

REV.  
B

AS22759/92

FEDERAL SUPPLY CLASS  
6145

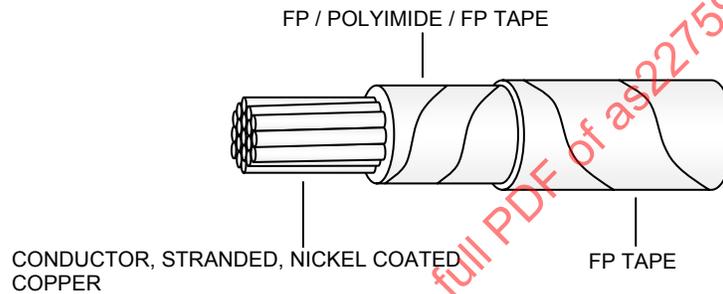
RATIONALE

TOTAL REVISION AND UPDATE WORD-FOR-WORD MIL SPECIFICATIONS CONVERTED TO SAE STANDARDS.

NOTICE

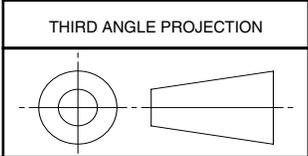
THE REQUIREMENTS FOR ACQUIRING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) SPECIFIED IN THE SOLICITATION: AS22759.

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



FP - FLUOROCARBON POLYMER, MODIFIED  
POLYTETRAFLUOROETHYLENE (PTFE)

FIGURE 1 - GENERAL CONFIGURATION



CUSTODIAN: SAE AE-8/AE-8D



**AEROSPACE STANDARD**

(R) WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/  
POLYIMIDE INSULATED, LIGHT WEIGHT, NICKEL  
COATED, COPPER CONDUCTOR, 260°C, 600 VOLTS

**AS22759/92**  
SHEET 1 OF 6

**REV.  
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TABLE 1 - CONSTRUCTION DETAILS

PART NO. 1/	WIRE SIZE	CONDUCTOR				FINISHED WIRE				
		STRANDING (NUMBER OF STRANDS X AWG GAUGE OF STRANDS)	DIAMETER (IN)		RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FT MAX)	DIAMETER (IN)		WEIGHT (LB/1000 FT) 2/		
			MIN	MAX		MIN	MAX	MIN	TARGET	MAX
M22759/92-26-*	26	19 X 38	0.0175	0.0204	42.2	0.030	0.034	1.16	1.31	1.45
M22759/92-24-*	24	19 X 36	0.0225	0.0244	25.9	0.034	0.038	1.70	1.85	2.00
M22759/92-22-*	22	19 X 34	0.0285	0.0314	16.0	0.040	0.043	2.55	2.75	2.95
M22759/92-20-*	20	19 X 32	0.0365	0.0394	9.77	0.048	0.051	4.05	4.25	4.45
M22759/92-18-*	18	19 X 30	0.0455	0.0494	6.10	0.056	0.060	6.15	6.40	6.65
M22759/92-16-*	16	19 X 29	0.0515	0.0554	4.76	0.063	0.067	7.75	8.05	8.35
M22759/92-14-*	14	19 X 27	0.0645	0.0694	3.00	0.076	0.080	12.0	12.4	12.8
M22759/92-12-*	12	37 X 28	0.0835	0.0894	1.98	0.096	0.100	18.5	19.2	19.7
M22759/92-10-*	10	37 X 26	0.106	0.112	1.24	0.119	0.123	29.2	30.0	30.8

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: M22759/92-20-93 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.

TABLE 2 - WIRE INSULATION MATERIALS 1/

TAPE CODE	THICKNESS (NOM)	MATERIAL
1	0.0012	0.00045 (FP)/0.00065 (POLYIMIDE)/0.0001 (FP)
2	0.0020	FP (UNSINTERED)
3	0.0025	FP (UNSINTERED)

1/ PHYSICAL PROPERTIES OF FP UNSINTERED TAPES SHALL BE IN ACCORDANCE WITH MIL-W-22759 REQUIREMENTS.

