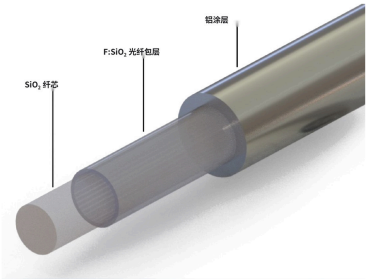


TOP® Aluminium-coated Quartz Fiber

Specification Datasheet · TopRays Optical Fiber

TOPRAYS' aluminium-coated quartz fibers are the preferred choice for applications with the highest reliability requirements under high-temperature, high-vacuum and other extreme conditions. Designed for applications where conventional polymer-coated fibers are unsuitable, they keep stable optical performance even in demanding industrial, research and aerospace environments. The aluminium coating provides efficient thermal management and long-term durability in applications such as high-temperature, radiation or intensive sterilization processes. These fibers retain all the inherent advantages of standard quartz-quartz fibers, including excellent optical transparency, low attenuation and chemical inertness. The metal coating also significantly improves mechanical strength and fatigue resistance and better withstands microbending, vibration and repeated mechanical stress. Their optical transmission range of 220 to 2400 nm supports various applications depending on the selected UV or NIR quartz core, including spectroscopic analysis, sensing, medical and industrial laser systems. Notably, they maintain stable performance across an extreme temperature range from ultra-low -270 °C to continuous operation at 450 °C.



Technical Parameters

Parameter	Value
Transmission Range	220 – 2400 nm
Operating Temperature	-270 to +450 °C
Standard Numerical Aperture (NA)	0.22 ± 0.02
Humidity Range	Up to 100%

Standard Aluminium-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: 2.5 – 9; multimode: 50; 62.5; 100; 200; 400; 600; 800; 1000
Aluminium Coating Thickness, µm	15 – 150 (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

Parameter	Value
Maximum Operating Temperature, °C	450
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