

REV.

SAE AS22759/183

FEDERAL SUPPLY CLASS  
6145

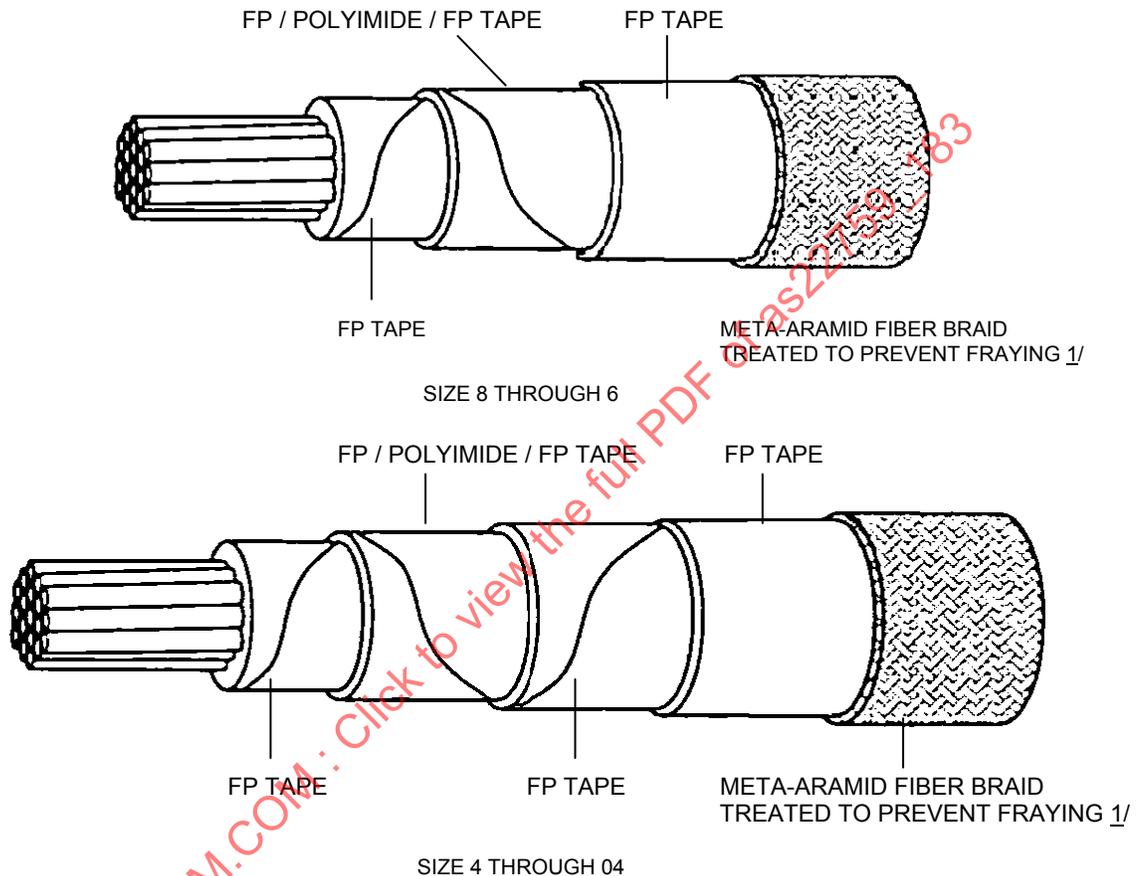
RATIONALE

THIS SPECIFICATION HAS BEEN DEVELOPED AT THE REQUEST OF NAVAL AIR SYSTEMS COMMAND AND THE UNITED STATES AIR FORCE. THIS PRODUCT IS BASED ON AS22759/83 WITH ADDITIONAL REQUIREMENTS INCLUDING A SMOOTH OUTER FLUOROPOLYMER SURFACE.

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

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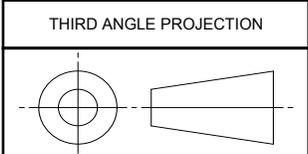


FP – FLUOROCARBON POLYMER MODIFIED POLYTETRAFLUOROETHYLENE (PTFE)  
CONDUCTOR – STRANDED SILVER COATED COPPER CONDUCTOR

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

SAE values your input. To provide feedback on this Technical Report, please visit <http://www.sae.org/technical/standards/AS22759/183>



CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION:

**SAE Aerospace**  
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**AEROSPACE STANDARD**

WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED, SMOOTH SURFACE, NORMAL WEIGHT, SILVER-COATED COPPER CONDUCTOR, 200 °C, 600 VOLTS

**SAE AS22759/183**  
SHEET 1 OF 4

REV.

ISSUED 2010-02

TABLE 1 – CONSTRUCTION DETAILS

PART NO. 1/	WIRE SIZE	CONDUCTOR				FINISHED WIRE 3/				
		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
M22759/183-8-*	8	133 X 29	0.158	0.166	0.658	0.192	0.213	58.4	60.5	62.6
M22759/183-6-*	6	133 X 27	0.198	0.208	0.418	0.231	0.254	88.2	90.6	93.0
M22759/183-4-*	4	133 X 25	0.250	0.263	0.264	0.288	0.313	142	146	150
M22759/183-2-*	2	665 X 30	0.320	0.340	0.170	0.356	0.389	213	222	231
M22759/183-1-*	1	817 X 30	0.366	0.380	0.139	0.400	0.433	280	289	298
M22759/183-01-*	0	1045 X 30	0.395	0.425	0.108	0.432	0.475	331	344	357
M22759/183-02-*	00	1330 X 30	0.440	0.475	0.085	0.487	0.530	414	434	454
M22759/183-03-*	000	1665 X 30	0.500	0.540	0.068	0.542	0.585	524	537	550
M22759/183-04-*	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 A COLOR DESIGNATOR OF 5D. EXAMPLE: SIZE 2 DARK GREEN – AS22759/183-2-5D. WHITE IS AN ACCEPTABLE ALTERNATIVE WITH A COLOR DESIGNATOR OF 9.

