

Super RadHard Singlemode Fiber



APPLICABLE STANDARDS

- IEC / EN 60793-2-50 type B-652.B
- ITU-T Recommendation G.652.B

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Prysmian's Super RadHard SMF is a revolutionary product that shows extremely low sensitivity for radiation effects in highly irradiative environments (ex. Gamma rays, X-flash, Neutrons, and other high energy charged particles). The fiber can be exposed to very high doses of radiation, and besides an exceptional radiation resistance to very high dose levels, the fiber also exhibits a faster recovery time compared to standard Ge-doped RadHard fibres. The fiber is a fully Fluorine-doped design due to which the Radiation Induced Attenuation (RIA) performance of the fiber is significantly improved. The F-doped Super RadHard SMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs.

OPTICAL SPECIFICATIONS

RADIATION INDUCED ATTENUATION (RIA)

Test Conditions	Units	RIA at 1310 nm
Dose = 2 MGy	dB/100m	< 1 (typical)
Dose Rate = 1.25 Gy/s		
Temperature ≈ 45°C		
Dose = 100 kGy	dB/100m	< 0.5 (typical)
Dose Rate = 1.6 Gy/s		
Temperature ≈ 24°C		
Dose = 10 kGy	dB/100m	< 0.25 (typical)
Dose Rate = 0.2 Gy/s		
Temperature ≈ 24°C		

ATTENUATION

Attribute	Units	1310 nm	1550 nm
Attenuation	dB/km	≤ 0.4	≤ 0.3

MODE FIELD DIAMETER

Wavelength (nm)	Units	MFD
1310	μm	9.0 ± 0.4
1550	μm	10.1 ± 0.5

Cutoff Wavelength

Cable Cutoff Wavelength (λ_{cct})	≤ 1260 nm
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CHROMATIC DISPERSION

Wavelength (nm)	Units	Chromatic Dispersion
Zero Dispersion Wavelength, λ_0	nm	1300 - 1324
Slope (S_0) at λ_0	ps/(nm ² · km)	≤ 0.092

ATTENUATION VARIATION VS. BENDING

Number of Turns	Wavelength (nm)	Induced Attenuation (dB)
100 turns on a R = 25 mm mandrel	1310 / 1550	≤ 0.05
100 turns on a R = 30 mm mandrel	1625	≤ 0.05

TYPICAL VALUES

Attribute	Units	1310 nm	1550 nm
Effective group index	-	1.463	1.464

GEOMETRICAL SPECIFICATIONS

GLASS GEOMETRY

Attribute	Units	Specified Values
Cladding Diameter	μm	125.0 ± 0.7
Cladding non-Circularity	%	≤ 1.0
Core - Cladding Concentricity Error	μm	≤ 0.6

COATING GEOMETRY

Attribute	Units	Specified Values
Coating Diameter	μm	245 ± 10
Coating non-Circularity	%	≤ 5
Coating - Cladding Concentricity Error	μm	≤ 12

MECHANICAL SPECIFICATIONS

Proof Test ¹

The entire spool length is subjected to a tensile proof stress ≥ 0.7 GPa (100 kpsi) ; 1% strain equivalent

¹ Higher proof test available upon request

COATING PERFORMANCE

Attribute	Units	Typical Values
Average Coating Strip Force, unaged and aged ²	N	1 to 3
Peak Coating Strip Force, unaged and aged ²	N	1.3 to 8.9

² Aging at 23°C, 30 days

FIBRE STRENGTH

Attribute	Units	Specified Values
Dynamic Tensile Strength (0.5 meter gauge length), unaged and aged ³	GPa	median > 3.8 (550 kpsi)
Dynamic Fatigue, unaged and aged ³	-	$n_d \geq 18$

³ Aging at 85°C, 85% RH, 30 days

ENVIRONMENTAL SPECIFICATIONS

Environmental test	Test Conditions	Induced attenuation at 1550, 1625 nm (dB/km)
Temperature Cycling	-60°C to +85°C	≤ 0.05
Temperature - Humidity Cycling	-10°C to +85°C, 4-98% RH	≤ 0.05
Water Immersion	30 days ; 23°C	≤ 0.05
Dry Heat	30 days ; 85°C	≤ 0.05
Damp Heat	30 days ; 85°C; 85% RH	≤ 0.05

OTHERS

Attribute	Specification
Length	Multiples of 2.2 km per spool
Coating	Standard Acrylate Coating (Clear)

All measurements in accordance with ITU-T G650 recommendations

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