

RATIONALE

The aerospace industry has always required the highest standards of workmanship to be maintained. To ensure that the aerospace fiber optics industry also adopts these same high standards, it's essential that minimum training and certification requirements be established. This document outlines the minimum training requirements for all personnel working as aerospace fiber optics fabricators in accordance with aerospace industry best practices.

1. SCOPE

This document establishes training guidelines applicable to fiber optic fabricator technical training for individuals involved in the manufacturing, installation, support, integration and testing of fiber optic systems. Applicable personnel include:

Managers

Engineers

Technicians

Trainers/Instructors

Third Party Maintenance Agencies

Quality Assurance

Production

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2. 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 SAE Publications

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

ARP5601 Guidelines for Testing and Support of Aerospace, Fiber Optic, Inter-Connect Systems

2.2 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ANSI Z136.1-200 American National Standard for Safe Use of Lasers

ANSI Z136.2-1997 American National Standard for the Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources

ANSI/TIA-440-B-2004 Fiber Optic Terminology

2.3 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401, www.arinc.com.

ARINC Report 806 Fiber Optic Installation and Maintenance Procedures

2.4 IEC Publications

Available from International Electrotechnical Commission, 3, rue de Varembe, P.O. Box 131, 1211 Geneva 20, Switzerland, Tel: +44-22-919-02-11, www.iec.ch.

IEC 60825-1 Laser Safety Equipment Classification (Safety of laser products)

IEC 60825-2 Safety of Optical Fibre Communication Systems

IEC 60825-4 Laser Guards

2.5 NASA Publications

Available from NASA, Documentation, Marshall Space Flight Center, AL 35812, www.nas.nasa.gov.

NASA-STD-8739.5 Fiber Optic Terminations, Cable Assemblies, and Installation

2.6 NAVAIR Publications

Available from Commanding Officer, Naval Air Technical Data and Engineering Service Command, Naval Air Station, North Island, P.O. Box 357031, Building 90, Distribution, San Diego, CA 92135-7031.

NAVAIR 01-1A-505.4 Installation and Testing Practices Aircraft Fiber Optic Cabling

2.7 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

FED-STD-1037C Glossary of Telecommunications Terms

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

MIL-PRF-29504/4D Termini, Fiber Optic, Connector, Removable, Environmental Resisting, Pin Terminus, Size 16, Rear Release, MIL-DTL-38999, Series III

MIL-PRF-29504/5D Termini, Fiber Optic, Connector, Removable, Environmental Resisting, Socket Terminus, Size 16, Rear Release, MIL-DTL-38999, Series

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

2.8 Other Applicable References

Understanding Fiber Optics, Jeff Hecht, ISBN 0-13-956145-5

Fiber Optics Installer and Technician Guide, Bill Woodward, ISBN 0-7821-4390-3

3. HOW TO USE THIS DOCUMENT

This document is intended to be used as a guideline for all persons conducting aerospace fiber optics fabricator training. This training document is broken into 29 sections. Each section contains detailed hands-on training competencies. To successfully complete this training each student must perform each competency in the presence of the instructor.

1. Demonstrate fiber optic connector endface cleaning methods with a lint free cloth.
2. Using a video microscope (minimum 100X) the student shall view the endfaces of three properly polished connectors. The connectors shall be populated with 50/125 μm , 100/140 μm , and 9/125 μm optical fiber. The student shall successfully identify both multimode optical fibers.
3. Using a video microscope (minimum 100X) the student shall view the endfaces of three properly polished connectors. The connectors shall be populated with 50/125 μm , 100/140 μm , and 9/125 μm optical fiber. The student shall successfully identify the single-mode optical fiber.
4. Using an optical (minimum 200X) microscope the student shall view the endface of a multimode connector and successfully identify a crack in the core.
5. Using optical (minimum 200X) and video (minimum 100X) microscopes the student shall view the endfaces of several polished multimode connectors and successfully evaluate the endface per ARINC 806, section 7.2.1.