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AS22759™/54

FEDERAL SUPPLY CLASS
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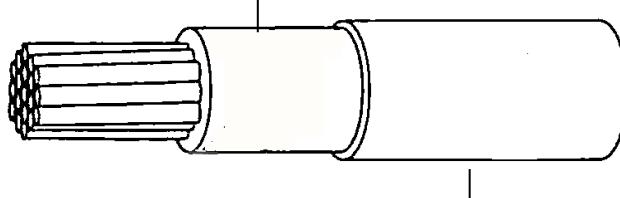
RATIONALE

SPECIFICATION UPDATED TO INCLUDE AS29606 CONDUCTOR REQUIREMENTS, ROHS RESTRICTIONS AND AS22759 MODIFICATIONS.

NOTICE

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

PRIMARY INSULATION - CROSSLINKED, EXTRUDED, MODIFIED ETFE



JACKET - CROSSLINKED, EXTRUDED, MODIFIED ETFE

ETFE – ETHYLENE TETRAFLUOROETHYLENE
CONDUCTOR – STRANDED SILVER COATED COPPER

FIGURE 1 - AS22759/54 CONFIGURATION

TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

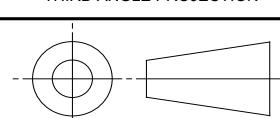
PART NO. 1/	WIRE SIZE	STRANDING (NUMBER OF STRANDS X SIZE GAUGE OF STRANDS) 2/	DIAMETER OF STRANDED CONDUCTOR (INCHES)		FINISHED WIRE		
			(MIN)	(MAX)	RESISTANCE AT 20 °C (68 °F) (OHMS/1,000 FEET) MAX	DIAMETER (INCHES)	WEIGHT (LB/1,000 FEET) (MAX)
M22759/54-30-*	30	7 X 38	.0105	.0124	100.7	.032 ± .002	1.0
M22759/54-28-*	28	7 X 36	.0135	.0154	74.4	.035 ± .002	1.3
M22759/54-26-*	26	19 X 38	.0175	.0194	38.4	.040 ± .002	1.7
M22759/54-24-*	24	19 X 36	.0225	.0244	24.3	.045 ± .002	2.3
M22759/54-22-*	22	19 X 34	.0285	.0304	15.1	.050 ± .002	3.3
M22759/54-20-*	20	19 X 32	.0365	.0384	9.19	.058 ± .002	4.7
M22759/54-18-*	18	19 X 30	.0455	.0484	5.79	.070 ± .002	7.2
M22759/54-16-*	16	19 X 29	.0515	.0544	4.52	.077 ± .003	9.0
M22759/54-14-*	14	19 X 27	.0645	.0684	2.88	.094 ± .003	13.8
M22759/54-12-*	12	37 X 28	.0835	.0874	1.90	.111 ± .003	20.5
M22759/54-10-*	10	37 X 26	.106	.112	1.19	.134 ± .004	32.4

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. EXAMPLES: SIZE 20, WHITE-M22759/54-20-9; WHITE WITH ORANGE STRIPE – M22759/54-20-93. PRINTING OF COLOR CODE DESIGNATOR ON SURFACE OF WIRE INSULATION IS NOT REQUIRED.

2/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE SCC SMALL DIAMETER SILVER PLATED COPPER CONDUCTOR FOR SIZES 30 THROUGH 12. SIZE 10 SHALL CONFORM TO GENERAL PURPOSE SILVER PLATED COPPER CONDUCTOR.

SAE values your input. To provide feedback on this Technical Report, please visit
<http://www.sae.org/technical/standards/AS22759/54A>

THIRD ANGLE PROJECTION



CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: AS22759



AEROSPACE STANDARD

(R) WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED,
CROSSLINKED MODIFIED ETFE, LOW FLUORIDE,
NORMAL WEIGHT, SILVER-COATED COPPER,
200 °C, 600 VOLT, ROHS

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REQUIREMENT: 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 AND 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:

SEE 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	1,500 VOLT (RMS) AT 60 HERTZ OR 3000 HERTZ ON PRIMARY INSULATION
IMPULSE TEST VOLTAGE	8.0 KILOVOLTS (PEAK)
HIGH FREQUENCY TEST VOLTAGE	5.7 KILOVOLTS (RMS)
FLUORIDE OFF-GASSING	MAXIMUM 20 PPM
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 INCHES
LAYER WICKING	2.25 INCHES (MAX) PROCEDURE: MULTI-LAYER WIRE
ELECTRICAL RESISTANCE (IR)	5,000 MEGOHMS (MIN) - 1,000 FEET
ELECTRICAL SURFACE RESISTANCE	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	5,000 LBF/IN ² (MIN) FOR PRIMARY INSULATION 5,000 LBF/IN ² (MIN) FOR TOTAL INSULATION
INSULATION ELONGATION	125% (MIN) FOR PRIMARY INSULATION 75% (MIN) FOR TOTAL INSULATION
UV LASER MARKING	75% MINIMUM AVERAGE
CONTINUOUS LENGTH SCHEDULE	B

