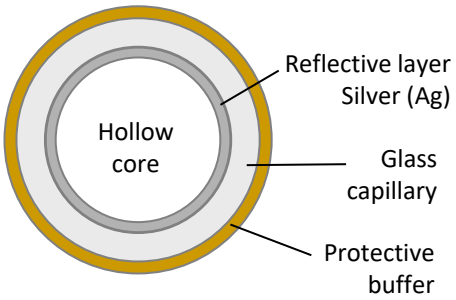
GUIDING PHOTONICS

VNIR Hollow Fiber Optics



Hollow core fiber

Hollow fibers with a silver reflective coating enable convenient delivery of high energy pulsed lasers covering visible through near-infrared wavelengths.

Fiber Internal Diameter (ID)

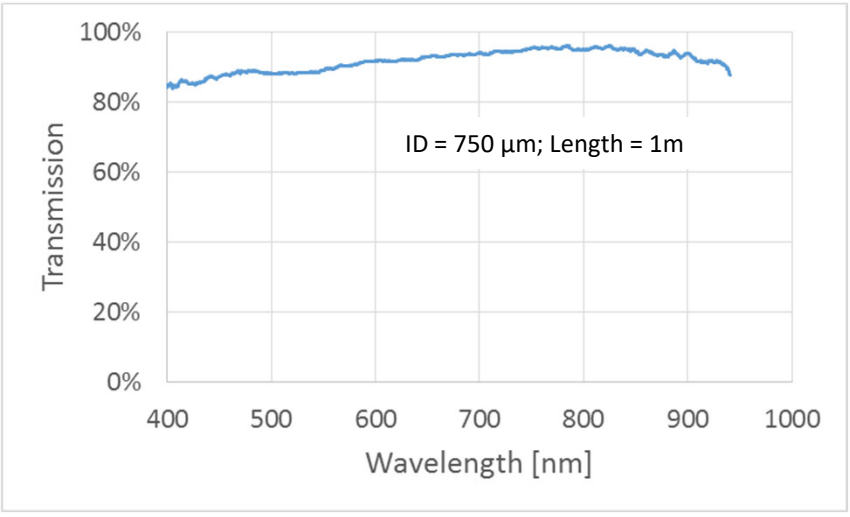
Overall transmission in hollow fibers depends strongly on the fiber internal diameter (ID). We offer three different standard ID size options ranging from ID = 500 µm to 1000 µm, and all of these fibers are multimode. Bending of the fiber will affect the beam quality and lead to higher loss. For best 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 ½ the fiber ID.

Silver Reflective Layer

For the visible to NIR wavelength range (λ = 400 - 1000 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* (λ = 532 nm; 5 ns)	20 mJ	50 mJ	75 mJ
Maximum Power *	30 W	50 W	100 W
Minimum Bend Radius	10 cm	20 cm	50 cm
Patch Cable Length	0.1 - 5.0 m		

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



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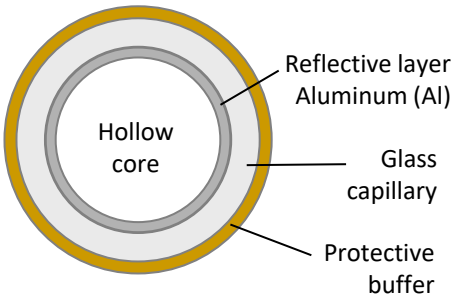
UV Hollow Fiber Optics

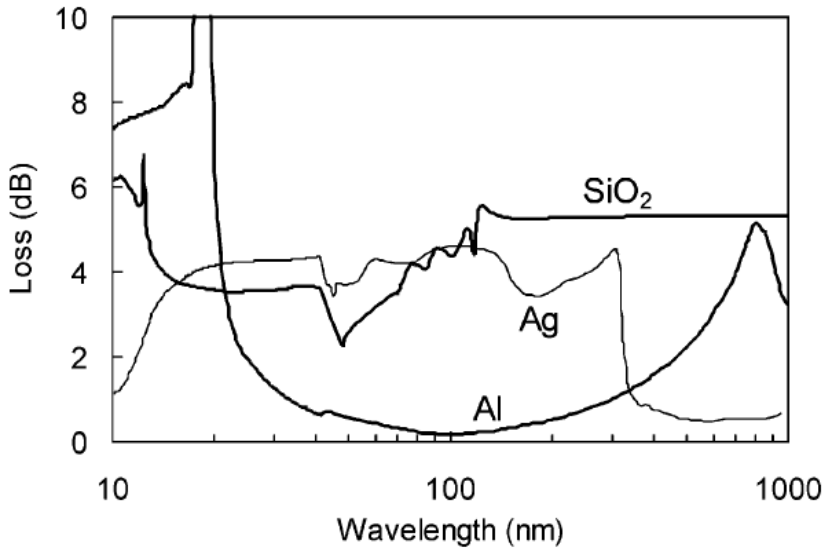


Hollow core fiber

Hollow fibers with an aluminum reflective coating are ideally suited for transmitting ultra-violet wavelength beams, including high power and/or high energy pulsed beams.

Internal Diameter (ID)	320 µm	700 µm	1000 µm
Typical Loss† (straight)	0.5 dB/m	0.4 dB/m	0.3 dB/m
Max Energy* (λ = 193 nm; ArF)	1 mJ	5 mJ	10 mJ
Maximum Power (average)*	0.5 W	1.0 W	2.0 W
Minimum Bend Radius	10 cm	20 cm	50 cm
Patch Cable Length	0.1 - 1.0 m		

† Additional loss on bending, which scales with radius (R) as 1/R.
* Assuming proper coupling. Initial alignment should always be done at reduced power.



Loss spectra of hollow fibers with different coatings. From Y. Matsuura & M. Miyagi, "Hollow Optical Fibers for Ultraviolet and Vacuum Ultraviolet Light", IEEE (2004).

UV Fibers

Coupling into aluminum coated hollow fibers is similar to coupling into our Mid-IR fibers, see guidingphotonics.com for more details. In general, a relatively long focal length lens should be used with the beam focused straight into the fiber. For vacuum UV wavelengths the fibers can be purged with an inert gas.

Related Products

Related hollow fiber optics are available for additional wavelength regimes from UV up to THz including a full line of hollow fiber optics products designed specifically for mid-infrared (Mid-IR) applications (λ = 2 - 16 µm). Note: the coating structure for such fibers, includes a dielectric layer with composition and thickness tuned specifically for a given wavelength range.

Contact Us

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We are a spin-off from Opto-Knowledge Systems, Inc. (OKSI)

OKSI