



AEROSPACE STANDARD

AS8438™

Issued

2021-11

Terminus, Fiber Optic, Harsh Environment,
General Specification

RATIONALE

The aerospace industry requires precise standards to support the unprecedented growth of fiber optic technology. It is meant to address the needs of current and future demand for fiber optic applications and emerging photonic technologies that are being deployed on aerospace fiber optic network infrastructures. AS8438 provides details of test methods that should be taken into consideration when qualifying fiber optic termini with the product specifications (slash sheets) providing pass/fail criteria, optical and physical intermatability, and interoperability requirements for fiber optic termini in circular, rectangular, and modular type aerospace connectors.

TABLE OF CONTENTS

1.	SCOPE	3
2.	REFERENCES	3
2.1	Applicable Documents	3
2.1.1	SAE Publications	3
2.1.2	ANSI Accredited Publications	3
2.1.3	Comité Européen de Normalisation (CEN) Publications	3
2.2	Related Publications	3
2.2.1	SAE Publications	3
2.2.2	U.S. Government Publications	4
2.3	Definitions	4
2.3.1	Mechanical Tests	4
2.3.2	Environmental Tests	5
2.3.3	Optical Tests	6
3.	EYE SAFETY	6
4.	FIBER OPTIC TERMINUS	6
5.	GENERAL DIMENSIONS	7
5.1	Fiber Type Identification Markings	7
5.2	Terminus Cable Interface	7
6.	MATERIAL AND WORKMANSHIP	7
6.1	Materials	7
6.2	Workmanship	7
7.	TEST REQUIREMENTS	8
7.1	Mechanical Test Requirements	8
7.2	Environmental Test Requirements	9

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Documents

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7.3	Interoperability	10
7.4	Optical Requirements.....	10
8.	QUALIFICATION TESTING	10
9.	CLEANING	10
10.	TOOLING	10
11.	TERMINATION INSTRUCTIONS	11
12.	DESIGNATION	11
13.	NOTES	11
13.1	Revision Indicator	11
Table 1	Cable interface code	7
Table 2	Test requirements	8
Table 3	Mechanical test requirements: single fiber cable terminus (terminated).....	8
Table 4	Mechanical test requirements: single terminus (terminated) installed in connector	8
Table 5	Mechanical test requirements: single or multiple termini (terminated) installed in single or multi-pin connector.....	9
Table 6	Environmental test requirements	9
Table 7	Interoperability	10
Table 8	Optical test requirements	10

1. SCOPE

This document provides details of test methods that should be taken into consideration when qualifying fiber optic termini to the product specifications (slash sheets). The product specifications (slash sheets) provide pass/fail criteria, optical and physical intermatability, and interoperability requirements for fiber optic termini in circular, rectangular, and modular type aerospace connectors.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AIR6282 Fiber Optic Environment Test Methods Cross Reference Document

ARP6283 In-Service Fiber Optic Inspection, Evaluation and Cleaning, Best Practices, Physical Contact Termini

AS9133 Qualification Procedure for Aerospace Standard Products

2.1.2 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ANSI Spec Z136.1 American National Standard for Safe Use of Lasers

2.1.3 Comité Européen de Normalisation (CEN) Publications

Copies of these publications are available from CEN, Avenue Marnix 17, B-1000 Brussels.

EN 2591-6402 Elements of electrical and optical connection - Test methods - Part 6402: Optical elements - Shock

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AIR1351 Manufacturers' Identification of Aerospace Electrical and Electronic Wiring Devices and Accessories

AIR6031 Fiber Optic Cleaning

AS5382 Aerospace Cable, Fiber Optic

AS5675 Characterization and Requirements for New Aerospace Fiber Optic Cable Assemblies - Jumpers, End Face Geometry, Link Loss Measurement, and Inspection

AS8050 Connectors, Fiber Optic, Advanced, Circular, Modular or Rectangular, Plug and Receptacle, Harsh Environment, Removable Termini, General Specification for

2.2.2 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-DTL-38999 Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded, and Breech Coupling), Environment Resistant, Removable Crimp and Hermetic Solder Contacts

MIL-DTL-64266 Connectors, Fiber Optic Circular and Rectangular, Plug and Receptacle Style, Multiple Removable Genderless Termini, Environment Resisting, General Specification for

MIL-PRF-29504 Termini, Fiber Optic Connector, Removable, General Specification for

MIL-STD-202 Electronic and Electrical Component Parts

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests

MIL-STD-1678 Fiber Optics Test Methods and Instrumentation

2.3 Definitions

2.3.1 Mechanical Tests

AXIAL LOAD TEST: Method of assessing the ability of a mated pair of optical connection elements (including permanent connections), optical termini, and fiber optic couplers to withstand axial loads without mechanical or optical damage.

CIRCULAR RUNOUT: Method for measuring a two-dimensional geometric tolerance that controls the form, orientation, and location of multiple cross sections of a cylindrical part as it rotates.

CONNECTOR COUPLING FORCES: Method to measure the forces or torques which are required to fully couple or uncouple an optical connector set.

EFFECTIVENESS OF CABLE ATTACHMENT (CABLE CYCLIC FLEXING): Methods of checking the effectiveness of cable attachment in the cyclic flexing mode for optical connection elements (including permanent connections), optical termini, and fiber optic couplers.

EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TORSION): Method of checking the effectiveness of cable attachment in the torsion mode for optical connection elements (including permanent connections), optical termini, and fiber optic couplers.

EFFECTIVENESS OF CABLE ATTACHMENT (TERMINUS PULL-OFF): Method of checking the effectiveness of cable attachment in the pulling mode for optical connection elements (including permanent connections), optical termini, and fiber optic couplers.

ENDURANCE AT TEMPERATURE: Method of checking the ability of optical connection elements (including permanent connections) and fiber optic couplers to withstand elevated temperatures.

EXAMINATION OF DIMENSIONS AND MASS/WEIGHT: Method for checking the dimensions and mass of elements of fiber optic connectors, termini, and other interconnecting components.

FUNGUS RESISTANCE: Method of determining the effect of fungus growth on optical connection elements (including permanent connections), optical termini, and fiber optic couplers.

IMPACT: Method of determining the impact resistance on a hard surface of optical connection elements (including permanent connections), optical termini, and fiber optic couplers.