

RATIONALE

SPECIFICATION UPDATED TO INCLUDE AS29606 CONDUCTOR REQUIREMENTS, ROHS RESTRICTIONS, AND AS22759 MODIFICATIONS. THIS CHANGE ALSO INCREASES THE MAXIMUM WEIGHT REQUIREMENTS FOR WIRE SIZES 8 THROUGH 02 TO ACCOUNT FOR INCREASED CIRCULAR MIL AREA (CMA) ADOPTED IN AS29606. AS22759 IS A CONVERTED MILITARY SPECIFICATION ORIGINALLY NOTED AS MIL-W-22759 CREATED IN 1971. CONDUCTOR REQUIREMENTS WERE ORIGINALLY DEFINED BY ASTM B3, B298, AND B355 FOR TIN, SILVER, AND NICKEL PLATE RESPECTIVELY. THESE SPECIFICATIONS CONTROLLED THE CONDUCTOR BY ESTABLISHING STRAND SIZE, CONDUCTOR SIZE, AND MAXIMUM DCR (DIRECT CURRENT RESISTANCE). BY THE LATE 1980'S, CONDUCTOR PRODUCERS WERE PRODUCING TIGHT TOLERANCE CONDUCTORS WHICH WERE MADE AT THE MINIMUM DIMENSIONAL AND MAXIMUM DCR LIMITS OF THE SPECIFICATION TO REDUCE THE WEIGHT (MASS) OF THE FINALLY INSULATED WIRE. BY THE EARLY 1990'S THE TIGHT TOLERANCE CONDUCTORS WERE PREVALENT THROUGHOUT AEROSPACE. ABOUT THE SAME TIME, LARGE GAUGE SIZE CONDUCTORS (SIZE 8 THROUGH 4/0) STARTED EXHIBITING CRIMP FAILURES IN TERMINAL LUGS MOUNTED ON AIRCRAFT GENERATORS. SINCE THESE CIRCUITS ROUTED PRIMARY ELECTRICAL POWER FROM THE GENERATOR TO THE MAIN POWER DISTRIBUTION CENTERS, CRIMP DEGRADATION RESULTING IN DISRUPTION OF ELECTRICAL POWER CAUSED SIGNIFICANT CONCERN. SEVERAL OEM'S AS WELL AS NAVY AND AIR FORCE LABORATORIES INVESTIGATED THE FAILURES AND DETERMINED THAT THE FAILED CRIMPS WERE DUE TO A COMBINATION OF LOW CMA, HIGH VIBRATION, AND THERMAL CYCLING. ADDITIONAL TESTING ESTABLISHED MINIMUM CMA LEVELS WHICH WOULD PREVENT THE CRIMP FAILURES. THESE NEW LIMITS WERE OFFERED TO ASTM BUT REJECTED. NAVAIR THEN PRODUCED AN ENGINEERING POSITION LETTER (EPL) TO MANDATE THE INCREASED CMA'S ON STRANDING USED IN AS22759 CONSTRUCTIONS. NAVAIR THEN CREATED MIL-W-29606 WHICH WAS INTENDED TO REPLACE THE ASTM SPECIFICATIONS AS THE REQUIRED CONDUCTOR SPECIFICATION. BEFORE THE MIL-W-29606 COULD BE ADDED TO MIL-W-22759, THE SPECIFICATION TRANSITION AND ADOPTION TOOK PLACE CONVERTING THE DOCUMENTS FROM MILITARY SPECIFICATIONS TO AS DOCUMENTS IN THE 1999 TO 2000 TIME FRAME. SINCE THE EPL NO LONGER HAD LEGAL STANDING AFTER THE CONVERSION, WIRE PRODUCERS DID NOT HAVE TO ABIDE BY THE RESTRICTIONS WHICH ALLOWED THIS ISSUE TO CREEP BACK INTO THE PRODUCTS FROM TIME TO TIME. IN 2011, THE SAE AE-8D COMMITTEE OPENED A PROJECT TO UPDATE THE AS22759 AND ITS ASSOCIATED DETAILED SPECIFICATION SHEETS. WHEN LOOKING AT THIS ISSUE, THE COMMITTEE DECIDED TO ADOPT MIL W 29606 (NOW AS29606) AND REPLACE THE ASTM REQUIREMENTS WITH THE AS29606 REQUIREMENTS. SINCE THE DIAMETER RANGE OF THE CONDUCTOR STRANDS NEEDED TO SHIFT SLIGHTLY TO THE RIGHT TO MEET THE NEW MINIMUM CMA REQUIREMENTS, OVERALL PRODUCT WEIGHT MAXIMUMS SHIFTED ABOUT 3 TO 5%. THE COMMITTEE EVALUATED SEVERAL METHODS OF INCORPORATING THIS CHANGE INCLUDING CANCELING AND SUPERSESSION, BUT THE END USERS DID NOT WANT TO CHANGE PART NUMBERS FOR PRODUCTS WHICH HAVE BEEN USED IN AEROSPACE AND INDUSTRY FOR OVER 40 YEARS AND IS CURRENTLY ON THOUSANDS OF DRAWINGS. SINCE THESE PRODUCTS ARE PRIMARILY USED FOR PRIMARY POWER DISTRIBUTION FROM THE GENERATORS TO THE MAIN DISTRIBUTION PANELS, THE WEIGHT INCREASE TO THE ELECTRICAL INTERCONNECT SYSTEM IS CONSIDERED INSIGNIFICANT. SINCE THIS CHANGE DOES AFFECT THE MAXIMUM WEIGHT LIMITS FOR SIZES 8 THROUGH 4/0, END USERS SHOULD VERIFY THAT THE NEW WEIGHT RANGES MEET THE DESIGN REQUIREMENTS OF LEGACY APPLICATIONS. REMOVE REQUIREMENT FOR ACID RESISTANCE AND POST FLAME DIELECTRIC TEST.

