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AS22759/89

FEDERAL SUPPLY CLASS
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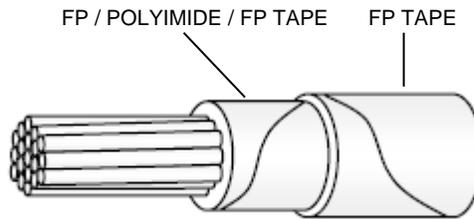
RATIONALE

SPECIFICATION UPDATED TO INCLUDE AS29606 CONDUCTOR REQUIREMENTS, ROHS RESTRICTIONS, HARMONIZATION WITH AS22759/86 AND AS22759 MODIFICATIONS.

NOTICE

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

THIS SPECIFICATION IS NOT INTENDED FOR USE IN NAVAL AIRCRAFT OR NAVAL AIR SYSTEMS APPLICATIONS.



SIZE 26 THROUGH 20

FP – FLUOROCARBON POLYMER MODIFIED POLYTETRAFLUOROETHYLENE (PTFE)
CONDUCTOR – STRANDED SILVER COATED HIGH STRENGTH OR ULTRA-HIGH STRENGTH COPPER ALLOY

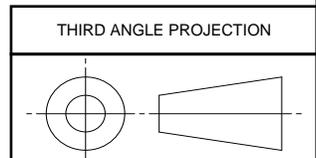
FIGURE 1 - AS22759/89 CONFIGURATION

TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

PART NO. 1/	WIRE SIZE	CONDUCTOR 3/				FINISHED WIRE				
		STRANDING (NUMBER OF STRANDS) X SIZE GAUGE OF STRANDS	DIAMETER (IN)		RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FEET MAX)	DIAMETER (IN)		WEIGHT (LB/1000 FEET) 2/		
			MIN	MAX		MIN	MAX	MIN	TARGET	MAX
M22759/89-26-*	26	19 X 38	.0175	.0204	56.4	.033	.037	1.34	1.47	1.60
M22759/89-24-*	24	19 X 36	.0225	.0244	28.4	.038	.042	1.87	2.04	2.20
M22759/89-22-*	22	19 X 34	.0285	.0314	17.5	.043	.047	2.70	2.90	3.10
M22759/89-20-*	20	19 X 32	.0365	.0395	10.7	.051	.055	4.25	4.48	4.70

- 1/ PART NUMBER: THE ASTERISKS IN THE PART NUMBER COLUMN OF TABLE 1 SHALL BE REPLACED BY COLOR CODE DESIGNATORS IN ACCORDANCE WITH MIL-STD-681. EXAMPLES: M22759/89-20-93 IS A 20 AWG WHITE WITH ORANGE STRIPE.
- 2/ THE ACCEPTABLE VALUE FOR THE CPK FOR THE FINISHED WIRE WEIGHT LISTED SHALL BE 1.3, USING A NORMAL (GAUSSIAN) DISTRIBUTION TO OBTAIN THOSE CPK VALUES.
- 3/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE SCA SMALL DIAMETER SILVER COATED HIGH STRENGTH COPPER ALLOY CONDUCTOR FOR WIRE SIZES 24 THROUGH 20 AND TYPE SCU SMALL DIAMETER SILVER COATED ULTRA HIGH STRENGTH COPPER ALLOY CONDUCTOR FOR WIRE SIZE 26.

SAE values your input. To provide feedback on this Technical Report, please visit <http://www.sae.org/technical/standards/AS22759/89D>



CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: AS22759



AEROSPACE STANDARD

(R) WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/ POLYIMIDE INSULATED, NORMAL WEIGHT, SILVER COATED, HIGH STRENGTH OR ULTRA HIGH STRENGTH COPPER, ALLOY, 200 °C, 600 VOLTS ROHS

AS22759/89
SHEET 1 OF 4

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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.

TABLE 2 - WIRE INSULATION MATERIALS

TAPE CODE	THICKNESS (NOM)	MATERIAL
1	.0020	.0005 (FP)/.0010 (POLYIMIDE)/.0005 (FP)
2	.0020	FP (UNSINTERED)

TABLE 3 - TAPE OVERLAP REQUIREMENTS ^{1/}

WIRE SIZE	WRAP 1				WRAP 2			NOMINAL WALL THICKNESS (MILS)
	TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP			
		MIN	MAX		MIN	MAX		
26	1	50.5	54.0	2	50.5	54.0	7.4	
24	1	50.5	54.0	2	50.5	54.0	7.4	
22	1	50.5	54.0	2	50.5	54.0	7.4	
20	1	50.5	54.0	2	50.5	54.0	7.4	

^{1/} WRAP 1 IS INNERMOST TAPE WHICH IS IN CONTACT WITH THE CONDUCTOR.

