

Corning® HPFS® Fused Silica Wafers

Corning/ Advanced Optics
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Industry-leading fused silica for high-performance wafer-level optics applications

Corning pioneered the first fused silica in the 1930s. The same superior material properties that make Corning HPFS Fused Silica ideal for extreme applications such as space shuttle windows, are also ideal for precise 3D sensing devices. Using state-of-the-art metrology systems, Corning Wafer-Level Optic Solutions has demonstrated the capability to supply industry-leading HPFS fused silica wafers with tight geometric tolerances in high volumes.

Benefits

- Extraordinarily low refractive index variation leading to
- State-of-the-art homogeneity
- Low birefringence
- Exceptional transmittance from the deep ultraviolet
- Through the infrared region
- Ultra-low coefficient of thermal expansion (CTE)

Advanced Optics

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Applications

Micro-optics and substrates for consumer electronics	Refractive optical elements (ROEs)/ Diffractive optical elements (DOEs)
RF components	Industrial 3D sensors and optics
Beam shaping elements	Homogenizers
Nanoimprint lithography substrates	Hard disk master
Camera optics	Molds
Biomedical	Blazed-wavelength and sub-wavelength gratings

Material Properties

Ultra-High Purity	100% SiO ₂
Inclusions	None detected under high-intensity illumination
OH Content	800-1000 ppm
Diameter	100, 150, 200, 300 mm
Diameter Tolerance	± 20 µm
Edge Exclusion	≤ 25 µm
Thickness	0.30 - 20 mm
Thickness Tolerance	± 25 µm
Available Upon Request	Various sizes, semi notice/flat specifications, laser serialization
Large Volume Capacity	Up to 60k WPM
Typical Lead Time	2-12 weeks
Polish Scratch/Dig	20/10 to 80/50
World-Class Metrology	Corning® Tropel® FlatMaster® MSP

Typical Properties and Attributes

TTV	≤ 1 µm to ≤ 5 µm
Bow	≤ 5 µm to ≤ 30 µm
Warp	± 20 µm to ± 40 µm
Surface roughness (Ra)	≤ 10 Å
SORI	≤ 0.5 µm to ≤ 1.5 µm

Electrical Properties @ 25 °C (10-50 GHz)

Loss Tangent	< 0.0003
Dielectric Constant	3.80

Thermal Properties

Thermal Expansion (ppm/°C)	
5 °C to 35 °C	0.52 x 10 ⁻⁶
0 °C to 200 °C	0.57 x 10 ⁻⁶
-100 °C to +200 °C	0.48 x 10 ⁻⁶

Optical Properties

- Refractive index uniformity is 2.5x better than competitive fused silica
- No Striae, ISO 10110-4 Class 5
- Abbe Constants @ 632nm: V_e 67.6, V_d 67.8, n_F-n_C 0.006797
- Low birefringence @ 632nm: ≤ 1 nm/cm
- Stress optic coefficient @ 632nm: 35.0 nm/cm MPa
- Exceptional transmittance across a broad range

