MATERIAL SAFETY DATA SHEET

Section 1: Product/Company Information


Mfg. Name: Powder Technology Inc.
14331 Ewing Avenue S.
Burnsville, MN 55306

Emergency Number: (952) 894-8737
Number for Info: (952) 894-8737
Date Updated: 21 January 2014

Section 2: Emergency and First Aid

Eyes: Immediately flush eye thoroughly with water. Seek medical attention if irritation persists.

Skin: Wash with soap and water. Seek medical attention if irritation persists.

Inhalation: Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician if discomfort is experienced.

Section 3: Composition Information

Typical chemical composition:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>Percent of Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>14808-60-7</td>
<td>68-76%</td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>1344-28-1</td>
<td>10-15%</td>
</tr>
<tr>
<td>Fe₂O₃</td>
<td>1309-37-1</td>
<td>2-5%</td>
</tr>
<tr>
<td>Na₂O</td>
<td>1313-59-3</td>
<td>2-4%</td>
</tr>
<tr>
<td>CaO</td>
<td>1305-78-8</td>
<td>2-5%</td>
</tr>
<tr>
<td>MgO</td>
<td>1309-48-4</td>
<td>1-2%</td>
</tr>
<tr>
<td>TiO₂</td>
<td>13463-67-7</td>
<td>0.5-1.0%</td>
</tr>
<tr>
<td>K₂O</td>
<td>12136-45-7</td>
<td>2-5%</td>
</tr>
</tbody>
</table>

Loss on Ignition  2 - 5 %

All components of this material are included on the TSCA Inventory.

Page 1 of 5   Arizona Test Dust MSDS   21 January 2014
Section 4: Hazardous Ingredients/Identity Information

This product contains free silica. Inhalation of dust may be harmful to your health. NIOSH has recommended an REL (Recommended Exposure Limit) of 0.05 mg/m³ as determined by a full shift sample up to 10 hours working day, 40 hours per week.

H.M.I.S. ratings: Health – * Flammability – 0 Reactivity - 0
* see Section 5 of this MSDS for further information on health effects

Section 5: Hazard Identification

Potential Health Effects: Potential health effects may vary depending upon the duration and degree of exposure. To reduce or eliminate health hazards associated with this product, use exposure controls or personal protection methods as described in Section 12.

Eye Contact: (Acute/Chronic) Exposure to airborne dust may cause immediate or delayed irritation or inflammation of the cornea.

Inhalation: (Chronic) Inhalation exposure to free silica may cause delayed lung injury, including silicosis, a disabling and potentially fatal lung disease, and/or cause or aggravate other lung diseases or conditions.

Carcinogenic Potential: This product contains free silica, which IARC classifies as a known human carcinogen. The NTP, in its Ninth Annual Report on Carcinogens, classified “silica, crystalline (respirable)” as a known carcinogen.

Section 6: Accidental Release Measures

Use clean-up methods that do not disperse dust into the air. Avoid inhalation of dust and contact with eyes. Use exposure control and personal protection methods as described in Section 12.

Section 7: Physical/Chemical Data

Boiling Point: 4040°F
Specific Gravity (H₂O = 1.0): 2.65
Vapor Pressure: Not applicable
Solubility in Water: Insoluble
Odor: No Odor
Physical State: Solid
Vapor Density: Not applicable
Section 8: Fire and Explosion Hazard Data

Flash Point: None
Auto ignition Temperature: Not combustible
Flammable Limits: N/A
Extinguishing Media: Not Combustible
Hazardous Combustion Products: None

Lower Explosive Limit: None
Upper Explosive Limit: None
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

Section 9: Stability and Reactivity Data

Stability: Product is stable
Incompatibility (Materials to Avoid): Strong oxidizing agents and acids
Hazardous Decomposition: Will not occur
Hazardous Polymerization: Will not occur

Section 10: Handling and Storage

Handle and store in a manner so that airborne dust does not exceed applicable exposure limits. Use adequate ventilation and dust collection. Use exposure control and personal protection methods as described in Section 12.

Section 11: Toxicological Information

Inhalation:
-Silicosis
The major concern is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute. Chronic or Ordinary Silicosis (often referred to as Simple Silicosis) is the most common form of silicosis, and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability.

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter.
Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling.

Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (corpumonale). Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of initial exposure. Progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that lung lesions appear earlier and progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

**Carcinogenic Potential:** IARC - The International Agency for Research on Cancer ("IARC") concluded that there was "sufficient evidence in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources," and that there is "sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." The IARC evaluation noted, "Carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, and "Silica, Some Silicates..." (1997).

### Section 12: Exposure Control/Personal Protection

**Respiratory Protection:** Use local exhaust or general dilution ventilation to control dust levels below applicable exposure limits. Minimize dispersal of dust into the air. Use appropriate NIOSH approved respiratory protection for respirable crystalline silica. NIOSH recommends the use of half-facepiece particulate respirators with N95 or better filters for airborne exposures to crystalline silica at concentrations less than or equal to 0.5 milligrams per cubic meter of air (mg/m³).

**Eye Protection:** Wear safety glasses with side shields or goggles to avoid contact with the eyes. In extremely dusty environments and unpredictable environments, wear tight-fitting unvented or indirectly vented goggles to avoid eye irritation or injury.

### Section 13: Disposal Considerations

All disposal methods must be in accordance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterization and compliance with applicable laws are the responsibility solely of the waste generator.
Section 14: Transportation Data

Arizona Test Dust is not hazardous under U.S. DOT or TDG regulations. This material is not regulated by IATA.

Section 15: Other Regulatory Information

Status under US OSHA Hazard Communications Rule 29 CFR 1910.1200: Silica sand is considered a hazardous chemical under this regulation and should be included in the employer’s hazard communication program.

Status under CERCLA/Superfund, 40 CFR 117 and 302: Not listed

Hazard Category under SARA (Title III), Sections 311 and 312: Silica sand qualifies as a hazardous substance with delayed health effects.

Status under SARA (Title III), Section 313: Not subject to reporting requirements under Section 313

Status under Canadian Environmental Protection Act: Not listed.

Section 16: Other Information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. It is the user’s obligation to determine the conditions of safe use of this product.