

REV.
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AS22759™/53

FEDERAL SUPPLY CLASS
6145

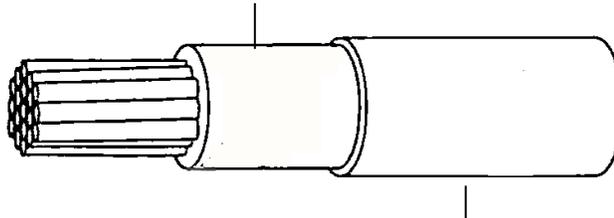
RATIONALE

CLARIFICATION OF COLOR FOR LASER MARKING CONTRAST REQUIREMENT IS NEEDED.

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 HIGH STRENGTH COPPER ALLOY

FIGURE 1 - AS22759/53 CONFIGURATION

TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

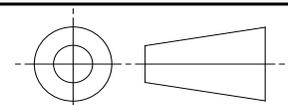
PART NO. 1/	WIRE SIZE	STRANDING (NUMBER OF STRANDS X SIZE GAUGE OF STRANDS)	DIAMETER OF STRANDED CONDUCTOR (INCHES) 2/		FINISHED WIRE		
			(MIN)	(MAX)	RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FEET) MAX	DIAMETER (INCHES)	WEIGHT (LB/1000 FEET) (MAX)
M22759/53-30-*	30	7 X 38	.0105	.0124	117.4	.032 ± .002	1.0
M22759/53-28-*	28	7 X 36	.0135	.0154	74.4	.035 ± .002	1.3
M22759/53-26-*	26	19 X 38	.0175	.0204	44.8	.040 ± .002	1.7
M22759/53-24-*	24	19 X 36	.0225	.0244	28.4	.045 ± .002	2.3
M22759/53-22-*	22	19 X 34	.0285	.0314	17.5	.050 ± .002	3.3
M22759/53-20-*	20	19 X 32	.0365	.0395	10.7	.058 ± .002	4.8

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-M22759/53-20-9; WHITE WITH ORANGE STRIPE - M22759/53-20-93. PRINTING OF COLOR CODE DESIGNATOR ON SURFACE OF WIRE INSULATION IS NOT REQUIRED.

2/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE SCA SMALL DIAMETER SILVER PLATED HIGH STRENGTH COPPER ALLOY CONDUCTOR.

For more information on this standard, visit
<https://www.sae.org/standards/content/AS22759/53C/>

THIRD ANGLE PROJECTION



CUSTODIAN: AE-8D

PROCUREMENT SPECIFICATION: AS22759



AEROSPACE STANDARD

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

AS22759™/53
SHEET 1 OF 4

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ISSUED 2013-07 REVISED 2025-02

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 AND TABLES 1, 2, 3, AND 4.

2. WIRE PERFORMANCE RATING:

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.

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	1500 VOLTS (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 INCH
LAYER WICKING	2.25 INCHES (MAX) PROCEDURE: MULTI-LAYER WIRE
ELECTRICAL RESISTANCE (IR)	5000 MEGOHMS (MIN) - 1000 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	5000 LBF/IN ² (MIN) FOR PRIMARY INSULATION 5000 LBF/IN ² (MIN) FOR TOTAL INSULATION
INSULATION ELONGATION	125% (MIN) FOR PRIMARY INSULATION 75% (MIN) FOR TOTAL INSULATION
UV LASER MARKING	70% 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.