TABLE 3 - PHYSICAL PROPERTIES OF FP/POLYIMIDE/FP TAPES

TENSILE STRENGTH	20,000 LB/IN SQ (AVERAGE MINIMUM)
TENSILE MODULUS	400,000 LB/IN SQ (AVERAGE MINIMUM)
ELONGATION	40 PERCENT (AVERAGE MINIMUM)
DIELECTRIC STRENGTH	4000 VOLTS/MIL (AVERAGE MINIMUM)
0.00045 FP LAYER	DISTINGUISHABLE COLOR (NEXT TO CONDUCTOR)

TABLE 4 - 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	5.8	
24	1	50.5	54.0	2	50.5	54.0	5.8	
22	1	50.5	54.0	2	50.5	54.0	5.8	
20	1	50.5	54.0	2	50.5	54.0	5.8	
18	1	50.5	54.0	2	50.5	54.0	5.8	
16	1	50.5	54.0	2	50.5	54.0	5.8	
14	1	50.5	54.0	2	50.5	54.0	5.8	
12	1	50.5	54.0	3	50.5	54.0	6.7	
10	1	50.5	54.0	3	50.5	54.0	6.7	

1/ WRAP 1 IS INNERMOST TAPE WHICH IS IN CONTACT WITH THE CONDUCTOR WITH THE 0.00045 INCH FP SIDE OF THE TAPE AGAINST THE CONDUCTOR.

## RATINGS:

TEMPERATURE RATING: 260 °C (500 °F) MAXIMUM CONTINUOUS CONDUCTOR TEMPERATURE.  
VOLTAGE RATING: 600 VOLTS (RMS) AT SEA LEVEL.

## ADDITIONAL REQUIREMENTS:

WET ARC PROPAGATION RESISTANCE (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): TEST IN ACCORDANCE WITH AS4373, METHOD 509. MEASURE THE DAMAGE OF THE BUNDLE ALONG THE AXIS. THE WIRE IS ACCEPTABLE IF THE FOLLOWING CRITERIA ARE MET:

1. A MINIMUM OF 64 WIRES PASS THE DIELECTRIC TEST.
2. THREE WIRES OR LESS FAIL THE DIELECTRIC TEST IN ANY ONE BUNDLE.
3. ACTUAL DAMAGE TO THE WIRE IS NOT MORE THAN 3 INCHES IN ANY TEST BUNDLE.

DRY ARC PROPAGATION RESISTANCE (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): TEST IN ACCORDANCE WITH AS4373, METHOD 508. MEASURE THE DAMAGE OF THE BUNDLE ALONG THE AXIS. THE WIRE IS ACCEPTABLE IF THE FOLLOWING CRITERIA ARE MET:

1. A MINIMUM OF 64 WIRES PASS THE DIELECTRIC TEST.
2. THREE WIRES OR LESS FAIL THE DIELECTRIC TEST IN ANY ONE BUNDLE.
3. ACTUAL DAMAGE TO THE WIRE IS NOT MORE THAN 3 INCHES IN ANY TEST BUNDLE.

BLOCKING: 260 °C ± 2 °C (500 °F ± 3.6 °F)

COLOR: WHITE IS THE PREFERRED COLOR AND SHALL BE IN ACCORDANCE WITH MIL-STD-104, CLASS 2. COLORS SHALL BE LASER MARKABLE AND MEET THE COLOR LIMITS BELOW. CONFORMITY OF COLOR SHALL NOT BE REQUIRED AFTER OVEN EXPOSURE.

## MUNSELL COLOR LIMITS FOR UV LASER MARKABLE WIRE

COLOR	HUE		VALUE		CHROMA	
	FROM	TO	FROM	TO	FROM	TO
BLACK	2.5N	2.5N	7	8.5	N/A	N/A
BLUE	5PB	7.5B	7	8	4	6
GREEN	2.5G	7.5G	7	9	2	6
RED	10RP	5R	7	8	4	6
YELLOW	5Y	10Y	8	9	4	6
BROWN	2.5YR	7.5R	7	9	2	4
ORANGE	10R	2.5YR	6	7	8	10
VIOLET	2.5P	7.5R	7	8	4	8
GRAY	SAME AS BLACK		SAME AS BLACK		SAME AS BLACK	

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

CONDUCTOR STRAND ADHESION: NOT REQUIRED.

CONTINUOUS LENGTHS: SCHEDULE B.

