FLSmidth manufacture an extensive range of Custom Furnace Muffles, Fire Assay Crucibles and Cupels to meet the robust handling and temperature requirements of precious metal assayers.

Using the most chemically suitable raw materials, FLSmidth guarantee quality, confidence and reliability.

FLSmidth manufacture and supply a wide range of high performance, multi-use Fire Assay Crucibles.

The fluxing and firing process of the sample is critical in the assaying process, to enable consistent mixing of sample and pots. Uniformly dimensioned crucibles are crucial in modern assaying equipment.

Additionally, when firing, a crucible that provides exceptional thermal shock resistance and chemical inertness results in more uses per crucible and overall lower operating costs for the laboratory.

FLSmidth Crucibles are made of a proprietary material exhibiting high thermal shock and corrosion resistant properties which ensure longer life, faster melting, constant melting speeds and exceptional resistance to rapid changes in temperature.

The latest bonding agents and manufacturing technologies, together with the rigorous applications of quality assurance procedures ensure a crucible of the highest quality with a performance to match the most demanding requirements.

<table>
<thead>
<tr>
<th>Size</th>
<th>Features and Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>20g, 30g, 40g, 50g, 55g and 65g sizes</td>
<td>Manufactured in metal moulds ensuring uniform dimensions for crucible handling equipment</td>
</tr>
<tr>
<td>Capacity to produce any size or specification</td>
<td>Proprietary ceramic recipe increases flux resistance, reduces associated holing and extends the reusability of the crucible</td>
</tr>
<tr>
<td>Ability to modify existing designs and dimensions</td>
<td>Global stocking locations ensure convenient and fast access and support in the local language</td>
</tr>
</tbody>
</table>
Fire Assay Cupels

FLSmidth supplies a range of high quality cupels
During cupellation, the lead is oxidized to litharge (PbO), most of which is absorbed by the cupels.

Gold, silver, platinum and other precious metals form a bead in the cupels. The bead is subsequently treated to determine its precious metal content. Cupels are typically made from magnesia MgO (sometimes mistakenly referred to as magnesite), bone ash, Portland cement and other materials.

Typical cupellation furnace temperatures in gold and silver assays are 900-1000°C, but can vary with technique, air flow volume and cupels material.

Cupellation is the last and most important step of the fire assaying process and as such, the quality of the cupels is extremely important. FLSmidth pack 48 cartons to a pallet and 20 x pallets to a 20 foot container.

FLSmidth can supply sizes other than listed below, please discuss with your FLSmidth representative.

<table>
<thead>
<tr>
<th>Size (per carton)</th>
<th>Features and Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A supplied 300 units</td>
<td>FLSmidth aim to achieve high magnesia content with low moisture percentage</td>
</tr>
<tr>
<td>7A supplied 300 units</td>
<td>Global stocking locations ensure convenient and fast deliveries</td>
</tr>
<tr>
<td>7AS supplied 300 units</td>
<td>Access and support in the local language</td>
</tr>
<tr>
<td>7AL supplied 420 units</td>
<td></td>
</tr>
<tr>
<td>8A supplied 240 units</td>
<td></td>
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<tr>
<td>9A supplied 160 units</td>
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</tbody>
</table>
Muffles and Vents

Cupellation furnace muffles
FLSmidth is the main supplier of Silicon Carbide Muffles to the major furnace manufacturers. They have been used in the mineral assaying industry for many years and are the preferred liner for most major furnace manufacturers.

Cupellation Furnaces are vital pieces of equipment in the final stages of the assaying process. FLSmidth Furnace Muffles are renowned for extending the maintenance requirements for high-usage furnaces therefore reducing operational down time, maintenance and repair costs.

