j-fiber Jena

Member of LEONI Group

MIL-Spec Radiation Hard Fibers
MIL-PRF-49291/1B MMF 50/125/500

MMF 50/125/500μm MIL-Spec Radiation Hard Multimode Fiber (PIN MIL-PRF-49291/1-02) is part of j-fiber's series of radiation hard multimode fibers which have been qualified and approved by the U.S. Defense Supply Center, Columbia (DSCC) 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 50μm and 62.5μm.

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-49291/1-02 (MMF 50/125/500)

Performance Characteristics

	MIIL-PRF-49291/1-02	Explanation
Type	I	Multimode
Class	I	graded index
Size	III	50/125
Composition	A	Glass & Glass Silica
Wavelength	B	850 & 1300

Optical Characteristics

Parameter	Specified Values	Typical values	Unit
Attenuation @ 850/1300nm	3.5/1.0	2.5/0.6	dB/km
Attenuation uniformity @ 1300nm	≤ 0.2	≤ 0.1	dB
Transient Attenuation @ 1300nm	≤ 1.5	≤ 0.5	dB/km
OFL Bandwidth @ 850/1300nm	500/500	500/500	MHz·km
Numerical Aperture @ 850nm	0.200 ± 0.015	0.200 ± 0.015	
Zero Dispersion Wavelength$_0$	$1295 \le \lambda_0 \le 1330$	$1295 \le \lambda_0 \le 1330$	nm
Zero Dispersion Slope S_0	≤ 0.11	≤ 0.1	ps/nm^2·km
Macrobending Attenuation @1300nm[1]	≤ 0.5	≤ 0.4	dB

[1]Radius 3.8 ± 0.05 cm, 100 turns

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

j-fiber GmbH
Im Semmicht 1
D-07751 Jena, Germany
Tel.: +49-3641-352 100
Fax: +49-3641-352 101
Email: info@j-fiber.com
Internet: www.j-fiber.com

Geometrical Characteristics

Parameter	Specified Values	Typical values	Unit
Core Diameter	50 ± 3	50 ± 2.5	µm
Core Non-Circularity	≤ 6.0	≤ 5.0	%
Core/Clad Concentricity Error	≤ 1.5	≤ 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 Aged	 ≥ 3.2 ≥ 1.75	 ≥ 3.8 ≥ 3.03	 GPa GPa
Operating Temperature Range	-55 to +85	-60 to +85	°C
Nonoperating 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 12.6km available upon request

Performance under Irradiation

The nuclear radiation resistance characteristics of this optical fiber are classified. The fiber passed the Navy QPL radiation requirements at –28, 25, and 85°C by measurement of the peak induced losses and recovery behaviour. The fibers pass the Army QPL radiation requirements by data analysis and extrapolation.

The tests were performed at US Naval Research Lab, 4555 Overlook Ave., SW, Washington, DC 20375

The test reports are available upon request.

Environmental Characteristics

Parameter	Specified Values	Typical values	Unit
Change in optical transmittance @	1300	850/1300	nm
Change of Temperature Attenuation increase, -55°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 50/125/500µm
MIL-Spec:	PRF-49291/1-02
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 (DSCC).

DB-FPR-001-00-0608

Issued June 2008

Officially registered facility according to EWG No. 761/2001

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