



AEROSPACE STANDARD

AS8050™

Issued

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

RATIONALE

The aerospace industry requires precise standards to support the unprecedented growth of fiber optic technology in the aerospace industry. It is meant to address the needs of today's and future demand for fiber optic applications and emerging photonic technologies being deployed on aerospace fiber optic network infrastructures. To address the shortfall of past technologies and provide the platform for future growth, the fiber optic infrastructure has to be able to support current and foreseeable technology requirements. AS8050 is intended to provide optical and physical intermatability and interoperability requirements for fiber optic circular, modular, and rectangular connectors in harsh environment applications.

TABLE OF CONTENTS

1.	SCOPE	4
2.	REFERENCES	4
2.1	Applicable Documents	4
2.1.1	SAE Publications	4
2.1.2	U.S. Government Publications	4
2.1.3	Non-Government Publications	4
2.1.4	Telecommunications Industries Association (TIA)	4
2.1.5	ANSI Accredited Publications	5
2.1.6	ASD-STAN Publications	5
2.1.7	ISO Publications	5
2.2	Related Publications	5
2.2.1	SAE Publications	5
2.2.2	U.S. Government Publications	5
2.2.3	Non-Government Publications	5
2.2.4	Telecommunications Industries Association (TIA)	6
2.2.5	ASTM Publications	6
2.2.6	ARINC Publications	6
3.	EYE SAFETY	6
4.	TECHNICAL SPECIFICATION	6
4.1	Description	6
5.	REQUIREMENTS	6
5.1	Qualification	6
5.1.1	Quality	7
6.	MATERIALS	7
6.1	Metals	7

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Documents

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6.1.1	Dissimilar Metals	7
6.1.2	Components	7
6.1.3	Magnetic Permeability	7
7.	DESIGN AND CONSTRUCTION	7
7.1	Fiber Optic Terminus	7
7.2	Insert Design	8
7.3	Sealing	8
7.4	Protective Caps	8
7.5	Connector Shell	8
7.6	Color Banding	9
7.7	Jam Nut Mounting Receptacles	9
7.8	Coupling	9
7.9	Locking Circular Connectors	9
7.10	Interchangeability	10
7.11	Terminus and Contact Location Identification	10
7.12	Hydrolytic Stability	10
8.	TEST METHODS	10
8.1	Mechanical Tests	10
8.2	Environmental Tests	11
8.3	Optical Tests	13
9.	QUALITY ASSURANCE PROVISIONS	13
9.1	Test Equipment and Examination Facilities	13
9.1.1	Responsibility for Examination	13
9.1.2	Responsibility for Compliance	13
9.2	Reliability Assurance Program	13
9.2.1	Classification of Examination	14
9.2.2	Examination Conditions	14
9.2.3	Qualification Examination	14
9.2.4	Initial Qualification Examination Routine and Test Report Submittal	14
9.2.5	Sample Size	14
9.2.6	Preparation of Samples	14
10.	QUALIFICATION TESTS	14
10.1	Specimens	14
10.1.1	Preparation of Specimens	15
10.2	Program of Qualification Tests	15
10.3	Program of Quality Conformance Tests	18
10.3.1	Failures	18
10.3.2	Retention of Qualification	18
10.3.3	Quality Conformance Examination	18
10.3.4	Examination of Product for Delivery	18
10.3.5	Periodic Examination	19
10.3.6	Failures of Groups A, B, or C	20
11.	POST-TEST SUMMARY	20
12.	PACKAGING	20
12.1	Packaging Requirements	20
12.2	Ordering Data	20
12.2.1	Protective Caps	21
13.	INTENDED USE	21
13.1	Ordering Data	21
14.	CLEANING INSTRUCTIONS	21

15.	TOOLING	21
16.	TERMINATION INSTRUCTIONS	21
17.	DESIGNATION	22
18.	NOTES	22
18.1	Revision Indicator	22
Table 1	Mechanical test methods	11
Table 2	Environmental test methods	12
Table 3	Optical test methods	13
Table 4	Test specimens	14
Table 5	Program of qualification tests	16
Table 6	Group B examination	19

1. SCOPE

The AS8050 master document contains general information for qualification of aerospace fiber optic, circular, modular, and rectangular connectors as part of a fiber optic interconnect assembly comprising of a connector, fiber optic cable, and fiber optic terminus. The product specifications (slash sheets) contain dimensional, mechanical, and operating performance requirements for aerospace fiber optic, circular, and rectangular connectors. The product specifications (slash sheets) reference associated aerospace fiber optic termini and cables suitable for use with AS8050 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 the 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 Harsh Environment Test Methods Cross Reference Document
ARP6283	In-Service Fiber Optic Inspection, Evaluation and Cleaning, Best Practices, Physical Contact Termini
AS3582	Packing, Preformed – O-Ring Seal AMS3304
AS9100	Quality Management Systems – Requirements for Aviation, Space, and Defense Organizations

2.1.2 U.S. Government Publications

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

MIL-DTL-38999	Connectors, Electrical, Circular
MIL-STD-889	Dissimilar Metals
MIL-STD-1678	Fiber Optic Cabling Systems Requirements and Measurements

2.1.3 Non-Government Publications

The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the document, which are DoD adopted, are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation.

