

REV.  
B

AS22759/85

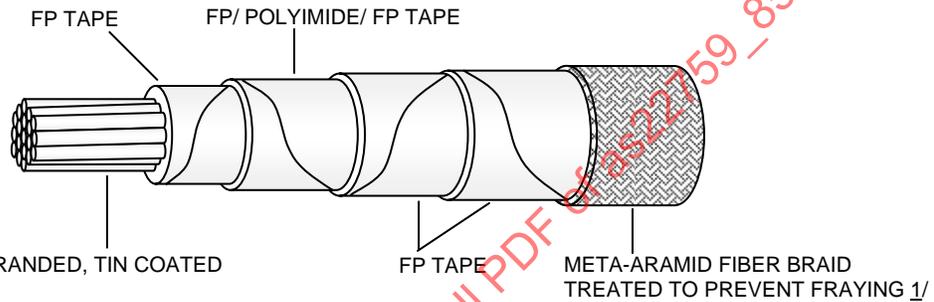
FEDERAL SUPPLY CLASS  
6145

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.

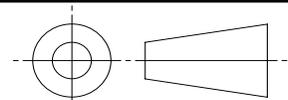


FP – FLUOROCARBON POLYMER, MODIFIED  
POLYTETRAFLUOROETHYLENE (PTFE)

<sup>1/</sup> 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

THIRD ANGLE PROJECTION



CUSTODIAN: SAE AE-8/AE-8D

**SAE Aerospace**  
An SAE International Group

**AEROSPACE STANDARD**

(R) WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/  
POLYIMIDE INSULATED, NORMAL WEIGHT, TIN  
COATED, COPPER CONDUCTOR, 150 °C, 600-VOLT

**AS22759/85**  
SHEET 1 OF 5

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TABLE 1 - CONSTRUCTION DETAILS

| PART NO. 1/    | WIRE SIZE | CONDUCTOR   |                  |       | FINISHED WIRE  |                  |       |                        |        |      |
|----------------|-----------|---|------------------|-------|--|------------------|-------|------------------------|--------|------|
|                |           | STRANDING<br>(NUMBER OF<br>STRANDS<br>X AWG<br>GAUGE OF<br>STRANDS) | DIAMETER<br>(IN) |       | RESISTANCE<br>AT 20 °C<br>(68 °F)<br>(OHMS/1000<br>FT MAX) | DIAMETER<br>(IN) |       | WEIGHT<br>(LB/1000 FT) |        |      |
|                |           |   | MIN              | MAX   |  | MIN              | MAX   | MIN                    | TARGET | MAX  |
| M22759/85-8    | 8         | 133 X 29  | 0.158            | 0.169 | 0.701  | 0.192            | 0.213 | 58.4                   | 60.5   | 62.6 |
| M22759/85-6    | 6         | 133 X 27  | 0.198            | 0.212 | 0.445  | 0.231            | 0.254 | 88.2                   | 90.6   | 93.0 |
| M22759/85-4    | 4         | 133 X 25  | 0.250            | 0.268 | 0.280  | 0.288            | 0.313 | 142                    | 146    | 150  |
| M22759/85-2-*  | 2         | 665 X 30  | 0.320            | 0.340 | 0.183  | 0.356            | 0.389 | 213                    | 222    | 231  |
| M22759/85-1-*  | 1         | 817 X 30  | 0.366            | 0.380 | 0.149  | 0.400            | 0.433 | 280                    | 289    | 298  |
| M22759/85-01-* | 0         | 1045 X 30   | 0.395            | 0.425 | 0.116  | 0.432            | 0.475 | 331                    | 344    | 357  |
| M22759/85-02-* | 00        | 1330 X 30   | 0.440            | 0.475 | 0.091  | 0.487            | 0.530 | 414                    | 434    | 454  |
| M22759/85-03-* | 000       | 1665 X 30   | 0.500            | 0.540 | 0.071  | 0.542            | 0.585 | 524                    | 537    | 550  |
| M22759/85-04-* | 0000      | 2109 X 30   | 0.565            | 0.605 | 0.056  | 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 - AS22759/85-2-5D. 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)<br>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 |        | 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: 150 °C (302 °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 AS22759/88-20.

DRY ARC PROPAGATION RESISTANCE (TEST REQUIRED FOR INITIAL QUALIFICATION ONLY): QUALIFICATION BY SIMILARITY TO AS22759/88-20.

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<br>(°C (°F)) | IMMERSION<br>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. (DARKENING OF THE TIN COATING OF THE CONDUCTORS DUE TO THE NORMAL AIR OXIDATION SHALL NOT BE CAUSE FOR REJECTION OF THIS TEST).

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: NOT REQUIRED. THIS SLASH SHEET IS PRIMARILY INTENDED FOR CRIMP TERMINATIONS. FOR SOLDERABILITY APPLICATIONS USE THE SILVER COATED COPPER VERSION OF THIS SPECIFICATION.

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 AS22759/88.

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

WRAP (MANDREL WRAP): NO CRACKING, NO DIELECTRIC BREAKDOWN. USE MANDRELS SPECIFIED IN TABLE 6. DIELECTRIC TEST, 2500 VOLTS (RMS), 60 HZ.