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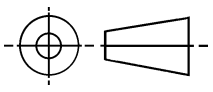
THIRD ANGLE PROJECTION



PREPARED BY SAE SUBCOMMITTEE AE-8D

SAE Aerospace
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AEROSPACE STANDARD

WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, CROSS-LINKED MODIFIED ETFE, NORMAL WEIGHT, NICKEL-COATED HIGH-STRENGTH COPPER ALLOY, 200°C, 600 VOLT

AS22759/42
SHEET 1 OF 6

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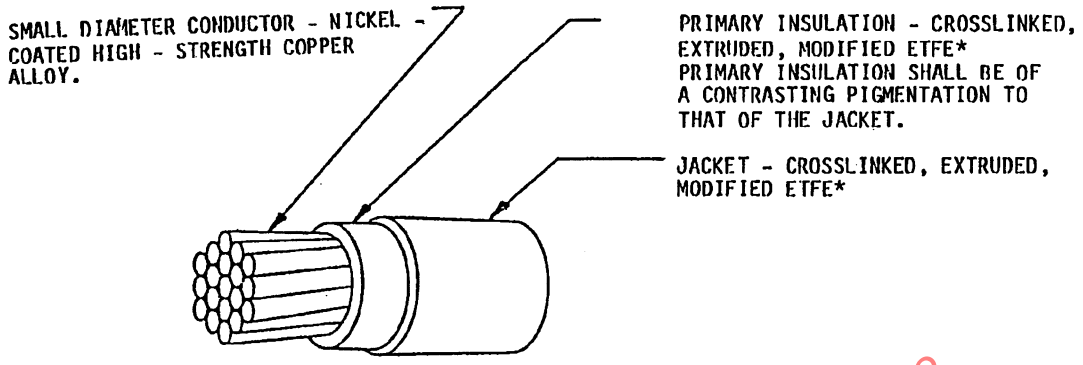
THE REQUIREMENTS FOR ACQUIRING THE WIRE DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION AND THE LATEST ISSUE OF MIL-W-22759.



* ETFE - Ethylene-tetrafluoroethylene copolymer

FIGURE 1. GENERAL CONFIGURATION.

TABLE I. CONSTRUCTION DETAILS.

Part no. 1/	Wire size	Stranding (number of strands x AWG gauge of strands)	Diameter of stranded conductor (inches)		Finished wire		
			(min)	(max)	Resistance at 20°C (68°F) (ohms/1000 ft) (max)	Diameter (inches)	Weight (lbs/1000 ft) (max)
M22759/42-26-*	26	19 x 38	.018	.020	49.4	.040 ±.002	1.7
M22759/42-24-*	24	19 x 36	.023	.025	30.1	.045 ±.002	2.3
M22759/42-22-*	22	19 x 34	.029	.031	18.6	.050 ±.002	3.3
M22759/42-20-*	20	19 x 32	.037	.039	11.4	.058 ±.002	4.8

1/ Part number: The asterisks in the part number column, tables I and II, shall be replaced by color code designators in accordance with MIL-STD-681. Examples: Size 20, white - M22759/42-20-9; white with orange stripe - M22759/42-20-93. Printing of color code designator on surface of wire insulation is not required.

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TABLE II. PERFORMANCE DETAILS.

Part no.	Bend testing			
	Mandrel diameter (inches) (±3%)		Test load (lbs) (±3%)	
	Crosslinking proof, immersion and life cycle tests	Cold bend test	Crosslinking proof, immersion and life cycle tests	Cold bend test
M22759/42-26-*	.375	1.00	.500	3.00
M22759/42-24-*	.500	1.00	.750	3.00
M22759/42-22-*	.500	1.00	1.00	3.00
M22759/42-20-*	.500	1.00	1.50	4.00

RATINGS:

Temperature rating: 200°C (392°F) maximum continuous conductor temperature.

Voltage rating: 600 volts (rms) at sea level.

ADDITIONAL REQUIREMENTS:

Acid resistance: No requirement.

Blocking: 230°C ±3°C (446°F ± 5.4°F).

Color: In accordance with MIL-STD-104, class 1; white preferred. Conformity of color to the limits of MIL-STD-104 shall not be required after crosslinking proof test or life cycle oven exposure.

Color striping or banding durability: 125 cycles (250 strokes) (min), 500 grams weight.

Crosslinking proof test: 7 hours at 300°C ±3°C (572°F ±5.4°F). Quality conformance test, group II. Requirements and procedures as for life cycle except for time and temperature.

