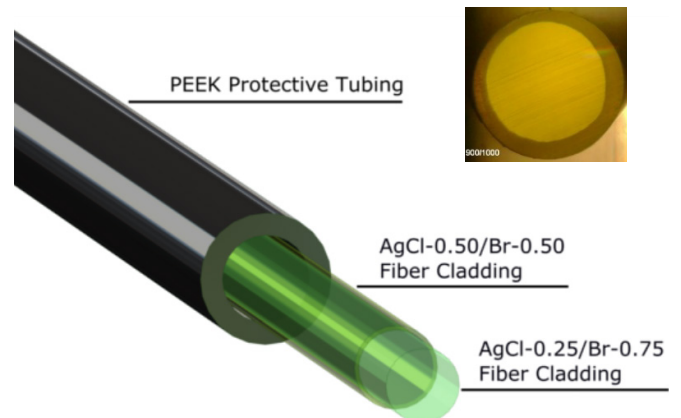


# Polycrystalline InfraRed PIR-fiber

**art photonics** developed a volume production technology of a unique product - Core / Clad Polycrystalline Infra-Red (PIR-) fibers transparent over a broad spectral range 3 - 18  $\mu\text{m}$ . Highest performance PIR core/clad fiber are extruded with core diameters span from 240 $\mu\text{m}$  to 860 $\mu\text{m}$ . Continuously improved extrusion process provides a superior optical quality and mechanical strength of PIR- fibers. Low optical losses without absorption peaks over the mentioned spectral range ensure a successful use of PIR- fiber for a broad range of applications.

## Applications:

- ✓ Mid IR spectroscopy
- ✓ Flexible IR pyrometry
- ✓ Flexible IR-Imaging systems
- ✓ Power delivery for Quantum Cascade Lasers
- ✓ Power delivery for CO and CO<sub>2</sub> Lasers



## Features:

- ✓ High transmittance in 3-18  $\mu\text{m}$  range (see transmission data)
- ✓ Low optical losses 0.2 – 0.3 dB/m in 9-13 $\mu\text{m}$  range
- ✓ Core/Clad structure with core diameters span from 240 to 860  $\mu\text{m}$
- ✓ Minimal aging effect
- ✓ Non-hydroscopic and non-toxic

## Parameters of standard Polycrystalline fibers

Code	Type	Core, $\mu\text{m}$	Cladding, $\mu\text{m}$	Protective Jacket, $\mu\text{m}$	NA	Min. bending Radius, mm
PIR240/300	Step Index few modes	240 $\pm$ 10	300+0/-10	no	0.35 $\pm$ 0.05	45
PIR400/500	Step Index Multimode	400 $\pm$ 10	500+0/-15	no	0.35 $\pm$ 0.05	75
PIR600/700	Step Index Multimode	600 $\pm$ 15	700+0/-15	no	0.35 $\pm$ 0.05	100
PIR900/1000	Step Index Multimode	860 $\pm$ 20	1000+0/-20	no	0.35 $\pm$ 0.05	150

# Specifications

Core/Cladding Composition	AgCl:AgBr
Spectral Range	3 - 18 $\mu\text{m}$
Core Refractive Index	2.15
Fresnel Reflection Losses	25%
Attenuation at 10.6 $\mu\text{m}$	0.2 - 0.4 dB/m
Effective Numerical Aperture NA	0.35 +/- 0.05
Melting Point	410 $^{\circ}\text{C}$
Operating Temperature	-273 to +140 $^{\circ}\text{C}$
Core/Clad Diameter (standard)	see table above
Laser Damage Threshold for CW CO <sub>2</sub> laser	>12 kW/cm <sup>2</sup>
Tensile Strength	> 70 MPa
Minimum Bending Radius (fixed)	5 [Fiber Diameter]
Minimum Elastic Bending Radius	150 [Fiber Diameter]

