

# Hard Coated Silica/Silica (Standard OH)

Fiberguide Industries

Superguide™ SFSH

### REFERENCE SUMMARY

**Product Category:**  
Fiber

**Mode:**  
Step Index, Multimode

**Type:**  
Hard Coated Silica/Silica  
(Standard OH)

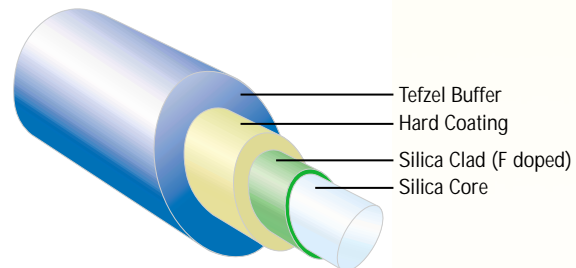
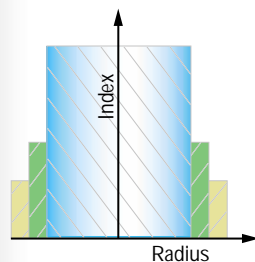
**Trade Name:**  
Superguide™ SFSH  
UV-VIS

### DESCRIPTION

When looking for a silica core and silica clad fiber with a hard polymer coating that allows a high core-to-clad ratio and a numerical aperture (N.A.) of 0.22 for efficient light coupling, the Superguide™ SFSH is the fiber of choice. The Superguide™ fiber is drawn from preforms manufactured by the Plasma Outside Deposition (POD) process. Rods of extremely pure synthetic fused silica are coated with fluorine doped silica layers to obtain preforms with step-like refractive index profiles. Plasma torches prepare the reaction compounds from  $\text{SiCl}_4$ ,  $\text{O}_2$ , and fluorine containing gas. Strong thermal gradients combined with the temperature plasma lead to chemical deposition conditions, which allow very high fluorine concentrations to be incorporated in the fused silica network. Refractive index differences of 0.27 corresponding to numerical apertures in excess of 0.28 have been realized with undoped core rods.



### FIBER CROSS SECTION



Buffer - Available in clear or blue Tefzel® and clear nylon.



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## FEATURES & BENEFITS

Features	Benefits
<ul style="list-style-type: none"><li>• Certified by NAMSA under ISO Standard 10993-10. Biological Evaluation of Medical Devices, Part 10.</li></ul>	<ul style="list-style-type: none"><li>• Test for Irritation and Delayed-Type Sensitivity for accelerated 510K.</li></ul>
<ul style="list-style-type: none"><li>• Certified by NAMSA under ISO Standard 10993-11. Biological Evaluation of Medical Devices, Part 11.</li></ul>	<ul style="list-style-type: none"><li>• Tests for Systemic Toxicity for accelerated 510K.</li></ul>
<ul style="list-style-type: none"><li>• Certified by NAMSA under ISO Standard 10993-6. Biological Evaluation of Medical Devices, Part 6.</li></ul>	<ul style="list-style-type: none"><li>• Tests for Local Effects after Implantation for accelerated 510K.</li></ul>
<ul style="list-style-type: none"><li>• Certified by NAMSA under ISO Standard 18472. Sterilization of Healthcare Products - Biological and Chemical Indicators.</li></ul>	<ul style="list-style-type: none"><li>• Accelerated 510K.</li></ul>
<ul style="list-style-type: none"><li>• Broad operating wavelength range.</li></ul>	<ul style="list-style-type: none"><li>• Excellent for Excimer Laser (193nm), Pulsed Dye (595nm) and HeNe (633nm).</li></ul>
<ul style="list-style-type: none"><li>• Low OH (water) content.</li></ul>	<ul style="list-style-type: none"><li>• ≤ 0.7 ppm (typical is 0.15ppm).</li></ul>
<ul style="list-style-type: none"><li>• Stability of silica clad.</li></ul>	<ul style="list-style-type: none"><li>• Allows for high power and high temperature handling capability relative to plastic cladding.</li></ul>
<ul style="list-style-type: none"><li>• Low-index, fluorine doped clad.</li></ul>	<ul style="list-style-type: none"><li>• Provides enhanced visible to infrared (VIS-IR) transmission as compared to plastic clad and borosilica clad fiber designs.</li></ul>
<ul style="list-style-type: none"><li>• Superior concentricity and core-to-clad ratio.</li></ul>	<ul style="list-style-type: none"><li>• Allows for excellent connection alignment, fiber core positioning and high transmission bundles.</li></ul>
<ul style="list-style-type: none"><li>• Hard polymer coating.</li></ul>	<ul style="list-style-type: none"><li>• Offers high strength fiber and reduced static fatigue, as well as protection for the fiber during buffer stripping.</li></ul>
<ul style="list-style-type: none"><li>• Strong bonding of the hard polymer to silica.</li></ul>	<ul style="list-style-type: none"><li>• Prevents relative movement of these materials in the fiber structure as the ambient temperature changes, sometimes referred to as "pistoning".</li></ul>
<ul style="list-style-type: none"><li>• Sterilizable by ETO, e-beam or gamma.</li></ul>	<ul style="list-style-type: none"><li>• Single use or reusable medical devices.</li></ul>
<ul style="list-style-type: none"><li>• All dielectric, non-magnetic construction.</li></ul>	<ul style="list-style-type: none"><li>• Metal free.</li></ul>
<ul style="list-style-type: none"><li>• Radiation resistant.</li></ul>	<ul style="list-style-type: none"><li>• Just the right medium for your "hot" environment.</li></ul>