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. FINISH WIRE INSULATION PROPERTIES:

FINISH WIRE INSULATION PROPERTIES SHALL BE IN ACCORDANCE WITH TABLE 4.

TABLE 4 - FINISHED WIRE INSULATION PROPERTIES REQUIREMENTS

INSULATION PROPERTIES	
IMPULSE TEST VOLTAGE	8.0 KILOVOLTS (PEAK)
HIGH FREQUENCY TEST VOLTAGE	5.7 KILOVOLTS (RMS)
INSULATION STATE OF SINTER	3.0 JOULES PER GRAM MAXIMUM
TAPE OVERLAP	TABLE 3
LAMINATION SEALING	260 °C ± 2 °C (500 °F ± 3.6 °F), 6 HOURS
INSULATION BLOCKING	200 °C ± 2 °C (392 °F ± 3.6 °F)
SHRINKAGE	230 °C ± 2 °C (446 °F ± 3.6 °F)
	MAXIMUM CHANGE .091 INCHES
ELECTRICAL RESISTANCE (IR)	5000 MEGOHMS (MIN)-1000 FEET
WET DIELECTRIC VOLTAGE	2500 VOLTS (RMS), 60 HERTZ
INSULATION STRIP FORCE	.25 - 6.0 POUNDS
UV LASER MARKING	55% MINIMUM AVERAGE
CONTINUOUS LENGTH SCHEDULE	B

5. FINISH WIRE IDENTIFICATION:

WIRE IDENTIFICATION EXCEPTIONS: NONE

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

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

6. FINISH WIRE PERFORMANCE:

FINISH WIRE FIXTURES APPLICABLE TO EACH WIRE SIZE SHALL BE IN ACCORDANCE WITH TABLE 5.

TABLE 5 - TEST MANDREL AND TEST LOAD REQUIREMENTS

WIRE SIZE (AWG)	TEST MANDREL DIAMETER ^{1/} (INCHES)			TEST LOAD ^{1/} (LB)	
	COLD BEND	LIFE CYCLE/ BEND TEST	WRAP	COLD BEND	LIFE CYCLE/ BEND TEST
26	1.00	.375	.125	3.00	.50
24	1.00	.500	.125	3.00	.75
22	1.00	.500	.125	4.00	1.00
20	1.00	.500	.125	4.00	1.50

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

FINISH WIRE PERFORMANCE CHARACTERS SHALL BE IN ACCORDANCE WITH TABLE 6.

TABLE 6 - FINISH WIRE PERFORMANCE CHARACTERISTICS

PERFORMANCE CHARACTERISTIC	REQUIREMENT
MANDREL BEND RESISTANCE (TAPES/BRAIDS)	REQUIRED
THERMAL SHOCK MECHANICAL RESISTANCE	TEMPERATURE EXPOSURE 200 °C ± 2 °C (392 °F ± 3.6 °F) MAXIMUM CHANGE .091 INCHES
THERMAL MECHANICAL RESISTANCE (LIFE CYCLE)	EXPOSURE 500 HOURS, 230 °C ± 2 °C (446 °F ± 3.6 °F)
HUMIDITY RESISTANCE (IR)	5000 MEGOHMS (MIN)-1000 FEET
FLUID RESISTANCE	DIAMETER INCREASE 5% (MAX)
SMOKE RESISTANCE	200 °C ± 5 °C (392 °F ± 9 °F)
FLAME RESISTANCE	SELF-EXTINGUISH TIME: 3 SECONDS BURN LENGTH 3 INCHES
WET ARC RESISTANCE	MINIMUM 67 WIRES PASS WET DIELECTRIC TEST 3 OR LESS WIRES FAIL IN ONE BUNDLE DAMAGE LENGTH: 3.0 INCHES OR LESS
DRY ARC RESISTANCE	MINIMUM 67 WIRES PASS WET DIELECTRIC TEST 3 OR LESS WIRES FAIL IN ONE BUNDLE DAMAGE LENGTH: 3.0 INCHES OR LESS
DYNAMIC CUT-THROUGH	WIRE SIZE 26 10 POUNDS AT 23 °C, 8 POUNDS AT 150 °C, 6 POUNDS AT 200 °C WIRE SIZE 20 15 POUNDS AT 23 °C, 12 POUNDS AT 150 °C, 10 POUNDS AT 200 °C
FORCED HYDROLYSIS INSULATION RESISTANCE	WIRE SIZE 20 70 °C ± 2 °C (158 °F ± 3.6 °F), 5000 HOURS
LONGEVITY RESISTANCE (THERMAL INDEX)	200 ± 2 °C (392 °F ± 3.6 °F), 10 000 HOURS