

RATIONALE

DETAIL SPECIFICATION REQUIRED TO STANDARDIZE COMMERCIAL WIRE FOR USER APPLICATIONS.

NOTICE

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

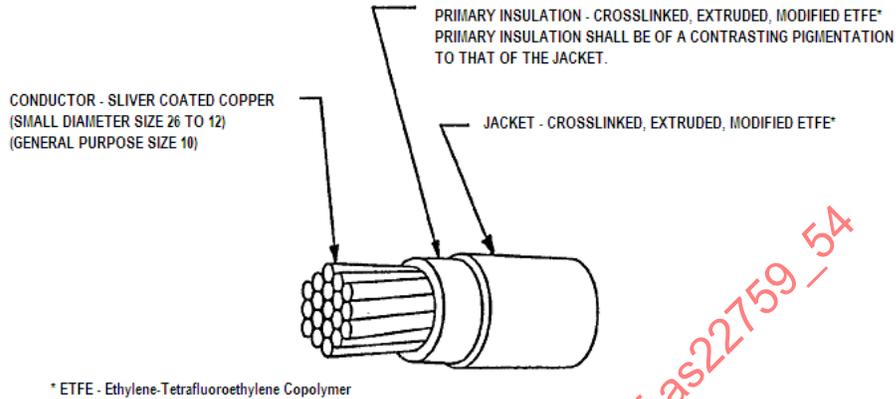


FIGURE 1 - GENERAL CONFIGURATION

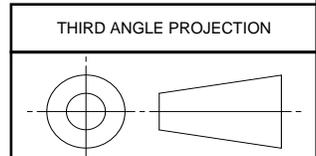
TABLE 1 - CONSTRUCTION DETAILS

PART NO. ^{1/}	WIRE SIZE	STRANDING (NUMBER OF STRANDS X AWG GAUGE OF STRANDS) ^{2/}	DIAMETER OF STRANDED CONDUCTOR (INCHES)		FINISHED WIRE		
			(MIN)	(MAX)	RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FEET) MAX	DIAMETER (INCHES)	WEIGHT (POUNDS/1000 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 2, 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 MIL-DTL-29606 TYPE SCC SMALL DIAMETER SILVER PLATED COPPER CONDUCTOR FOR SIZES 26 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/AS22759/54>



CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: AS22759



AEROSPACE STANDARD

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

SAE AS22759/54
SHEET 1 OF 4

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SAE AS22759/54

ISSUED 2013-07

TABLE 2 - PERFORMANCE DETAILS

PART NO.	BEND TESTING			
	MANDREL DIAMETER (INCHES) (±3%)		TEST LOAD (POUNDS) (±3%)	
	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

REQUIREMENTS:

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

CONFIGURATION:

WIRE SHALL BE CONSTRUCTED IN ACCORDANCE WITH FIGURE 1 AND TABLE 1.

INSULATION THICKNESS:

- .003 INCH (MIN) FOR PRIMARY INSULATION
- .004 INCH (MIN) FOR OUTER JACKET
- .008 INCH (MIN) FOR TOTAL INSULATION

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/INCH² (MIN) FOR PRIMARY INSULATION, 5000 LBF/INCH² (MIN) FOR TOTAL INSULATION (PRIMARY INSULATION AND JACKET).

ELONGATION, 125% (MIN) FOR PRIMARY INSULATION, 75% (MIN) FOR TOTAL INSULATION (PRIMARY INSULATION AND JACKET).

WIRE CONTINUOUS LENGTH: SCHEDULE B.

RATINGS:

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

ADDITIONAL REQUIREMENTS:

SILVER PLATED CONDUCTOR: SHALL MEET QUALITY CONFORMANCE TEST FOR CONDUCTOR MATERIAL AND REQUIREMENTS AS DEFINED FOR SMALL DIAMETER OR GENERAL PURPOSE SCC TYPE CONDUCTORS.

BLOCKING: 230 °C ± 3 °C (446 °F ± 5.4 °F).

COLOR STRIPING OR BANDING DURABILITY: 125 CYCLES (250 STROKES) (MIN), 500 GRAMS WEIGHT.