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/ THE WIRE CONSTRUCTION SHALL HAVE A SMOOTH POLYTETRAFLUOROETHYLENE (PTFE) OUTER LAYER WITH COMPLETE BONDING BETWEEN THE HOMOGENEOUS LAYERS.

TABLE 2 – WIRE INSULATION MATERIAL 1/

TAPE CODE	THICKNESS (NOM)	MATERIAL
1	0.002	0.0005 (FP)/0.0010 (POLYIMIDE)/0.0005 (FP)
2	0.002	FP (SKIVED)
3	0.003	FR (UNSINTERED)
4	0.001	FP (SKIVED)

1/ PHYSICAL PROPERTIES OF THE 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	4000 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 1/

WIRE SIZE	WRAP 1		WRAP 2		WRAP 3		WRAP 4		NOMINAL WALL THICKNESS (MILS) 2/	
	TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		
		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	16.2
2	2	20.5	35.0	1	50.5	55.9	3	50.5	54.0	16.2
1	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	16.2
1/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	16.2
2/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	16.2
3/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	16.2
4/0	2	20.5	35.0	1	50.5	55.0	3	50.5	54.0	16.2

1/ WRAP 1 IS THE 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.



**AEROSPACE STANDARD**

WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED, SMOOTH SURFACE, NORMAL WEIGHT, SILVER-COATED COPPER CONDUCTOR, 200 °C, 600 VOLTS

**SAE AS22759/183**  
SHEET 2 OF 4

**REV.**

TEMPERATURE RATING: 200 °C (392 °F) MAXIMUM CONTINUOUS CONDUCTOR TEMPERATURE.  
VOLTAGE RATING: 600 VOLTS (RMS) AT SEA LEVEL.

ADDITIONAL REQUIREMENTS:

DRY ARC PROPAGATION RESISTANCE (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): QUALIFICATION BY SIMILARITY TO AS22759/186-20.

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. FOR WIRE TESTING ASSOCIATED WITH QUALIFICATION, RETENTION OF QUALIFICATION AND QUALITY CONFORMANCE, CONFORMITY OF COLOR TO THE LIMITS OF MIL-STD-104 SHALL NOT BE REQUIRED AFTER OVEN EXPOSURE.

COLOR STRIPING OR BAND DURABILITY: NOT REQUIRED.

CONDUCTOR STRAND ADHESION: REQUIRED.

CONTINUOUS LENGTHS: SCHEDULE B.

FLAMMABILITY: TEST IN ACCORDANCE WITH AS4373, METHOD 801.

REQUIREMENTS:

DURATION AFTER-FLAME	3.0 SECONDS (MAXIMUM)
FLAME TRAVEL	3.0 INCHES (MAXIMUM))
NO FLAMING OF TISSUE	

HIGH FREQUENCY SPARK TEST: (WHEN USED IN LIEU OF THE IMPULSE DIELECTRIC TEST) 5.7 KILOVOLTS (RMS). TEST 100 PERCENT OF THE WIRE.

HUMIDITY RESISTANCE: REQUIRED. AFTER HUMIDITY EXPOSURE, THE 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 INTITAL QUALIFICATION ONLY) TEST IN ACCORDANCE WITH AS4373, METHOD 601. USE MANDRELS AND WEIGHTS LISTED IN TABLE 5 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.

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

INSULATION RESISTANCE: 3000 MEGOHMS PER 1000 FEET (MINIMUM)

LAMINATION SEALING: (QUALIFICATION AND GROUP II QUALITY CONFORMANCE TEST) WHEN TESTED IN ACCORDANCE WITH AS4373, METHOD 809 AT 260 °C ± 2 °C (500 °F ± 3.6 °F) 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 5. 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 5. CHAMBER TEMPERATURE, -65 °C ± 2 °C (-85 °F ± 3.6 °F). DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HZ.

OUTER INSULATION LAYER SURFACE SMOOTHNESS: (QUALIFICATION AND GROUP II QUALITY CONFORMANCE TEST) WHEN TESTED IN ACCORDANCE WITH AS4373, METHOD 110, THE DIFFERENCE IN WALL THICKNESS OF THE OUTER PTFE INSULATION LAYER AT THE DISCERNABLE TAPE EDGE SHALL NOT EXCEED THE LIMITS BELOW:

WIRE SIZES 8 AWG THROUGH 6 AWG:	7.0 PERCENT
WIRE SIZES 4 AWG THROUGH 04 AWG:	5.0 PERCENT

SHRINKAGE: TEST AT 230 °C ± 2 °C (446 °F ± 3.6 °F). MAXIMUM CHANGE IN MEASUREMENT, 0.125 INCH.

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

SOLDERABILITY: REQUIRED.

STRIPPABILITY: NOT REQUIRED.

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	WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED, SMOOTH SURFACE, NORMAL WEIGHT, SILVER-COATED COPPER CONDUCTOR, 200 °C, 600 VOLTS		