FEDERAL SUPPLY CLASS
5940

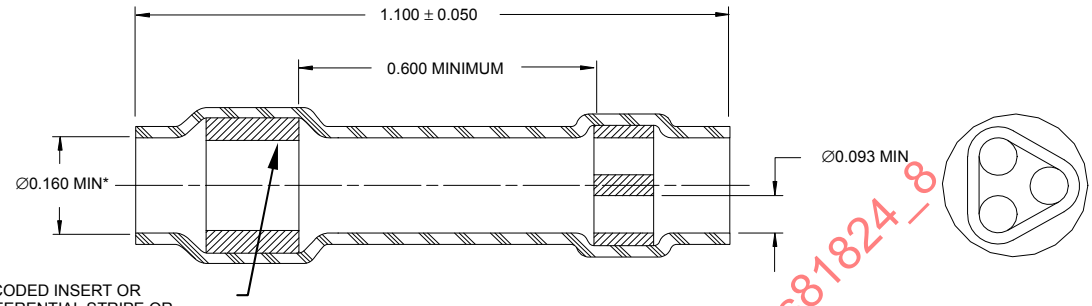
RATIONALE

THIS DOCUMENT PROVIDES THE REQUIREMENTS FOR A NEW ENVIRONMENT RESISTANT SPLICE FOR USE WITH SINGLE OR MULTIPLE CONDUCTOR SPLICING.

NOTICE

THE COMPLETE REQUIREMENTS FOR PROCURING SPLICE DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE LATEST ISSUE OF: SAE AS81824.

SEALING SLEEVE



COLOR CODED INSERT OR CIRCUMFERENTIAL STRIPE OR SLEEVE IN ACCORDANCE WITH TABLE 1. THE CONFIGURATION OF THE MELTABLE INSERT MAY VARY ACCORDING TO THE INDIVIDUAL MFR'S DESIGN

METAL CRIMP SPLICE

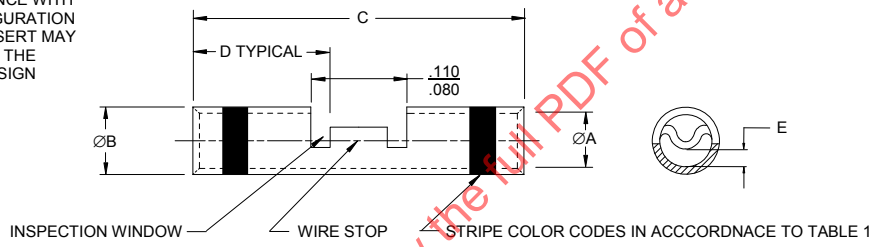


TABLE 1 - CONSTRUCTION DETAILS

PART NUMBER	WIRE RANGE	ØA	ØB	C	D	E MAX	COLOR CODE	WEIGHT LB (KG) PER 1000 PCS – MAX REF
M81824/8-1	SEE TABLE 4	.053 (1.35) .045 (1.14)	.080 (2.03) .075 (1.91)	.510 (12.95) .490 (12.45)	.245 (6.22) .225 (5.72)	.015 (0.38)	RED	5.35 (2.4)
M81824/8-2	SEE TABLE 4	.070 (1.78) .063 (1.60)	.107 (2.72) .100 (2.54)	.585 (14.86) .565 (14.35)	.280 (7.11) .260 (6.60)	.020 (0.51)	BLUE	5.95 (2.7)
M81824/8-3	SEE TABLE 4	.103 (2.62) .095 (2.41)	.155 (3.94) .146 (3.71)	.585 (14.86) .565 (14.35)	.280 (7.11) .260 (6.60)	.050 (1.27)	YELLOW	7.20 (3.3)

*I.D. "AS RECEIVED"

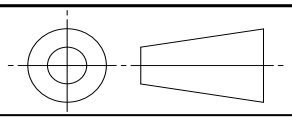
DIMENSIONS ARE IN INCHES

METRIC EQUIVALENTS (TO THE NEAREST 0.01 MM) ARE GIVEN FOR GENERAL INFORMATION ONLY AND ARE BASED UPON 1 INCH = 25.4 MM

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE
± .005 (0.13 MM) FOR THREE PLACE DECIMALS
± .01 (0.25 MM) FOR TWO PLACE DECIMALS

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS81824/8

THIRD ANGLE PROJECTION



ISSUED 2012-07

CUSTODIAN: AE-8/AE-8C2

PROCUREMENT SPECIFICATION: AS81824

SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SPLICE, IN-LINE, ELECTRIC, CRIMP, NI/CU, ENVIRONMENTAL, HEAT-SHRINKABLE SLEEVE (175 °C), 1 X 3 SEALANT OPENING

SAE AS81824/8
SHEET 1 OF 4

REQUIREMENTS:

MATERIAL:

METAL CRIMP SPLICE: COPPER PER ASTM B280, ASTM B75-68, ASTM B1, ASTM B187 OR ASTM B152

INSULATION SLEEVE: HEAT SHRINKABLE, TRANSPARENT POLYVINYLIDENE FLUORIDE PER THE PERFORMANCE REQUIREMENTS OF SAE AS23053/8.

