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AS22759/186

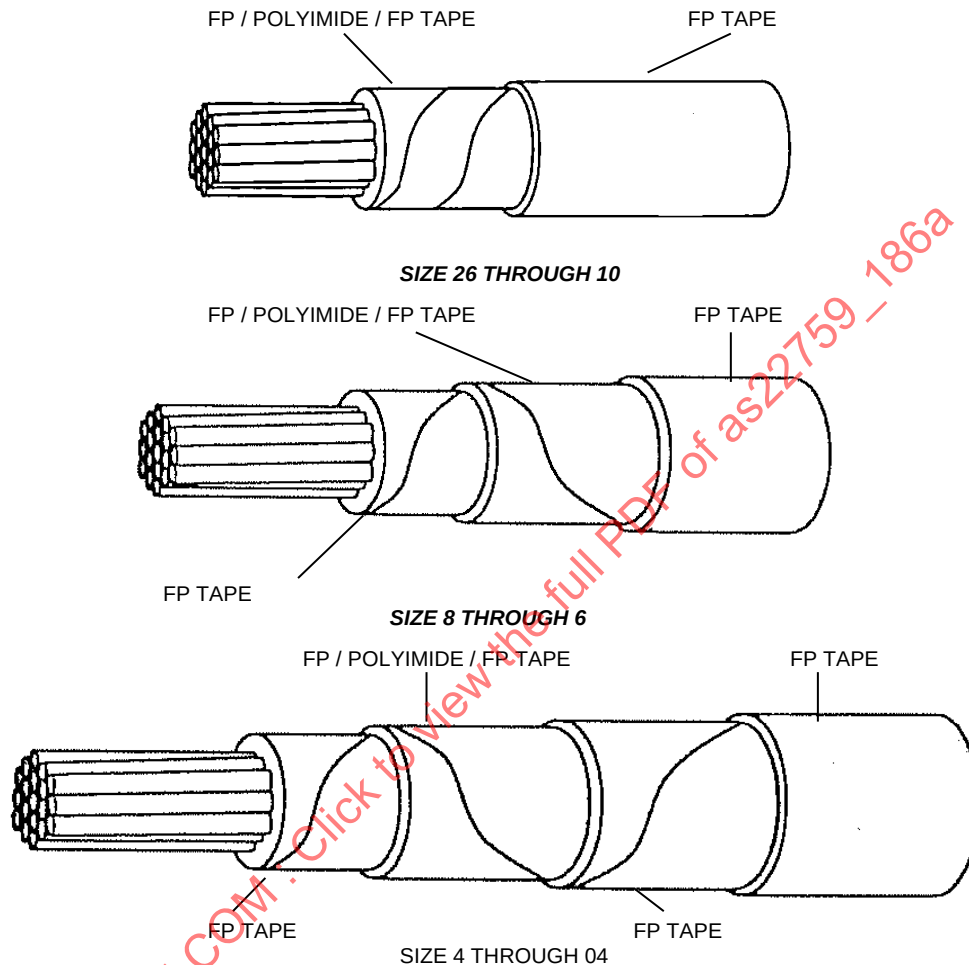
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RATIONALE

SPECIFICATION UPDATED TO INCLUDE AS29606 CONDUCTOR REQUIREMENTS, ROHS RESTRICTIONS AND AS22759 MODIFICATIONS.

NOTICE

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

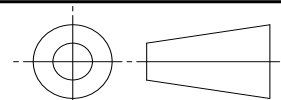


FP – FLUOROCARBON POLYMER MODIFIED POLYTETRAFLUOROETHYLENE (PTFE)
CONDUCTOR – STRANDED SILVER COATED COPPER

FIGURE 1 - AS22759/186 CONFIGURATION

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on this Technical Report, please visit
http://www.sae.org/technical/standards/AS22759_186A

THIRD ANGLE PROJECTION



CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: NONE



AEROSPACE STANDARD

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

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TABLE 1 - CONSTRUCTION DETAILS FOR FINISHED WIRE

PART NO. 1/	WIRE SIZE	CONDUCTOR 4/				FINISHED WIRE 3/				
		STRANDING (NUMBER OF STRANDS X SIZE 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
M22759/186-26-*	26	19 X 38	.0175	.0194	38.4	.033	.037	1.29	1.42	1.55
M22759/186-24-*	24	19 X 36	.0225	.0244	24.3	.038	.042	1.87	2.04	2.20
M22759/186-22-*	22	19 X 34	.0285	.0304	15.1	.043	.047	2.70	2.90	3.10
M22759/186-20-*	20	19 X 32	.0365	.0384	9.19	.051	.055	4.25	4.48	4.70
M22759/186-18-*	18	19 X 30	.0455	.0484	5.79	.061	.065	6.40	6.65	6.90
M22759/186-16-*	16	19 X 29	.0515	.0544	4.52	.068	.073	8.20	8.50	8.80
M22759/186-14-*	14	19 X 27	.0645	.0684	2.88	.081	.086	12.4	12.9	13.4
M22759/186-12-*	12	37 X 28	.0835	.0874	1.90	.100	.105	18.9	19.7	20.4
M22759/186-10-*	10	37 X 26	.106	.110	1.19	.122	.127	29.3	30.8	31.6
M22759/186-8-*	8	133 X 29	.158	.166	.658	.180	.188	54.7	56.6	58.5
M22759/186-6-*	6	133 X 27	.198	.208	.418	.219	.229	84.1	86.5	88.9
M22759/186-4-*	4	133 X 25	.250	.263	.264	.276	.288	136	140	144
M22759/186-2-*	2	665 X 30	.320	.340	.170	.344	.364	210	218	226
M22759/186-1-*	1	817 X 30	.366	.380	.139	.388	.408	274	283	292
M22759/186-01-*	0	1045 X 30	.395	.425	.108	.420	.450	324	338	352
M22759/186-02-*	00	1330 X 30	.440	.475	.085	.475	.505	410	429	448
M22759/186-03-*	000	1665 X 30	.500	.540	.068	.530	.560	518	531	544
M22759/186-04-*	0000	2109 X 30	.565	.605	.054	.590	.630	646	667	688

