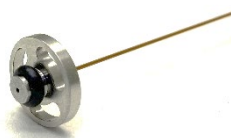




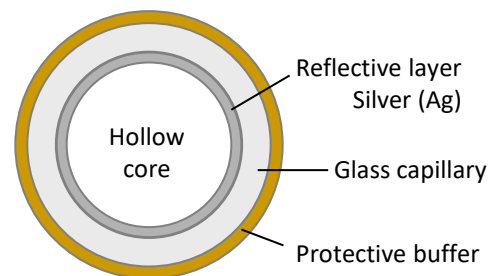
VNIR Hollow Fiber Optics



Patch Cables



Gas Cells



Hollow core fiber

Hollow fibers with a silver-only reflective coating are used for high energy pulsed lasers, as well as for Raman spectroscopy, covering visible through near-infrared wavelengths.

Fiber Internal Diameter (ID)

Overall transmission in hollow fibers depends strongly on the fiber internal diameter (ID). We offer three different standard ID size options ranging from ID = 500 μm to 1000 μm , all these fibers are multimode. Bending of the fiber will affect the beam quality and lead to higher loss. For best results, an input beam should be focused straight into the hollow fiber with a relatively long focal length optic such that the focused spot size is about 2/3 the fiber ID.

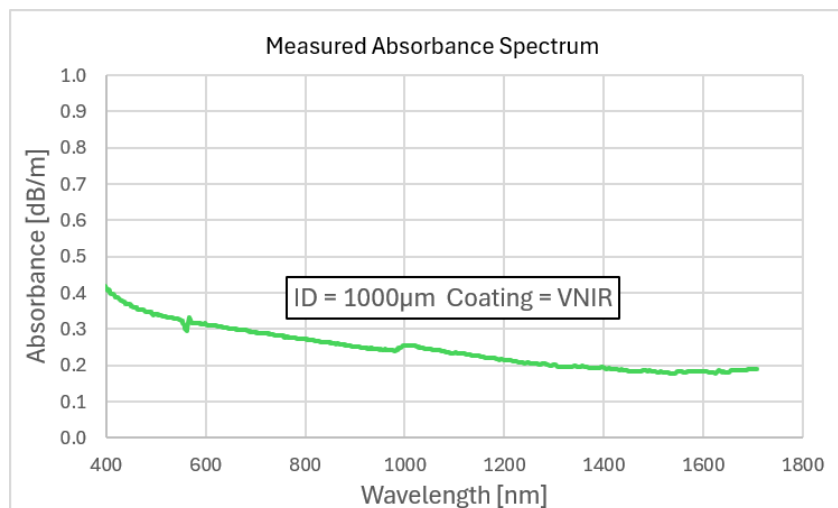
Silver Reflective Layer

For the visible to NIR wavelength range ($\lambda = 400 - 1600 \text{ nm}$), a bare silver layer is deposited on the inside of glass capillary tubing. The surface quality of the silver layer is vitally important, and Guiding has developed coating techniques to minimize surface roughness enabling relatively high transmission.

Internal Diameter (ID)	500 μm	750 μm	1000 μm
Typical Loss (straight)†	1.0 dB/m	0.4 dB/m	0.3 dB/m
Max Energy* ($\lambda = 532 \text{ nm}$; 5 ns)	20 mJ	50 mJ	75 mJ
Maximum Power *	30 W	50 W	100 W
Minimum Bend Radius	10 cm	20 cm	30 cm
Patch Cable Length	0.1 - 5.0 m		

† Additional loss on bending, which scales with bending radius (R) as $1/R$.

* Assuming proper coupling. Initial alignment should always be done at reduced power.

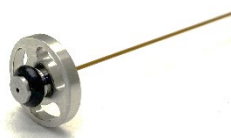




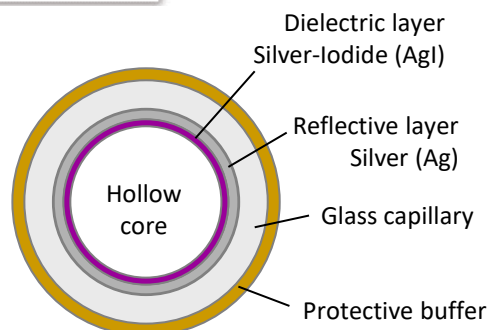
NIR Hollow Fiber Optics



Patch Cables



Gas Cells



Hollow core fiber

Hollow fibers with a silver + dielectric coating enable multi-mode delivery of high energy pulsed lasers with a coating optimized for near-infrared wavelengths, e.g. $\lambda = 1064 \text{ nm}$.

Fiber Internal Diameter (ID)

Overall transmission in hollow fibers depends strongly on the fiber internal diameter (ID). We offer three different standard ID size options ranging from ID = 500 μm to 1000 μm , all these fibers are multimode. Bending of the fiber will affect the beam quality and lead to higher loss. For best results, an input beam should be focused straight into the hollow fiber with a relatively long focal length optic such that the focused spot size is about 2/3 the fiber ID.

Internal Dielectric Coating

The relative spectral transmission of hollow fibers depends on the thickness of the dielectric layer deposited inside the hollow fiber. For NIR wavelengths we use a relatively thin dielectric layer optimized for high reflectivity for $\lambda \geq 1.0 \mu\text{m}$. In addition to enhancing the reflectivity, the silver-iodide dielectric provides a resilient, protective layer.

Internal Diameter (ID)	500 μm	750 μm	1000 μm
Typical Loss (straight)	1.0 dB/m	0.3 dB/m	0.2 dB/m
Max Energy* ($\lambda = 1064 \text{ nm}$; 5 ns)	20 mJ	50 mJ	75 mJ
Maximum Power *	30 W	50 W	100 W
Minimum Bend Radius	10 cm	20 cm	30 cm
Patch Cable Length	0.1 - 5.0 m		

† Additional loss on bending, which scales with bending radius (R) as $1/R$.

* Assuming proper coupling. Initial alignment should always be done at reduced power.