SEALING MATERIAL: MODIFIED THERMOPLASTIC, SEE PROCUREMENT SPECIFICATION.

FINISH: METAL, NICKEL PLATED PER SAE AMS-QQ-N-290.

1. CONTOUR: CONTOUR MAY VARY FROM THAT SHOWN.
2. AVERAGES OF DIAMETERS "A" AND "B" OF THE INSPECTION SAMPLES MUST BE WITHIN SPECIFIED LIMITS.
3. "B" DIAMETER SHALL NOT INCLUDE COLOR STRIPE.
4. NO ETCHING OR SOLVENT TREATING OF THE ASSOCIATED WIRE INSULATION SHALL BE PERMITTED.
5. RESERVED
6. RESERVED
7. RESERVED
8. QUALIFICATION: QUALIFICATION SHALL BE TESTED IN ACCORDANCE WITH SAE AS81824. SEE 8.3 FOR EXCEPTIONS.

8.1 TERMINATION TOOL: FOR QUALIFICATION TESTING, ONLY SPLICE ASSEMBLIES MADE WITH WIRE CONFORMING TO M22759/12 SHALL BE TESTED WITH THE METAL SPLICE. THE SEALING AND INSULATING SLEEVE SHALL BE INSTALLED WITH THE APPLICABLE HEATING TOOL. FOR CRIMPING TOOLS, SEE TABLE 2.

TABLE 2 - CRIMP TOOLS

SPLICE PART NO.	BASIC CRIMP TOOL NO.	DIE NO.
M81824/8-1 M81824/8-2	M22520/5-01 M22520/10-01 M22520/37-01	M22520/5-103 M22520/10-104 N/A
M81824/8-3	M22520/5-01 M22520/10-01 M22520/37-01	M22520/5-102 M22520/10-103 N/A

8.2 WIRE RANGE: TABLE 3 LISTS TYPICAL WIRE RANGES FOR EACH SPLICE SIZES. FOR MULTIPLE CONDUCTOR SPLICING, DETERMINE THE PROPER CRIMP BARREL SIZE BASED ON TOTAL CONDUCTOR MIL AREA (CMA) OR CONDUCTOR AREA IN MM^2 FOR EACH SIDE.

TABLE 3 - QUALIFICATION SPLICE CONFIGURATION

PART NUMBER	MULTIPLE WIRE – SIZE (QTY) ON SINGLE SEALANT OPENING SIDE		MULTIPLE WIRE – SIZE (QTY) ON THREE SEALANT OPENING SIDE	
	MIN SAMPLE WIRE SIZE	MAX SAMPLE COMBINATION	MIN SAMPLE COMBINATION /1	MAX SAMPLE COMBINATION
M81824/8-1	26	26(1) + 24(1)	26(2)	26(3) + 24(1)
M81824/8-2	20	22(1) + 20(1)	26(1) + 22(1)	26(1) + 24(5)
M81824/8-3	16	22(1) + 12(1)	24(1) + 18(1)	24(3) + 22(3)

/1 ONE SEALANT OPENING IS EMPTY IN THE MINIMUM COMBINATION CONFIGURATION.

8.3 FOLLOWING EXCEPTIONS OR VARIATIONS TO SAE AS81824 QUALIFICATIONS APPLY FOR MULTIPLE WIRE TERMINATION TESTING:

8.3.1 VOLTAGE DROP (REFERENCE: SAE AS81824 PARAGRAPH 4.8.1): REFERENCE VOLTAGE DROP SHALL BE DETERMINED BY AVERAGING 4 SAMPLES OF APPLICABLE COMBINATION WIRES WITH SOLDERED CRIMP SPLICES. THE REFERENCE MILLIVOLT SHALL BE MADE BY PUNCTURING THE LARGEST WIRE INSULATION ON BOTH SIDES OF THE CRIMP 1/16 INCH BACK FROM THE ENDS OF THE SEALING SLEEVE.

8.3.2 TENSILE STRENGTH (REFERENCE: SAE AS81824 PARAGRAPH 4.8.5): THE TENSILE STRENGTH SHALL BE TESTED AS FOLLOWS:

8.3.2.1 SMALLEST WIRE ON EACH SIDE SHALL BE ATTACHED TO OPPOSING GRIPS OF THE PULL TESTER WITH THE SPLICE UNATTACHED IN THE APPROXIMATE CENTER, AND PULLED WITH SUFFICIENT FORCE* TO PULL ONE OF THE WIRES OUT OF THE SPLICE OR BREAK ONE OF THE WIRES, OR BREAK THE SPLICE.

