

# Er :YAG Laser Delivery Fiber



High transmission

>90%\*

## APPLICATIONS

- Dentistry
- Dermatology
- General surgery

## FIBER SPECIFICATIONS

- Fiber Core Diameter: 450  $\mu\text{m}$  typical (60 to 600  $\mu\text{m}$  available)
- Attenuation < 0.1 dB/m @ 2.9  $\mu\text{m}$
- Numerical Aperture: 0.20 typical (0.10 to 0.25 available)
- Dual clad for higher power handling

## DESCRIPTION

IRphotonics offers the HPF fiber (**H**igh **P**ower **F**iber) especially designed for delivering Er:YAG beams. IRphotonics built on its mid-infrared expertise to develop a special high power fiber made of fluoride glass offering exceptional optical and mechanical characteristics.

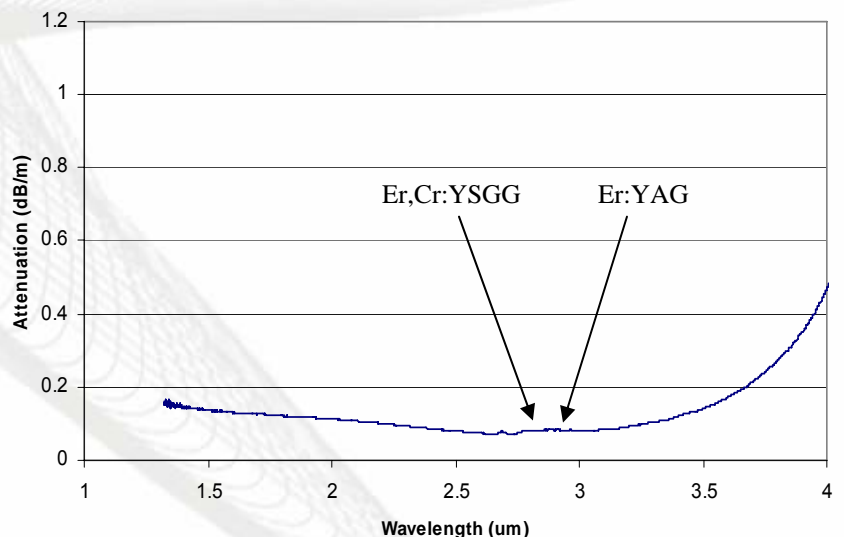
The HPF's unique properties provide a higher transmission at Er:YAG and Er,Cr:YSGG wavelengths than competing technologies. In addition, IRphotonics HPF high power fiber transmits very efficiently visible light from pointing lasers.

The standard HPF fiber features a 450/510  $\mu\text{m}$  core/cladding that provides the ideal tradeoff between mechanical flexibility and high coupling efficiency.

Clinicians will love the greater ease of use provided by this fiber compared to cumbersome articulated arms.

## FEATURES

- Ideal for Er:YAG (2.94  $\mu\text{m}$ ) and Er,Cr:YSGG (2.78  $\mu\text{m}$ ) Laser Delivery
- High Transmission in the Visible for Pointing Lasers
- Very Low Fresnel Losses of 4% per End Face
- High Laser Damage Thresholds
- Connectorized Assemblies Available



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## STANDARD HPF FIBER SPECIFICATIONS

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Core Diameter	450 ± 15 µm
Primary Glass Cladding Diameter	510 ± 10 µm
Low Index Polymer Cladding Diameter	540 ± 10 µm
Acrylate Buffer Diameter	700 µm
Minimum Bending Diameter	20 cm
Length	2 meters (other lengths available upon request)
Numerical Aperture	0.20 ± 0.02

*Custom fiber available upon request.*

## OPTICAL SPECIFICATIONS

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Operating Wavelength Range	0.3 to 4.5 µm
Loss @ 2.94 µm (Er:YAG)	≤ 0.1 dB/m
Loss @ 2.78 µm (Er,Cr:YSGG)	≤ 0.1 dB/m
Loss in visible (pointing laser)	≤ 0.3 dB/m

## POWER HANDLING SPECIFICATIONS

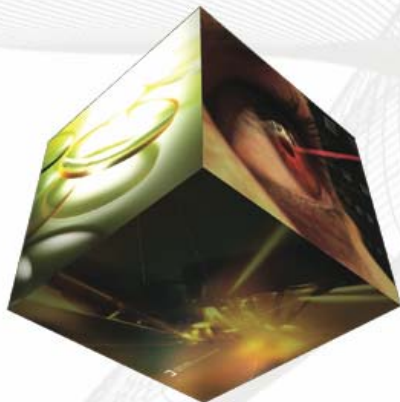
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The HPF fiber can withstand peak power density in MW/cm<sup>2</sup> and up to GW/cm<sup>2</sup>. Power handling specifications can vary greatly with launch conditions and laser specifications (energy per pulse, repetition rate, pulse duration, wavelength, beam diameter).

### Power Handling example \*

Laser specs	Peak Power Density	Energy Density
@ 2.7-2.9 µm	4.5 MW/cm <sup>2</sup>	650 J/cm <sup>2</sup>
8 W average power		
20 Hz repetition rate		
150 µs pulse width		
330 µm beam diameter		

These damage threshold measurements were limited by the laser power available.



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\* demonstrated in a stepped stress test with jacket heat sinking of proximal and distal points.

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