



AEROSPACE STANDARD	AS22759™	REV. E
	Issued 2001-07 Revised 2024-07	
	Superseding AS22759D	
Wire, Electrical, Fluoropolymer-Insulated, Copper or Copper Alloy		

RATIONALE

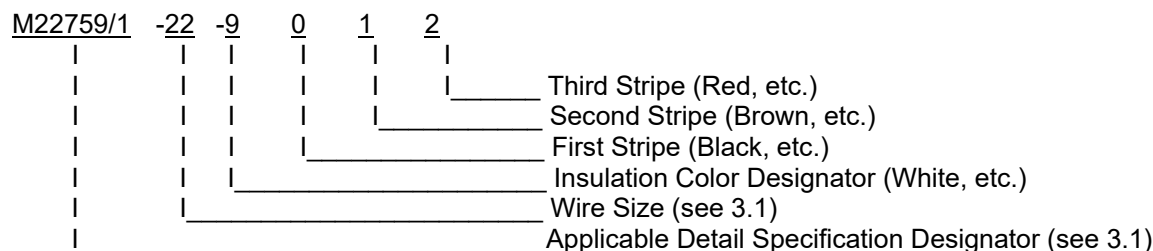
Revision is required to accommodate additional detail specifications AS22759/59 and AS22759/60.

1. SCOPE

AS22759 specification covers fluoropolymer-insulated single conductor electrical wires made with tin-coated, silver-coated, or nickel-coated conductors of copper or copper alloy as specified in the applicable detail specification. The fluoropolymer insulation may be polytetrafluoroethylene (PTFE), fluorinated ethylene propylene (FEP), polyvinylidene fluoride (PVF₂), ethylene-tetrafluoroethylene copolymer (ETFE), or other Fluoropolymer resin. The fluoropolymer may be used alone or in combination with other insulation materials. These abbreviations shall be used herein. When a wire is referenced herein, it means an insulated conductor (see 7.7).

1.1 Part Numbers

Unless otherwise specified (see 3.1), part numbers are coded as in the following example (see 3.8 for details):



1.2 Temperature Rating of Wire

The maximum conductor temperature of the wire for continuous use is specified in the detail specification (see 7.11).

1.3 Voltage Rating of Wire

The voltage rating of a wire for continuous use is specified in the detail specification (see 7.12).

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<https://www.sae.org/standards/content/AS22759E>

Documents

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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 +1 724-776-4970 (outside USA), www.sae.org.

AMS1424	Deicing/Anti-Icing Fluid, Aircraft, SAE Type I
AIR5717	Mitigating Wire Insulation Damage During Processing and Handling
ARP5607	Legibility of Print on Aerospace Wires and Cables
ARP6400	Recommended Practice for Processing and Handling Wire and Cable with Silver Plated Conductors and Shields
ARP9013	Statistical Product Acceptance Requirements
AS1241	Fire Resistant Phosphate Ester Hydraulic Fluid for Aircraft
AS4373	Test Methods for Insulated Electric Wire
AS4461	Assembly and Soldering Criteria for High Quality/High Reliability Soldered Wire and Cable Termination in Aerospace Vehicles
AS5768	Tool, Stripper, Electrical Insulation, General Specification For
AS5768/1	Tool, Stripper, Manually Actuated, Electrical Insulation, Round Wire, Size 10 to 30
AS5768/2	Tool, Stripper, Manually Actuated, Small Grip, Electrical Insulation, Round Wire, Size 16 to 30
AS22759/1*	Wire, Electrical, Fluoropolymer-Insulated, PTFE and PTFE-Coated Glass, Silver-Coated Copper Conductor, 600-Volt
AS22759/2*	Wire, Electrical, Fluoropolymer-Insulated, PTFE, and PTFE-Coated-Glass, Nickel-Coated Copper Conductor, 600-Volt
AS22759/3*	Wire, Electrical, Fluoropolymer-Insulated, TFE-Glass-TFE, Medium Weight, Nickel-Coated Copper Conductor, 600-Volt
AS22759/4*	Wire, Electrical, Fluoropolymer-Insulated, TFE-Glass-FEP, Medium Weight, Silver-Coated Copper Conductor, 600-Volt
AS22759/5*	Wire, Electrical, Fluoropolymer-Insulated, Abrasion Resistant Extruded PTFE, Silver-Coated Copper Conductor, 600-Volt, RoHS
AS22759/6*	Wire, Electrical, Fluoropolymer-Insulated, Abrasion Resistant Extruded PTFE, Nickel-Coated Copper Conductor, 600-Volt, RoHS
AS22759/7*	Wire, Electrical, Fluoropolymer-Insulated, Abrasion Resistant Extruded PTFE, Medium Weight, Silver-Coated Copper Conductor, 600-Volt, RoHS

