

REV.  
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AS22759/83

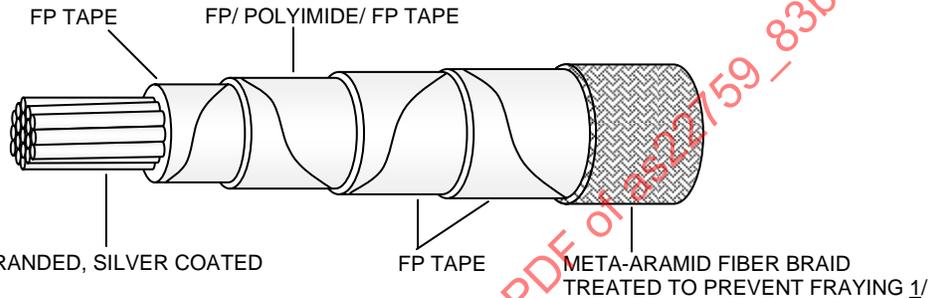
FEDERAL SUPPLY CLASS  
6145

RATIONALE

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

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.

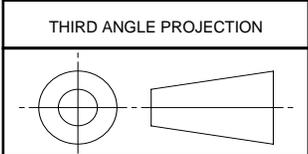
THIS SPECIFICATION IS NOT INTENDED FOR USE IN NAVAL AIRCRAFT OR NAVAL AIR SYSTEMS APPLICATIONS.



FP – FLUOROCARBON POLYMER, MODIFIED  
POLYTETRAFLUOROETHYLENE (PTFE)

1/ BRAID: BRIGHT AROMATIC POLYAMIDE YARN, 200 DENIER, 100 FILAMENTS, TIGHTLY FORMED, UNIFORM IN APPEARANCE, TREATED WITH A CLEAR FINISHER COATING. THE FINISHER COATING SHALL BE COMPATIBLE WITH THE TEMPERATURE RATING AND PERFORMANCE REQUIREMENTS OF THE INSULATED WIRE. BRAID SHALL GRIP THE UNDERLYING INSULATION SUFFICIENTLY AS TO NOT SLIDE ALONG THE TAPE SURFACE DURING NORMAL HANDLING.

FIGURE 1 - GENERAL CONFIGURATION



CUSTODIAN: SAE AE-8/AE-8D



**AEROSPACE STANDARD**

(R) WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/  
POLYIMIDE INSULATED, NORMAL WEIGHT, SILVER  
COATED, COPPER CONDUCTOR, 200 °C, 600-VOLT

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SHEET 1 OF 5

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ISSUED 2000-06 REVISED 2006-12

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)		
			MIN	MAX		MIN	MAX	MIN	TARGET	MAX
M22759/83-8	8	133 X 29	0.158	0.166	0.658	0.192	0.213	58.4	60.5	62.6
M22759/83-6	6	133 X 27	0.198	0.208	0.418	0.231	0.254	88.2	90.6	93.0
M22759/83-4	4	133 X 25	0.250	0.263	0.264	0.288	0.313	142	146	150
M22759/83-2-*	2	665 X 30	0.320	0.340	0.170	0.356	0.389	213	222	231
M22759/83-1-*	1	817 X 30	0.366	0.380	0.139	0.400	0.433	280	289	298
M22759/83-01-*	0	1045 X 30	0.395	0.425	0.108	0.432	0.475	331	344	357
M22759/83-02-*	00	1330 X 30	0.440	0.475	0.085	0.487	0.530	414	434	454
M22759/83-03-*	000	1665 X 30	0.500	0.540	0.068	0.542	0.585	524	537	550
M22759/83-04-*	0000	2109 X 30	0.565	0.605	0.054	0.602	0.655	654	675	696

1/ PART NUMBER: THE PREFERRED COLOR IS DARK GREEN WITH THE COLOR DESIGNATOR 5D. EXAMPLE: SIZE 2 DARK GREEN - AS22759/83-2-5D. WHITE IS AN ACCEPTABLE ALTERNATE WITH A COLOR DESIGNATOR 9.

TABLE 2 - WIRE INSULATION MATERIALS 1/

TAPE CODE	THICKNESS NOMINAL	MATERIAL
1	0.0020	0.0005 (FP)/0.0010 (POLYIMIDE)/0.0005 (FP)
2	0.0020	FP (SKIVED)
3	0.0030	FP (UNSINTERED OR PRESINTERED BONDABLE)
4	0.0010	FP (SKIVED)

1/ PHYSICAL PROPERTIES OF FP TAPES (SKIVED AND UNSINTERED) SHALL BE IN ACCORDANCE WITH AS22759 REQUIREMENTS.

