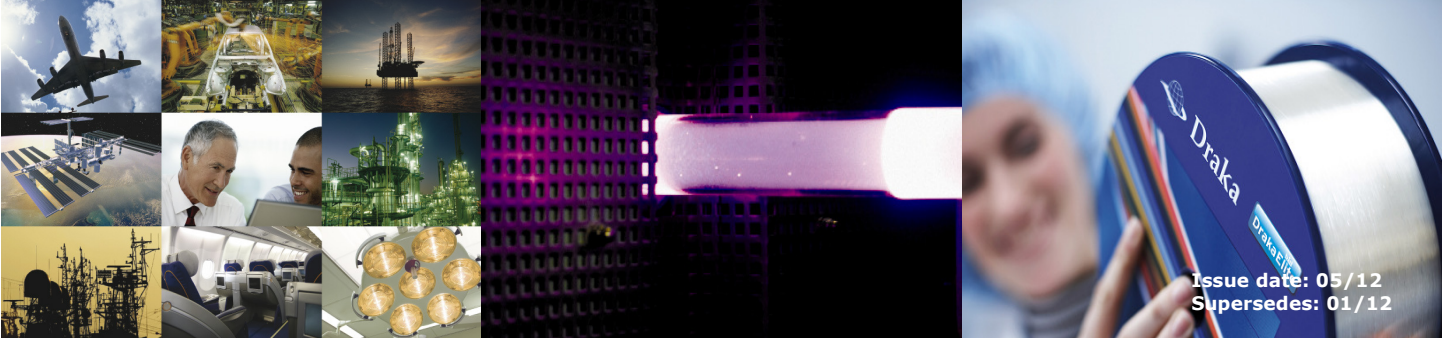


## Super RadHard 50/125 µm GI-Multimode Optical Fibre

Most radiation insensitive, high bandwidth GI-multimode fibre available in the market



Prysmian Group has developed a revolutionary new product as part of its DrakaElite™ specialty radiation hardened (RadHard) fibres portfolio. This 50µm core diameter Super RadHard graded-index multimode fibre (MMF) shows extremely low sensitivity for radiation effects in irradiative environments (e.g. gamma rays, X-flash, neutrons protons) while simultaneously offering high bandwidth.

By combining the excellent performance of the proprietary deposition process (PCVD) with a full Fluorine-doped design, the Radiation Induced Attenuation (RIA) response of this DrakaElite™ Super RadHard MMF is significantly improved.

It allows much more tolerance than standard MIL-PRF-49291 approved Germanium-doped 50µm core diameter MMF particularly for dose levels exposure above 10 Gy. In addition, this Super RadHard MMF exhibits a faster recovery time as compared to standard RadHard MMFs. The benefit of the Super RadHard MMF compared to the standard RadHard MMF increases with the total dose, for example by a factor 20 at 1300nm, for a cumulated dose of 10kGy.

Because each end-user application is defined by specific radiation exposure conditions, assessing RIA performance of different fibres shall be conducted for the same test conditions.

The DrakaElite™ Fluorine-doped Super RadHard MMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs. This fibre complies with or exceeds IEC 60793-2-10 type A1a.1 Optical Fibre Specification, with exception of the Zero-Dispersion wavelength, which is much lower than for regular Germanium-doped GI-MMFs, resulting in strongly reduced chromatic dispersion at 850nm.

### Features

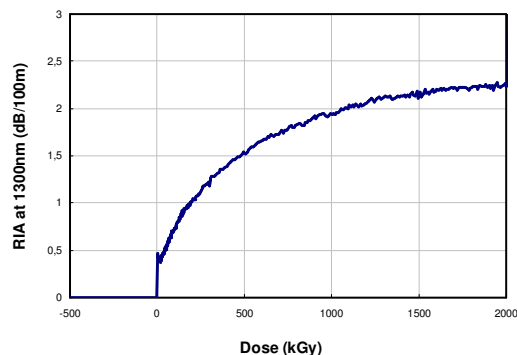
Super RadHard behaviour

Coated with the dual layer UV Acrylate

### Advantages

- Optimized for use in highly irradiative environments
- Strongly improved performance compared to regular Germanium-doped fibres
- Optimized performance in tight-buffer cable applications
- High resistance to micro-bending

