

REV.  
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AS22759™/91

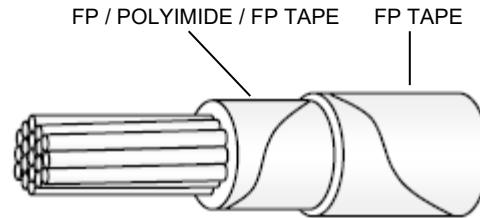
FEDERAL SUPPLY CLASS  
6145

## RATIONALE

REMOVAL OF THE INTENDED USE LIMITATION FOR NAVAL AIRCRAFT AND NAVAL AIR SYSTEMS APPLICATION IS REQUIRED TO SYNCHRONIZE THIS DOCUMENT WITH THE REQUIREMENT OF AS50881.

## NOTICE

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



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

FIGURE 1 - AS22759/91 CONFIGURATION

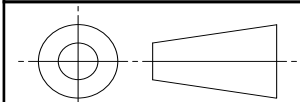
TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

| PART NO. 1/    | WIRE SIZE | CONDUCTOR 3/                                            |                 |       |                                                           | FINISHED WIRE   |      |                             |        |      |
|----------------|-----------|---------------------------------------------------------|-----------------|-------|-----------------------------------------------------------|-----------------|------|-----------------------------|--------|------|
|                |           | STRANDING<br>(NUMBER OF STRANDS X AWG GAUGE OF STRANDS) | DIAMETER (INCH) |       | RESISTANCE<br>AT 20 °C<br>(68 °F)<br>(OHMS/1000 FEET MAX) | DIAMETER (INCH) |      | WEIGHT<br>(LB/1000 FEET) 2/ |        |      |
|                |           |                                                         | MIN             | MAX   |                                                           | MIN             | MAX  | MIN                         | TARGET | MAX  |
| M22759/91-26-* | 26        | 19 X 38                                                 | .0175           | .0194 | 38.4                                                      | .030            | .034 | 1.16                        | 1.31   | 1.45 |
| M22759/91-24-* | 24        | 19 X 36                                                 | .0225           | .0244 | 24.3                                                      | .034            | .038 | 1.70                        | 1.85   | 2.00 |
| M22759/91-22-* | 22        | 19 X 34                                                 | .0285           | .0304 | 15.1                                                      | .040            | .043 | 2.55                        | 2.75   | 2.96 |
| M22759/91-20-* | 20        | 19 X 32                                                 | .0365           | .0384 | 9.19                                                      | .048            | .051 | 4.02                        | 4.26   | 4.50 |
| M22759/91-18-* | 18        | 19 X 30                                                 | .0455           | .0484 | 5.79                                                      | .056            | .060 | 6.16                        | 6.43   | 6.70 |
| M22759/91-16-* | 16        | 19 X 29                                                 | .0515           | .0544 | 4.52                                                      | .063            | .067 | 7.75                        | 8.09   | 8.40 |
| M22759/91-14-* | 14        | 19 X 27                                                 | .0645           | .0684 | 2.88                                                      | .076            | .080 | 12.0                        | 12.5   | 12.9 |
| M22759/91-12-* | 12        | 37 X 28                                                 | .0835           | .0874 | 1.90                                                      | .096            | .100 | 18.4                        | 19.2   | 19.9 |
| M22759/91-10-* | 10        | 37 X 26                                                 | .106            | .110  | 1.19                                                      | .119            | .123 | 28.5                        | 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: M22759/91-20-93 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 SCC SMALL DIAMETER SILVER COATED COPPER CONDUCTOR.

For more information on this standard, visit  
<https://www.sae.org/standards/content/AS22759/91D/>

THIRD ANGLE PROJECTION



CUSTODIAN: AE-8D

PROCUREMENT SPECIFICATION:



## AEROSPACE STANDARD

WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/  
POLYIMIDE INSULATED, LIGHT WEIGHT, SILVER COATED,  
COPPER CONDUCTOR, 260 °C, 600 VOLT, ROHS

AS22759™/91  
SHEET 1 OF 4

REV.  
D

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         | .0012           | .00045 (FP)/.00065 (POLYIMIDE)/.0001 (FP) |
| 2         | .0020           | FP (UNSINTERED)                           |
| 3         | .0025           | FP (UNSINTERED)                           |

**TABLE 3 - TAPE OVERLAP REQUIREMENTS 1/**

| WIRE<br>SIZE | WRAP 1       |                    |      | WRAP 2       |                    |      | NOMINAL<br>WALL<br>THICKNESS<br>(MILS) |
|--------------|--------------|--------------------|------|--------------|--------------------|------|----------------------------------------|
|              | TAPE<br>CODE | PERCENT<br>OVERLAP |      | TAPE<br>CODE | PERCENT<br>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 .00045 INCH FP SIDE OF THE TAPE AGAINST 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:

