Prysmian Elite

RadHard Single-Mode Fibre

APPLICABLE STANDARDS

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

Issue Date: September 2024
Supersedes: December 2022

Prysmian Group's Singlemode Radhard fiber can be used in moderate irradiative environments (ex. Gamma rays, X-flash, Neutrons, and other high energy charged particles). The Germanium-doped 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 1550 nm
Dose = 10 kGy Dose Rate = 0.5 Gy/s Temperature ≈ 28°C	dB/100m	< 3 (typical)
Dose = 20 kGy Dose Rate = 2.5 Gy/s Temperature ≈ 25°C	dB/100m	< 4 (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_{ccf})	≤ 1260 nm

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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

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

All measurements in accordance with ITU-T G650 recommendations

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