

Hard Coated Silica/Silica (Low OH)

Fiberguide Industries

Anhydroguide™ AFSH

REFERENCE SUMMARY

Product Category:
Fiber

Mode:
Step Index, Multimode

Type:
Hard Coated Silica/Silica (Low OH)

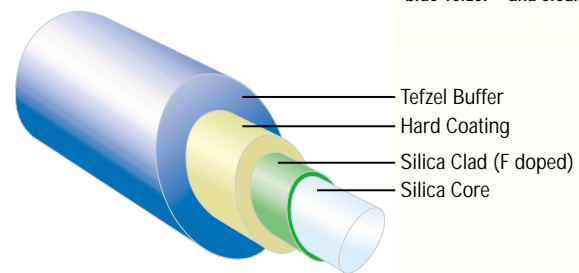
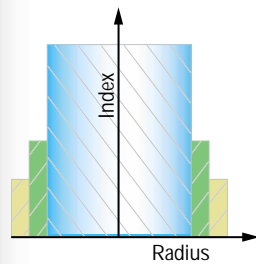
Trade Name:
Anhydroguide™ AFSH
VIS-IR

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 Anhydroguide™ AFSH is the fiber of choice. The Anhydroguide™ 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 SiCl_4 , 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"> • Certified by NAMSA under ISO Standard 10993-10. Biological Evaluation of Medical Devices, Part 10. 	<ul style="list-style-type: none"> • Test for Irritation and Delayed-Type Sensitivity for accelerated 510K.
<ul style="list-style-type: none"> • Certified by NAMSA under ISO Standard 10993-11. Biological Evaluation of Medical Devices, Part 11. 	<ul style="list-style-type: none"> • Tests for Systemic Toxicity for accelerated 510K.
<ul style="list-style-type: none"> • Certified by NAMSA under ISO Standard 10993-6. Biological Evaluation of Medical Devices, Part 6. 	<ul style="list-style-type: none"> • Tests for Local Effects after Implantation for accelerated 510K.
<ul style="list-style-type: none"> • Certified by NAMSA under ISO Standard 18472. Sterilization of Healthcare Products - Biological and Chemical Indicators. 	<ul style="list-style-type: none"> • Accelerated 510K.
<ul style="list-style-type: none"> • Broad operating wavelength range. 	<ul style="list-style-type: none"> • Excellent for Diode Laser (800-900nm), Erbium Laser (1540nm) and Holmium Laser (2100nm).
<ul style="list-style-type: none"> • Low OH (water) content. 	<ul style="list-style-type: none"> • ≤ 0.7 ppm (typical is 0.15ppm).
<ul style="list-style-type: none"> • Stability of silica clad. 	<ul style="list-style-type: none"> • Allows for high power and high temperature handling capability relative to plastic cladding.
<ul style="list-style-type: none"> • Low-index, fluorine doped clad. 	<ul style="list-style-type: none"> • Provides enhanced visible to infrared (VIS-IR) transmission as compared to plastic clad and borosilica clad fiber designs.
<ul style="list-style-type: none"> • Superior concentricity and core-to-clad ratio. 	<ul style="list-style-type: none"> • Allows for excellent connection alignment, fiber core positioning and high transmission bundles.
<ul style="list-style-type: none"> • Hard polymer coating. 	<ul style="list-style-type: none"> • Offers high strength fiber and reduced static fatigue, as well as protection for the fiber during buffer stripping.
<ul style="list-style-type: none"> • Strong bonding of the hard polymer to silica. 	<ul style="list-style-type: none"> • Prevents relative movement of these materials in the fiber structure as the ambient temperature changes, sometimes referred to as "pistoning".
<ul style="list-style-type: none"> • Sterilizable by ETO, e-beam or gamma. 	<ul style="list-style-type: none"> • Single use or reusable medical devices.
<ul style="list-style-type: none"> • All dielectric, non-magnetic construction. 	<ul style="list-style-type: none"> • Metal free.
<ul style="list-style-type: none"> • Radiation resistant. 	<ul style="list-style-type: none"> • Just the right medium for your "hot" environment.



