Material Safety Data Sheet

1 Product & Company Identification

Manufacturer’s Name: Alsey Refractories Company
Highway 106
Alsey, IL 62610
Phone: 314-963-7900

Product Name: Flue-Set
Product Type: Dry, Medium Duty, Non-Water Soluble Mortar

2 Hazards Identification

<table>
<thead>
<tr>
<th>Potential Health Effects</th>
<th>Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Dust or grains can cause mechanical irritation.</td>
<td>Not known.</td>
</tr>
<tr>
<td>Skin</td>
<td>Dry material can cause abrasions; wet material could cause dermatitis on sensitive types of skin.</td>
<td>Not known.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Dust, if present, may cause upper respiratory irritation.</td>
<td>Repeated inhalation of dusts containing crystalline silica over time can cause progressive fibrotic lung disease (silicosis)* and increase the risks of developing respiratory cancer.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Not considered a likely route of exposure under normal product use conditions. May cause gastrointestinal irritation if swallowed. Product is relatively non-toxic.</td>
<td>Unknown.</td>
</tr>
</tbody>
</table>

*According to Group 1 of 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.

Medical Conditions Aggravated by Exposure: Pre-existing disease or other conditions of the lungs, skin, eyes and mucous membranes. Persons that develop silicosis are more likely to develop tuberculosis. Smoking and exposure to crystalline silica increases the risks of lung damage. Chronic obstructive pulmonary disease and autoimmune related diseases have been linked to crystalline silica exposure.

3 Composition/Information on Hazardous Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline Silica (Total)</td>
<td></td>
<td>15-40</td>
</tr>
<tr>
<td>Cristobalite</td>
<td>14464-46-1</td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>1-7</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>15-40</td>
</tr>
<tr>
<td>Calcium Aluminate Cement</td>
<td>65997-16-2</td>
<td>8-20</td>
</tr>
</tbody>
</table>

4 First Aid Measures

Eye Contact: Flush with clean water for 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash with mild soap and water. If irritation continues, seek medical attention.

Ingestion: As shipped, product is not likely to be ingested; however, do not induce vomiting unless instructed by a physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs. Seek medical attention.

Inhalation: Remove to fresh air. Seek medical attention if coughing or other symptoms persist.
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5 Fire Fighting Measures

**Flammable Properties:** Non flammable.

**Extinguishing Media:** Not combustible. As appropriate for surrounding fire.

**Precautions for Firefighters:** Firefighters should wear a NIOSH approved full-face, self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear.

**Unusual Fire & Explosion Hazards:** None Known

6 Accidental Release Measures

**Personal Precautions:** Avoid breathing dust. When wet, this material is slightly caustic and skin contact should be avoided.

**Small/Large Spill:** Scoop spilled material into a container for reclamation or disposal.

**Methods for Clean Up:** All personnel engaged in cleanup should adhere to the instruction outlined in Section 8 for personal protection.

7 Handling and Storage

**Handling:** Avoid direct contact with product or dusts from product by following Section 8 (Personal Protection).

**Storage:** Store in a dry area away from extreme heat.

8 Exposure Controls and Personal Protection

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline Silica (Total)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cristobalite</td>
<td>0.025 R mg/m³</td>
<td>½ the value calculated from the respirable dust formulae for Quartz</td>
</tr>
<tr>
<td>Quartz</td>
<td>0.025 R mg/m³</td>
<td>30mg/m³÷% SiO2+2 (total dust) or 10mg/m³÷% SiO2+2 (respirable dust)</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>10 mg/m³</td>
<td>15 mg/m³ (total dust)</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>Not established</td>
<td>15mg/m³ (total dust) or 5mg/m³ (respirable fraction)</td>
</tr>
<tr>
<td>Calcium Aluminate Cement</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

**Engineering Measures:** Use local exhaust and general ventilation as necessary to control air contaminants at or below acceptable exposure guidelines.

**Eye/Face Protection:** Goggles or safety glasses with side shields. Eye wash stations are recommended in areas where this product is used.

**Skin and Body Protection:** Impervious gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact. Safety shoes should be worn.

**Respiratory Protection:** Use NIOSH or MSHA approved respirators as listed in accordance with 29 CFR Part 134 for existing conditions. Appropriate respirator selection is dependent upon the magnitude of exposure. A medical surveillance program should be implemented in accordance with NIOSH recommendations and other applicable federal, state, local or provincial requirements.

9 Physical and Chemical Properties

**Appearance:** Grey powder

**Physical State:** Granular mixture

**Flash Point:** Not applicable

**Melting Point/Range:** 2700°F

**Water Solubility:** Reacts with water to form a solid insoluble, non flammable ceramic

**Autoignition:** Not applicable

**Odor:** Earthy

**Boiling Point/Range:** Not applicable

**Specific Gravity:** 1.00g/cc

10 Stability and Reactivity

**Stability:** Product is stable under normal conditions of use, storage, and transportation.

**Incompatible Products:** None known.

**Conditions to Avoid:** Avoid dust formation. Refractories containing crystalline silica may, after service, contain more or less crystalline silica. Care must be taken to avoid and/or control dust from demolition. If in doubt of the proper protection, seek advice from a safety professional.
11 Toxicological Information

Acute Toxicity—Product information: No data for LD50 or LC50 for oral, dermal, or inhalation routes of administration.

Chronic Toxicity: Irritant to skin and mucous membranes.

Carcinogenicity: If inhaled

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogenicity Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline Silica (Total)</td>
<td>IARC-1, MAK-1, NIOSH-Ca, NTP-K, TLV-A2</td>
</tr>
<tr>
<td>Cristobalite</td>
<td>IARC-1, MAK-1, NIOSH-Ca, NTP-K, TLV-A2</td>
</tr>
<tr>
<td>Quartz</td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>IARC-2B, MAK-3A, NIOSH-Ca, TLV-A4</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>MAK-2 (fibrous dust), TLV-A4</td>
</tr>
</tbody>
</table>

Target Organ Effects: Lungs, eyes, respiratory system, skin.

12 Ecological Information

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

13 Disposal Considerations

Disposal of Product: As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

14 Transport Information

U.S.A. DOT: Not regulated

15 Regulatory Information

International Inventories

TSCA: This substance or all ingredients are on the Chemical Substances Inventory of the Toxic Substances Control Act (TSCA Inventory. The presence on this list does not require any legal reporting. All components listed.

DSL: All components listed.

U.S. Federal Regulations

SARA 313: Not applicable

California: California Proposition 65: This product contains crystalline silica, chemical 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 & EPA regulations may apply to these products. Contact your local agency if in doubt.

WHMIS Hazard Class: Class D - Division 2 - Sub Division A:

16 Other Information

MSDS Status: Replaces all prior MSDS.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with Alsey Refractories Co. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

End of MSDS