AS22759/8*	Wire, Electrical, Fluoropolymer-Insulated, Abrasion Resistant Extruded PTFE, Medium Weight, Nickel-Coated Copper Conductor, 600-Volt, RoHS
AS22759/9*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated Copper Conductor, 1000-Volt, RoHS
AS22759/10*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Nickel-Coated Copper Conductor, 1000-Volt, RoHS
AS22759/11*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated Copper Conductor, 600-Volt, RoHS
AS22759/12*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Nickel-Coated Copper Conductor, 600-Volt, RoHS
AS22759/13*	Wire, Electrical, Fluoropolymer-Insulated, FEP-PVF2, Medium Weight, Tin-Coated Copper Conductor, 600-Volt, RoHS
AS22759/14*	Wire, Electrical, Fluoropolymer-Insulated, FEP-PVF2, Light Weight, Tin-Coated Copper Conductor, 600-Volt, RoHS
AS22759/15*	Wire, Electrical, Fluoropolymer-Insulated, FEP-PVF2, Light Weight, Silver-Coated High Strength Copper Alloy Conductor, 600-Volt, RoHS
AS22759/16*	Wire, Electrical, Fluoropolymer-Insulated, Extruded ETFE, Medium Weight, Tin-Coated Copper Conductor, 600-Volt, 150°C, RoHS
AS22759/17*	Wire, Electrical, Fluoropolymer-Insulated, Extruded ETFE, Medium Weight, Silver-Coated High Strength Copper Alloy Conductor, 600-Volt, 150°C, RoHS
AS22759/18*	Wire, Electrical, Fluoropolymer-Insulated, Extruded ETFE, Light Weight, Tin-Coated Copper Conductor, 600-Volt, 150°C, RoHS
AS22759/19*	Wire, Electrical, Fluoropolymer-Insulated, Extruded ETFE, Light Weight, Silver-Coated High Strength Copper Alloy Conductor, 600-Volt, 150°C, RoHS
AS22759/20*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated High Strength Copper Alloy Conductor, 1000-Volt, RoHS
AS22759/21*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Nickel-Coated High Strength Copper Alloy Conductor, 1000-Volt, RoHS
AS22759/22*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated High Strength Copper Alloy Conductor, 600-Volt, RoHS
AS22759/23*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Nickel-Coated High Strength Copper Alloy Conductor, 600-Volt, RoHS
AS22759/24-/27*	MIL-W-22759 detail versions (/24-/27) were canceled without supersession. To maintain harmony between AS22759 and MIL-DTL-22759 the AS22759/24-/27 numbers will not be used
AS22759/28*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Polyimide Coated, Silver-Coated Copper Conductor, 600-Volt, RoHS
AS22759/29*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Polyimide Coated, Nickel-Coated Copper Conductor, 600-Volt, RoHS

