FEDERAL SUPPLY CLASS
5940

RATIONALE

THIS DOCUMENT PROVIDES THE REQUIREMENTS FOR A NEW ENVIRONMENT RESISTANT STUB SPLICE WITH NICKEL-COATED CRIMP BARREL AND TEMPERATURE RATING OF 175 °C.

NOTICE

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

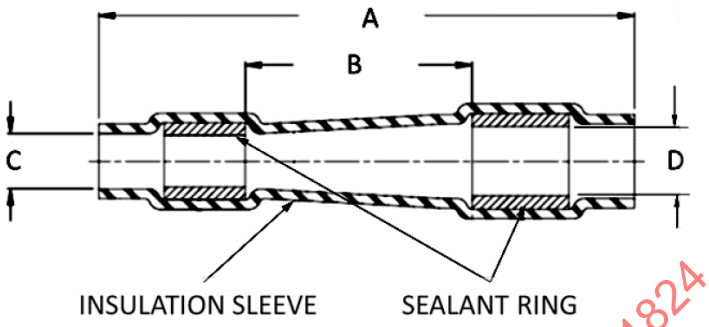


FIGURE 1 - SEALING SLEEVE

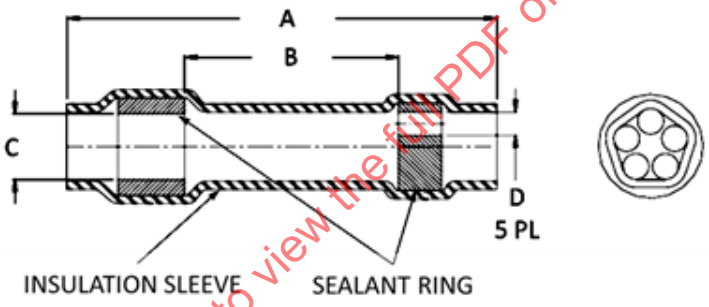


FIGURE 2 - METAL CRIMP SPLICE

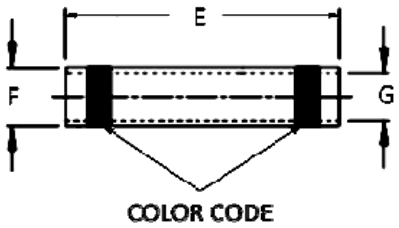
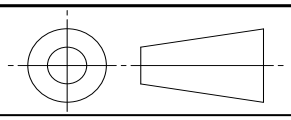


FIGURE 3 - METAL CRIMP

THIRD ANGLE PROJECTION



ISSUED 2012-11

CUSTODIAN: AE-8/AE-8C1

PROCUREMENT SPECIFICATION: AS81824

SAE Aerospace
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AEROSPACE STANDARD

SPLICE, STUB, ELECTRIC, PERMANENT, CRIMP STYLE, NICKEL/COPPER, INSULATED, ENVIRONMENT RESISTANT, 175 °C MAX

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TABLE 1 - CONSTRUCTION DETAILS

PART NUMBER	MAX NO. OF WIRE	A ±.05 ±(1.3)	B MIN	C MIN	D MIN 1/	E ±.005 ±(0.13)	F (OD) ±.002 ±(0.07) 3/	G (ID) ±.002 ±(0.07)	COLOR CODE	FIG 2/	WEIGHT LB (Kg) PER 1000 PCS MAX
M81824/13-1	2	.73 (18.5)	.325 (8.3)	.04 (1.0)	.08 (2.0)	.275 (6.99)	.077 (1.96)	.048 (1.22)	RED	1	.50 (0.2)
M81824/13-2	2	1.15 (29.2)	.275 (7.0)	.09 (2.3)	.18 (4.6)	.275 (6.99)	.103 (2.62)	.067 (1.70)	BLUE	1	1.40 (0.6)
M81824/13-3	2	1.15 (29.2)	.275 (7.0)	.09 (2.3)	.18 (4.6)	.275 (6.99)	.150 (3.81)	.100 (2.54)	YELLOW	1	1.80 (0.8)
M81824/13-4	8 4/	.93 (23.5)	.375 (9.5)	.25 (6.4)	.08 (2.0)	.275 (6.99)	.103 (2.62)	.067 (1.70)	BLUE	2	1.65 (0.7)
M81824/13-5	10 4/	.93 (23.6)	.375 (9.5)	.25 (6.4)	.08 (2.0)	.275 (6.99)	.150 (3.81)	.100 (2.54)	YELLOW	2	2.15 (1.0)

1/ FOR -1, A .08 INCH (2.0 MM) DIAMETER GAGE PIN SHALL CLEAR MINIMUM OF .25 INCH (6.4 MM) FROM THE INSIDE EDGE OF THE SEALANT RING.
2/ REFER TO LISTED FIGURE NUMBER(FIG) FOR INSULATION SLEEVE. FIGURE 4 APPLIES TO ALL DASH NUMBERS.
3/ TOLERANCES FOR -3 AND -5 ARE ±.003 (0.08).
4/ MAXIMUM NUMBER OF WIRES IN EACH SEALANT OPENING IS 2. FOR -4, MAXIMUM NUMBER OF WIRE ASSUMES THE MINIMUM SIZE WIRE IS 26 - SEE TABLE 4 AND TABLE 5.