5. FINISHED WIRE IDENTIFICATION:

WIRE IDENTIFICATION EXCEPTIONS: NONE

WIRE IDENTIFICATION DURABILITY: 125 CYCLES (250 STROKES) WITH 500 GRAMS WEIGHT

STRIPE AND BAND DURABILITY: 125 CYCLES (250 STROKES) WITH 500 GRAMS WEIGHT

6. FINISHED WIRE PERFORMANCE:

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

 SAE INTERNATIONAL	AEROSPACE STANDARD	AS22759™/54 SHEET 2 OF 4	REV. A
	(R) WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, CROSSLINKED MODIFIED ETFE, LOW FLUORIDE, NORMAL WEIGHT, SILVER-COATED COPPER, 200 °C, 600 VOLT, ROHS		

TABLE 3 - PERFORMANCE DETAILS

PART NO.	BEND TESTING			
	MANDREL DIAMETER ^{1/} (INCHES)		TEST LOAD ^{1/} (LB)	
	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST
M22759/54-30-*	.375	1.00	.250	1.00
M22759/54-28-*	.375	1.00	.500	2.00
M22759/54-26-*	.375	1.00	.500	3.00
M22759/54-24-*	.375	1.00	.750	3.00
M22759/54-22-*	.500	1.00	1.00	3.00
M22759/54-20-*	.500	1.00	1.50	4.00
M22759/54-18-*	.750	1.50	2.00	4.00
M22759/54-16-*	1.00	1.50	2.00	5.00
M22759/54-14-*	1.00	2.00	3.00	5.00
M22759/54-12-*	1.50	2.00	3.00	5.00
M22759/54-10-*	2.00	3.00	3.00	5.00

^{1/} TOLERANCE SHALL BE $\pm 3\%$ OF THE GIVEN VALUES.

FINISHED WIRE PERFORMANCE CHARACTERISTICS SHALL BE IN ACCORDANCE WITH TABLE 4.

TABLE 4 - FINISHED WIRE PERFORMANCE CHARACTERISTICS

PERFORMANCE CHARACTERISTIC	REQUIREMENT
WRAP BACK BEND RESISTANCE	TEMPERATURE EXPOSURE $13^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($595^{\circ}\text{F} \pm 5.4^{\circ}\text{F}$)
THERMAL SHOCK MECHANICAL RESISTANCE	TEMPERATURE EXPOSURE $200^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($392^{\circ}\text{F} \pm 5.4^{\circ}\text{F}$) WIRE SIZES 30 - 12: MAXIMUM CHANGE .060 INCHES WIRE SIZE 10: MAXIMUM CHANGE .100 INCHES
THERMAL MECHANICAL RESISTANCE (LIFE CYCLE)	EXPOSURE 500 HOURS, $230^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($446^{\circ}\text{F} \pm 5.4^{\circ}\text{F}$) UV LASER CONTRAST MARKING RESISTANCE AFTER THERMAL AGING: 168 HOURS, 60% (MIN)
HUMIDITY RESISTANCE (IR)	5,000 MOHMS (MIN) - 1,000 FEET
FLUID RESISTANCE	DIAMETER INCREASE 5% (MAX)
SMOKE RESISTANCE	$250^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($482^{\circ}\text{F} \pm 9^{\circ}\text{F}$)
FLAME RESISTANCE	SELF-EXTINGUISH TIME: 3 SECONDS BURN LENGTH 3 INCHES
WET ARC RESISTANCE	MINIMUM 70 WIRES PASS WET DIELECTRIC TEST 2 OR LESS WIRES FAIL IN ONE BUNDLE DAMAGE LENGTH: 1.0 INCHES OR LESS
DRY ARC RESISTANCE	MINIMUM 70 WIRES PASS WET DIELECTRIC TEST 2 OR LESS WIRES FAIL IN ONE BUNDLE DAMAGE LENGTH: 1.0 INCHES OR LESS
DYNAMIC CUT-THROUGH	WIRE SIZE 26 10 POUNDS AT 23°C , 6 POUNDS AT 70°C , 4 POUNDS AT 150°C , 1 POUND AT 200°C WIRE SIZE 20 25 POUNDS AT 23°C , 15 POUNDS AT 70°C , 5 POUNDS AT 150°C , 2 POUNDS AT 200°C WIRE SIZE 16 35 POUNDS AT 23°C , 20 POUNDS AT 70°C , 6 POUNDS AT 150°C , 2 POUNDS AT 200°C
LONGEVITY RESISTANCE (THERMAL INDEX)	$200^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($392^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$), 10,000 HOURS
ABRASION RESISTANCE (NEEDLE)	WIRE SIZE 20 SAMPLE SIZE 8 READINGS 1,000 MIN CYCLES, $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($73^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$) 500 MIN CYCLES, $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($158^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$) 50 IN CYCLES, $150^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($302^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$)