Dielectric test after immersion: 2,500 volts (rms), 60 Hz.

Flammability: Quality conformance test, group C. For requirements and procedures see below.

Humidity resistance: After humidity exposure, wire shall meet the requirements for initial insulation resistance.

Identification of product: Not required for size 24 and smaller. Color code designator not required.

Identification durability: 125 cycles (250 strokes) (min), 500 grams weight.

Immersion: For procedure see below.

Impulse dielectric test: 8.0 kilovolts (peak), 100 percent test.

Insulation resistance, initial: 5,000 megohms for 1,000 feet (min).

Insulation thickness:
0.003 inch (min) for primary insulation.
0.004 inch (min) for outer jacket.
0.008 inch (min) for total insulation.

Life cycle: 500 hours at 230°C ±3°C (446°F ±5.4°F). Dielectric test, 2,500 volts (rms), 60 Hz. Procedure to use mandrels coated with polytetrafluoroethylene in the form of either enamel or wrapped tape, such that the diameter of the mandrels, after coating, still conform to the requirements of performance details, table II.

Low temperature (cold bend):
Bend temperature, -65°C ±3°C (-85°F ±5.4°F).
Dielectric test, 2,500 volts (rms), 60 Hz.

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Physical properties of insulation: Pulled at 2 inches per minute. Primary insulation shall be separated from the outer jacket for determination of primary insulation tensile strength and elongation.

Tensile strength, 5000 lbf/in^2 (min) for primary insulation, 500 lbf/in^2 (min) for total insulation (primary insulation and jacket).

Elongation, 125 percent (min) for primary insulation, 75 percent (min) for total insulation (primary insulation and jacket).

Propellant resistance: No dielectric breakdown. For procedure see below.

Shrinkage: 0.125 inch (max) at 230°C ±3°C (446°F ±5.4°F).

Smoke: 250°C ±5°C (482°F ±9°F); no visible smoke.

Solderability: Not applicable.

Spark test of primary insulation: 1,500 volts (rms), 60 Hz.

Surface resistance: 500 megohms - inches (min), initial and final readings.

Thermal shock resistance:

Oven temperature, 200°C ±3°C (392°F ±5.4°F).

Maximum change in measurement, 0.060 inch.

Wicking: Procedure II; weight increase, no requirement. Dye travel between layers of insulation, 2.25 inches (max from end of specimen).

Wire length requirements: Schedule B.

Wrap test:

Wrap back test.

Oven temperature, 313°C ±3°C (595°F ±5.4°F).

Flammability requirements and procedure:

The flammability test of MIL-W-22759 shall be modified for the wire of this specification sheet as follows: The specified test burner shall be used without the wing top flame spreader and shall be adjusted to furnish a 3-inch conical flame with an inner cone approximately 1 inch in height and a temperature of 955°C ±30°C (1751°F ±54°F) at its hottest point. A sheet of facial tissue conforming to UU-T-450 shall be suspended taut and horizontal 9-1/2 inches below the marked point on the wire specimen in the test chamber and at least 1/2 inch above the floor of the chamber. The period of application of the hot flame tip to the marked point on the wire specimen shall be 30 seconds for all sizes of wire. Observations shall include time of burning after removal of the test flame, final distance of flame travel on the wire above the test mark, and presence or absence of flame in the facial tissue due to incendiary drip from the specimen. Requirements shall be:

Duration of after-flame	3 seconds (max)
Flame travel	3.0 inches (max)
No flaming of tissue	

Breaking of the wire specimen in size 24 or smaller shall not be considered as failure provided the requirements for duration of flame, final distance of flame travel, and absence of incendiary dripping are met.

One specimen shall be tested from each sample unit. The post-flame dielectric test of MIL-W-22759 is not required for wire of this specification sheet.

Immersion procedure:

A 24-inch specimen, for each test fluid in table III, shall have its diameter measured and shall then be immersed to within 6 inches of each end for the time and temperature specified. During immersion, the radius of bend of the wire shall be not less than 14 nor more than 35 times the specified maximum diameter of the wire under test. Upon removal from the test fluid, the specimen shall be wiped dry and then remain for 1 hour in free air at room temperature. The diameter shall be measured and compared to the initial diameter. The insulation shall be removed for a distance of 1/2 inch from each end of the specimen. The specimen shall then be subjected to the bend test and dielectric test specified in the procedure for life cycle testing.

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