The proprietary ceramic formulation and firing methodology produces high quality long lasting furnace liners that have exceptional thermal conductivity. The fired silicon carbide liners outlast and out perform any comparable cast refractory liner available.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>• Range of Furnace Muffles and Vents available for common usage furnaces</td>
<td>• Exceptional thermal conductivity reducing energy consumption (lower operating costs)</td>
</tr>
<tr>
<td>• Customised solutions available if required</td>
<td>• Fired ceramic is less prone to thermal degradation and material crumbling</td>
</tr>
<tr>
<td></td>
<td>• Muffles last longer and reduce overall maintenance costs</td>
</tr>
<tr>
<td></td>
<td>• Silicon carbide material provides exceptional resistance to oxidisation and thermal shock, resulting in a longer life and reduced maintenance costs</td>
</tr>
<tr>
<td></td>
<td>• Internal production facility allows for ongoing R&amp;D and continuous product improvement</td>
</tr>
</tbody>
</table>
The longevity of the kiln is dependent not only on the quality of the product, but also on the usage conditions – a perfectly good kiln will fail if used incorrectly or in the wrong application.

Consideration must be given to the kiln combustion system and type of fuel used, kiln atmosphere, the operating temperature, firing curve, cooling method and the weight and distribution of production material. Selecting a high quality cordierite-mullite Kiln Batt will go a long way to help preserve the floor of the kiln and thus the life span of the kiln itself.

FLSmidth pack 48 cartons to a pallet and 20 x pallets to a 20 foot container.

Kiln Batts

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Size</th>
<th>Features and Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material: Cordierite- Mullite</td>
<td>Size range of 420 x 420mm to 650 x 650mm</td>
<td>Can be used in tunnel and shuttle kilns as well as fusion and cupellation furnaces</td>
</tr>
<tr>
<td>Temperature rating: Maximum operating temperature of 1300°C</td>
<td>Thicknesses of 13mm, 15mm, 20mm and 25mm</td>
<td>High quality ceramic with high temperature and thermal shock resistance. Lasts for many uses without cracking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stock on hand – can be cut to a custom dimensions in house ensuring fast delivery times</td>
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<td></td>
<td></td>
<td>Global stocking locations ensure convenient and fast access and support in the local language</td>
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</table>

Other sizes can be arranged to suit your requirements - contact your FLSmith representative for further information.
FLSmidth has a long history supplying high grade ceramics for analytical services including academic research, exploration, environmental baseline studies, refined metals analysis, and mine development and production.

FLSmidth design and manufacture a wide range of innovative, long-lasting and cost-effective laboratory products.

Sampling and testing materials primarily involves heat and attrition. These elements contribute to thermal shock and wear. FLSmidth laboratory products are made from high-quality products to withstand the most arduous laboratory testing and sampling.

**Specifications**
- As-fired condition
- Standard tolerances between ±0.5mm to ±2mm (depending on the dimension) or ±2%, whichever is greater
- Finer surface finishes and greater tolerances are available upon request

**Material**
- Non-porous, 99.7% purity alumina
- Silicon carbide supporting components such as carousels
- Fused silica

**Features and Benefits**
- High purity material prevents contamination of test results
- Experienced staff provide material selection advice on the right product for the application, saving time and waste
- Quality products deliver consistent results
- Custom designed and manufactured to suit any requirement

**Laboratory Ware Products**
- Trays
- Milling jars
- Lids and dishes
- Combustion boats
- Mortars and pestles
- Porous micro-filters
- DTA and TGA crucibles
- Conical crucibles
- Cylindrical crucibles
- Furnace tube liners
- Grinding media
Heat Resistant Coatings and Linings

FLSmidth manufactures custom coatings and linings to reduce maintenance and extend the lifespan of furnace and thermal equipment.

The zirconia-based refractory composition coating forms a thick skin covering the equipment and is easy to use and apply.

<table>
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<tbody>
<tr>
<td>20kg/10L plastic pails</td>
<td>High temperature and molten metal resistant properties protect foundry equipment extending their usable life</td>
</tr>
<tr>
<td>48 pails per palet</td>
<td>Impervious coating prevents ingestion of metal resulting in premature life of equipment and refractory ceramics</td>
</tr>
<tr>
<td></td>
<td>Non-wetting properties reduce maintenance requirements on aluminium casting equipment</td>
</tr>
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