CROSSLINKING PROOF TEST: 300 °C ± 3 °C (572 °F ± 5.4 °F).

 An SAE International Group	AEROSPACE STANDARD WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, CROSSLINKED MODIFIED ETFE, LOW FLUORIDE, NORMAL WEIGHT, SILVER-COATED COPPER, 200 °C, 600 VOLT	SAE AS22759/54 SHEET 2 OF 4	

WET DIELECTRIC TEST: 2500 VOLTS (RMS), 60 HERTZ.

DRY ARC PROPAGATION RESISTANCE: THE WIRE SHALL MEET THE FOLLOWING.

1. A MINIMUM OF 70 WIRES PASS THE DIELECTRIC TEST.
2. TWO WIRES OR LESS FAIL THE DIELECTRIC TEST IN ANY ONE BUNDLE.
3. ACTUAL DAMAGE TO THE WIRE IS NOT MORE THAN 1.0 INCHES IN ANY TEST BUNDLE.

DYNAMIC CUT-THROUGH: MINIMUM AVERAGE DYNAMIC CUT THROUGH SHALL BE IN ACCORDANCE WITH TABLE 3.

TABLE 3 - DYNAMIC CUT-THROUGH

WIRE SIZE	23 °C ± 5 °C	70 °C ± 5 °C	150 °C ± 5 °C	200 °C ± 5 °C
26	10	6	4	1
20	20	12	4	2
16	25	15	5	3

FLAMMABILITY: FLAME TRAVEL SHALL NOT EXCEED 3.0 INCHES.

FLUORIDE OFFGASSING TEST: REQUIRED

FINISH WIRE INSULATION FLAWS:

SPARK TEST OF PRIMARY INSULATION: 1500 VOLTS (RMS), 60 HERTZ OR HIGH FREQUENCY (3000 HERTZ)

IMPULSE DIELECTRIC TEST: 8.0 KILOVOLTS (PEAK)

HIGH FREQUENCY SPARK TEST: (WHEN USED IN LIEU OF THE IMPULSE DIELECTRIC TEST) 5.7 KILOVOLTS (RMS)

HUMIDITY RESISTANCE: 5000 MEGOHMS FOR 1000 FEET (MIN).

IDENTIFICATION DURABILITY: 125 CYCLES (250 STROKES) (MIN), 500 GRAMS WEIGHT.

IMMERSION: REQUIRED

INSULATION RESISTANCE INITIAL: 5000 MEGOHMS FOR 1000 FEET (MIN).

LIFE CYCLE: 500 HOURS AT 230 °C ± 3 °C (446 °F ± 5.4 °F).

LOW TEMPERATURE (COLD BEND): BEND TEMPERATURE, -65 °C ± 3 °C (-85 °F ± 5.4 °F).
DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HERTZ.

NEEDLE ABRASION: (INITIAL QUALIFICATION AND RETENTION OF QUALIFICATION) WIRE SIZE 20 ONLY. WHEN TESTED IN ACCORDANCE WITH AS4373, METHOD 301, THE AVERAGE CYCLES TO FAILURE ON 8 READINGS, AFTER DROPPING THE HIGHEST AND LOWEST VALUE OF THE 10 READINGS TESTED, SHALL NOT BE LESS THAN THE VALUES SPECIFIED IN TABLE 4 WHEN APPLYING A 1 (10 POUND ± 0.01 POUND LOAD.

TABLE 4 - NEEDLE ABRASION CYCLES TO FAILURE AT TEMPERATURE

TEMPERATURE (°C (°F))	CYCLES TO FAILURE (MIN)
21-25 (67-77)	1000
68-72 (153-163)	500
148-152 (297-307)	50

SHRINKAGE: .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: ALL CONDUCTORS SHALL BE TESTED IN ACCORDANCE WITH AS4373, METHOD 105 WITHOUT STEAM AGING.

SURFACE RESISTANCE: 500 MEGOHMS - INCHES (MIN), INITIAL AND FINAL READINGS.