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APPLICATIONS

**High Power Laser
Delivery Systems**

- Medical
- Photodynamic therapy
- Laser welding/soldering

Remote Spectroscopy

Laser Ordnance Initiation

Analytical Instrumentation

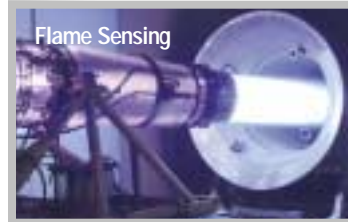
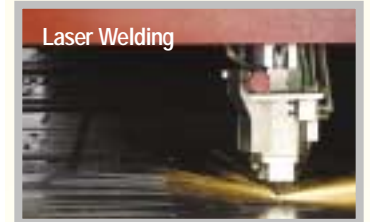
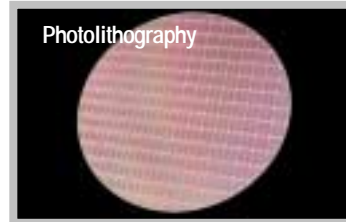
**Optical Pyrometry
Industrial/Scientific**

- Sensors
- Laser diode pigtailling
- Remote illumination
- Diagnostics

Nuclear Plasma Diagnostics

Semiconductor Manufacturing

TYPICAL EXAMPLES



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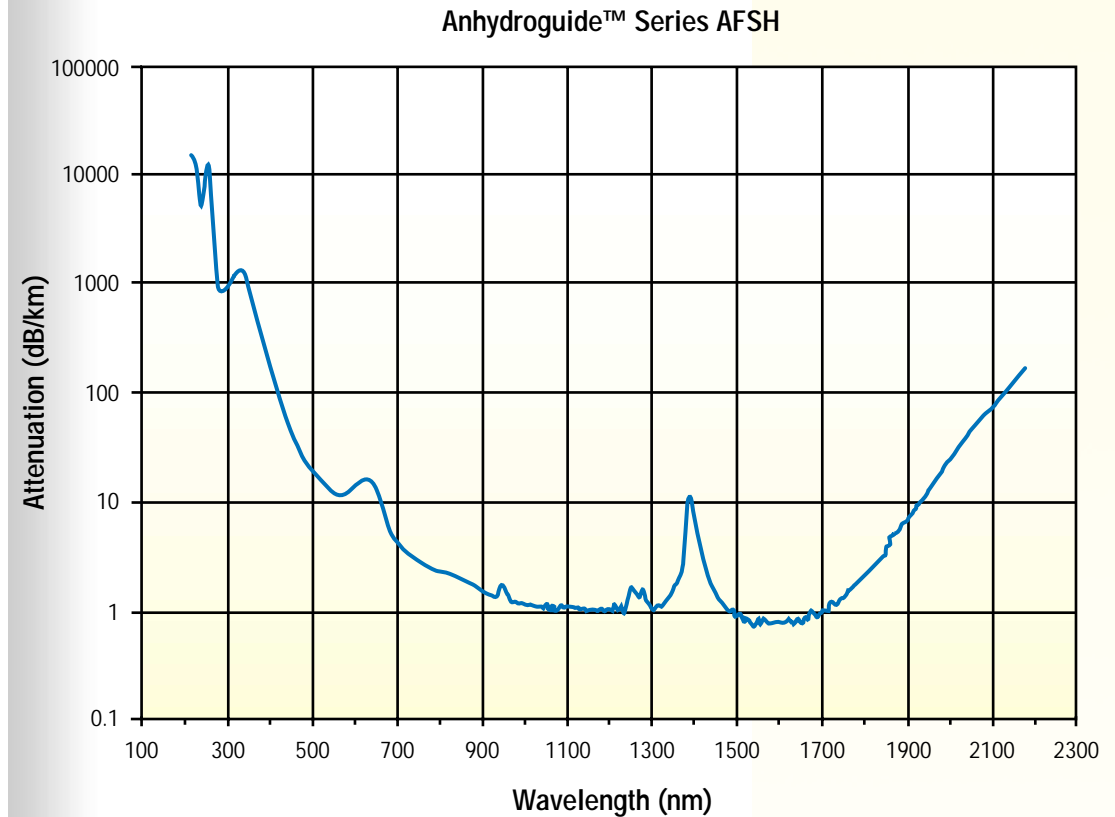
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SPECTRAL ATTENUATION (Typical)



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:
15dB/km @ 633nm
2dB/km @ 850nm
1.5dB/km @ 1064nm
10dB/km @ 1385nm
70dB/km @ 2100nm
- 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 "AFSH" standing for "Anhydroguide 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

Low OH Product Code	AFSH200/240C	AFSH273/300C	AFSH365/400C
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 ¹	0.2kW	0.4kW	0.7kW
-Pulsed ²	1.0MW	2.0MW	3.4MW

Low OH Product Code	AFSH550/600C	AFSH910/1000C
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 ¹	1.5kW	5.0kW
-Pulsed ²	7.6MW	25.1MW

NOTES

- 1 - Based on 1 MW/cm² for 1064nm ND:YAG laser and input spot size equal to 80% of the core diameter.
- 2 - Based on 5 GW/cm² 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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