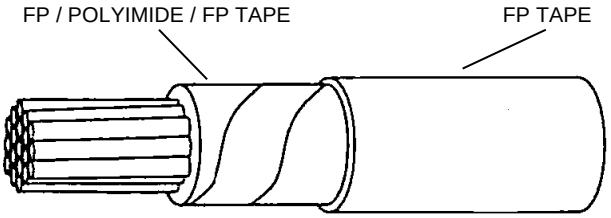
FEDERAL SUPPLY CLASS
6145

RATIONALE

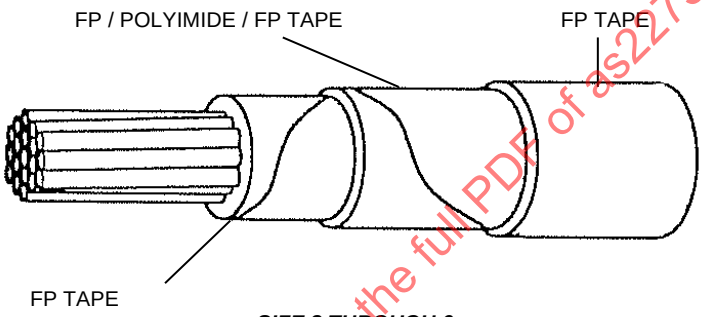
SPECIFICATION UPDATED TO INCLUDE AS29606 CONDUCTOR REQUIREMENTS, ROHS RESTRICTIONS AND AS22759 MODIFICATIONS.

NOTICE

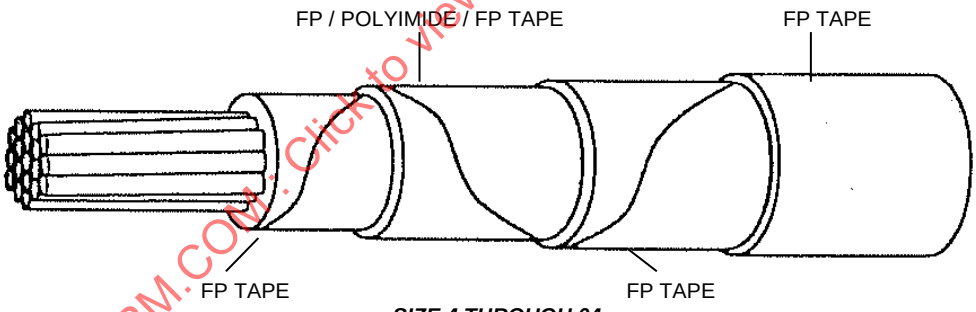
THE COMPLETE REQUIREMENTS FOR PROCURING THE PRODUCT DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF AS22759.



SIZE 26 THROUGH 10



SIZE 8 THROUGH 6



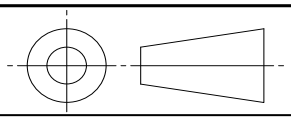
SIZE 4 THROUGH 04

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

FIGURE 1 - AS22759/187 CONFIGURATION

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS22759_187A

THIRD ANGLE PROJECTION



ISSUED 2010-02 REVISED 2014-12

CUSTODIAN: AE-8/AE-8D

PROCUREMENT SPECIFICATION: NONE

SAE INTERNATIONAL

AEROSPACE STANDARD

(R) WIRE, ELECTRICAL, POLYTETRAFLUOROETHYLENE/ POLYIMIDE INSULATED, SMOOTH SURFACE, NORMAL WEIGHT, NICKEL-COATED COPPER CONDUCTOR, 260 °C, 600 VOLTS ROHS

AS22759/187
SHEET 1 OF 5

REV. A

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)** **Tel: +1 724-776-4970 (outside USA)**
Fax: 724-776-0790 **Email: CustomerService@sae.org** **SAE WEB ADDRESS: http://www.sae.org**

TABLE 1 - CONSTRUCTION DETAILS

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
M22759/187-26-*	26	19 X 38	0175	.0204	42.2	.033	.037	1.29	1.42	1.55
M22759/187-24-*	24	19 X 36	.0225	.0244	25.9	.038	.042	1.87	2.04	2.20
M22759/187-22-*	22	19 X 34	.0285	.0314	16.0	.043	.047	2.70	2.90	3.10
M22759/187-20-*	20	19 X 32	.0365	.0394	9.77	.051	.055	4.25	4.45	4.65
M22759/187-18-*	18	19 X 30	.0455	.0494	6.10	.061	.065	6.35	6.60	6.85
M22759/187-16-*	16	19 X 29	.0515	.0554	4.76	.068	.073	8.10	8.40	8.70
M22759/187-14-*	14	19 X 27	.0645	.0694	3.00	.081	.086	12.3	12.8	13.3
M22759/187-12-*	12	37 X 28	.0835	.0894	1.98	.100	.105	19.0	19.7	20.2
M22759/187-10-*	10	37 X 26	.106	.112	1.24	.122	.127	30.0	30.8	31.6
M22759/187-8-*	8	133 X 29	.158	.169	.694	.180	.188	54.7	56.6	58.5
M22759/187-6-*	6	133 X 27	.198	.212	.436	.219	.229	84.1	86.5	88.9
M22759/187-4-*	4	133 X 25	.250	.268	.275	.276	.288	136	140	144
M22759/187-2-*	2	665 X 30	.320	.340	.177	.344	.364	210	218	226
M22759/187-1-*	1	817 X 30	.360	.380	.144	.388	.408	274	283	292
M22759/187-01-*	0	1045 X 30	.395	.425	.113	.420	.450	324	338	352
M22759/187-02-*	00	1330 X 30	.440	.475	.089	.475	.505	410	429	448
M22759/187-03-*	000	1665 X 30	.500	.540	.071	.530	.560	518	531	544
M22759/187-04-*	0000	2109 X 30	.565	.605	.056	.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. M22759/187-20-93 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 NCC SMALL DIAMETER NICKEL 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, TABLE 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: 260 °C (500 °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.

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	260 °C ± 2 °C (500 °F ± 3.6 °F)
SHRINKAGE	290 °C ± 2 °C (554 °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 PERCENT OF THE GIVEN VALUES.