AS22759/30*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Polyimide Coated, Silver-Coated High Strength Copper Alloy Conductor, 600-Volt, RoHS
AS22759/31*	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Polyimide Coated, Nickel-Coated High Strength Copper Alloy Conductor, 600-Volt, RoHS
AS22759/32*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Light Weight, Tin-Coated Copper, 150°C, 600-Volt, RoHS
AS22759/33*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Light Weight, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/34*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Normal Weight, Tin-Coated Copper, 150°C, 600-Volt
AS22759/35*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Normal Weight, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt
AS22759/36-/40*	MIL-W-22759 detail versions (/36-/40) were canceled without supersession. To maintain harmony between AS22759 and MIL-DTL-22759 the AS22759/36-/40 numbers will not be used
AS22759/41*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Normal Weight, Nickel-Coated Copper, 200°C, 600-Volt
AS22759/42*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Normal Weight, Nickel-Coated High Strength Copper Alloy, 200°C, 600-Volt
AS22759/43*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Normal Weight, Silver-Coated Copper, 200°C, 600-Volt
AS22759/44*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Light Weight, Silver-Coated Copper, 200°C, 600-Volt, RoHS
AS22759/45*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Light Weight, Nickel-Coated Copper, 200°C, 600-Volt, RoHS
AS22759/46*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Light Weight, Nickel-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/47*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Light Weight, 80 Microinch, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/48*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Light Weight, 80 Microinch, Silver-Coated Copper, 200°C, 600-Volt, RoHS
AS22759/49*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Normal Weight, 80 Microinch, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/50*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Normal Weight, 80 Microinch, Silver-Coated Copper, 200°C, 600-Volt, RoHS
AS22759/51*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Light Weight, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/52*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Light Weight, Silver-Coated Copper, 200°C, 600-Volt, RoHS

AS22759/53*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Normal Weight, Silver-Coated High Strength Copper Alloy, 200°C, 600-Volt, RoHS
AS22759/54*	Wire, Electrical, Fluoropolymer-Insulated, Cross-linked Modified ETFE, Low Fluoride, Normal Weight, Silver-Coated Copper, 200°C, 600-Volt, RoHS
AS22759/55*	Wire, Electrical, Fluoropolymer-Insulated, Cross Linked Modified ETFE, Lightweight, Silver Coated, Extra High Strength Copper Alloy, 200 °C, 600 Volt, ROHS
AS22759/56*	Wire, Electrical, Fluoropolymer-Insulated, Cross Linked Modified ETFE, Normal Weight, Silver Coated, Extra High Strength Copper Alloy, 200 °C, 600 Volt, ROHS
AS22759/57*	Wire, Electrical, Fluoropolymer-Insulated, Cross Linked Modified ETFE, Normal Weight, Nickel Coated, Extra High Strength Copper Alloy, 200 °C, 600 Volt, ROHS
AS22759/58*	Wire, Electrical, Fluoropolymer-Insulated, Cross Linked Modified ETFE, Lightweight, Nickel Coated, Extra High Strength Copper Alloy, 200 °C, 600 Volt, ROHS
AS22759/59	Wire, Electrical, Fluoropolymer-Insulated, Crosslinked Modified ETFE, Fluoride Controlled, Medium Weight, Silver-Coated Copper, 200 °C, 600 Volt, ROHS
AS22759/60	Wire, Electrical, Fluoropolymer-Insulated Crosslinked Modified ETFE, Fluoride Controlled, Medium Weight, Silver-Coated High Strength Copper Alloy, 200 °C, 600 Volt, ROHS
AS22759/61-/79*	For future detail specifications
AS22759/80*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/81*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/82*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/83*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Over Braid, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/84*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated Over Braid, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS
AS22759/85*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated Over Braid, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/86*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/87*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS
AS22759/88*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/89*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/90*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volts, RoHS



AS22759/91*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/92*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS
AS22759/93*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, Extra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/94*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Nickel Coated, Extra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/95*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Extra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/96*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, Extra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/97-/179*	For future detail specifications
AS22759/180*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/181*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/182*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/183*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Over Braid, Smooth Surface, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/184*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Over Braid, Smooth Surface, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS
AS22759/185*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Over Braid, Smooth Surface, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/186*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/187*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS
AS22759/188*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts, RoHS
AS22759/189*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/190*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/191*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts, RoHS
AS22759/192*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts, RoHS



AS22759/193*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Silver Coated, Extra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/194*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Light Weight, Nickel Coated, Extra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS22759/195*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Silver Coated, Extra High Strength Copper Alloy, 200°C, 600 Volts, RoHS
AS22759/196*	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Nickel Coated, Extra High Strength Copper Alloy, 260°C, 600 Volts, RoHS
AS29606	Wire, Electrical, Stranded, Uninsulated Copper, Copper Alloy, or Aluminum, or Thermocouple Extension, General Specification For
AS9003	Inspection and Test Quality System
AS50881	Wiring, Aerospace Vehicle

* AS22759 detail specifications

2.2 European Committee for Standardization Publications

Available from European Parliament, Bât. Altiero Spinelli, 60 rue Wiertz/Wiertzstraat 60, B-1047 - Bruxelles/Brussels Belgium.

