Polycrystalline IR fiber

Main features:
- ✔ High transmittance from 4μm up to 18μm
- ✔ High flexibility
- ✔ Non-hydroscopic and non-toxic
- ✔ Low attenuation at 10.6μm (0.2 – 0.4 dB/m)
- ✔ Core/Clad design to minimize aging effect
- ✔ Suitable for CO₂, CO₂- QC – laser power flexible delivery

Applications:
- ✔ Spectroscopy and process monitoring in Gases & Liquids
- ✔ Pyrometry
- ✔ Flexible Radiometry
- ✔ Flexible IR-imaging Systems
- ✔ Power delivery for CO, CO₂ and QC – Lasers

art photonics development of specialty fibers for the Mid-Infrared region has resulted in a unique product – Core / Clad Polycrystalline Infra-Red (PIR-) fibers, transparent over a broad spectral range – 4 -18 μm and capable for operating over the wide temperature band from 4K to 420K.

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Core Diameter, μm</th>
<th>Cladding Diameter, μm</th>
<th>Coating</th>
<th>NA effective value*</th>
<th>min. Bending Radius (fixed), mm</th>
<th>min. Elastic Bending Radius, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIR240/300</td>
<td>Step Index Multimode</td>
<td>240 ± 10</td>
<td>300 +0/-10</td>
<td>no</td>
<td>0.35</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>PIR400/500</td>
<td>Step Index Multimode</td>
<td>400 ± 10</td>
<td>400 +0/-15</td>
<td>no</td>
<td>0.35</td>
<td>1.5</td>
<td>70</td>
</tr>
<tr>
<td>PIR600/700</td>
<td>Step Index Multimode</td>
<td>600 ± 15</td>
<td>700 +0/-15</td>
<td>no</td>
<td>0.35</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>PIR900/1000</td>
<td>Step Index Multimode</td>
<td>860 ± 20</td>
<td>1000 +0/-20</td>
<td>no</td>
<td>0.35</td>
<td>3</td>
<td>130</td>
</tr>
</tbody>
</table>
### Polycrystalline IR fiber

**Specifications:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral Range</td>
<td>3 - 18 μm</td>
</tr>
<tr>
<td>Core Refractive Index</td>
<td>2.15 +/- 0.02</td>
</tr>
<tr>
<td>Fresnel Reflection Losses</td>
<td>25%</td>
</tr>
<tr>
<td>Attenuation at 10.6μm</td>
<td>0.2 - 0.4 dB/m</td>
</tr>
<tr>
<td>Effective Numerical Aperture NA</td>
<td>0.35 +/- 0.05</td>
</tr>
<tr>
<td>Material Composition</td>
<td>AgCl : AgBr</td>
</tr>
<tr>
<td>Melting Point</td>
<td>415°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-200 to +140°C</td>
</tr>
<tr>
<td>Core/Clad Diameter (standard)</td>
<td>see table below</td>
</tr>
<tr>
<td>Laser Damage Threshold for CW CO₂-Laser</td>
<td>&gt; 12 kW/cm²</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>&gt; 100 MPa</td>
</tr>
<tr>
<td>Minimum Bending Radius (fixed)</td>
<td>5 [Fiber Diameter]</td>
</tr>
<tr>
<td>Minimum Elastic Bending Radius</td>
<td>150 [Fiber Diameter]</td>
</tr>
</tbody>
</table>

![Graph showing optical losses vs. wavelength in μm](image)

![Graph showing optical losses vs. wavenumbers in cm⁻¹](image)