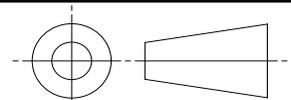
AS22759/1A HAS BEEN REAFFIRMED TO COMPLY WITH THE SAE FIVE-YEAR REVIEW POLICY.

NOTICE

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

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THIRD ANGLE PROJECTION



For more information on this standard, visit
<https://www.sae.org/standards/content/AS22759/1A/>

CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: AS22759



AEROSPACE STANDARD

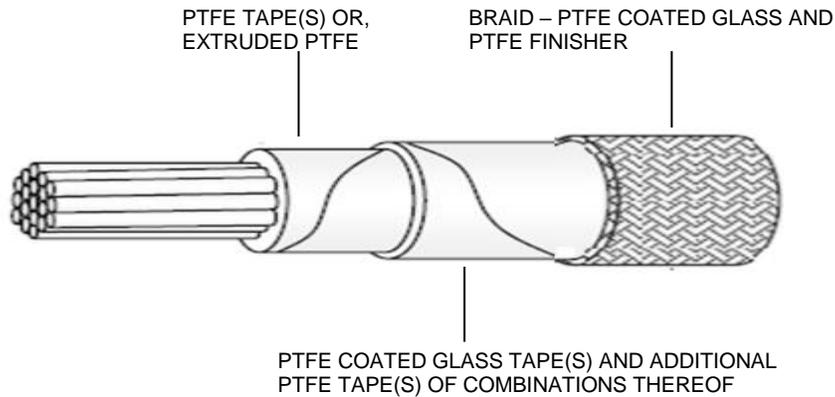
(R) WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED,
PTFE AND PTFE-COATED GLASS,
SILVER-COATED COPPER CONDUCTOR,
600 VOLT, ROHS

AS22759™/1
SHEET 1 OF 4

REV.
A

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ISSUED 2000-09 REVISED 2017-09 REAFFIRMED 2022-07



