

3M Advanced Materials Division

# 3M™ Fused Silica Advanced Shell Systems GM2

## Introduction

3M™ Fused Silica Advanced Shell Systems GM2 is a high-performance, fiber-based flour blend for investment casting backup slurries. GM2 is a dry blend of fused silica and high performance additives jointly developed by 3M Technical Ceramics, Inc. and Nalco. It offers increased shell build which, coupled with improved permeability, can help remove dips and minimize autoclave shell cracking.

Because each foundry has different requirements, GM2 is engineered with built-in flexibility and can be adjusted for specific application needs. We will work with you to optimize the blend for your process.

GM2 is packaged in 55 lbs. (25 kg) paper bags or 2,200 lbs. (1,000 kg) tote sacks.

## Features and Benefits

- Improved permeability to help reduce non-fill and autoclave cracking
- Fiber-based shell system for thicker and faster shell build to help reduce coats
- Improved knock out for easier shell removal
- Unique slurry rheology substantially shortens drain times to increase foundry output
- Optimized shell build for uniform coverage of corners and edges
- Improved load carrying ability and strong laminar shell to reduce handling damage and cracking

## Fused Silica for Investment Casting Shells

We supply high-purity fused silica for the slurries and stuccos used to make 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.

## Typical Physical Properties

(Not for specification purposes)

Property	3M™ Fused Silica GM2
Physical Form	Powder
Color	Gray
Density	60 – 90 lb/ft <sup>3</sup>
Specific Gravity	2.2



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## 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.

## 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 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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