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

TENSILE STRENGTH	19,000 LB/IN SQ (AVERAGE MINIMUM)
TENSILE MODULUS	350,000 LB/IN SQ (AVERAGE MINIMUM)
ELONGATION	40 PERCENT (AVERAGE MINIMUM)
DIELECTRIC STRENGTH	4,000 VOLTS/MIL (AVERAGE MINIMUM)
0.0005 FP LAYER (BOTTOM)	DISTINGUISHABLE COLOR (NEXT TO CONDUCTOR) MAY BE USED AT MANUFACTURER'S OPTION

TABLE 4 - TAPE OVERLAP REQUIREMENTS

WIRE SIZE	WRAP 1				WRAP 2				WRAP 3				WRAP 4				NOMINAL WALL THICKNESS (MILS) <sup>2/</sup>
	TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP						
		MIN	MAX		MIN	MAX		MIN	MAX		MIN	MAX					
8	4	20.5	35.0	1	50.5	55.0	3	67.0	71.0					13.2			
6	4	20.5	35.0	1	50.5	55.0	3	67.0	71.0					13.2			
4	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
2	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
1	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
1/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
2/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
3/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			
4/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	3	50.5	54.0		16.2			

1/ WRAP 1 IS INNERMOST TAPE WHICH IS IN CONTACT WITH THE CONDUCTOR. WRAPS 2, 3 AND 4 ARE PROGRESSIVELY FURTHER AWAY FROM THE CONDUCTOR CORE.

2/ NOMINAL WALL THICKNESS DOES NOT INCLUDE THE POLYAMIDE BRAID THICKNESS.

#### RATINGS:

TEMPERATURE RATING: 200 °C (392 °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): QUALIFICATION BY SIMILARITY TO AS22759/86-20.

DRY ARC PROPAGATION RESISTANCE (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): QUALIFICATION BY SIMILARITY TO AS22759/86-20.

BLOCKING: 200 °C ± 2 °C (392 °F ± 3.6 °F).

COLOR: FOR BRAIDED CONSTRUCTIONS, PREFERRED COLOR SHALL BE DARK GREEN WITH THE MUNSELL COLOR LIMITS OF 5Y 3/2 AND 5B 2/0.5. WHITE IS AN ACCEPTABLE ALTERNATIVE. CONFORMITY OF COLOR TO THE LIMITS OF MIL-STD-104 SHALL NOT BE REQUIRED AFTER OVEN EXPOSURE.

COLOR STRIPING OR BANDING DURABILITY: NOT REQUIRED.

CONDUCTOR STRAND ADHESION: REQUIRED.

CONTINUOUS LENGTHS: SCHEDULE B.

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

HIGH FREQUENCY SPARK TEST: (WHEN USED IN LIEU OF IMPULSE DIELECTRIC TEST) TEST IN ACCORDANCE WITH AS4373, METHOD 505, 5.7 KILOVOLTS (RMS) TEST 100% OF THE WIRE.

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

IDENTIFICATION OF PRODUCT: COLOR CODE DESIGNATOR NOT REQUIRED.

IDENTIFICATION DURABILITY: NOT REQUIRED.

IMMERSION (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): TEST IN ACCORDANCE WITH AS4373, METHOD 601 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 JP4 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 AMS1424, ANTI-ICING AND DEICING DEFROSTING FLUID, UNDILUTED	48-50 (118-122)	20
B. SAE AMS1424, 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. SAE 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 D4814, GASOLINE, AUTOMOTIVE, COMBAT	20-25 (68-77)	168

IMPULSE DIELECTRIC TEST: 8.0 KILOVOLTS (PEAK). TEST 100% OF THE WIRE.

INSULATION RESISTANCE: 3000 MEGOHMS FOR 1000 FEET (MIN).

LAMINATION SEALING: (GROUP II QUALITY CONFORMANCE TEST) WHEN TESTED IN ACCORDANCE WITH AS4373, METHOD 809 AT 260 °C FOR 6 HOURS, THERE SHALL BE NO EVIDENCE OF TAPE SEPARATION OR LIFTING. THREE SAMPLES PER LOT SHALL BE TESTED.

LIFE CYCLE: 500 HOURS AT 230 °C ± 2 °C (446 °F ± 3.6 °F). DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HZ USE MANDRELS COATED WITH POLYTETRAFLUOROETHYLENE SUCH THAT THE DIAMETER OF THE MANDRELS, AFTER COATING, STILL CONFORM TO THE REQUIRED TEST MANDRELS DIAMETERS OF TABLE 6. AFTER OVEN EXPOSURE, LAYERS SHALL NOT SEPARATE AND OR TAPES SHALL NOT LIFT ALONG THE INSULATION OR AT THE ENDS.

LOW TEMPERATURE (COLD BEND): USE MANDRELS AND WEIGHTS SPECIFIED IN TABLE 6. CHAMBER TEMPERATURE, -65 °C ± 2 °C (-85 °F ± 3.6 °F). DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HZ.

SHRINKAGE: .125 INCH (MAX) AT 230 °C ± 2 °C (446 °F ± 3.6 °F).

SMOKE: 200 °C ± 5 °C (392 °F ± 9 °F); NO VISIBLE SMOKE,

SOLDERABILITY: REQUIRED.

STRIPPABILITY: NOT REQUIRED.

TAPE OVERLAP: IN ACCORDANCE WITH MIL-STD-2223, METHOD 6005.

TENSILE MODULUS: TEST COMPOSITE FILM IN ACCORDANCE WITH ASTM D 882, METHOD A.

THERMAL INDEX: (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY). QUALIFICATION BY SIMILARITY TO AS22759/86.

THERMAL SHOCK RESISTANCE: OVEN TEMPERATURE, 200 °C ± 2 °C (392 °F ± 3.6 °F), MAXIMUM CHANGE IN MEASUREMENT, .125 INCHES.