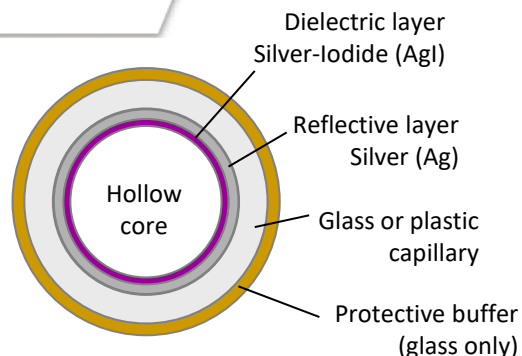




## Mid-Infrared Fiber Patch Cables



Hollow core fiber

Single mode and multi mode patch cables are available for the entire Mid-IR wavelength range from  $\lambda = 2$  to  $16 \mu\text{m}$  including both off-the-shelf and made-to-order assemblies.

|                                                                     | Glass                        |                              |                               |                   |                    | Plastic            |
|---------------------------------------------------------------------|------------------------------|------------------------------|-------------------------------|-------------------|--------------------|--------------------|
| Internal Diameter (ID)                                              | 200 $\mu\text{m}$            | 300 $\mu\text{m}$            | 500 $\mu\text{m}$             | 750 $\mu\text{m}$ | 1000 $\mu\text{m}$ | 1500 $\mu\text{m}$ |
| <b>Typical Loss (straight)<sup>†</sup></b>                          | 4 dB/m                       | 1 dB/m                       | 0.5 dB/m                      | 0.2 dB/m          | 0.1 dB/m           | 0.2 dB/m           |
| <b>Single Mode Range</b>                                            | $\lambda \geq 4 \mu\text{m}$ | $\lambda \geq 8 \mu\text{m}$ | $\lambda \geq 12 \mu\text{m}$ | ---               | ---                | -                  |
| <b>Output Divergence <math>\frac{1}{2}</math> Angle<sup>‡</sup></b> | 50 mRad                      | 40 mRad                      | 30 mRad                       | 30 mRad           | 30 mRad            | 30 mRad            |
| <b>Minimum Bend Radius</b>                                          | 5 cm                         | 5 cm                         | 10 cm                         | 20 cm             | 50 cm              | 5 cm               |
| <b>Maximum Power<sup>*</sup></b>                                    | 5 W                          | 10 W                         | 30 W                          | 50 W              | 100 W              | 30 W               |
| <b>Patch Cable Length</b>                                           | 0.1 - 1.0 m                  | 0.1 - 2.0 m                  | 0.1 - 5.0 m                   | 0.1 - 5.0 m       | 0.1 - 5.0 m        | 0.1 - 5.0 m        |

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

<sup>‡</sup> Value listed is for  $\lambda = 10 \mu\text{m}$ , and generally scales linearly with wavelength

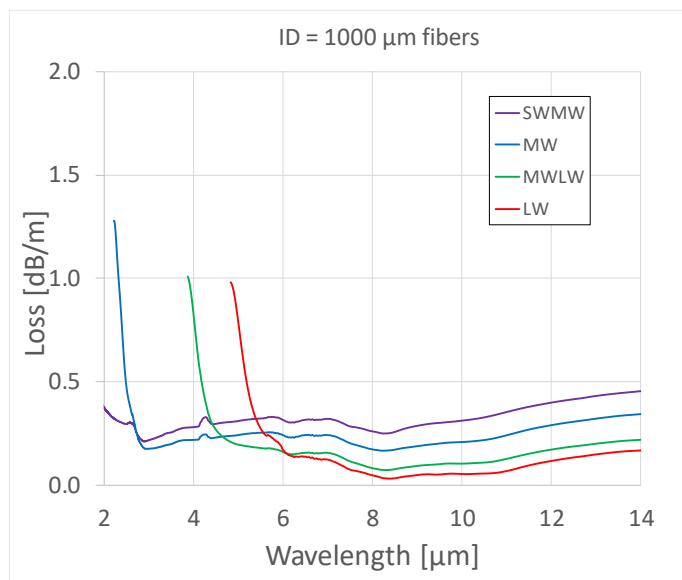
<sup>\*</sup> CW power rating assuming proper coupling and alignment. Initial alignment should always be done at reduced power.

## Fiber Internal Diameter (ID)

Transmission depends strongly on the fiber internal diameter (ID). Theoretically, loss can be described by Hybrid  $\text{HE}_{lm}$  modes with attenuation coefficients scaling as  $1/(\text{ID})^3$ . Larger ID fibers have lower loss, but support more modes (i.e., multi-mode). Smaller ID fibers have higher loss, but heavily damp out the higher order modes, and can thus deliver single mode output.

## Internal Dielectric Coating

The relative spectral transmission of hollow fibers depends on the thickness of the dielectric layer deposited inside the hollow fiber. We offer 4 standard coating options covering the entire Mid-IR. Additional options are also available for other wavelength regions including UV, Visible, and THz.





## Mid-Infrared Fiber Patch Cables

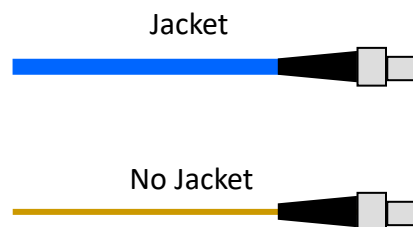
### Connector Options

Fibers can be packaged with standard SMA 905, FC/PC type connectors, or left bare. The FC connectors have a 2 mm key, which mates to most FC/PC and FC/APC receptacles. Due to size constraints, the FC connectors are NOT available for the plastic 1500  $\mu\text{m}$  fibers. With the "bare" fiber option, there is no connector on the end of the fiber.



### Jacket Options

Fibers can be packaged with or without a protective jacket. We use standard furcation tubing, the fiber sits in an inner tube, surrounded by aramid fibers, with a PVC jacket on the outside. The jacket comes in a choice of different colors. For fibers with an ID < 750  $\mu\text{m}$ , the jacket diameter is 3.0 mm, and for fibers with an ID  $\geq$  750  $\mu\text{m}$ , the jacket diameter is 3.8 mm.



### Custom Bundles

Guiding assembles custom bundles that enable multi-beam delivery of multiple laser sources in a single connector. Note: the fibers are side-by-side rather than fused. In addition to hollow fibers for the Mid-IR, we can also include standard solid core fibers for visible, NIR, and SWIR wavelengths.



### Contact Us

Email: [sales@guidingphotonics.com](mailto:sales@guidingphotonics.com)  
Web: <https://guidingphotonics.com>

We are a spin-off from Opto-Knowledge Systems, Inc. **OptoKnowledge**