REFER TO 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 INCH                 |
| ELECTRICAL RESISTANCE (IR)  | 5000 MEGOHMS (MIN)-1000 FEET             |
| WET DIELECTRIC VOLTAGE      | 2500 VOLTS (RMS), 60 HERTZ               |
| INSULATION STRIP FORCE      | .25-6.0 POUNDS: WIRE SIZES 26-20         |
|                             | .50-7.0 POUNDS: WIRE SIZES 18-14         |
| UV LASER MARKING            | 55% MINIMUM AVERAGE                      |
| CONTINUOUS LENGTH SCHEDULE  | B                                        |

|                                                                                     |                                                                                                                                             |                                    |                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------|
|  | <b>AEROSPACE STANDARD</b>                                                                                                                   | <b>AS22759™/91</b><br>SHEET 2 OF 4 | <b>REV.</b><br><b>D</b> |
|                                                                                     | WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/<br>POLYIMIDE INSULATED, LIGHT WEIGHT, SILVER COATED,<br>COPPER CONDUCTOR, 260 °C, 600 VOLT, ROHS |                                    |                         |

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/ (POUNDS) |                       |
|-----------------|-----------------------------------|-----------------------|------|-----------------------|-----------------------|
|                 | 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                  |
| 18              | 1.50                              | .750                  | .250 | 5.00                  | 2.00                  |
| 16              | 1.50                              | 1.00                  | .250 | 5.00                  | 2.00                  |
| 14              | 2.00                              | 1.00                  | .375 | 5.00                  | 3.00                  |
| 12              | 2.00                              | 1.50                  | .375 | 5.00                  | 3.00                  |
| 10              | 3.00                              | 2.00                  | .375 | 6.00                  | 3.00                  |

1/ TOLERANCE SHALL BE  $\pm 3\%$  OF THE GIVEN VALUES.

FINISH WIRE PERFORMANCE CHARACTERISTICS 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 $200^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ( $392^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ )<br>MAXIMUM CHANGE .091 INCH                                                                                                                                                                                                                                          |
| THERMAL MECHANICAL RESISTANCE (LIFE CYCLE) | EXPOSURE 500 HOURS, $230^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ( $446^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ )                                                                                                                                                                                                                                                                       |
| HUMIDITY RESISTANCE (IR)                   | 5000 MEGOHMS (MIN)-1000 FEET                                                                                                                                                                                                                                                                                                                                                            |
| FLUID RESISTANCE                           | DIAMETER INCREASE 5% (MAX)                                                                                                                                                                                                                                                                                                                                                              |
| SMOKE RESISTANCE                           | $200^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ( $392^{\circ}\text{F} \pm 9^{\circ}\text{F}$ )                                                                                                                                                                                                                                                                                             |
| FLAME RESISTANCE                           | SELF-EXTINGUISH TIME: 3 SECONDS<br>BURN LENGTH 3 INCHES                                                                                                                                                                                                                                                                                                                                 |
| WET ARC RESISTANCE                         | MINIMUM 64 WIRES PASS WET DIELECTRIC TEST<br>3 OR LESS WIRES FAIL IN ONE BUNDLE<br>DAMAGE LENGTH: 3.0 INCHES OR LESS                                                                                                                                                                                                                                                                    |
| DRY ARC RESISTANCE                         | MINIMUM 64 WIRES PASS WET DIELECTRIC TEST<br>3 OR LESS WIRES FAIL IN ONE BUNDLE<br>DAMAGE LENGTH: 3.0 INCHES OR LESS                                                                                                                                                                                                                                                                    |
| DYNAMIC CUT-THROUGH                        | WIRE SIZE 26<br>10 POUNDS AT $23^{\circ}\text{C}$ , 8 POUNDS AT $150^{\circ}\text{C}$ , 6 POUNDS AT $200^{\circ}\text{C}$<br>WIRE SIZE 20<br>25 POUNDS AT $23^{\circ}\text{C}$ , 20 POUNDS AT $150^{\circ}\text{C}$ , 15 POUNDS AT $200^{\circ}\text{C}$<br>WIRE SIZE 16<br>20 POUNDS AT $23^{\circ}\text{C}$ , 15 POUNDS AT $150^{\circ}\text{C}$ , 15 POUNDS AT $200^{\circ}\text{C}$ |
| FORCED HYDROLYSIS INSULATION RESISTANCE    | WIRE SIZE 20<br>$70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ( $158^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ ), 5000 HOURS                                                                                                                                                                                                                                                                |
| LONGEVITY RESISTANCE (THERMAL INDEX)       | $200^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ( $392^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ ), 10000 HOURS                                                                                                                                                                                                                                                                              |

7. REQUIREMENT EXCEPTION TO THE AS22759:

NONE.

APPLICATION NOTES:

- PRODUCTS MANUFACTURED TO THIS SPECIFICATION ARE ROHS COMPLIANT.

|                                                                                     |                                                                                                                                             |                                    |                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------|
|  | <b>AEROSPACE STANDARD</b>                                                                                                                   | <b>AS22759™/91</b><br>SHEET 3 OF 4 | <b>REV.</b><br><b>D</b> |
|                                                                                     | WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/<br>POLYIMIDE INSULATED, LIGHT WEIGHT, SILVER COATED,<br>COPPER CONDUCTOR, 260 °C, 600 VOLT, ROHS |                                    |                         |