

Specialty Fiber



Issue date: 12/09
Supersedes: 09/09

Product Type: Super RadHard G.652.B
Coating Type: Dual Layer Primary Coating (DLPC9)

For specific radiative environments

- Military/Defense/Aerospace
- Industrial networks
- Nuclear power plants and high energy physics laboratories
- Sensors

Draka Communications has developed a revolutionary new product in the specialty family of DrakaElite™ radiation hardened fibers. This single-mode fiber shows extremely low sensitivity for radiation effects in radiative environments (e.g. gamma rays, X-flash, neutrons protons). This Draka's Super RadHard single-mode fiber is developed according to ITU-T Rec. G.652.B. with optimum performance at 1310 nm.

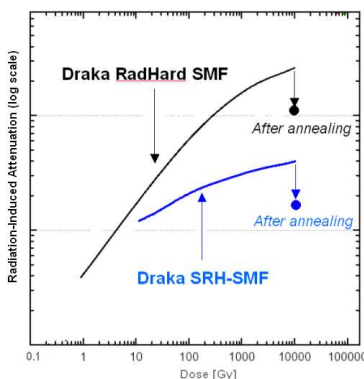
This Fluorine-doped DrakaElite™ Super RadHard fiber is more radiation-resistant than Draka's standard RadHard and MIL-49291 approved single-mode fiber for dose levels as low as or larger than 10Gy. The benefit of the Super RadHard SMF compared to the standard RadHard SMF increases when increasing the total dose. At 1310nm, after 10kGy at a dose rate of 0.2Gy/s at room temperature, the Super RadHard SMF is 6 times better than Draka's standard RadHard SMF. After annealing, the difference goes up to a factor near to 10.



Value Innovation is a way of looking at the world. How we can help our customers do more, make more, save more, achieve more.

Each application area is featured by specific radiative environment. This is important, as the Radiation Induced Attenuation (RIA) of each fiber strongly depends on the radiation conditions.

DrakaElite™ Super RadHard SMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs. The fiber complies with or exceeds the ITU-T Recommendation G.652.B, the IEC Int. Standard 60793-2-50 type B.1.1 Optical Fiber Specification and Telcordia GR-20-CORE.



Features	Benefits
Super RadHard behavior	<ul style="list-style-type: none"> • Optimized for use in highly radiative environments • Strongly improved performance compared to regular Ge-doped fibers
Coated with the dual layer UV Acrylate DLPC9	<ul style="list-style-type: none"> • Optimized for tight-buffer cable applications • High resistance to micro-bending

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Optical Specifications

Attenuation

Attenuation at 1310 nm	≤ 0.4 dB/km
Attenuation at 1550 nm	≤ 0.3 dB/km
<i>Other values available on request</i>	

Attenuation vs. Wavelength

Maximum attenuation change over the window from reference			
Min	Max	Reference λ (nm)	Difference (dB/km)
1285	1330	1310	≤ 0.04
1525	1575	1550	≤ 0.03

Point discontinuities

No point discontinuity greater than 0.05 dB at 1310 nm and 1550 nm.

Attenuation with Bending

Number of Turns	Mandrel Radius (mm)	Wavelength (nm)	Induced Attenuation (dB)
100	25	1310	≤ 0.05
100	25	1550	≤ 0.05
100	30	1625	≤ 0.05

Cutoff Wavelength

Cable Cutoff wavelength (λ_{ccf})	≤ 1260 nm
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Mode Field Diameter

Wavelength (nm)	MFD (μ m)
1310	9.0 ± 0.4
1550	10.1 ± 0.5

Chromatic Dispersion

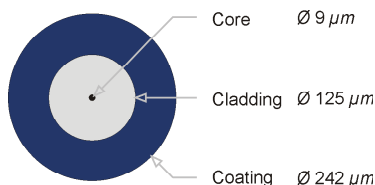
Wavelength (nm)	Chromatic Dispersion (ps/[nm.km])
1285 – 1330	≤ 3
1550	≤ 18.0
1625	≤ 22.0

Zero Dispersion Wavelength (λ_0):	1300 - 1324 nm
Slope (S_0) at λ_0 :	≤ 0.092 ps/(nm ² .km)

Polarization Mode Dispersion (PMD)

PMD Link Design Value* (ps \sqrt km)	≤ 0.20
Max. Individual Fiber (ps \sqrt km)	≤ 0.20

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



Geometrical Specifications

Glass Geometry

Cladding Diameter	125.0 ± 0.7 μ m
Core/Cladding Concentricity Error	≤ 0.5 μ m
Cladding Non-Circularity	≤ 0.7 %
Fiber Curl (Radius)	≥ 4 m

Coating Geometry

Coating Diameter	242 ± 10 μ m
Coating/Cladding Concentricity Error	≤ 12 μ m
Coating Non-Circularity	≤ 5.0 %
Lengths	1.1, 2.2 km and multiples

Mechanical Specifications

Proof Test

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

Dynamic tensile strength (0.5 meter gauge length):	
Aged** and unaged median:	> 3.8 GPa (550 kpsi)

Dynamic and Static Fatigue

Dynamic fatigue, unaged and aged**	$n_d \geq 20$
Static fatigue, aged**	$n_s \geq 23$

** Aging at 85°C, 85% RH, 30 days

Coating Performance

Coating strip force unaged and aged***:	
- Average strip force:	1 N to 3 N
- Peak strip force:	1.3 N to 8.9 N

*** Aging:

- 0°C and 45°C
- 30 days at 85°C and 85% RH
- 14 days water immersion at 23°C
- Wasp spray exposure (Telcordia)

Environmental Specifications

Environmental Test	Test Conditions	Induced Attenuation at 1310, 1550 nm (dB/km)
Temperature cycling	-60°C to 85°C	≤ 0.05
Temperature-	-10°C to 85°C	≤ 0.05
Humidity cycling	4-98% RH	
Water Immersion	14 days; 23°C	≤ 0.05
Dry Heat	30 days; 85°C	≤ 0.05
Damp Heat	30 days; 85°C; 85% RH	≤ 0.05

How can we be of service to you?

Value Innovation is a way of looking at the world. How can we help our customers do more, make more, save more, achieve more?

Take DrakaElite™. Based on our proprietary manufacturing process and our control of all technological building blocks, we offer an extensive portfolio of specialized optical fibers that have been designed, developed, manufactured

and tested for every environment. Whether you want to guide, amplify, transmit, process, control or sense light, Draka has the fiber you need, whatever your environment. And if for some reason we don't have exactly what you need, well, we'll just make it.

That's Value Innovation in action.

Draka Communications

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The Draka Communications policy of continuous improvement may cause in changed specifications without prior notice