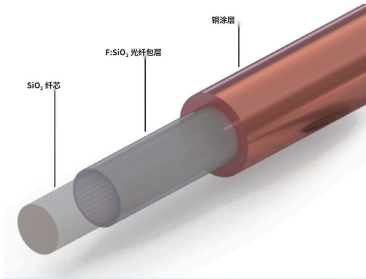


TOP® Copper-coated Quartz Fiber

Specification Datasheet · TopRays Optical Fiber

TOPRAYS' copper-alloy-coated quartz fibers represent leading fiber technology for extreme applications, including very high temperatures, high vacuum and demanding operating environments. Designed for applications where conventional fiber solutions are unsuitable, they combine excellent optical stability with strong thermal and mechanical performance for industrial, research and aerospace use. They retain all the key advantages of conventional quartz-quartz fibers, and the metal coating significantly improves mechanical strength and durability compared with polymer-coated fibers, enhancing resistance to fatigue and mechanical stress. Depending on the selected UV or NIR quartz core, their optical transmission range of 220 to 2400 nm supports a wide range of optical and spectroscopic applications. These fibers maintain reliable performance across an extreme temperature range from ultra-low -270 °C to continuous operation up to 600 °C, and withstand humidity up to 100% without compromising optical or mechanical integrity.



Technical Parameters

Parameter	Value
Transmission Range	220 – 2400 nm
Operating Temperature	-270 to +600 °C
Standard Numerical Aperture (NA)	0.22 ± 0.02
Humidity Range	Up to 100%

Standard Copper-coated Fiber Specifications

Parameter	Value
Core/Cladding Material (Step-index)	Pure fused silica core / fluorine-doped silica cladding
Core/Cladding Material (Graded-index)	Germanium-doped fused silica core / pure fused silica cladding
Core Diameter, μm	Single-mode: 4 – 9; multimode: 50; 62.5; 100; 200; 400; 600; 800; 1000
Copper Alloy Coating Thickness, μm	15 – 50 (depending on fiber diameter)
Standard Numerical Aperture (NA)	0.22 ± 0.02
Optional Numerical Aperture (NA)	0.12 ± 0.02 0.26 ± 0.02
Minimum Operating Temperature, °C	-270
Maximum Operating Temperature, °C	600

Parameter	Value
Humidity Range	Up to 100%
Minimum Bending Radius (Long-term)	200 × fiber outer diameter
Minimum Bending Radius (Short-term)	100 × fiber outer diameter
Tensile Strength (short gauge length), GPa	3.5 – 6
Two-point Bending Strength, GPa	> 10
Static Fatigue Parameter	> 100