1/ PART NUMBER: THE ASTERISKS IN THE PART NUMBER COLUMN OF TABLE 1 SHALL BE REPLACED BY THE COLOR CODE DESIGNATORS IN ACCORDANCE WITH MIL-STD-681. M22759/186-20-93 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/ THE WIRE CONSTRUCTION SHALL HAVE A SMOOTH POLYTETRAFLUOROETHYLENE (PTFE) OUTER LAYER WITH COMPLETE BONDING BETWEEN THE HOMOGENEOUS LAYERS.

4/ CONDUCTOR SHALL CONFORM TO AS29606 TYPE SCC SMALL DIAMETER SILVER COATED COPPER CONDUCTOR FOR WIRE SIZES 26 THROUGH 4 AND GENERAL PURPOSE FOR WIRE SIZES 2 THROUGH 0000.

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 MATERIAL

TAPE CODE	THICKNESS (NOM)	MATERIAL
1	.0020	.0005 (FP)/.0010 (POLYIMIDE)/.0005 (FP)
2	.0010	FP (SKIVED)
3	.0020	FP (SKIVED)
4	.0020	FP (UNSINTERED)
5	.0025	FP (UNSINTERED)
6	.0030	FP (UNSINTERED)

TABLE 3 - TAPE OVERLAP REQUIREMENTS ^{1/}

WIRE SIZE	WRAP 1			WRAP 2			WRAP 3			WRAP 4			NOMINAL WALL THICKNESS (MILS)
	TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		TAPE CODE	PERCENT OVERLAP		
		MIN	MAX		MIN	MAX		MIN	MAX		MIN	MAX	
26	1	50.5	54.0	4	50.5	54.0							7.4
24	1	50.5	54.0	4	50.5	54.0							7.4
22	1	50.5	54.0	4	50.5	54.0							7.4
20	1	50.5	54.0	4	50.5	54.0							7.4
18	1	50.5	54.0	4	50.5	54.0							7.4
16	1	50.5	54.0	5	50.5	54.0							8.3
14	1	50.5	54.0	5	50.5	54.0							8.3
12	1	50.5	54.0	6	50.5	54.0							9.1
10	1	50.5	54.0	6	50.5	54.0							9.1
8	2	20.5	35.0	1	50.5	55.0	6	67.0	71.0				13.2
6	2	20.5	35.0	1	50.5	55.0	6	67.0	71.0				13.2
4	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	50.5	54.0	16.2
2	3	20.5	35.0	1	50.5	55.9	6	50.5	54.0	6	50.5	54.0	16.2
1	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	50.5	54.0	16.2
1/0	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	50.5	54.0	16.2
2/0	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	50.5	54.0	16.2
3/0	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	50.5	54.0	16.2
4/0	3	20.5	35.0	1	50.5	55.0	6	50.5	54.0	6	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. 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. FINISH WIRE INSULATION PROPERTIES:

FINISH WIRE INSULATION PROPERTIES SHALL BE IN ACCORDANCE WITH TABLE 4.



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COPPER CONDUCTOR, 200 °C, 600 VOLTS ROHS

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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 INCHES WIRE SIZES 26 - 10
	MAXIMUM CHANGE .125 INCHES WIRE SIZE 8 - 0000
ELECTRICAL RESISTANCE (IR)	5000 MEGOHMS (MIN)-1000 FEET WIRE SIZES 26 - 10
	3000 MEGOHMS (MIN)-1000 FEET WIRE SIZES 8 - 0000
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	62% MINIMUM AVERAGE
CONTINUOUS LENGTH SCHEDULE	B

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 (LB)	
	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
8	4.00	3.00	.750	10.00	4.00
6	5.00	4.00	1.00	10.00	4.00
4	6.00	5.00	1.25	15.00	4.50
2	8.00	6.00	2.00	15.00	6.00
1	10.00	8.00	2.50	15.00	6.00
0	10.00	8.00	3.00	15.00	6.00
00	12.00	10.00	4.00	20.00	8.00
000	18.00	10.00	5.00	30.00	10.00
0000	18.00	10.00	6.00	30.00	10.00

^{1/} TOLERANCE SHALL BE ±3% OF THE GIVEN VALUES.