RoHS Restriction of Hazardous Substances Directive (RoHS) 2002/95/EC by January 1, 2015

2.3 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada), 001-800-514-1564 (Mexico), or +1-414-272-8575 (all other locations), www.asq.org.

ANSI/ASQC-Z1.4 Sampling Procedures and Tables for Inspection by Attributes

2.4 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 B286	Copper Conductors for Use in Hookup Wire for Electronic Equipment
ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D471	Standard Test Method for Rubber Property
ASTM D770	Standard Specification for Isopropyl Alcohol
ASTM D792	Standard Methods of Test for Specific Gravity and Density of Plastics by Displacement
ASTM D882	Standard Test Methods for Tensile Properties of Thin Plastic Sheet
ASTM D1153	Methyl Isobutyl Ketone (for Use in Organic Coatings)
ASTM D1655	Standard Specification for Aviation Turbine Fuels
ASTM D2116	Standard Specification for FEP-Fluorocarbon Molding and Extrusion Materials



ASTM D3032	Hook Up Wire Insulation Standard Test Method For
ASTM D3159	Standard Specification for Modified ETFE-Fluoropolymer Molding and Extrusion Materials
ASTM D3222	Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials
ASTM D4591	Temperature and Heats Determining of Transition of Fluoropolymers by Differential Scanning Calorimetry
ASTM D4814	Standard Specification for Automotive Spark-Ignition Engine Fuel
ASTM D4895	Standard Specification for Polytetrafluoroethylene (PTFE) Resin Produced From Dispersion

2.5 IPC-Association Connecting Electronics Industries Publications

Available from IPC, 3000 Lakeside Drive, 309 S, Bannockburn, IL 60015, Tel: 847-615-7100, www.ipc.org.

J-STD-002	Component Leads, Terminations, Lugs, wires, Solderability Tests For
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2.6 NCSL Publications

Available from National Conference of Standards Laboratories International, 2995 Wilderness Place, Suite 107, Boulder, CO 80301, Tel: 303-440-3339, www.ncsli.org.

NCSL Z540.3	Calibration of Measuring and Test Equipment, Requirements for
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2.7 U.S. Government Publications

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

A-A-59921	Cleaning Compound, Aircraft Surface
MIL-STD-104	Limits for Electrical Insulation Color
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-202	Electronic and Electrical Components Parts
MIL-STD-681	Identification Coding and Application of Hookup and Lead Wire
MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-DTL-12000	Cable, Cord, and Wire, Electric; Packaging of
MIL-DTL-83133	Turbine Fuel, Aviation, Kerosene Types, NATO F-34 (JP-8) and NATO F-35
MIL-PRF-5606	Hydraulic Fluid, Petroleum Base; Aircraft, Missile and Ordnance
MIL-PRF-7808	Lubricating Oil, Aircraft, Turbine Engine, Synthetic Base
MIL-PRF-23699	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-PRF-87252	Coolant Fluid, Hydrolytically Stable, Dielectric
MIL-PRF-87937	Cleaning Compound, Aerospace Equipment

SD6 Provisions Governing Qualification

SAM System for Award Management*

*Available from <https://www.sam.gov/portal/public/SAM/>.

3. REQUIREMENTS

3.1 Detail Specification (see 2.1)

The product requirements shall be as specified herein and in accordance with the applicable detail specification. In the event of any conflict between the requirements of this specification and the detail specification, the latter shall govern. The detail specification shall be formatted as shown in Appendix A.

3.2 Qualification (see 4.2)

The wire furnished herein shall be a product that has been tested and has passed the qualification tests specified herein and has been listed on or approved for listing on the applicable Qualified Products List (see 9.2).

