

RadHard Single-Mode Fiber

(Dose levels up to 10 KGy)



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Prysmian's Singlemode Radhard fiber can be used in moderate irradiative environments (ex. Gamma rays, X-flash, Neutrons, and other high energy charged particles) up to a dose of 10 KGy. The Germanium-doped RadHard SMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs.

Applicable Standards

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

Optical Specifications

Radiation Induced Attenuation (RIA)

Test Conditions	Units	RIA at 1550 nm
Dose = 10 kGy Dose Rate = 0.5 Gy/s Temperature ≈ 28°C	dB/100m	~ 3 (typical)

Attenuation

Attribute	Units	1310 nm	1383 nm ¹	1550 nm	1625 nm
Attenuation	dB/km	≤ 0.36	≤ 0.40	≤ 0.25	≤ 0.30

¹ Including H2-aging according to IEC 60793-2-50, type B-652.D

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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Optical Fiber Sales

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Chromatic Dispersion

Wavelength (nm)	Units	Chromatic Dispersion
In the interval 1285 – 1330	ps/[nm.km]	≤ 3
At 1550	ps/[nm.km]	≤ 18.0
At 1625	ps/[nm.km]	≤ 22.0
Zero Dispersion Wavelength, λ_0	nm	1300 - 1324
Slope (S_0) at λ_0	ps/(nm ² · km)	≤ 0.092

Polarization Mode Dispersion (PMD)

Attribute	Units	Specified Values
PMD Link Design Value ²	ps/√km	≤ 0.06
Max. individual Fiber	ps/√km	≤ 0.1

² According to IEC 60794 -3, Ed 3 (Q=0.01%)

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	1625 nm
Effective group index	-	1.467	1.468	1.468

Geometrical Specifications

Glass Geometry

Attribute	Units	Specified Values
Cladding Diameter	μm	125.0 ± 0.7
Cladding non-Circularity	%	≤ 0.7
Core - Cladding Concentricity Error	μm	≤ 0.5

Coating Geometry

Attribute	Units	Specified Values
Coating Diameter	μm	242 ± 7
Coating non-Circularity	%	≤ 5
Coating - Cladding Concentricity Error	μm	≤ 12

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Mechanical Specifications

Proof Test ³

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

³ Higher proof test available upon request

Coating Performance

Attribute	Units	Typical Values
Average Coating Strip Force, unaged and aged ⁴	N	1 to 3
Peak Coating Strip Force, unaged and aged ⁴	N	1.2 to 8.9

⁴ Aging at 23°C, 30 days

Fibre Strength

Attribute	Units	Specified Values
Dynamic Tensile Strength (0.5 meter gauge length), unaged and aged ⁵	GPa	median > 3.8 (550 kpsi)
Dynamic Fatigue, unaged and aged ⁵	-	$n_d \geq 20$

⁵ Aging at 85°C, 85% RH, 30 days

Environmental Specifications

Environmental test	Test Conditions	Induced attenuation at 15550, 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

Length	Up to 25.2 km per spool
Coating	Standard Acrylate Coating (Clear)

All measurements in accordance with ITU-T G650 recommendations