2.1.4 Telecommunications Industries Association (TIA)

Available from 1320 N. Courthouse Rd., Suite 200 Arlington, VA 22201, Tel: 703-907-7700, www.tiaonline.org.

TIA RS-359	Standard Colors for Color Identification and Coding (ANSI C-83.1-1973)
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2.1.5 ANSI Accredited Publications

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

ANSI Y14.5 Dimensioning and Tolerancing

ANSI Z136.4 Recommended Practice for Laser Safety Measurements for Hazard Evaluation

2.1.6 ASD-STAN Publications

Available from ASD-STAN Secretariat, Rue Montoyer, 10/50, B-1000 Brussels, Belgium, Tel: +32 2 775 81 26, www.asd-stan.org.

EN 2591 Aerospace Series, Elements of Electrical and Optical Connection, Test Methods

2.1.7 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO 10012-1 Quality Assurance Requirements for Measuring Equipment – Part 1: Metrological Confirmation System for Measuring Equipment

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.

AIR6031 Fiber Optic Cleaning

AS8041 Cables, Fiber Optic, Aerospace Specification

2.2.2 U.S. Government Publications

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

MIL-I-81969 Installation and Removal Tools, Connector, Electrical, General Specification For

MIL-PRF-29504 Termini, Fiber Optic Connectors

MIL-PRF-49291 Fiber, Optical

MIL-PRF-85045 Cables, Fiber Optic, (Metric), General Specification For

MIL-STD-202 Test Method Standard – Electronic and Electrical Component Parts

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests

2.2.3 Non-Government Publications

The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the document, which are DoD adopted, are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation.

2.2.4 Telecommunications Industries Association (TIA)

Available from 1320 N. Courthouse Rd., Suite 200 Arlington, VA 22201, Tel: 703-907-7700, www.tiaonline.org.

TIA 364 Connector Test Method Standards

TIA 455 Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components

2.2.5 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E595-84 Materials for Outgassing in a Vacuum Environment, Total Mass Loss and Collected Volatile Condensable, Standard Test Method for

2.2.6 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401-7435, Tel: 410-266-4000, www.arinc.com.

ARINC805 Fiber Optic Test Procedures

3. EYE SAFETY

Permanent eye damage can occur if exposed to high intensity light sources. Maintainers are unable to manually determine the nature or level of the optical power; therefore, the following practices should always be adopted:

- Under no circumstance should a fiber optic connector end-face, fiber optic terminus end-face, prepared optical fiber or fractured optical fibre be viewed directly until it is confirmed that there is no transmitted power through the fiber.
- Do not inspect active fiber optic systems with optical magnifying scopes.
- Protective end caps and connector covers should always be kept on all unmated connectors.
- Wherever possible, protective eyewear should be worn when preparing optical fibers for termination.

Refer to ANSI Z136.4 for further information regarding eye safety and light source hazards.

4. TECHNICAL SPECIFICATION

4.1 Description

The connectors detailed in this document support either fiber optic termini only or a combination of fiber optic termini and electrical contacts. The connectors are designed for use with fiber optic termini as detailed in AS8438 and shall be capable of meeting the requirements defined in the product specification (slash sheet).

5. REQUIREMENTS

The individual item requirements shall be as specified in this standard and in accordance with applicable product specifications (slash sheets). In the event of conflict between this standard and the product specification (slash sheet), the product specification (slash sheet) shall take precedence.

5.1 Qualification

Where applicable, fiber optic connectors and accessories qualified under this standard shall be suitable for listing on qualified products lists.

5.1.1 Quality

The contractor's quality program for assembled connectors and assembly procedures shall meet the requirements of AS9100.

6. MATERIALS

Materials shall fulfil all operating environmental requirements.

6.1 Metals

Metals shall be of a corrosion resistant type or shall be plated or treated to resist corrosion.

6.1.1 Dissimilar Metals

When dissimilar metals are used in intimate contact with each other, protection against galvanic corrosion shall be provided.

- The use of dissimilar metals which produce active galvanic corrosion is not acceptable.
- Metal plating of dissimilar base metals to provide similar or suitable abutting surfaces is permitted.
- The use of dissimilar metals separated by a suitable insulating material is also permitted.
- Dissimilar metals and compatible couples are defined in MIL-STD-889.

6.1.2 Components

Connectors shall conform to the information detailed in MIL-DTL-38999, components materials and plating details.

6.1.3 Magnetic Permeability

The magnetic permeability of the terminated, assembled, and fully mated connector assembly shall be less than 2.0 μ .

7. DESIGN AND CONSTRUCTION

Connectors and accessories shall be designed and constructed to withstand normal handling during installation and maintenance in service. Connector intermatability control and accessory interface dimensions shall be as specified on individual product specifications (slash sheets). Recommended panel cutout dimensions are shown on relevant product specification (slash sheet). Dimensions and tolerances shall be in accordance with ANSI Y14.5M.

7.1 Fiber Optic Terminus

Fiber optic termini shall be removable as specified and may be used with all classes of connectors.

7.1.1 Indirect Shipment of Termini

Connectors are supplied without termini unless as specified in the product specification (slash sheet).

7.1.2 Terminus Arrangement

Terminus arrangements shall be in accordance with the relevant product specification (slash sheet).

7.1.3 Terminus Insertion/Removal Tools

For correct terminus insertion and removal tools, refer to the AS8438 product specification (slash sheet).