3.2.1 Conformity to Qualified Sample

Except for changes approved by the purchase order, it is understood that wire supplied under the purchase order shall be the same material formulations, material sources, and manufacturing processes as approved by the Qualifying Activity. Any unapproved changes made after the qualification approval date, unless accepted by the Qualifying Activity, may constitute cause for rejection. All identified unapproved changes must be reported to the Qualifying Activity. Failure of a manufacturer to notify the Qualifying Activity of a change in design, material, manufacturing process (including quality conformance) or plant location shall be reason for adverse action or removal from the Qualified Products List.

3.3 Materials (see 5.1)

Unless otherwise specified in the detail specification, the wire materials shall be as specified herein. The wire insulation shall contain no additives except those required as wetting agents in suspensoids, pigmentation for colors, and lubricants used in extrusion. Fillers shall be added only when required. The use of reclaimed or recycled insulation material is not prohibited, but if used, the recycled materials shall not have been degraded, shall be free of contaminants, and shall be identical with the original materials in performance. When required in the detail specification, the wire shall comply with Restriction of Hazardous Substances Directive (RoHS).

3.3.1 Conductor Material (see 5.1.1)

All conductors shall meet the material requirements of AS29606. The wire supplier is responsible for all quality assurance and compliance requirements imposed on the conductor per AS29606. Conductor material data shall be maintained for a minimum of 6 years (see 4.3.2 and 4.4.3).

3.3.2 PTFE Coated Fibrous Glass Yarns Material (see 5.1.2)

All fibrous glass yarns used in braiding shall be coated with PTFE resin to the extent of not less than 15% by weight of the coated yarn. In addition, after each braid application, the braid shall be coated with PTFE. This coating shall be a PTFE finisher, PTFE extrusion, or PTFE unsupported tape.

3.3.3 PTFE Coated Fibrous Glass Tapes Material (see 5.1.3)

All fibrous glass tapes used in insulation shall contain not less than 50% of PTFE by weight of the coated tape.

3.3.4 Fluoropolymer (FP)/Polyimide/Fluoropolymer (FP) Tapes Material (see 5.1.4)

FP/Polyimide/FP tapes used as a wrap on a conductor shall be as specified in Table 1.

Table 1 - FP/polyimide/FP tapes

Wire Tape Characteristics	0.00045 (FP)/0.00065 (Polyimide)/0.0001 (FP)	0.0005 (FP)/0.0010 (Polyimide)/0.0005 (FP)
Tensile Strength (min average lb/in ²)	20000	19000
Longitudinal Elongation (min average %)	40	40
Dielectric Strength (min average volts/mil)	4000	4000
Specific Gravity (g/cc)	1.78 nominal	1.81 nominal
Thickness 1/	1.1 mils min - 1.3 mils max	1.85 mils min - 2.15 mils max

1/ Description of the film describe the nominal thickness of each layer. Each film has a polyimide substrate (center) with a modified Fluoropolymer (FP) coating on the outside.

3.3.5 Unsupported PTFE Tape Material (see 5.1.4)

Unsupported PTFE tapes shall be as specified in Table 2. For extruded unsintered PTFE tapes, requirements are only applicable to detail specifications which do not contain a wire insulation state of sinter requirement on the PTFE tape layer.

Table 2 - Unsupported PTFE tapes

Wire Tape Characteristics	Skived PTFE Tape			Cast PTFE Tape Tape Thickness (mils)		Extruded Unsintered PTFE Tape
	0-3.5	3.6-5.5	5.6 min	0-3.5	3.6-5.5	0-5.5
Dielectric Strength (min average volts/mil)	2700	2200	1500	3200	2700	700
Specific Gravity (g/cc)	2.14 min 2.21 max			2.14 min 2.21 max		1.5 min
Tensile Strength (min average lb/in ²)	4000			3000		1300
Longitudinal Elongation (min average %)	300			300		50

3.3.6 Fluoropolymer Insulation Resin Material (see 5.1.5)

Fluoropolymer insulation material properties used for extrusion of wire primary and jacket insulations as well as insulating tapes shall conform to the material controls specified in Table 3.