DYNAMIC CUT-THROUGH (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY: TEST IN ACCORDANCE WITH AS4373, METHOD 703. BLADE SHALL BE THE STANDARD CUTTING BLADE EXCEPT THE CUTTING EDGE RADIUS SHALL BE 0.005 INCH  $\pm$  0.001 INCH. MINIMUM AVERAGE DYNAMIC CUT-THROUGH (LB) SHALL BE AS FOLLOWS:

WIRE SIZE	23 °C $\pm$ 5 °C	150 °C $\pm$ 5 °C	200 °C $\pm$ 5 °C	260 °C $\pm$ 5 °C
26	10 LB	8 LB	6 LB	4 LB
20	25 LB	20 LB	15 LB	10 LB
16	20 LB	15 LB	15 LB	10 LB

FLAMMABILITY: TEST IN ACCORDANCE WITH AS4373, METHOD 801:

REQUIREMENTS:

DURATION OF AFTER-FLAME 3 SECONDS (MAX)  
 FLAME TRAVEL 3 INCHES (MAX)  
 NO FLAMING OF TISSUE

FORCED HYDROLYSIS: (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY) 5000 HOURS AT 70 °C. TEST 5 UNCONDITIONED AND 5 CONDITIONED SAMPLES OF AWG SIZE 20 ONLY IN ACCORDANCE WITH AS4373 METHOD 602. ALL SAMPLES MUST PASS THE DIELECTRIC TEST AS LISTED IN METHOD 602.

HIGH FREQUENCY SPARK TEST: (WHEN USED IN LIEU OF IMPULSE DIELECTRIC TEST) TEST IN ACCORDANCE WITH AS4373, METHOD 601, 5.7 KILOVOLTS (RMS). TEST 100 PERCENT OF THE WIRE.

HUMIDITY RESISTANCE: AFTER HUMIDITY EXPOSURE WIRE SHALL MEET THE REQUIREMENTS FOR INITIAL INSULATION RESISTANCE.

IDENTIFICATION OF PRODUCT: NOT REQUIRED FOR SIZE 26. COLOR CODE DESIGNATOR NOT REQUIRED.

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

IMMERSION (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): TEST IN ACCORDANCE WITH AS4373, METHOD 505 INCLUDING THE ADDITIONAL FLUIDS LISTED IN TABLE 5 OF THIS SPECIFICATION. USE MANDRELS AND WEIGHTS LISTED IN TABLE 6 FOR BEND TESTING. DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HZ. FOR TURBINE FUEL IMMERSION TEST OF AS4373, EITHER JP-4 OR MIL-DTL-83133 TYPE JP-8 (NATO TYPE F-34) MAY BE USED.

TABLE 5 - FLUID TABLE

TEST FLUID	TEST TEMPERATURE (°C (°F))	IMMERSION TIME (HOURS)
A. SAE AMS 1424, ANTI-ICING AND DEICING DEFROSTING FLUID, UNDILUTED	48-50 (118-122)	20
B. SAE AMS 1424, ANTI-ICING AND DEICING DEFROSTING FLUID, DILUTED 60/40 (FLUID/WATER) RATIO	48-50 (118-122)	20
C. MIL-C-43616, CLEANING COMPOUND, AIRCRAFT SURFACE, TYPE I	48-50 (118-122)	20
D. ASTM D 1153, METHYL ISOBUTYL KETONE (FOR USE IN ORGANIC COATINGS)	20-25 (68-77)	168
E. AS1241, FIRE RESISTANT HYDRAULIC FLUID FOR AIRCRAFT	48-50 (118-122)	20
F. MIL-PRF-7808, LUBRICATING OIL, AIRCRAFT TURBINE ENGINE, SYNTHETIC BASE	118-121 (244-250)	30
G. MIL-PRF-87937, CLEANING COMPOUND, AEROSPACE EQUIPMENT, TYPE II OR TYPE IV, UNDILUTED	63-68 (145-154)	20
H. MIL-PRF-87937, CLEANING COMPOUND, AEROSPACE EQUIPMENT, TYPE II OR TYPE IV, DILUTED 25/75 (FLUID/WATER) RATIO	63-68 (145-154)	20
I. TT-S-735, STANDARD TEST FLUIDS: HYDROCARBON, TYPE I	20-25 (68-77)	168
J. TT-S-735, STANDARD TEST FLUIDS: HYDROCARBON, TYPE II	20-25 (68-77)	168
K. TT-S-735, STANDARD TEST FLUIDS: HYDROCARBON, TYPE IV	20-25 (68-77)	168
L. DIELECTRIC-COOLANT FLUID SYNTHETIC SILICATE ESTER BASE, MONSANTO COOLANOL 25 OR APPROVED EQUIVALENT	20-25 (68-77)	168
M. ASTM D 4814, GASOLINE, AUTOMOTIVE, COMBAT	20-25 (68-77)	168