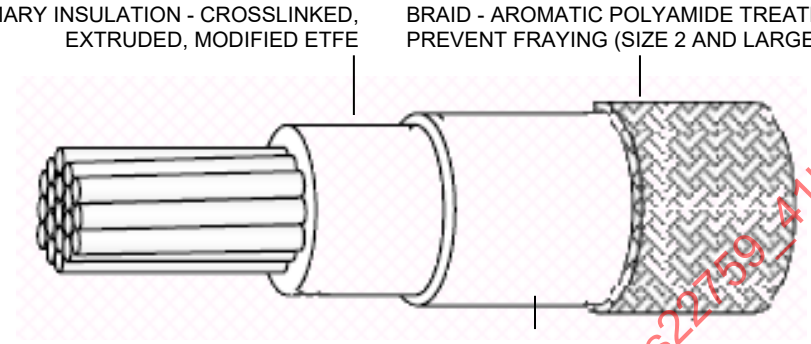
FEDERAL SUPPLY CLASS
6145

RATIONALE

SURFACE RESISTANCE TESTS FOR WIRE SIZE 2 AND LARGER NEEDS TO BE TESTED PRIOR TO BRAIDING. UPDATE CONDUCTOR SIZE TO COINCIDE WITH AS29606.

NOTICE

THE COMPLETE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS22759.



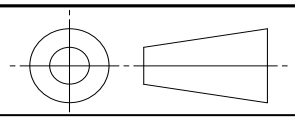
ETFE - ETHYLENE TETRAFLUOROETHYLENE
CONDUCTOR - STRANDED NICKEL COATED COPPER

1/ BRAID: BRIGHT AROMATIC POLYAMIDE YARN, 200 DENIER, 100 FILAMENTS, TIGHTLY FORMED, UNIFORM IN APPEARANCE, TREATED WITH A CLEAR FINISHER COATING. THE FINISHER COATING SHALL BE COMPATIBLE WITH THE TEMPERATURE RATING AND PERFORMANCE REQUIREMENTS OF THE INSULATED WIRE.

FIGURE 1 - AS22759/41 CONFIGURATION

ISSUED 2000-04 REAFFIRMED 2021-06 REVISED 2023-11

THIRD ANGLE PROJECTION



For more information on this standard, visit
https://www.sae.org/standards/content/AS22759/41B

CUSTODIAN: AE-8D

PROCUREMENT SPECIFICATION: AS22759

SAE INTERNATIONAL

AEROSPACE STANDARD

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

AS22759™/41
SHEET 1 OF 4

REV. B

TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

PART NO. 1/	WIRE SIZE	STRANDING (NUMBER OF STRANDS X SIZE GAUGE OF STRANDS) 3/	DIAMETER OF STRANDED CONDUCTOR (INCHES) 3/		FINISHED WIRE		
			(MIN)	(MAX)	RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FT) (MAX)	DIAMETER (INCHES)	WEIGHT (LB/1000 FT) (MAX)
M22759/41-26-*	26	19 X 38	.0175	.0204	42.2	.040 ± .002	1.70
M22759/41-24-*	24	19 X 36	.0225	.0244	25.9	.045 ± .002	2.30
M22759/41-22-*	22	19 X 34	.0285	.0314	16.0	.050 ± .002	3.20
M22759/41-20-*	20	19 X 32	.0365	.0394	9.77	.058 ± .002	4.70
M22759/41-18-*	18	19 X 30	.0455	.0494	6.10	.070 ± .003	7.20
M22759/41-16-*	16	19 X 29	.0515	.0554	4.76	.077 ± .003	9.00
M22759/41-14-*	14	19 X 27	.0645	.0694	3.00	.094 ± .003	13.8
M22759/41-12-*	12	37 X 28	.0835	.0894	1.98	.111 ± .003	20.5
M22759/41-10-*	10	37 X 26	.106	.114	1.24	.134 ± .004	32.4
M22759/41-8-*	8	133 X 29	.158	.173	.694	.195 ± .008	67.4
M22759/41-6-*	6	133 X 27	.198	.217	.436	.241 ± .010	102.
M22759/41-4-*	4	133 X 25	.250	.274	.275	.310 ± .010	171.
M22759/41-2-*	2	665 X 30	.320	.340	.177	.405 ± .016	258.
M22759/41-1-*	1	817 X 30	.360	.380	.144	.445 ± .016	330.
M22759/41-01-*	0 2/	1045 X 30	.395	.425	.113	.485 ± .016	442.
M22759/41-02-*	00 2/	1330 X 30	.440	.475	.089	.545 ± .016	544.