Table 3 - Fluoropolymer insulation resin properties

Fluoropolymer Insulation Material	Material Specification
Polytetrafluoroethylene (PTFE)	ASTM D4895
Fluorinated Ethylene Propylene (FEP)	ASTM D2116
Polyvinylidene Fluoride (PVF2)	ASTM D3222
Ethylene-tetrafluoroethylene copolymer (ETFE)	ASTM D3159

3.4 Conductor Construction (see 5.2)

3.4.1 Conductor Construction Prior to Insulation Application (see 5.2.1 and 7.4)

The conductor construction prior to the application of the insulation shall be in accordance with AS29606.

3.4.2 Insulated Conductor Splice (see 5.2.2)

Insulated conductor splices shall meet the requirement of AS29606.

3.4.3 Insulated Conductor Tin and Silver Solderability (see 5.2.3)

The insulated conductor with tin coated or silver coated strands shall meet the “Acceptable” solder coverage of the stranded conductor in accordance with J-STD-002. The test is not applicable to wires with nickel coated strands (see 7.2).

3.4.4 Insulated Conductor Geometric Characteristics (see 5.2.4)

The insulated conductor diameter, strand count, and strand diameter shall be in accordance with AS29606 and listed in the detail specification.

3.4.5 Insulated Conductor Strand Blocking - Adhesion (see 5.2.5)

For 19-strand conductor (wire sizes 26 through 12), the total number of unbonded single strands plus the number of metallic bonded pairs and metallic bonded groups of strands in the specimen shall be not less than 13. For all other conductors (7 strands, etc.), the total count of unbonded single strands, metallic bonded pairs of strands, and metallic bonded groups of strands shall not be less than 0.70 times the number of strands in the conductor.

3.4.6 Insulated Conductor Elongation and Tensile Break Strength (see 5.2.6)

The wire conductor elongation and tensile break strength shall be in accordance with AS29606.

3.5 Wire Insulation Properties (see 5.3)

3.5.1 Insulation Construction and Mechanical Properties (see 5.3.1)

The wire insulation/jacket construction (see 5.3.1.1) and mechanical properties (see 5.3.1.2 and 5.3.1.3) shall be as specified in the detail specification and Tables 4 through 6.

Table 4 - PTFE extruded insulation and jacket

Wire Insulation Properties	Wire Size										
	28-20	18-12	10-8	6-4/0	28-14	12-8	6-4/0	28-16	14-12	10-8	6-4/0
Tensile Strength (min average lb/in²)	4500	4000	3500	N/A							
Longitudinal Elongation (min average %)					250	200	N/A				
Circumferential Elongation (min average)								200	150	100	N/A

Table 5 - Abrasion resistant (mineral filled) PTFE extruded insulation and jacket

Wire Insulation Properties	Wire Size									
	24-20	18-4	2-4/0	28-8	6-4	2-4/0	24-16	14-12	10-4	2-4/0
Tensile Strength (min average lb/in ²)	4000	3500	N/A							
Longitudinal Elongation (min average %)				200	150	N/A				
Circumferential Elongation (min average)							100	75	50	N/A

Table 6 - FEP, ETFE, PVF₂, and XLETFE (cross linked) extruded insulation and jacket

Wire Insulation Properties	FEP	ETFE	PVF ₂	XLETFE ^{1/}
Tensile Strength (min average lb/in ²)	2000	5000	5000	5000
Longitudinal Elongation (min average %)	150	150	250	75 ^{1/}

^{1/} Longitudinal Elongation of the inner layer of dual-wall insulations is 125% minimum for size 10 and smaller only.

3.5.2 Primary and Jacket Insulation Tape Splices (see 5.3.2)

Wire splices shall be permitted in the insulation tapes provided the performance characteristics of the wire are not affected. No splice in one layer of insulation tape shall be so positioned on the wire as to overlap any part of a splice in another layer of insulation tape. The measured maximum diameter of the wire at a splice in the insulation tape shall not exceed the measured diameter of the wire where no tape splice is present by more than five times the nominal thickness of the tape in which the splice occurs (seven times for single-tape insulations). Splices of the outer insulation tape shall not be longer than 1 inch and not more than one splice of the outer insulation tape shall occur in any 150 feet of the wire.