REQUIREMENTS:

1. MATERIALS:

   INSULATION SLEEVE: HEAT SHRINKABLE CROSS-LINKED FLUOROPOLYMER (PERFORMANCE REQUIREMENTS PER AS23053/8)

   SEALING RING: MODIFIED THERMOPLASTIC

   METAL CRIMP:

      COPPER: ASTM B280, ASTM B75/B75M, ASTM B1, ASTM B187/B187M, OR ASTM B152/B157M

      FINISH: NICKEL PER AMS-QQ-N-290

2. DIMENSIONS:

   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 AND .01 (0.25 MM) FOR TWO PLACE DECIMALS.

3. CONTOUR:

   THE CONTOUR OF THE SPLICE MAY VARY FROM THAT SHOWN PROVIDED THAT THE SPLICE REMAINS WITHIN THE MAXIMUM ENVELOPE DIMENSIONS.

4. NO ETCHING OR SOLVENT TREATING OF THE ASSOCIATED WIRE INSULATION SHALL BE PERMITTED.

5. SEALING SLEEVE CLOSURE

   WHEN TERMINATED, MELTABLE SEALANT ON THE NON-WIRED SIDE SHALL CLOSE THE OPENING AND PROVIDE SEALING.

6. QUALIFICATION:

6.1 TERMINATION TOOL: FOR QUALIFICATION TESTING, SPLICE ASSEMBLIES MADE WITH WIRE CONFORMING TO AS22759/12 SHALL BE TESTED WITH THE METAL SPLICE. THE SEALING AND INSULATING SLEEVE SHALL BE INSTALLED WITH THE APPLICABLE HEAT TOOL. FOR CRIMPING TOOLS SEE TABLE 2. THE RECOMMENDED CRIMP TOOL IS THE M22520/37-1, BUT THE M22520/5 AND M22520/10 CRIMP TOOLS WITH DIES LISTED IN TABLE 2 MAY ALSO BE USED.

6.1.1 THE SHORT METAL CRIMP FERRULE IN THIS SPLICE SERIES DOES NOT POSITION AGAINST THE LOCATOR STOP FEATURE OF THE CRIMP TOOL AND DIES SPECIFIED IN PARAGRAPH 6.1 AND TABLE 2. THE METAL CRIMP FERRULE IS TO BE LOADED INTO THE CORRECT CRIMP CAVITY AND MANUALLY CENTERED IN THE CRIMP NEST/INDENTER CAVITY.

TABLE 2 - CRIMP TOOLS

SPLICE PART NO.	BASIC CRIMP TOOL FRAME NO. WITH DIE NO.
M81824/13-1 M81824/13-2 M81824/13-4	M22520/5-01 WITH M22520/5-103 M22520/10-01 WITH M22520/10-104 M22520/37-01
M81824/13-3 M81824/13-5	M22520/5-01 WITH M22520/5-102 M22520/10-01 WITH M22520/10-103 M22520/37-01

6.1.2 WIRE RANGE: TABLE 3 LISTS TYPICAL TEST WIRE COMBINATION 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 - TEST WIRE COMBINATIONS

PART NUMBER	MULTIPLE WIRE – SIZE (QTY)	
	MIN SAMPLE COMBINATION	MAX SAMPLE COMBINATION
M81824/13-1	26(2)	26(1) + 24(1)
M81824/13-2	26(1) + 22(1)	24(1) + 18(1)
M81824/13-3	24(1) + 18(1)	22(1) + 12(1)
M81824/13-4	26(1) + 22(1)	26(4) + 20(1)
M81824/13-5	24(1) + 18(1)	24(8) + 16(1)

6.2 QUALIFICATION OF MULTIPLE WIRE COMBINATION SHALL BE TESTED IN ACCORDANCE WITH AS81824 EXCEPT AS FOLLOWS:

6.2.1 VOLTAGE DROP (REFERENCE: AS81824 PARAGRAPH 4.8.1): REFERENCE VOLTAGE DROP SHALL BE DETERMINED BY AVERAGING FOUR SAMPLES OF APPLICABLE COMBINATION WIRES WITH SOLDERED CRIMP SPLICES. THE REFERENCE MILLIVOLT DROP SHALL BE MADE BY PUNCTURING WIRE INSULATION 1/16 INCH AWAY FROM THE ENDS OF THE SEALING SLEEVE. THE MEASUREMENTS SHALL BE MADE FROM THE LARGEST WIRE TO ALL OTHERS UNDER TEST INDIVIDUALLY.

6.2.2 TENSILE STRENGTH (REFERENCE: AS81824 PARAGRAPH 4.8.5): THE TENSILE STRENGTH SHALL BE TESTED BY MOUNTING THE METAL CRIMP WITHOUT INSULATION SLEEVE THROUGH A PASS-THRU FIXTURE THAT PASSES THE WIRE THROUGH BUT RETAINS THE SPLICE. THE PULL FORCE SHALL BE APPLIED TO THE LEADING EDGE OF THE METAL CRIMP AND THE WIRE UNDER TENSION (DO NOT GRIP THE METAL CRIMP FERRULE IN A WAY THAT IT ADDS COMPRESSION TO THE CRIMP IMPRESSION).

6.2.2.1 EACH WIRE SHALL BE PULLED INDIVIDUALLY. ONLY ONE WIRE SHALL BE TESTED IN EACH SPLICE CRIMP SAMPLE.

6.2.2.2 THE FIXTURE SHALL BE HELD ON THE FIXED POINT OF THE TENSILE STRENGTH MEASUREMENT INSTRUMENT. THE WIRE SHALL BE PULLED AT THE HEAD SPEED PULL RATE OF 1 INCH ± 1/4 INCH PER MINUTE.

6.2.2.3 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.