

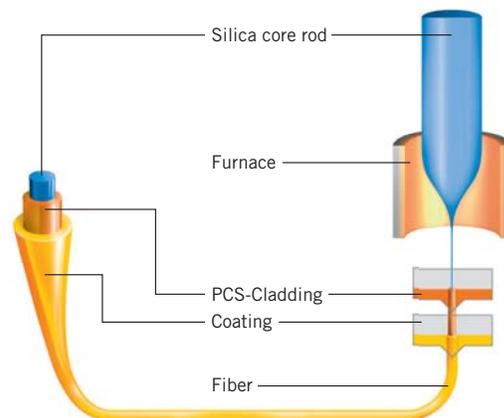


## Pure Silica Rods for Specialty Fiber Applications

Heraeus has long produced fused silica materials with optimized optical properties for a broad range of specialty fiber applications. Heraeus has mastered the manufacturing of fused silica base materials for UV, VIS, and NIR spectroscopy applications. In addition, we have successfully developed fused silica materials optimized for demanding applications from radiation resistance to high power transmission characteristics.

These fused silica rods are the basis for many types of specialty fiber preforms and applications, such as:

- Starting materials for plastic clad silica fiber preforms (PCS)
- Starting materials for photonic crystal fiber preforms (PCF)



**Heraeus manufactures the base material needed for your fiber applications**

Heraeus possesses a comprehensive knowledge and portfolio of base materials with optimized optical properties for preform production and related fiber draw applications. Therefore, we can help our customers determine the best fused silica materials for their applications and ultimately provide the material to meet these required specifications. Due to our long history of experience in this area, our base material products have been developed with consistent and tightly controlled optical properties. We also have been successful in producing base materials for large volumes while controlling costs for price-sensitive applications.

**Available F300 grades – ES and HQ**

F300 rods are offered in two grades: ES and HQ. The process for making ES grade materials has been developed for cost-optimized fused silica core rods for large volume applications. ES material is suited for those applications where the quality and higher costs of the HQ grade are not required to meet the customer's application needs. In contrast, the HQ grade material is manufactured by a complex process which produces rods free of bubbles with correspondingly tight geometric tolerances. The HQ grade material is available in small batches and is designed for the most demanding optical performance applications.

**Low OH Rods – Optical Properties and Application Reference Table**

	<b>F300ES</b>	<b>F300HQ</b>	<b>F500HQ</b>	<b>F320-08HQ</b>
OH [ppm] specified	≤ 5	≤ 1	≤ 0.1	≤ 1
OH [ppm] typical	0.2	0.2	0.02	0.2
Cl [ppm]	≤ 2,500	≤ 2,500	≤ 2,500	≤ 200
F [ppm]	-	-	-	3,000 ... 4,000
Trace impurities	below detection limit of ICP-MS			
Refractive index*	+3.5 ... +5 x 10 <sup>-4</sup>	+3.5 ... +5 x 10 <sup>-4</sup>	+3.5 ... +5 x 10 <sup>-4</sup>	-6 ... -12 x 10 <sup>-4</sup>
Features	<ul style="list-style-type: none"> <li>■ Excellent transmission properties in VIS – NIR</li> <li>■ Absorption bands at λ &lt; 400 nm</li> <li>■ Well suited for laser transmission at 1,064 nm</li> <li>■ Cost optimized quality for large volume price sensitive applications</li> </ul>	<ul style="list-style-type: none"> <li>■ Excellent transmission properties in VIS – NIR</li> <li>■ Absorption bands at λ &lt; 400 nm</li> <li>■ Well suited for laser transmission at 1,064 nm</li> <li>■ Customized quality available in small quantities</li> <li>■ Bubble free material</li> <li>■ Tight geometrical tolerances</li> <li>■ No surface scratches are allowed</li> </ul>	<ul style="list-style-type: none"> <li>■ Optimized water-free material</li> <li>■ Material properties similar to F300HQ, but lower OH-content</li> </ul>	<ul style="list-style-type: none"> <li>■ Fluorine doped material</li> <li>■ Ideal for broad range spectroscopy from 350 – 2,200 nm</li> <li>■ High radiation resistance to gamma irradiation at VIS and 1,310 nm</li> </ul>

\*Difference to un-doped silica (Heraeus standard)

**High OH UV Rods – Optical Properties and Application Reference Table**

	<b>F100</b>	<b>F110</b>	<b>Spectrosil</b>
OH [ppm] typical	700	400	1000
Cl [ppm] typical	200 ... 300 ppm	200 ... 300 ppm	< 0.15
Trace impurities	below detection limit of ICP-MS		
Refractive index*	-1 ... -1.6 x 10 <sup>-4</sup>	-1 ... 0 x 10 <sup>-4</sup>	-1.6 ... -2.5 x 10 <sup>-4</sup>
Features	<ul style="list-style-type: none"> <li>■ Excellent transmission in UV (190 – 400 nm)</li> <li>■ Good transmission near the OH absorption band minima around 670, 800 and 1,030 nm</li> <li>■ High resistance to gamma irradiation at 800 nm</li> <li>■ Low UV solarization</li> </ul>	<ul style="list-style-type: none"> <li>■ Excellent transmission in UV (260 – 400 nm)</li> <li>■ Good transmission near the OH absorption band minima around 670, 800 and 1,030 nm</li> <li>■ Low UV solarization at 308 nm</li> </ul>	<ul style="list-style-type: none"> <li>■ Chlorine free material</li> <li>■ For price sensitive applications</li> </ul>

\*Difference to un-doped silica (Heraeus standard)

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