

RadHard 50 µm BendBright™ Multimode Fibre

(Dose levels up to 10 KGy)



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Prysmian Group's 50 µm RadHard MMF 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 bend-insensitive RadHard MMF has a Germanium-doped core and with its outstanding bending performance, the fibre provides improved fibre and cable performance.

The 50 µm RadHard MMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs.

Applicable Standards

- IEC / EN 60793-2-10: type A1-OM2/OM3/OM4/OM5
- ISO / IEC 11801: Category OM2/OM3/OM4/OM5
- TIA / EIA 492 AAAF

Optical Specifications

Radiation Induced Attenuation (RIA)

Test Conditions	Units	RIA at 1300 nm
Dose = 10 kGy Dose Rate = 1.67 Gy/s Temperature ≈ 28°C	dB/100m	< 7.5 (typical)

Attenuation

Attribute	Units	Specified Values
Attenuation coefficient at 850 nm	dB/km	≤ 2.4
Attenuation coefficient at 1300 nm	dB/km	≤ 0.6

Bandwidth (OFL)

Attribute	Units	OM2	OM3	OM4	OM5
Overfilled Modal Bandwidth at 850 nm	MHz•km	≥ 500	≥ 1500	≥ 3500	≥ 3500
Overfilled Modal Bandwidth at 1300 nm	MHz•km	≥ 500	≥ 500	≥ 500	≥ 500
Overfilled Modal Bandwidth at 953 nm	MHz•km	-	-	-	≥ 1850

Bandwidth (EMB)

Attribute	Units	OM3	OM4	OM5
Effective Modal Bandwidth at 850 nm	MHz•km	≥ 2000	≥ 4700	≥ 4700
Overfilled Modal Bandwidth at 953 nm	MHz•km	-	-	≥ 2470

Numerical Aperture

Numerical aperture	0.200 ± 0.015			
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Macrobending Loss

Conditions	Wavelength	Units	Specified Values
Mandrel Radius = 7.5 mm, 2 Turns	850 / 1300 nm	dB	≤ 0.2 / ≤ 0.5
Mandrel Radius = 15 mm, 2 Turns	850 / 1300 nm	dB	≤ 0.1 / ≤ 0.3
Mandrel Radius = 37.5 mm, 100 Turns	850 / 1300 nm	dB	≤ 0.5 / ≤ 0.5

Chromatic Dispersion

Attribute	Units	Specified Values
Zero Dispersion Wavelength, λ_0	nm	$1297 \leq \lambda_0 \leq 1328$

Backscatter characteristics ¹

Attribute	Conditions	Units	Specified Values
Point Discontinuity ²	850 nm, 1300 nm	dB	≤ 0.1
Irregularities over fibre length	850 nm, 1300 nm	dB	≤ 0.1
Reflections	-	-	Not allowed
Group Index of Refraction	850 nm	(Typical)	1.482 (typical)
Group Index of Refraction	1300 nm	-	1.477 (typical)

¹ OTDR measurement with 0.5 μ s pulse width.

² Mean of bi-directional measurement

Geometrical Specifications

Glass Geometry

Attribute	Units	Specified Values
Core Diameter	μ m	50 ± 2.5
Core non-Circularity	%	≤ 5
Core-Cladding Concentricity Error	μ m	≤ 1.5
Cladding Diameter	μ m	125.0 ± 1.0
Cladding non-Circularity	%	≤ 1

Coating Geometry

Attribute	Units	Specified Values
Coating Diameter	μ m	242 ± 7
Coating non-Circularity	%	≤ 5
Coating-Cladding Concentricity Error	μ m	≤ 10

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	1.3 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 850, 1300 nm (dB/km)
Temperature Cycling	-60°C to +85°C	≤ 0.1
Temperature - Humidity Cycling	-10°C to +85°C, 4-98% RH	≤ 0.1
Water Immersion	30 days ; 23°C	≤ 0.1
Dry Heat	30 days ; 85°C	≤ 0.1
Damp Heat	30 days; 85°C; 85% RH	≤ 0.1

Others

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

All measurements in accordance with ITU-T G650 recommendations