

METRIC

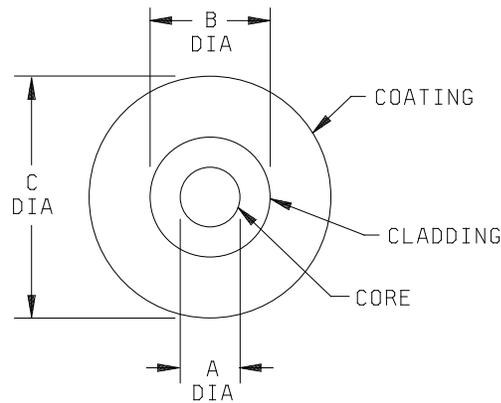
MIL-PRF-49291/1B
w/Amendment 2
25 July 2013
SUPERSEDING
MIL-PRF-49291/1B
w/Amendment 1
25 September 2006

PERFORMANCE SPECIFICATION SHEET

FIBER, OPTICAL, TYPE I, CLASS I, COMPOSITION A, SIZE III,
WAVELENGTH B, RADIATION RESISTANT (METRIC)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

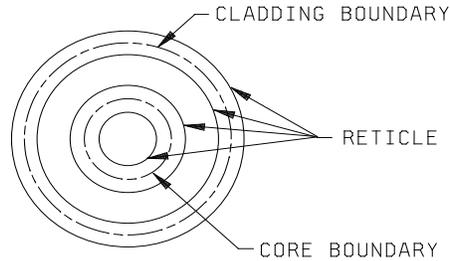
The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-49291.



Fiber	PIN	Dimensions		
		A (μm)	B (μm)	C (μm)
Standard	M49291/1-01	50.0 ± 3	125 ± 1	245 ± 10
Standard	M49291/1-02	50.0 ± 3	125 ± 1	500 ± 25

FIGURE 1. Dimensions and configuration of optical fiber construction.

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Circle (solid)	Diameter (μm)
Inner	47.0
Second	53.0
Third	124.0
Fourth	126.0

FIGURE 2. Tolerance fields.

DIMENSIONS AND CONFIGURATION:

Diameter: See figures 1 and 2. (Diameter requirements are based on selecting fibers with end-points tolerances of $125 \pm 1 \mu\text{m}$ from production with a $125 \pm 2 \mu\text{m}$ tolerance.)

Ovality: The fiber core and cladding ovality tolerances shall be as specified in Figure 2.
Core: $\pm 3 \mu\text{m}$.
Cladding: $\pm 1 \mu\text{m}$.

Offset: Core-to-cladding: $\leq 1.5 \mu\text{m}$.
Fiber-to-coating: coating-cladding concentricity error $\leq 12.5 \mu\text{m}$.

Splices: Not allowed.

Fiber mass/unit length: 0.1 kg/km maximum for 250 μm coating.
0.25 kg/km maximum for 500 μm coating.

Tensile proof: 690 MPa.

Change in optical transmittance: Measurements to be made at $1300 \pm 20 \text{ nm}$.

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Maximum attenuation rate: 3.5 dB/km at 850 ± 20 nm
1.0 dB/km at 1300 ± 20 nm

Numerical aperture: 0.20 ± 0.015 at $850 \text{ nm} \pm 25 \text{ nm}$.

Bandwidth: ≥ 500 MHZ-km at $1300 \text{ nm} \pm 20 \text{ nm}$.
 ≥ 500 MHZ-km at $850 \text{ nm} \pm 20 \text{ nm}$.

Macrobend attenuation: Performed at 1300 ± 20 nm.

Chromatic dispersion: The zero dispersion wavelength (L_0) shall be not less than 1295 nm and not greater than 1340 nm. The dispersion slope at the zero dispersion wavelength shall not be greater than 0.105 ps/nm²km from not less than 1295 nm and not greater than 1310 nm and shall not be greater than 0.000375(1590- L_0) ps/nm²km from not less than 1310 nm and not greater than 1340 nm.

Transient Attenuation: ≤ 1.5 dB at 1300 nm.

Light launch conditions: In accordance with TIA-455-78.

Wavelength: 1300 ± 25 nm.

Source type: LED with full width at half maximum (FWHM) spectral width ≤ 160 nm.

ENVIRONMENTAL:

Temperature range:

Operating: -55° C to $+85^\circ$

Nonoperating: -62° C to $+85^\circ \text{ C}$

Storage: -62° C to $+85^\circ \text{ C}$

Fluid immersion aging: Not applicable.

Nuclear radiation resistance: The nuclear radiation resistance characteristics of this optical fiber are classified and are contained in an appendix to this specification. Application to receive this appendix must be made through the US Army Communications- Electronics Command, ATTN: AMSEL-LC-LEO-E-EP, Fort Monmouth, NJ 07703-5023. Information concerning security clearance classification and "need to know" must be detailed in the request.

Fungus: Applicable.

Dynamic tensile strength: Applicable.

QUALITY CONFORMANCE:

In group A testing length may be measured using mechanical methods.

In group C testing the mechanical stripability test may be omitted if the optical fiber coatings have not changed from when the mechanical stripability test was last performed. The manufacturer shall provide a certificate of compliance for mechanical stripability in the group C test report.

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Part or identifying number (PIN). (See figure 1 and table I):

TABLE I. Supersession data.

PIN	Superseding
M49291/1-01	D49291/1-01
M49291/1-02	None

Qualification by similarity:

Manufacturers who are qualified under this specification sheet and whose optical fiber with a change in the coating (composition, thickness, etc.) passes the tests in table II specified herein, are qualified under this specification sheet for the optical fiber with changed coating.

TABLE II. Qualification by similarity for a change in coating.

Test
Visual inspection
Mechanical inspection
Fiber mass/unit length
Attenuation rate
Transient attenuation
Macrobend attenuation
Coating diameter
Mechanical stripability
Dynamic tensile strength
Thermal shock
Storage temperature
Temperature humidity cycling
Temperature cycling
Life aging
Fungus resistance

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Amendment notations: Marginal notations of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Referenced documents. In addition to MIL-PRF-49291, this specification sheet references the following document:

TIA-455-78

Custodians:

Army - CR
Navy - SH
Air Force - 85
DLA - CC
NASA - NA

Preparing activity:
DLA - CC

(Project 6010-2008-005)

Review activities:

Navy - AS
Air Force - 13, 19, 93, 99
DIA - DI

NOTE: The activities listed above were interested in this document on the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>