | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Calcium Aluminate Cement | No Data |
| Short Term Toxicity | |
| Alumina | No Data |
| Crystalline Silica (Total) | |
| Cristobalite | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Tridymite | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Quartz | Repeated and prolonged inhalations may cause lung disease (silicosis). |
| Calcium Aluminate Cement | No Data |

Section 12- Ecological Information

Accidental Release: No information has been developed regarding the ecotoxicity or environmental fate of this product.

Section 13- Disposal Considerations

Waste Disposal Method: The as manufactured refractory, or dust from this material, is not considered a hazardous waste as defined by 40 CFR 261. However, used product (and dust generated during maintenance and tear-out operations) may be contaminated with other hazardous substances from the particular application (for example, metals). Therefore, appropriate waste analysis may be necessary to determine proper disposal. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state, and local regulations.

Section 14-Transport Information

DOT (Department of Transportation) Classification under 49 CFR 172.101: Not Regulated

UN (United Nations) Number: Not Applicable

NA (North American) Number: Not Applicable

Section 15- Regulatory Information

Resco Products, Inc. considers this product to be hazardous as defined by the OSHA Hazardous Communications Standard (29 CFR 1910.1200). Section 2 chemicals, which must be addressed, and the summary of regulatory and other lists upon which they appear are:

| INGREDIENT | CAS NUMER | LIST |
|--------------------------|------------------|-------------|
| Alumina | 1344-28-1 | 1,2,3,4 |
| Crystalline Silica | Not Applicable | |
| Cristobalite | 14464-46-1 | 1,2,3,4 |
| Tridymite | 15468-32-3 | 1,2,3,4 |
| Quartz | 14808-60-7 | 1,2,3,4 |
| Calcium Aluminate Cement | 12042-68-1 | 4 |

The lists are as follows:

1. ACGIH TLV "Threshold Limit Values" (2007)
2. OSHA Air Contaminates- Permissible Exposure Limits
3. Canadian Domestic Substance List
4. EPA TSCA Chemical Inventory List

WHMIS Hazard Classification (Canada): D-2B

SARA Title III: Section 311/312 Hazardous Categories: Irritant

Section 16- Other Information

This information and recommendations set forth herein are taken from sources believed to be accurate as of the date herein; however, Resco Products, Inc. makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.