1/ PART NUMBER: THE ASTERISKS IN THE PART NUMBER COLUMN, TABLES 1 AND 3, SHALL BE REPLACED BY COLOR CODE DESIGNATORS IN ACCORDANCE WITH MIL-STD-681, EXCEPT THAT FOR SIZES 2 AND LARGER THE BRAID PREFERRED COLOR IS DARK GREEN WITH THE COLOR DESIGNATOR 5D. EXAMPLE: SIZE 2 DARK GREEN - AS22759/41-2-5D. WHITE IS AN ACCEPTABLE ALTERNATE WITH A COLOR DESIGNATOR 9. SIZE 20, WHITE WITH ORANGE STRIPE - M22759/41-20-93. PRINTING OF COLOR CODE DESIGNATOR ON SURFACE OF WIRE INSULATION IS NOT REQUIRED.

2/ WIRE SIZES 0 AND 00 HAVE BEEN SUPERSEDED BY -01 AND -02, RESPECTIVELY.

3/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE NCC SMALL DIAMETER NICKEL PLATED COPPER CONDUCTOR FOR SIZES 26 THROUGH 12. SIZE 10 THROUGH 02 SHALL CONFORM TO GENERAL PURPOSE NICKEL PLATED COPPER CONDUCTOR.

REQUIREMENTS: ALL REQUIREMENTS SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS22759.

1. WIRE CONSTRUCTION:

   WIRE CONSTRUCTION SHALL BE IN ACCORDANCE WITH FIGURE 1, TABLES 1, 2, 3, AND 4.

2. WIRE PERFORMANCE RATING:

   TEMPERATURE RATING: 200 °C (392 °F) MAXIMUM CONDUCTOR CONTINUOUS TEMPERATURE.

   VOLTAGE RATING: 600 VOLTS (RMS) AT SEA LEVEL. THIS INSULATION SYSTEM HAS BEEN USED IN AEROSPACE APPLICATIONS USING 115 VOLTS (PHASE TO NEUTRAL), 400 HERTZ AC AND 28 VOLTS DC. VERIFICATION OF THE SUITABILITY OF THIS PRODUCT FOR USE IN OTHER ELECTRICAL SYSTEM CONFIGURATIONS IS THE RESPONSIBILITY OF THE USER.

3. MATERIALS AND PHYSICAL PROPERTIES:

   REFER TO AS22759 FOR MATERIAL REQUIREMENT. MATERIALS USED IN THE MANUFACTURE OF THESE PRODUCTS SHALL COMPLY WITH THE RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE 2002/95/EC.

4. FINISHED WIRE INSULATION PROPERTIES:

   PRIMARY INSULATION SHALL HAVE A CONTRASTING PIGMENTATION TO THAT OF THE JACKET.

   PHYSICAL PROPERTIES OF INSULATION: PRIMARY INSULATION SHALL BE SEPARATED FROM THE OUTER JACKET FOR DETERMINATION OF PRIMARY INSULATION TENSILE STRENGTH AND ELONGATION.

   FINISHED WIRE INSULATION PROPERTIES SHALL BE IN ACCORDANCE WITH TABLE 2.