Example of RIA for Draka SRH-MMF  
at 1300nm under dose  
rate of 1.25Gy/s up to 2MGy at 45°C



## Super RadHard GI-Multimode Optical Fibre 50/125 µm

Most radiation insensitive, high bandwidth GI-multimode fibre available in the market

Product Type: Super RadHard 50 / 125 / 242 µm GI-Multimode Fibre (SRH-MMF)  
Coating Type: Dual Layer Primary Coating (DLPC9)

Issue date: 05/12  
Supersedes: 01/12

Characteristics	Conditions	Specified Values	Units
<b>Optical Specifications (Uncabled fibre)</b>			
Attenuation Coefficient	850 nm	≤ 2.5 (typical ≤ 2.2)	dB/km
	1300 nm	≤ 0.5	dB/km
Min. Overfilled Modal Bandwidth <sup>1</sup>	850 nm / 1300 nm	500 / 500 <sup>2</sup>	MHz.km
Numerical Aperture		0.200 ± 0.015	
<b>Chromatic Dispersion</b>			
Zero Dispersion Wavelength, λ <sub>0</sub>	typical	1275	nm
Zero Dispersion Slope, S <sub>0</sub>		≤ 0.105	ps/nm <sup>2</sup> .km
Bending Loss	850 nm, 1300 nm / 2 turns, 7.5 mm radius 850 nm, 1300 nm / 2 turns, 15 mm radius	TBD	dB
<b>Backscatter Characteristics<sup>3</sup></b>			
Point Discontinuity <sup>4</sup>	850 nm, 1300 nm	≤ 0.1	dB
Irregularities over fibre length	850 nm, 1300 nm	≤ 0.1	dB
Reflections		Not allowed	
Group Index of Refraction (Typ.)	850 nm	~1.482 (f.f.s)	
	1300 nm	~1.477 (f.f.s.)	
<b>Geometrical Specifications</b>			
Core Diameter		50 ± 2.5	µm
Core Non-Circularity		≤ 6	%
Core/Cladding Concentricity Error		≤ 1.5	µm
Cladding Diameter		125.0 ± 1.0	µm
Cladding Non-Circularity		≤ 1	%
Coating Diameter		242 ± 5	µm
Coating Non-Circularity		≤ 5	%
Coating/Cladding Concentricity Error		≤ 12.5	µm
Length	Standard lengths up to	Multiples of 2.2	km
<b>Mechanical Specifications</b>			
Proof Test	Off line	> 0.7 (100)	GPa (kpsi)
Dynamic Tensile Strength (median value)	0.5 meter gauge length unaged and aged <sup>5</sup>	> 3.8 (550)	GPa (kpsi)
Fatigue Parameter (Typical)	Dynamic fatigue, unaged and aged <sup>5</sup>	n <sub>d</sub> > 18	
Coating Strip Force	Average strip force, unaged and aged <sup>6</sup>	1 to 3	N
	Peak strip force, unaged and aged <sup>6</sup>	1.3 to 8.9	N
<b>Environmental Specifications</b>			
Temperature Cycling	850 nm, 1300 nm; -60°C to +85°C	≤ 0.2	dB/km
Temperature-Humidity Cycling	850 nm, 1300 nm; -10°C to +85°C, 4-98% RH	≤ 0.2	dB/km
Water Immersion	850 nm, 1300 nm; 23°C, 30 days	≤ 0.2	dB/km
Dry Heat	850 nm, 1300 nm; 85°C, 30 days	≤ 0.2	dB/km
Damp Heat	850 nm, 1300 nm; 85°C; 85% RH, 30 days	≤ 0.2	dB/km
<b>Typical Radiation Induced Attenuation (RIA)</b>			
Radiation Induced Attenuation	1300 nm / ~45°C dose=2 MGy / dose rate =1.25 Gy/s	~2.2	dB/100m

- 1). The modal bandwidth is linearly normalized to 1 km, according to IEC 60793-2-10.
- 2). Higher modal bandwidth values (e.g. 1000/1000 MHz.km) are under development.
- 3). OTDR measurement with 0.5 µs pulse width.
- 4). Mean of bi-directional measurement.
- 5). Aging at 85°C, 85% RH, 30 days.
- 6). Aging: 23°C, 0°C and 45°C;  
30 days at 85°C and 85% RH;  
14 days water immersion at 23°C.

