Super RadHard 50 µm MMF with High Temperature Acrylate coating

(Dose levels up to 2 MGy and Optimized for temperature range -60°C to 150°C)

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Prysmian Group's Super RadHard MMF 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) while simultaneously offering high bandwidth.

The fiber can be exposed to very high doses of radiation (~2 MGy), 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 HTA coating protects the fiber in applications exposed to high temperatures, up to 150°C. The F-doped Super RadHard MMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs.

Applicable Standards

The fiber complies with or exceeds IEC 60793-2-10: type A1-OM2 fibre specification, with the exception of Zero-Dispersion Wavelength which is much lower than for regular Ge-doped GI-MMFs, resulting in strongly reduced chromatic dispersion at 850nm.

Optical Specifications

Radiation Induced Attenuation (RIA)

Test Conditions	Units	RIA at 850 / 1300 nm (typical)
Dose = 2 MGy Dose Rate = 1.25 Gy/s Temperature ≈ 45°C	dB/100m	< 4.7 / < 2.2
Dose = 10 kGy Dose Rate = 0.2 Gy/s Temperature ≈ 24°C	dB/100m	< 4.2 / < 0.5

Attenuation

Attribute	Units	Specified Values
Attenuation coefficient at 850 nm	dB/km	≤ 2.6
Attenuation coefficient at 1300 nm	dB/km	≤ 0.6

Optical Fibre Sales

fibersales@prysmiangroup.com
Europe: +31 (0)88 808 4200 3
USA: +1 828-459-8441

Bandwidth (OFL)

Attribute	Units	Specified Values
Overfilled Modal Bandwidth at 850 nm	MHz•km	≥ 500
Overfilled Modal Bandwidth at 1300 nm	MHz•km	≥ 500

Numerical Aperture

Numerical aperture	0.200 ± 0.015	

Macrobending Loss

Conditions	Wavelength	Units	Specified Values
Mandrel Radius = 15 mm, 2 Turns	850 / 1300 nm	dB	≤ 1.0 / ≤ 1.0
Mandrel Radius = 37.5 mm, 100 Turns	850 / 1300 nm	dB	≤ 0.5 / ≤ 0.5

Chromatic Dispersion

Attribute	Units	Typical Values
Zero Dispersion Wavelength, λ_0	nm	1275
Zero Dispersion Slope, S_0	ps/(nm^2 • km)	≤ 0.105

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)	1.472 (typical)
Group Index of Refraction	1300 nm	-	1.466 (typical)

[1] OTDR measurement with 0.5 µs pulse width.
[2] Mean of bi-directional measurement

Geometrical Specifications

Glass Geometry

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

Coating Geometry

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

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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	2.7
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]	-	$n_d \geq 18$

[5] Aging at 85°C, 85% RH, 30 days

Environmental Specifications (Operating Temperature: -60°C to +150°C)

Environmental test	Test Conditions	Induced attenuation at 850, 1300 nm (dB/km)
Temperature Cycling	-60°C to +150°C	≤ 0.2
Temperature - Humidity Cycling	-10°C to +85°C, 4-98% RH	≤ 0.2
Water Immersion	30 days ; 23°C	≤ 0.2
Dry Heat	3000 h ; 150°C	≤ 0.2
Damp Heat	30 days; 85°C; 85% RH	≤ 0.2

Others

Length	Multiples of 2.2 km per spool
Coating	High Temperature Resistant Acrylate Coating (Clear)

All measurements in accordance with ITU-T G650 recommendations

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