3.5.3 Wire Primary Insulation Flaws (see 5.3.3)

The primary insulation shall be subjected to the spark test, impulse dielectric test, or the high frequency spark test. This evaluation shall be performed before the application of any additional layers to the wire. Any portion showing insulation breakdown shall be cut out of the primary insulation at least two inches on each side of the failure. Unless otherwise specified in the detail specification, the test voltage shall be as specified in Table 7.

Table 7 - Primary insulation flaw voltages

Test Type	Voltage Requirement
Spark (see 5.3.3.1)	1.5 kV (rms)
Impulse Dielectric (see 5.3.3.2)	6.0 kV (peak)
High Frequency Spark (see 5.3.3.3)	4.2 kV (rms)

3.5.4 Wire Final Insulation Flaws (see 5.3.3)

One hundred percent of the wire shall pass either the impulse dielectric test or the preferred high frequency spark test. The test shall be performed during the final winding of the wire on shipment spools or reels. Unless otherwise specified, the test voltage shall be as specified in Table 8.

Table 8 - Wire final insulation flaw voltages

Test Type	Voltage Requirement
Impulse Dielectric (see 5.3.3.2)	8.0 kV (peak)
High Frequency Spark (see 5.3.3.3)	5.7 kV (rms)

3.5.5 Insulation State of Sinter (see 5.3.4)

Layers of insulations shall meet the state of sinter requirement as specified in the detail specification.

3.5.6 Tape Overlap (see 5.3.5)

The minimum (and maximum if applicable) percent overlap in applying each layer of insulation tape shall be as indicated in the detail specification.

3.5.7 Outer Insulation Tape Layer Surface Smoothness (see 5.3.6)

The difference in the wall thickness of the outer insulation layer at the discernible tape edge shall not exceed the limits in Table 9.

Table 9 - Smooth surface tape wall thickness percent different

Wire Size	Percent Difference (%)
26 thru 10	10.0
8 thru 6	7.0
4 thru 4/0	5.0

3.5.8 Fluoride Off-Gassing (see 5.3.7)

Unless otherwise specified in the detail specification, the fluoride extraction level, when required, shall not exceed 20 parts per million.

3.5.9 Lamination Sealing (see 5.3.8)

When lamination sealing is required in the detail specification, there shall be no evidence of tape separation or lifting.

3.5.10 Polyimide Topcoat Cure (see 5.3.9)

When polyimide topcoat cure is required in the detail specification, the topcoat shall have no visible cracks.

3.5.11 Insulation Proof Test (Crosslink Proof/Accelerated Aging/Short-Term Thermal Stability - see 5.3.10)

When the insulation proof test is required in the detail specification, the exposure temperature shall be $300\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ ($572\text{ }^{\circ}\text{F} \pm 5.4\text{ }^{\circ}\text{F}$) and the change in marking, color, or conductor pitting (see 7.4.2) shall not be considered. There shall be no observed cracks or splits when subjected to the bend test and no dielectric breakdown of the insulation.

3.5.12 Insulation Blocking (see 5.3.11)

Adjacent turns or layers of the wire shall not stick to one another.

3.5.13 Insulation Shrinkage (see 5.3.12)

Insulation shrinkage shall not exceed the values specified in the detail specification. Unless otherwise specified in the detail specification insulation expansion is not required.

3.5.14 Insulation Layer Wicking (see 5.3.13)

Wicking between the insulation layers shall not travel beyond dye length specified in the detail specification.

3.6 Wire Electrical Properties (see 5.4)

3.6.1 Wire Conductor Electrical Resistance (see 5.4.1)

The wire conductor electrical resistance shall be in accordance with the detail specification.

3.6.2 Wire Electrical Insulation Resistance (see 5.4.2)

Unless otherwise specified in the detail specification, the insulation resistance shall be 5000 MΩ minimum for 1000 feet.

3.6.3 Wire Electrical Surface Resistance (see 5.4.3)

The wire surface resistance shall be in accordance with the detail specification.

3.6.4 Electrical Dielectric Resistance - Wet Dielectric Voltage (see 5.4.4)

The wire electrical dielectric resistance shall be in accordance with the detail specification following the specified test conditioning.

3.7 Wire Physical Properties (see 5.5)

3.7.1 Wire Diameter (see 5.5.1)

The wire diameter shall be as specified in the detail specification.