

3M Advanced Materials Division

3M™ Fused Silica Advanced Shell Systems WDS3

Introduction

3M™ Fused Silica Advanced Shell Systems WDS3 is a specially designed high-performance flour blend for investment casting backup slurries. 3M Technical Ceramics, Inc. co-developed WDS3 with Nalco as part of a Wide Distribution Slurry (WDS) program to solve foundry problems with positive metal scrap and shell cracks. A patented dry blend of fused silica and high performance additives, WDS3 offers increased shell build and improved permeability. This can potentially reduce the number of backup dips required, and helps minimize autoclave shell cracking.

Because each foundry has different requirements, WDS3 is engineered with built-in flexibility and can be adjusted for specific application needs. We will work with you to optimize the application of WDS3 for your process.

WDS3 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
- Non-fiber based shell system optimized for parts with difficult geometries and detail
- Improved knock out for easier shell removal
- Unique slurry rheology to substantially shorten drain times and help increase foundry output
- Optimized shell build for uniform coverage of corners and edges without neglecting the flow needed to fill slots and holes in difficult castings
- Improved load carrying ability 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.



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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 are available and willing to assist.

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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