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## APPLICATIONS

### Sensors/Industrial Controls/Illumination

- Make/Break
- Distance
- Temperature
- Liquid level
- Proximity
- Chemical analysis
- Biotechnology

### Industrial/Scientific Diagnostic Instrumentation/Devices

- Spectrophotometer
- Gas/liquid chromatography
- Flame pyrometer
- Cytometry
- DNA sequencing

### Medical/Dental

- Ruby (694.3nm)
  - Treatment of tattoos, pigmented lesions and hair removal
- Alexandrite (755nm)
  - Hair and tattoo removal
- Pulsed Dye (PDL) (595nm)
  - Treatment of vascular lesions
- Copper Vapor (CVL) (512nm)
  - Treatment of vascular lesions
- Excimer (Ar:F) (193nm)
  - Cardiac revascularization
- PRK and LASIK Laser (480nm)
  - Lithotripsy

- Argon Laser (514.5nm)
  - Retinal and inner ear surgery
  - Removal of port wine birth marks, facial spider veins, junctional nevi and cherry hemangioma
- KTP:YAG Laser (532nm)
  - Vascular lesions
  - Tattoos
- HeNe Laser (633nm)
  - Photodynamic therapy

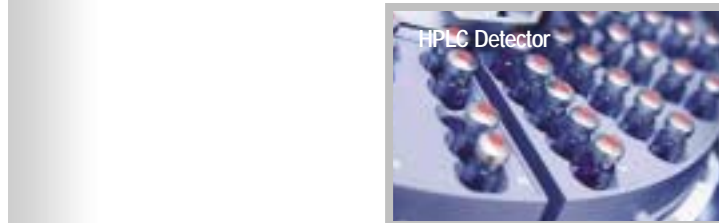
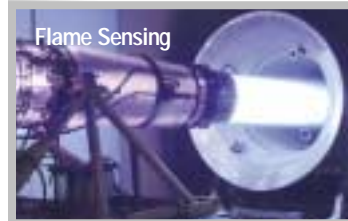
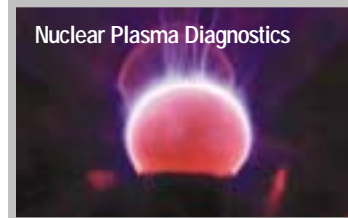
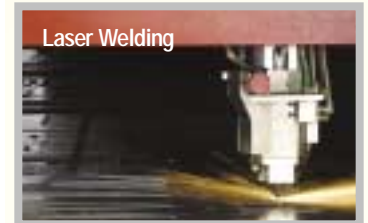
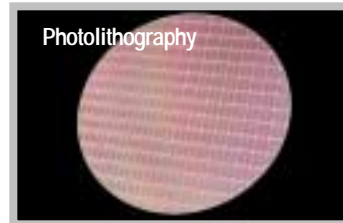
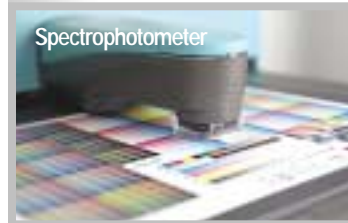
### Short-haul Data Transmission