PTFE – POLYTETRAFLUOROETHYLENE
CONDUCTOR – STRANDED SILVER COATED COPPER

FIGURE 1 - AS22759/1 CONFIGURATION

TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

PART NO. 1/	WIRE SIZE	STRANDING (NUMBER OF STRANDS X SIZE GAUGE OF STRANDS) 2/	DIAMETER OF STRANDED CONDUCTOR (INCHES) 2/		FINISHED WIRE		
			(MIN)	(MAX)	RESISTANCE AT 20 °C (68 °F) (OHMS/1000 FEET) MAX	DIAMETER (INCHES)	WEIGHT (LB/1000 FEET) (MAX)
M22759/1-22-*	22	19 X 34	.0285	.0324	15.1	.084 ± .004	7.50
M22759/1-20-*	20	19 X 32	.0365	.0404	9.19	.094 ± .004	9.50
M22759/1-18-*	18	19 X 30	.0455	.0504	5.79	.105 ± .005	13.0
M22759/1-16-*	16	19 X 29	.0515	.0574	4.52	.120 ± .005	16.5
M22759/1-14-*	14	19 X 27	.0645	.0724	2.88	.138 ± .005	23.0
M22759/1-12-*	12	37 X 28	.0835	.0894	1.90	.157 ± .005	32.1
M22759/1-10-*	0	37 X 26	.106	.112	1.19	.181 ± .005	47.0
M22759/1-8-*	8	133 X 29	.158	.169	.658	.248 ± .007	86.1
M22759/1-6-*	6	133 X 27	.198	.213	.418	.293 ± .007	128
M22759/1-4-*	4	133 X 25	.250	.268	.264	.355 ± .010	189
M22759/1-2-*	2	665 X 30	.320	.340	.170	.420 ± .015	289
M22759/1-1-*	1	817 X 30	.360	.380	.139	.470 ± .015	365
M22759/1-01-*	0	1045 X 30	.395	.425	.108	.515 ± .020	450
M22759/1-02-*	00	1330 X 30	.440	.475	.085	.575 ± .020	569
M22759/1-03-*	000	1665 X 30	.500	.540	.068	.640 ± .020	701
M22759/1-04-*	0000	2109 X 30	.565	.605	.054	.710 ± .020	877

1/ PART NUMBER: THE ASTERISKS IN THE PART NUMBER COLUMN, TABLES 1 THROUGH 3, SHALL BE REPLACED BY COLOR CODE DESIGNATORS IN ACCORDANCE WITH MIL-STD-681. EXAMPLES: SIZE 20, WHITE – M22759/1-20-9, WHITE WITH ORANGE STRIPE – M22759/1-20-93.

2/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE SCC GENERAL PURPOSE SILVER PLATED COPPER CONDUCTOR.

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.

	AEROSPACE STANDARD	AS22759™/1 SHEET 2 OF 4	REV. A
	(R) WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, PTFE AND PTFE-COATED GLASS, SILVER-COATED COPPER CONDUCTOR, 600 VOLT, ROHS		

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:

SEE 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. FINISHED WIRE INSULATION PROPERTIES:

THE PTFE-COATED-GLASS OUTER BRAID SHALL BE TIGHTLY APPLIED WITH NO GAPS APPARENT WHEN EXAMINED VISUALLY WITHOUT THE AID OF MAGNIFICATION.

THE INSULATION, INCLUDING THE OUTER BRAID, SHALL BE HEAT SINTERED SO THAT IT CANNOT BE EASILY DELAMINATED.

FINISHED WIRE INSULATION PROPERTIES SHALL BE IN ACCORDANCE WITH TABLE 2.

TABLE 2 - FINISHED WIRE INSULATION PROPERTIES REQUIREMENTS

INSULATION PROPERTIES	
IMPULSE TEST VOLTAGE	6.5 KILOVOLTS (PEAK)
HIGH FREQUENCY TEST VOLTAGE	4.6 KILOVOLTS (RMS)
INSULATION BLOCKING	260 °C ± 2 °C (500 °F ± 3.6 °F)
SHRINKAGE	200 °C ± 2 °C (392 °F ± 3.6 °F)
	MAXIMUM CHANGE .125 INCHES
LAYER WICKING	.75 INCHES (MAX) WIRE SIZES 22 - 12
	WIRE SIZES 10 - 0000 NO REQUIREMENT
	PROCEDURE: MULTI-LAYER WIRE
ELECTRICAL RESISTANCE (IR)	5000 MEGOHMS (MIN)-1000 FEET
ELECTRICAL SURFACE RESISTANCE	500 MEGOHMS - INCHES (MIN) WIRE SIZES 22 - 12
	WIRE SIZES 10 - 0000 NO REQUIREMENT
WET DIELECTRIC VOLTAGE	2500 VOLTS (RMS), 60 HERTZ
CONTINUOUS LENGTH SCHEDULE	B

5. FINISHED WIRE IDENTIFICATION:

WIRE IDENTIFICATION EXCEPTIONS: NONE

WIRE IDENTIFICATION DURABILITY: 50 CYCLES (100 STROKES) WITH 125 GRAMS WEIGHT

STRIPE AND BAND DURABILITY: 50 CYCLES (100 STROKES) WITH 125 GRAMS WEIGHT

	AEROSPACE STANDARD	AS22759™/1 SHEET 3 OF 4	REV. A
	(R) WIRE, ELECTRICAL, FLUOROPOLYMER-INSULATED, PTFE AND PTFE-COATED GLASS, SILVER-COATED COPPER CONDUCTOR, 600 VOLT, ROHS		