	AEROSPACE STANDARD	AS22759™/53 SHEET 2 OF 4	REV. C
	WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, CROSSLINKED MODIFIED ETFE, LOW FLUORIDE, NORMAL WEIGHT, SILVER-COATED HIGH STRENGTH COPPER ALLOY, 200 °C, 600 VOLT, ROHS		

TABLE 3 - PERFORMANCE DETAILS

PART NO.	BEND TESTING			
	MANDREL DIAMETER 1/ (INCHES)		TEST LOAD 1/ (POUNDS)	
	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST	CROSSLINKING PROOF, IMMERSION AND LIFE CYCLE TESTS	COLD BEND TEST
M22759/53-30-*	.375	1.00	.250	1.00
M22759/53-28-*	.375	1.00	.500	2.00
M22759/53-26-*	.375	1.00	.500	3.00
M22759/53-24-*	.500	1.00	.750	3.00
M22759/53-22-*	.500	1.00	1.00	3.00
M22759/53-20-*	.500	1.00	1.50	4.00

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

7. 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 313 °C ± 3 °C (595 °F ± 5.4 °F)
THERMAL SHOCK MECHANICAL RESISTANCE	TEMPERATURE EXPOSURE 200 °C ± 3 °C (392 °F ± 5.4 °F)
	MAXIMUM CHANGE .060 INCH
THERMAL MECHANICAL RESISTANCE (LIFE CYCLE)	EXPOSURE 500 HOURS, 230 °C ± 3 °C (446 °F ± 5.4 °F)
UV LASER CONTRAST MARKING RESISTANCE AFTER THERMAL AGING	EXPOSURE 168 HOURS, 230 °C ± 3 °C (446 °F ± 5.4 °F), 55% (MIN)
HUMIDITY RESISTANCE (IR)	5000 MEGOHMS (MIN) - 1000 FEET
FLUID RESISTANCE	DIAMETER INCREASE 5% (MAX)
SMOKE RESISTANCE	250 °C ± 5 °C (482 °F ± 9 °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 INCH OR LESS
DRY ARC RESISTANCE	MINIMUM 70 WIRES PASS WET DIELECTRIC TEST
	2 OR LESS WIRES FAIL IN ONE BUNDLE
	DAMAGE LENGTH: 1.0 INCH OR LESS
DYNAMIC CUT-THROUGH	WIRE SIZE 26 6 POUNDS AT 23 °C, 4 POUNDS AT 70 °C, 2 POUNDS AT 150 °C, 1 POUND AT 200 °C
	WIRE SIZE 20 20 POUNDS AT 23 °C, 12 POUNDS AT 70 °C, 3 POUNDS AT 150 °C, 2 POUNDS AT 200 °C
ABRASION RESISTANCE (NEEDLE)	WIRE SIZE 20
	SAMPLE SIZE 8 READINGS
	1000 MIN CYCLES, 23 °C ± 2 °C (73 °F ± 3.6 °F)
	500 MIN CYCLES, 70 °C ± 2 °C (158 °F ± 3.6 °F)
	50 MIN CYCLES, 150 °C ± 2 °C (302 °F ± 3.6 °F)

8. REQUIREMENT EXCEPTION TO AS22759:

- a. LASER MARK CONTRAST SHALL BE TESTED ON WHITE (COLOR CODE 9) INSULATION ONLY.
- b. COLORS SHALL BE IN ACCORDANCE WITH MIL-STD-104 CLASS 1.

APPLICATION NOTES:

- 1. PRODUCTS MANUFACTURED TO THIS SPECIFICATION ARE ROHS COMPLIANT.
- 2. THE INDUSTRY HAS IDENTIFIED FLUORIDE OFF-GASSING AS A SERIOUS ISSUE IN ENCLOSED ENVIRONMENTS. THE EVOLUTION OF FLUORIDE GAS CAN ACCELERATE CORROSION OF METAL SURFACES AND ETCHING OF OPTICS. IT CAN ALSO ACCELERATE COPPER OXIDATION. IF ENCLOSED ENVIRONMENTS ARE NOT AN ISSUE, CONSIDER USING AS22759/35.

	AEROSPACE STANDARD	AS22759™/53 SHEET 3 OF 4	REV. C
	WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, CROSSLINKED MODIFIED ETFE, LOW FLUORIDE, NORMAL WEIGHT, SILVER-COATED HIGH STRENGTH COPPER ALLOY, 200 °C, 600 VOLT, ROHS		