- In-plant systems

### Ordnance Initiation

- Carries signal for launch/detonation

## TYPICAL EXAMPLES



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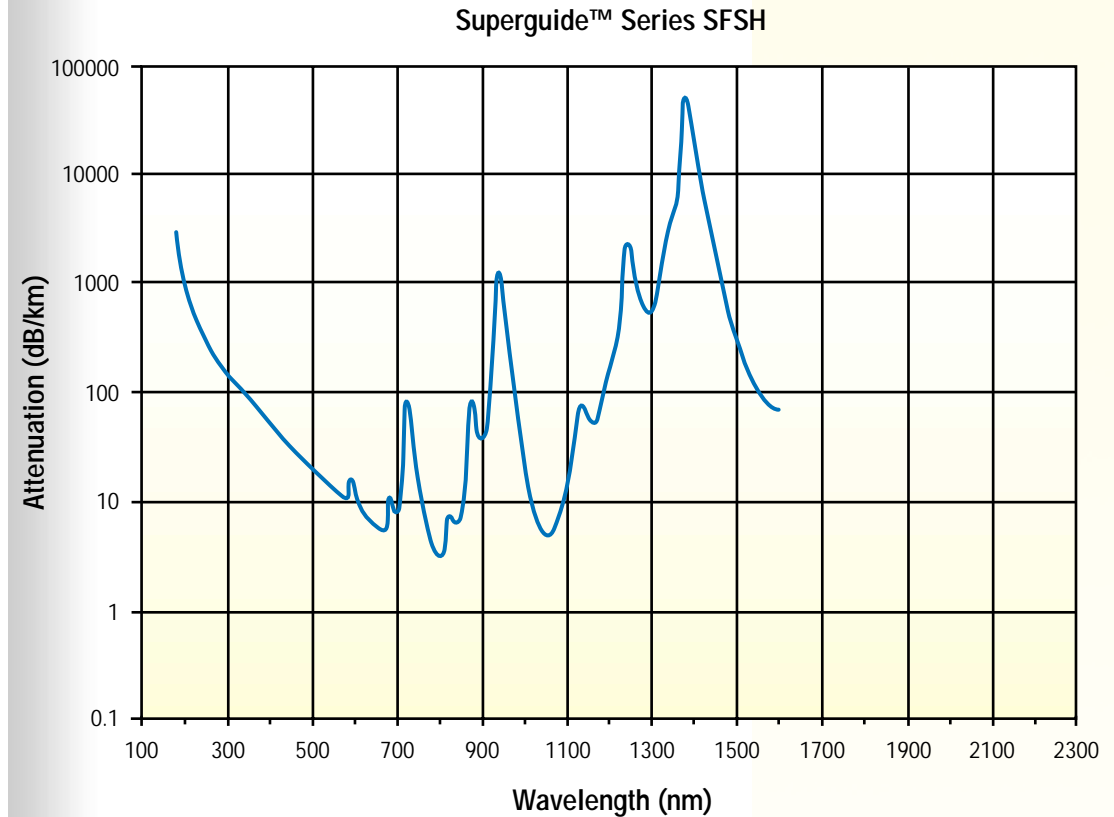
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## SPECTRAL ATTENUATION (Typical)



## FIBER SPECIFICATIONS

- Standard Secondary Buffer Coating Blue Tefzel® (suffix "C"). Also available at additional cost in 750 Clear Tefzel® (suffix "Z") and Clear Nylon (suffix "N").
- Operating Temperature: -60°C to +125°C
- Numerical Aperture: 0.22 ± 0.02 (Full Acceptance Angle 25°)
- Typical Attenuation Values:
  - 800dB/km @ 210nm
  - 380dB/km @ 248nm
  - 120dB/km @ 308nm
  - 70dB/km @ 350nm
  - 3.5dB/km @ 800nm
- Recommended Bend Radius:
  - Short Term: 120 x Clad Diameter
  - Long Term: 240 x Clad Diameter
- Proof Test Using Bend Method

**Note:** The fibers in the following table carry a designation "SFSH" standing for "Superguide Fiber Series Hard Clad" followed by the core diameter and clad diameter (in microns) and concluding with the suffix "Z" that designates a clear Tefzel® secondary buffer.



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## FIBER SPECIFICATIONS

Standard OH Product Code	SFSH200/240C	SFSH273/300C	SFSH365/400C
Core Diameter	200µ ± 8µ	273µ ± 10µ	365µ ± 14µ
Clad Diameter	240µ ± 5µ	300µ ± 6µ	400µ ± 8µ
Coating Diameter	260µ ± 6µ	325µ ± 10µ	425µ ± 10µ
Buffer Diameter	400µ ± 30µ	420µ ± 30µ	750µ ± 30µ
Maximum Core/Coating Offset	5µ	6µ	7µ
Maximum Power Capability			
-CW <sup>1</sup>	0.2kW	0.4kW	0.7kW
-Pulsed <sup>2</sup>	1.0MW	2.0MW	3.4MW

Standard OH Product Code	SFSH550/600C	SFSH910/1000C
Core Diameter	550µ ± 19µ	910µ ± 30µ
Clad Diameter	600µ ± 10µ	1000µ ± 15µ
Coating Diameter	630µ ± 10µ	1035µ ± 15µ
Buffer Diameter	750µ ± 30µ	1400µ ± 30µ
Maximum Core/Coating Offset	9µ	10µ
Maximum Power Capability		
-CW <sup>1</sup>	1.5kW	5.0kW
-Pulsed <sup>2</sup>	7.6MW	25.1MW

## NOTES

- 1 - Based on 1 MW/cm<sup>2</sup> for 1064nm ND:YAG laser and input spot size equal to 80% of the core diameter.
- 2 - Based on 5 GW/cm<sup>2</sup> for 1064nm ND:YAG laser with 10nsec. pulse length and input spot size equal to 80% of the core diameter.

### Fiberguide Industries Customization Program

Fiberguide Industries is a full service custom fiber and value-added assembly provider. If you have unique requirements, please contact us to discuss tailoring a product or design to optimize optical performance for your specific application.

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