

Wedge India

Fused Silica Sand & Powder

High Purity | Uniform Particle Size | High Performance





Sizes of Fused Silica Available at Wedge India

- FUSED SILICA 0.2-0.5 MM (30-80 MESH) Refractory
- FUSED SILICA 10-20 MESH
- FUSED SILICA 120 MESH
- FUSED SILICA 200 MESH
- FUSED SILICA 30-50MESH
- FUSED SILICA 325MESH
- FUSED SILICA 5 MICRON
- FUSED SILICA 50-100 MESH
- FUSED SILICA 80-120 MESH



Wedge Fused Silica

Wedge Fused silica, also known as fused quartz, is a high-purity form of silicon dioxide (SiO₂) glass that is produced by melting pure silica and then cooling it rapidly to prevent crystallization. This results in a material with excellent optical, thermal, and mechanical properties. Fused silica is widely used in various industries and applications due to its unique characteristics:

- **High Purity** : Fused silica is composed almost entirely of silicon dioxide, with impurities typically reduced to very low levels. This high purity makes it suitable for applications where contamination is a concern, such as in semiconductor manufacturing.
- **Transparency** : Fused silica is highly transparent to a wide range of wavelengths, including ultraviolet (UV), visible, and infrared (IR) light. This makes it ideal for optical components like lenses, prisms, and windows used in scientific instruments, lasers, and optical communication systems.
- **Low Thermal Expansion** : Fused silica has a very low coefficient of thermal expansion, which means it can withstand rapid temperature changes without cracking or warping. This property makes it valuable in high-temperature applications, such as in the manufacturing of crucibles and thermal insulators.
- **High Melting Point** : Fused silica has a high melting point (around 1,710°C or 3,130°F), which allows it to be used in applications involving extreme heat, such as in the production of high-temperature laboratory equipment and furnace tubes.
- **Chemical Inertness** : Fused silica is chemically inert and does not react with most chemicals, making it suitable for use in corrosive environments.
- **Low Dispersion** : Fused silica exhibits low dispersion, which means it does not separate light into its spectral components as much as other materials. This is important in optical systems to minimize chromatic aberration.
- **Electrical Insulation** : Due to its high purity and low electrical conductivity, fused silica is used in electrical insulators and other applications where electrical isolation is necessary.
- **Excellent Mechanical Strength** : Fused silica is relatively strong and resistant to mechanical stress, making it suitable for use in precision instruments and equipment.
- **UV-Curing** : In some applications, fused silica is used as a substrate for UV-curable adhesives and coatings due to its UV transparency.
- **Semiconductor Industry** : Fused silica is used extensively in the semiconductor industry for manufacturing silicon wafers and as a material for critical components in semiconductor processing equipment.

Fused silica is a versatile material with a wide range of applications, primarily in industries that require high-quality optical components, high-temperature resistance, and chemical inertness. Its properties make it an essential material in scientific research, aerospace, telecommunications, and various other advanced technologies.

Applications of Fused Silica

- **Investment casting** : Fused silica products have nearly zero thermal expansion rate, low thermal conductivity, excellent thermal stability, high purity, superior chemical stability and mechanical stability. which widely used in the casting industry and precision processes for parts manufacturing.
- **Refractory materials** : Fused Silica has nearly zero thermal expansion rate, low thermal conductivity, excellent thermal stability, high purity, low impurity content, superior chemical stability and mechanical stability. which widely used for the refractory industry application .
- **Refractory products (bricks, nozzles, etc.)** : Fused silica has high melting point, low thermal expansion coefficient, low thermal conductivity, high purity and stable chemical properties. It can be used in the production of high temperature refractory products such as refractory bricks and refractory nozzles.
- **Fused Silica crucible** : Fused silica has nearly zero thermal expansion rate, low thermal conductivity, excellent thermal stability, high purity, low impurity content, superior chemical stability and mechanical stability, which widely used for silica crucible Industry.
- **Fused silica roller / ceramics** : Fused silica has nearly zero thermal expansion rate, low thermal conductivity, excellent thermal stability, high purity, low impurity content, superior chemical stability and mechanical stability which widely used for fused silica rollers and high-temperature technical ceramics etc application.
- **Optics and Lenses** : Fused silica is widely used in the manufacturing of high-quality lenses, windows, and optical components. Its exceptional transparency in the ultraviolet (UV), visible, and near-infrared (NIR) spectra makes it ideal for applications in astronomy, laser technology, microscopy, and semiconductor lithography.
- **UV and High-Temperature Applications** : Its high transmittance in the UV range, as well as its ability to withstand extreme temperatures (up to 1,200°C or higher), makes it valuable in UV exposure systems, high-temperature furnaces, and aerospace applications.
- **Chemical and Pharmaceutical Industry** : Fused silica is used in laboratory equipment, such as crucibles, test tubes, and reaction vessels, because it is resistant to most chemicals and can withstand high-temperature reactions.
- **Fiber Optics** : Fused silica is used as the core material in optical fibers for telecommunications and data transmission. Its low attenuation at optical wavelengths ensures efficient light propagation.
- **Solar Energy** : Fused silica is used in solar cell manufacturing for its ability to withstand the high temperatures encountered during solar panel production. It is also used in concentrating solar power systems.
- **UV-C Germicidal Lamps** : Fused silica is used in the construction of UV-C germicidal lamps used for disinfection purposes, as it allows the passage of the germicidal UV light.