TABLE 2 - FINISHED WIRE INSULATION PROPERTIES REQUIREMENTS

INSULATION PROPERTIES	
SPARK TEST VOLTAGE (PRIMARY INSULATION	1500 VOLT (RMS) AT 60 HERTZ
IMPULSE TEST VOLTAGE (PRIMARY INSULATION)	6.0 KILOVOLTS (PEAK)
HIGH FREQUENCY TEST VOLTAGE (PRIMARY INSULATION)	4.2 KILOVOLTS (RMS)
IMPULSE TEST VOLTAGE	8.0 KILOVOLTS (PEAK)
HIGH FREQUENCY TEST VOLTAGE	5.7 KILOVOLTS (RMS)
CROSSLINK PROOF	300 °C ± 3 °C (572 °F ± 5.4 °F), 7 HOURS
INSULATION BLOCKING	230 °C ± 3 °C (446 °F ± 5.4 °F)
SHRINKAGE	230 °C ± 3 °C (446 °F ± 5.4 °F)
	MAXIMUM CHANGE .125 INCH
LAYER WICKING	2.25 INCHES (MAX)
	PROCEDURE: MULTI-LAYER WIRE
ELECTRICAL RESISTANCE (IR)	5000 MEGOHMS (MIN) - 1000 FEET WIRE SIZES 26 TO 10
	3000 MEGOHMS (MIN) - 1000 FEET WIRE SIZES 8 TO 02
ELECTRICAL SURFACE RESISTANCE 1/	500 MEGOHMS - INCHES (MIN)
WET DIELECTRIC VOLTAGE	2500 VOLTS (RMS), 60 HERTZ
WALL THICKNESS	.003 INCH (MIN) FOR PRIMARY INSULATION
	.004 INCH (MIN) FOR OUTER JACKET
	.008 INCH (MIN) FOR TOTAL INSULATION
INSULATION TENSILE STRENGTH	5000 LBF/IN^2 (MIN) FOR PRIMARY INSULATION
	5000 LBF/IN^2 (MIN) FOR TOTAL INSULATION
INSULATION ELONGATION	125% (MIN) FOR PRIMARY INSULATION WIRE SIZES 26-10 ONLY
	75% (MIN) FOR TOTAL INSULATION
CONTINUOUS LENGTH SCHEDULE	B

1/ ELECTRICAL SURFACE RESISTANCE TEST SHALL BE PERFORMED PRIOR TO APPLICATION OF BRAID FOR WIRE SIZE 2 AND LARGER.

5. FINISHED WIRE IDENTIFICATION:

WIRE IDENTIFICATION EXCEPTIONS: NONE.

WIRE IDENTIFICATION DURABILITY: 125 CYCLES (250 STROKES) WITH 500 GRAMS WEIGHT (NOT REQUIRED FOR WIRE SIZES 2 THROUGH 02).

STRIPE AND BAND DURABILITY: 125 CYCLES (250 STROKES) WITH 500 GRAMS WEIGHT (NOT REQUIRED FOR WIRE SIZES 2 THROUGH 02).

6. FINISHED WIRE PERFORMANCE:

FINISHED WIRE FIXTURES APPLICABLE TO EACH WIRE SIZE SHALL BE IN ACCORDANCE WITH TABLE 3.

TABLE 3 - PERFORMANCE DETAILS

	BEND TESTING			
	MANDREL DIAMETER (INCHES) 1/		TEST LOAD (POUNDS) 1/	
PART NO.	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST
M22759/41-26-*	.375	1.00	.500	3.00
M22759/41-24-*	.500	1.00	.750	3.00
M22759/41-22-*	.500	1.00	1.00	3.00
M22759/41-20-*	.500	1.00	1.50	4.00
M22759/41-18-*	.750	1.50	2.00	4.00
M22759/41-16-*	1.00	1.50	2.00	5.00
M22759/41-14-*	1.00	2.00	3.00	5.00
M22759/41-12-*	1.50	2.00	3.00	5.00
M22759/41-10-*	2.00	3.00	3.00	5.00
M22759/41-8-*	3.00	4.00	4.00	6.00
M22759/41-6-*	4.00	5.00	4.00	10.0
M22759/41-4-*	5.00	6.00	4.00	10.0
M22759/41-2-*	6.00	8.00	6.00	15.0
M22759/41-1-*	8.00	10.0	6.00	15.0
M22759/41-01-*	8.00	10.0	6.00	15.0
M22759/41-02-*	10.0	12.0	8.00	20.0

1/ TOLERANCE SHALL BE ±3% OF THE GIVEN VALUES.