Once the perlite is expanded at an extreme temperature, the relatively coarse aggregate is then milled and classified to strict specifications for particle size. The resulting particles are highly amorphous and exhibit a packing arrangement that is ideal for cake filtration. Our exfoliation process allows for separation and removal of other non-perlite volcanic glasses, i.e. obsidian, which lack the amorphous shape of the perlite and are non-filtering resulting in a superior perlite filter-aid.

**Overview**

Sil-Kleer filter aids are produced by subjecting a single ingredient, perlite rock (a naturally occurring volcanic glass), to a temperature in excess of 1500°F. Combined moisture within the rock vaporizes and the molten glass forms a multicelled bubble cluster, then it is milled to form amorphous-shaped particles.

**Uses**

Perlite filter-aids are used as a cost-effective replacement for other filter-aids, including diatomaceous earth, silica gels, and clays. They are used as both a precoat and body feed on pressure and vacuum filters of various designs, and also as a process aid for applications on pressure leaf filters, filter presses, pressure tube, pressure belt, vacuum belt, vacuum tube, and rotary vacuum filters.

Please see back page for a list of the extensive uses of perlite filter-aids across industries.

**Structure**

Standard Chemical Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>SiO₂</th>
<th>Al₂O₃</th>
<th>K₂O</th>
<th>Na₂O</th>
<th>CaO</th>
<th>Trace Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Dioxide</td>
<td>73%</td>
<td>17%</td>
<td>5%</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium Oxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Oxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium Oxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trace Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Manganese</th>
<th>Sulfur</th>
<th>Titanium</th>
<th>Barium</th>
<th>Gallium</th>
<th>Boron</th>
<th>Chromium</th>
<th>Zirconium</th>
<th>Molybdenum</th>
<th>Nickel</th>
<th>Copper</th>
<th>Lead</th>
<th>Arsenic</th>
<th>Chlorine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;0.3%</td>
<td>&lt;0.2%</td>
<td>&lt;0.1%</td>
<td>&lt;0.1%</td>
<td>&lt;0.05%</td>
<td>&lt;0.01%</td>
<td>&lt;0.0075%</td>
<td>&lt;0.003%</td>
<td>&lt;0.002%</td>
<td>&lt;0.002%</td>
<td>&lt;0.0015%</td>
<td>&lt;0.001%*</td>
<td>&lt;0.0005%*</td>
<td></td>
</tr>
</tbody>
</table>

All analyses are shown in elemental form even though the actual forms present are mixed glassy silicates. Free Silica may be present in small amounts, characteristic of the particular ore body.

*By Food Chemicals Codex Method

**Physical Properties**

- **Hygroscopic Moisture**: 0%
- **Surface pH**: 6.5-7.5
- **Color**: White
- **Fusion Point (°F)**: 2300
- **Fusion Point (°C)**: 1260

**Typical Filtration and Physical Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Fine/Slow Flow</th>
<th>Medium Flow</th>
<th>Coarse/Fast Flow</th>
<th>Air/Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Rate (mL)</td>
<td>300</td>
<td>550</td>
<td>750</td>
<td>950</td>
</tr>
<tr>
<td>Cake Density (bs/ft³)</td>
<td>12.0</td>
<td>8.0</td>
<td>9.0</td>
<td>8.5</td>
</tr>
<tr>
<td>Permeability (Darcy)</td>
<td>.2</td>
<td>.5</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Mean Diameter (µ)</td>
<td>20-25</td>
<td>30-35</td>
<td>35-40</td>
<td>45-50</td>
</tr>
<tr>
<td>Size Range (µ)</td>
<td>5-120</td>
<td>5-140</td>
<td>5-150</td>
<td>5-180</td>
</tr>
</tbody>
</table>
Food Fermentation
Wine, beer, penicillins, cyclines, soy sauce, pickled fruits and vegetables

Industrial Fermentation
Solvent recovery, waste water, cyclic crudes, dyes, pigments, disposal wells, completion fluids, inks

Metal Working
Coolants and oils, plating baths, rolling mill lubricants, surface agent oils

Air/Gas
Baghouse precoat for asphalt, cement kilns, foundries and steel mills, coke ovens

Industrial Fermentation
Enzymes/amino acids, bio-based chemicals, biological products, citric acid

Process Chemicals
Sulfuric acid, inorganic and organic chemicals, chlorine, molten sulfur, gum and wood chemicals

Energy
Biodiesel

Applications

Perlite Benefits
• Sterile
• Inert
• Non-Hazardous
• Inorganic fused glass that is virtually insoluble
• No color, taste or odor
• Used in standard filter equipment
• Various packaging options (4 ft³ bags, super sacs, bulk)
• Increased filter cloth/screen backwashing capacity
• Kosher Certified
• AAFCO approved as a feed ingredient
• Classified as having GRAS Status by FDA
• Processed/Stored in facility that only produces perlite

Maximized Filtration
• Perlite particle overlay forms billions of microscopic openings and promotes higher flux rates
• Filter aid becomes a separation medium, thus the septum media can be sized for higher flux rates
• By forming a porous layer on the septum, you maximize capturing solids while protecting the septum
• With proper grade selection, you can achieve increased clarity
• Filter downtime and maintenance cost is reduced due to the added layer of filtration

Cost Advantage
With a 20 to 50% density advantage, Sil-Kleer offers twice as much filtration, pound for pound, than diatomaceous earth. Filter cake density is only 7 to 12 lb/ft³ or a dry density range of 6 to 10 lb/ft³. Sil-Kleer users can realize substantial savings in filtration operations with a better filter aid.

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For more information or to arrange for samples, please call: 800-323-4287 or email: info@silbrico.com

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