- **Astronomy and Space Exploration** : Fused silica is used in the construction of telescope mirrors and optical components for space telescopes and satellites due to its low thermal expansion and high thermal stability.
- **Chemical Analytical Instruments** : Fused silica capillary columns are used in gas chromatography for separating and analyzing chemical compounds.
- **High-Precision Instruments** : It is used in the manufacturing of high-precision instruments like atomic force microscopes (AFMs) and scanning tunneling microscopes (STMs) due to its stability and optical properties.
- **Glassware and Laboratory Equipment** : Fused silica is used in the production of specialized glassware, such as cuvettes, test tubes, and quartz crucibles, in laboratories and research facilities.
- **UV Filters and Windows** : It is used to make UV filters and windows for scientific and industrial applications where UV radiation needs to be controlled or isolated.

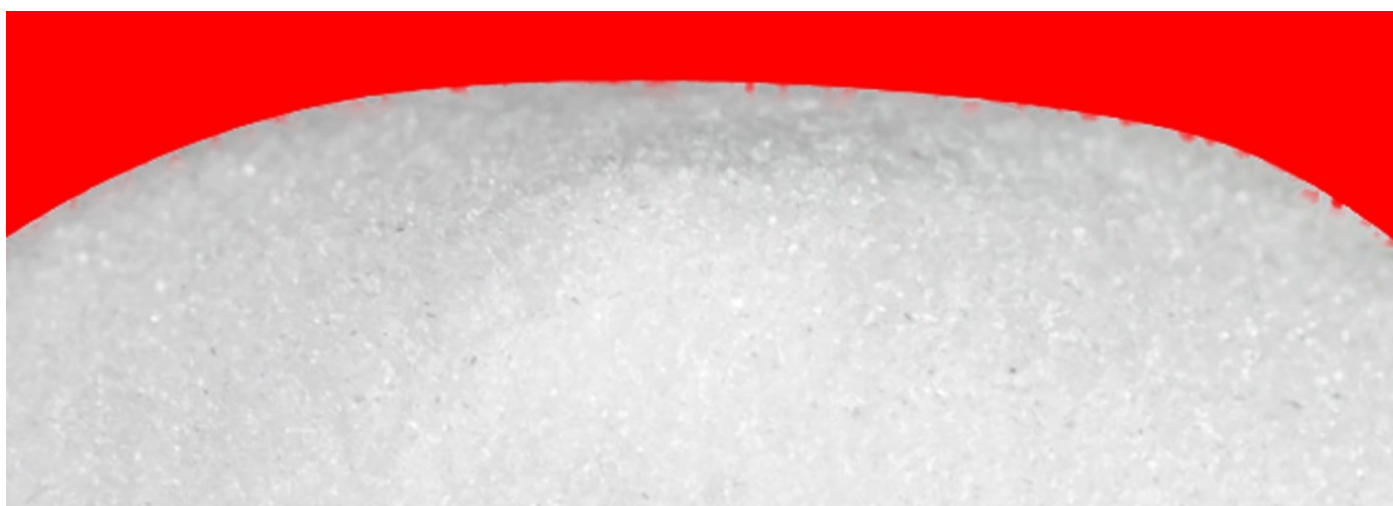
Wedge HPFS | High Performance Fused Silica

Fused silica, also known as fused quartz, is a high-purity, non-crystalline form of silicon dioxide (SiO₂). It has a wide range of applications due to its exceptional optical, thermal, and mechanical properties, as well as its resistance to high temperatures and chemical corrosion. Fused silica is a commonly used material in investment casting, also known as precision casting or lost-wax casting. Investment casting is a manufacturing process that involves creating near-net-shape metal parts by pouring molten metal into a mold created from a wax or plastic pattern. Fused silica refractory materials are a type of refractory (heat-resistant) material made from high-purity fused silica, which is non-crystalline silicon dioxide (SiO₂).

These materials are known for their exceptional resistance to high temperatures, thermal shock, and chemical corrosion. They find various applications in industries where extreme heat and harsh chemical environments are encountered. Fused silica's electrical insulating properties, along with its high-temperature resistance and optical transparency, make it a valuable material in addressing EMC concerns in a wide range of electronic and electrical applications. It helps ensure that electronic devices and systems can operate reliably and coexist without causing electromagnetic interference issues.

Technical Properties of Fused Silica

Properties	HPFST7	HPFSC8	HPFSX9	HPFSX6	HPFSX5
SiO ₂ (%)	99.7	99.8	99.9	99.6	99.5
Fe ₂ O ₃ (%)	0.02	0.02	0.02	0.02	0.02
Al ₂ O ₃ (%)	0.05	0.05	0.05	0.05	0.05
Na ₂ O (%)	0.01	0.01	0.01	0.01	0.01
K ₂ O (%)	0.01	0.01	0.01	0.01	0.01
CaO (%)	0.01	0.01	0.01	0.01	0.01
MgO (%)	0.01	0.01	0.01	0.01	0.01
Magnetic(%)	0.01	0.01	0.01	0.01	0.01
Moisture (%)	0.1	0.1	0.1	0.1	0.1
Specific Gravity (g/cm ³)	2.2	2.2	2.2	2.2	2.2
Hardness Mohs	7	7	7	7	7
Thermal Expansion	0.5*10 ⁻⁶	0.5*10 ⁻⁶	0.5*10 ⁻⁶	0.5*10 ⁻⁶	0.5*10 ⁻⁶





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