

3M Advanced Materials Division

# 3M™ Fused Silica Flours

## Introduction

3M Technical Ceramics, Inc. offers high-purity ceramic powders used in investment casting slurries. 3M™ Fused Silica Flours are available in a variety of standard particle sizes, and can also be customized to your specifications.

3M fused silica flours are available in 55 lbs. (25 kg) paper bags or 2,200 lbs. (1,000 kg) tote sacks.

## Fused Silica for Investment Casting Shells

We supply high-purity fused silica flour and advanced shell system flour blends that are used in investment casting shells. Our revolutionary furnace design helps prevent the raw silica sand from becoming contaminated during processing – resulting in a finished product that is 99.7% pure, while increasing productivity tenfold over conventional furnaces. 3M™ Fused Silica Flours and Grains are optimized

for consistency from batch to batch, to help you produce components with a high degree of dimensional accuracy. 3M fused silica products are available in both standard and custom particle sizes and distributions, and our experts will work with you to optimize your application. In addition, we can provide traceability data throughout our process, from the arrival of the high-purity sand at our facility to each bag of finished fused silica in your inventory.



3M™ Fused Silica Flours

## Fused Silica Custom Lab Equipment and Capabilities

In order to ensure the purity and consistency of our fused silica products, we utilize state-of-the-art particle analysis systems, enhanced grinding and blending processes, and extensive high-intensity magnetic separation methods. Our lab facilities are equipped with a complete set of mixers, pumps, slurry pots, a drying

room, ovens and furnaces for advanced slurry research and development. Our labs are also capable of performing a wide variety of tests, including BET surface area analysis; shell permeability; Green or Hot Wet MOR/MOE; shell crush strength; bacteria testing; % binder silica; and accelerated gel testing. To determine shell drying characteristics we use data loggers, loss-in-weight scales and capillary absorption equipment. 3M Technical Ceramics technical personnel can design and perform additional custom tests according to your specifications.

## Chemical Analysis

(Not for specification purposes)

Chemical	3M™ Fused Silica Flours
SiO <sub>2</sub>	>99.7%
Al <sub>2</sub> O <sub>3</sub>	<1750 ppm
Fe <sub>2</sub> O <sub>3</sub>	<280 ppm
TiO <sub>2</sub>	<250 ppm
K <sub>2</sub> O	<120 ppm
CaO	<75 ppm
Na <sub>2</sub> O	<50 ppm

## Particle Size Distribution, % Retained

(Not for specification purposes)

U.S. Mesh (ASTM No.)	Microns	120F	200F	290F	325F
50	300	<0.7	-	-	-
80	180	-	<0.6	-	-
100	150	<10	<0.7	-	<0.15
140	106	-	<3	<1.5	-
200	75	-	4.5–7.8	<5	<3
325	45	41–49	13–19	6–17	4–11
Pan		45–52	71–79	80–97	86–97
Coulter D50 µm		48–62	19–27	14.5–19	9.5–16
Magnetics ppm		<50	<50	<50	<25

## Product Storage, Handling and Safety

**Storage:** Store in a dry location and protect from the elements. Store away from oxidizing agents. See product Safety Data Sheet (SDS) for additional information.

**Handling:** Product may contain respirable quartz silica at  $\leq 0.2\%$ . Avoid skin contact with hot material. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid contact with oxidizing agents (e.g. chlorine, chromic acid etc.). See product SDS for additional information.

**Safety:** See product SDS for additional information.

Product is manufactured and sold by 3M Technical Ceramics Inc.

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**3M Technical Ceramics, Inc.**  
510 Midway Circle  
Midway, TN 37809  
Phone 800-525-9753  
Web 3m.com/fusedsilica

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