8.3.2.1.1 THE PASS/FAIL CRITERIA FOR THIS TEST IS THE AS81824 ESTABLISHED MINIMUM STRENGTH FOR THE WIRE TYPE (PLATING) AND GAGE SIZE OF THE WIRE THAT PULLED OUT OR BROKE. IF THE SPLICE BROKE, THE TENSILE VALUE FOR THE SMALLEST WIRE ATTACHED TO THE PULL TESTER GRIPS WILL APPLY.

8.3.2.2 ON A DIFFERENT BATCH OF SAMPLES THE LARGEST WIRE IN EACH OF THE SPLICE SHALL BE ATTACHED TO OPPOSING GRIPS OF THE PULL TESTER WITH THE SPLICE UNATTACHED IN THE APPROXIMATE CENTER, AND PULLED WITH SUFFICIENT FORCE* TO PULL ONE OF THE WIRES OUT OF THE SPLICE OR BREAK ONE OF THE WIRES OR BREAK THE SPLICE.

8.3.2.2.1 THE PASS/FAIL CRITERIA FOR THIS TEST IS THE AS81824 ESTABLISHED MINIMUM STRENGTH FOR THE WIRE TYPE (PLATING) AND GAGE SIZE OF THE WIRE THAT PULLED OUT OR BROKE. IF THE SPLICE BROKE, THE TENSILE VALUE FOR THE LARGEST WIRE ATTACHED TO THE PULL TESTER GRIPS WILL APPLY.

* HEAD SPEED PULL RATE: 1 INCH ±1/4 INCH PER MINUTE

8.3.3 CURRENT CYCLINIG (REFERENCE: SAE AS81824 PARAGRAPH 4.8.2): THE CURRENT CYCLING TEST SHALL BE PERFORMED AS FOLLOWS:

8.3.3.1 SAMPLES SHALL BE ATTACHED TO 3 FOOT LENGTH OF THE LARGEST ACCOMMODATED SINGLE WIRE ON ONE SIDE AND MAXIMUM ACCOMMODATED MULTIPLE WIRES ON THE OTHER SIDE. THIS PATTERN SHALL ALTERNATE TO CONNECT THE REQUIRED NUMBER OF SAMPLES PER TABLE 3 OF SAE AS81824 – QUALIFICATION INSPECTION. THE CURRENT FOR THE MAXIMUM SINGLE WIRE AS DEFINED IN TABLE 1 OF SAE AS81824 – TEST REQUIREMENTS SHALL BE APPLIED FOR THE NUMBER OF CYCLES AND DURATION DEFINED IN 4.8.2 OF SAE AS81824.

8.3.3.2 VOLTAGE DROP SHALL BE MEASURED FOR EACH WIRE AND COMPARED TO THE SOLDERED EQUAL CONFIGURATION AS DESCRIBED IN 8.3.1.

8.3.4 INSULATION RESISTANCE AND DIELECTRIC WITHSTANDING VOLTAGE (REFERENCE: SAE AS81824 PARAGRAPH 4.8.3 AND 4.8.4) MEASUREMENTS SHALL BE PERFORMED ON THE LAREST WIRE ON EACH SIDE OF THE SPLICE.

9. NOTES:

RECOMMENDED WIRE RANGE:

TABLE 4 - RECOMMENDED WIRE RANGE (REFERENCE)

PART NUMBER	SINGLE WIRE /1	MULTIPLE WIRE TOTAL OD SINGLE SEALANT SIDE (OD_1+OD_2) MAX	MULTIPLE WIRE RANGE CMA (mm^2)	MULTIPLE WIRE TOTAL OD PER OPENING (OD_1+OD_2) MAX
M81824/8-1	26-24-22-20	0.085 (2.16)	304 – 1510 (0.15 – 0.75)	0.093 (2.36)
M81824/8-2	20-18-16	0.110 (2.79)	1058 – 2680 (0.53 – 1.34)	0.093 (2.36)
M81824/8-3	16-14-12	0.170 (4.32)	2375– 6755 (1.19 – 3.37)	0.093 (2.36)

/1 FOR OVERLAPPING WIRE SIZES (E.G., SIZE 20 FOR M81824/8-1 AND M81824/8-2 AND SIZE 16 FOR M81824/8-2 AND M81824/8-3), THE SMALLER SIZE SPLICES ARE PREFERRED (I.E., FOR SIZE 20 AND SIZE 16 WIRES, M81824/8-1 AND M81824/8-2, RESPECTIVELY, ARE PREFERRED).

TABLE 5 - TYPICAL CONDUCTOR CMA (REFERENCE)

SIZE	26	24	22	20	18	16	14	12
STRANDS	19	19	19	19	19	19	19	37
CMA	304	475	754	1216	1900	2426	3831	5874
(mm^2)	(0.15)	(0.24)	(0.38)	(0.61)	(0.95)	(1.21)	(1.92)	(2.94)