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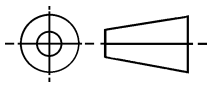
THIRD ANGLE PROJECTION



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PREPARED BY SAE SUBCOMMITTEE AE-8D

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space® INTERNATIONAL
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AEROSPACE STANDARD

WIRE, ELECTRIC, FLUOROPOLYMER-INSULATED, EXTRUDED TFE, POLYIMIDE COATED, NICKEL-COATED HIGH STRENGTH COPPER ALLOY CONDUCTOR, 600-VOLT

AS22759/31
SHEET 1 OF 4

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The complete requirements for procuring the wire described herein shall consist of this document and the issue in effect of Specification MIL-W-22759.

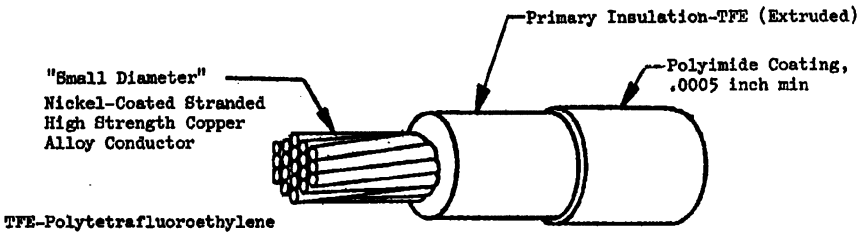

TABLE I. CONSTRUCTION DETAILS

Part No. 1/	Wire size	Stranding (Number of strands X AWG gage 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)
M22759/31-28-*	28	7 X 36	.014	0.016	79.0	.034 ±.002	1.37
M22759/31-26-*	26	19 X 38	.018	0.020	49.4	.039 ±.002	1.99
M22759/31-24-*	24	19 X 36	.023	0.025	30.1	.044 ±.002	2.73
M22759/31-22-*	22	19 X 34	.029	0.031	18.6	.050 ±.002	3.77
M22759/31-20-*	20	19 X 32	.037	0.040	11.4	.059 ±.002	5.55

1/ PART NUMBERS AND AVAILABLE INSULATION COLORS: The asterisks in the part number column, Tables I and II, shall be replaced by numerical color designators in accordance with the following:

Black	0	Orange	3
Brown	1	Yellow	4
Red	2	Green	5

The wires of this specification sheet are presently available in the above-listed solid colors only. Insulation colors blue, violet, gray, and white are not available. See also “COLOR” under “ADDITIONAL REQUIREMENTS”, page 3 of this specification sheet.

TABLE II. PERFORMANCE DETAILS

Part No.	Abrasion resistance (Procedure II)				Bend testing			
					Mandrel diameter (inches) (±3%)		Test load (lbs) (±3%)	
	Resistance (inches of tape) (min) (initial condition)	Weight support bracket	Weight (lbs)	Tension load (lbs)	Life cycle (oven & bend tests) 1/	Cold bend test	Life cycle (oven & bend tests) 1/	Cold bend test
M22759/31-28-*	15	A	.50	1.0	.125	.250	.50	
M22759/31-26-*	21	A	.50	1.0	.125	.250	.50	
M22759/31-24-*	21	A	.50	1.0	.125	.250	.50	
M22759/31-22-*	27	A	.50	1.0	.250	.375	.75	
M22759/31-20-*	27	A	.50	1.0	.250	.375	.75	

1/ Also for bend tests after immersion.

WIRE RATINGS AND ADDITIONAL REQUIREMENTS

TEMPERATURE RATING: 260°C (500°F) max conductor temperature

VOLTAGE RATING: 600 volts (rms) at sea level

ABRASION RESISTANCE AFTER IMMERSION: No requirement

ACID RESISTANCE: Dielectric test, 3000 volts (rms), 60 Hz

BLOCKING: 260 ±2°C (500 ±3.6°F)

COLOR: The color limits of MIL-STD-104 are not applicable to the insulation colors of this specification sheet.

DIELECTRIC TEST AFTER IMMERSION: 3000 volts (rms), 60 Hz

FLAMMABILITY: Post-flame dielectric test not required

HUMIDITY RESISTANCE: No requirement

IDENTIFICATION OF PRODUCT: White print preferred to provide greater contrast with inherent dark colors of this wire

IDENTIFICATION DURABILITY: 125 cycles (250 strokes) (min), 500 grams weight

IMPULSE DIELECTRIC TEST: 8.0 kilovolts (peak), 100% test

INSULATION RESISTANCE: 2500 megohms for 1000 ft (min)

LIFE CYCLE:
Oven temperature, 275 ±2°C (527 ±3.6°F)
Dielectric test, 3000 volts (rms), 60 Hz

LOW TEMPERATURE (COLD BEND):
Bend temperature: -65 ±2°C (-85 ±3.6°F)
Dielectric test, 3000 volts (rms), 60 Hz

POLYIMIDE CURE TEST: Required. This polyimide coating shall not crack when tested by the procedure shown on page 4 of this specification sheet. For wires of this specification sheet, the polyimide cure test shall be part of the Group II tests of the MIL-W-22759 Quality Conformance Inspection and shall be subject to the inspection level and acceptable quality level specified for the Group II tests.

SHRINKAGE: 0.03 inch max at 290 ±2°C (554 ±3.6°F)

SMOKE: 290°C (554°F)

SPARK TEST OF PRIMARY INSULATION: 1500 volts (rms), 60Hz, 100% test

SURFACE RESISTANCE: 5 megohm-inches (min), initial and final readings

THERMAL SHOCK:
Oven temperature, 260 ±2°C (500 ±3.6°F)
Max change in measurement, 0.060 inch

WICKING: No requirement

WIRE LENGTH REQUIREMENTS: Schedule A

WRAP TEST:
"Wrap back" test required; no cracking
Oven temperature, 313 ±2°C (595.4 ±3.6°F)

Conductor strand adhesion - not applicable

CURE TEST FOR POLYIMIDE COATING

Two hundred milliliters of distilled water together with a few boiling chips or beads shall be placed in a 1 liter Erlenmeyer flask and the flask shall be closed by a rubber stopper fitted with a water cooled reflux condenser. The flask shall be heated by a hot plate or heating mantle until the water is boiling and condensate is returning from the reflux condenser. One end of an approximately 12 inch length of the wire to be tested shall be inserted into the flask by passing it between the rubber stopper and the side of the flask or through a snugly fitting hole in the stopper, so that 5 inches of the wire length extends into the vapor phase inside the flask. The portion of the wire inside the flask shall be essentially straight and shall not be in contact with the glass sides of the flask or condenser, the layer of liquid water in the bottom of the flask, or the liquid condensate returning from the condenser. Heating of the flask shall be resumed, with stopper and reflux condenser again in place. The portion of wire inside the flask shall be exposed to the vapor phase above the boiling water for exactly one hour and shall then be removed from the flask. A 4 inch specimen shall be cut from the vapor-exposed portion of the wire, avoiding the one inch which was nearest the rubber stopper during vapor exposure. The 4 inch specimen shall be allowed to cool at room temperature for a minimum of fifteen minutes, after which it shall be wrapped in a tight spiral for six turns or the full length of the specimen, whichever is lesser, around a mandrel which for wire sizes 18 and smaller shall be the specified maximum diameter of the wire and for wire sizes 16 and larger shall be three times the specified maximum diameter of the wire. The specimen shall then be inspected visually for cracks without the aid of magnification.