

MIL-Spec Radiation Hard Fibers

MIL-PRF-49291/6C MMF 62.5/125/500

MMF 62.5/125/500 μ m MIL-Spec Radiation Hard Multimode Fiber (PIN MIL-PRF-49291/6-05) is part of j-fiber's series of radiation hard multimode fibers which have been qualified and approved by the Defense Logistic Agency (DLA) in accordance with the U.S. Military MIL-PRF-49291 standard. These fibers have been specifically designed to withstand the hazards of radiation threatened and harsh environments in military and aerospace applications. j-fiber's series of MIL-Spec Radiation Hard Multimode fibers are offered in graded index configurations and in core sizes of 50 μ m and 62.5 μ m.

Features and Benefits

- Lowest attenuation changes under radiation exposure
- High bandwidth, suitable for high data rates
- Easy handling and splicing

MIL-Specification

In compliance with MIL-PRF-49291/6-05 (MMF 62.5/125/500)

Performance Characteristics

	MIL-PRF-49291/6-05	Explanation
Type	I	Multimode
Class	I	graded index
Size	IV	62.5/125
Composition	A	Glass & Glass Silica
Wavelength	B	850 & 1300

Optical Characteristics

Parameter	Specified Values	Typical values	Unit
Attenuation @ 850/1300nm	3.5/1.0	2.8/0.7	dB/km
Attenuation uniformity @ 1300nm	0.2	$\leq \square 0.1$	dB
OFL Bandwidth @ 850/1300nm	300/600	300/600	MHz-km
RML Bandwidth @ 850/1300nm	385/700	385/700	MHz-km
Numerical Aperture @ 850nm	0.275 ± 0.015	0.275 ± 0.015	
Zero Dispersion Wavelength λ_0	$1320 \leq \lambda_0 \leq 1365$	$1320 \leq \lambda_0 \leq 1365$	nm
Zero Dispersion Slope S_0	≤ 0.11	≤ 0.10	ps/nm ² ·km
Macrobending Attenuation @ 1300nm	≤ 0.5	≤ 0.1	dB

¹Radius 3.8 ± 0.05 cm, 100 turns

For further information about our Multimode Fiber and other j-fiber products and services, please contact us:

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Geometrical Characteristics

Parameter	Specified Values	Typical values	Unit
Core Diameter	62.5 ± 3	62.5 ± 2.5	μm
Core Non-Circularity	≤ 6.0	≤ 5.0	%
Core/Clad Concentricity Error	≤ 4	≤ 1.5	μm
Clad Diameter	125 ± 1	125 ± 1	μm
Cladding Non-Circularity	≤ 2.0	≤ 1.0	%
Coating Diameter	500 ± 25	500 ± 15	μm
Coating /Clad Concentricity Error	≤ 15.0	≤ 15.0	μm
Overall Coating Concentricity Ratio (OCCR)	≥ 0.84	≥ 0.90	

Mechanical Characteristics

Parameter	Specified Values	Typical values	Unit
Length	≥ 1.1	1.1-8.8 ¹	km
Fiber mass/unit length	≤ 0.25	≤ 0.25	kg/km
Tensile Proof	690	≥ 690	MPa
Dynamic Tensile Strength			
Initial	≥ 3.2	≥ 3.8	GPa
Aged	≥ 1.75	≥ 3.03	GPa
Operating Temperature Range	-46 to +85	-60 to +85	°C
Non-operating Temperature Range	-62 to +85	-62 to +85	°C
Storage Temperature Range	-62 to +85	-62 to +85	°C
Coating Strip Force	1.8 ≤ F ≤ 20.0	4.0	N

¹ Lengths up to 12.6 km available upon request

Performance under Irradiation

Steady state gamma radiation test conditions		
Test temperature [°C]	Dose rate	Total dose (rad (Si))
-28 ± 2	(50 +0, -20) rad (Si)/sec	Classified
25 ± 2		
85 ± 2		

The test reports are available upon request.

j-fiber 62.5/125/500 MIL-Spec Radiation Hard Fibers are certified to meet the US Navy and Army irradiation performance requirements.

Environmental Characteristics

Parameter	Specified Values	Typical values	Unit
Change in optical transmittance @	1300	850/1300	nm
Change of Temperature Attenuation increase, -46°C to +85°C	≤ 0.5	≤ 0.20	dB/km
Dry Heat Attenuation increase, 30 days at 85°C	≤ 0.5	≤ 0.20	dB/km
Damp Heat Attenuation increase, 30 days at 85°C/85% R.H.	≤ 0.5	≤ 0.20	dB/km
Water Immersion Attenuation increase, 30 days in 23°C water	≤ 0.5	≤ 0.20	dB/km

Fiber Qualification

All j-fiber MIL-Spec Radiation Hard fibers comply with or exceed the MIL-PRF-49291 U.S. Military Specification, the ITU recommendation G.651, or the IEC 60793-2-10 Optical Fiber Specifications. Each fiber is 100% quality measured according to IEC 60793. The irradiation performance of the fiber has been tested according to TIA/EIA 455-64, Procedure for Measuring Radiation-Induced Attenuation in Optical Fibers.

Ordering Information

To order j-fiber MIL-Spec Radiation Hard Multimode optical fiber please call, fax or email us and specify the following parameters:

Fiber Type:	j-fiber MIL-Spec Radiation Hard Multimode Fiber 62.5/125/500μm
MIL-Spec:	PRF-49291/6-05
Desired Attenuation, Bandwidth:	@ 850nm/1300nm
Fiber Quantity:	kms
Other:	desired ship date, reel length, special requests

All fibers and preforms are subject to j-fiber's ongoing process and quality improvement programs ensuring excellent performance and high reliability. We reserve the right to make changes to the above specification when required from the Qualification Authority (DLA).

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j-fiber GmbH is a MIL-STD 790 certified facility.