

METRIC

MIL-S-246238  
AMENDMENT 1  
21 JUNE 1995

MILITARY SPECIFICATION

SPLICE, FIBER OPTIC CABLE  
GENERAL SPECIFICATION FOR (METRIC)

This amendment forms a part of MIL-S-246238, dated 10 June 1991, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

1.2: Delete in its entirety.

1.2.1: Delete in its entirety.

PAGE 2

2.1.1, Specifications, Federal: Add the following:

" QQ-A-225 - Aluminum and Aluminum Alloy Bar, Rod, Wire, or Special Shapes, Rolled, Drawn, or Cold Finished, General Specification for."

PAGE 3

2.2, AMERICAN SOCIETY FOR TESTING AND MATERIALS: Add the following:

" ASTM-D-1141 - Standard Specification for Substitute Ocean Water."

PAGE 5

3.3.7: Delete the first and second sentence in their entirety and substitute "Liquid materials shall not be used."

PAGE 7

3.4.6, fourth sentence: Delete "shall be defined in MIL-STD-889" and substitute "shall be as defined in MIL-STD-889."

3.5.2, title: Delete "Mass" and substitute "Weight".

PAGE 8

3.5.5, title: Delete in its entirety and substitute "Cable seal flexing (for cable splice only)."

3.5.6, title: Delete in its entirety and substitute "Twist (for cable splice only)."

3.5.7, title: Delete in its entirety and substitute "Axial compressive loading (for cable splice only)."

3.5.8, title: Delete in its entirety and substitute "Crush (for cable splice only)."

3.5.12: Delete in its entirety and substitute:

" 3.5.12 Fiber pull out force. When tested in accordance with 4.6.1.12, the minimum fiber to fiber splice pullout strength shall be 14.0 N (3.1 pounds). The splice shall meet the optical requirements specified in 3.6.2."

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3.5.13, first sentence: Delete "the minimum of 50 percent of the cable strength or".

3.6.1: Delete in its entirety and substitute:

" 3.6.1 Insertion loss (see 4.6.2.2). Unless otherwise specified (see 3.1), the insertion loss shall not exceed 0.9 dB during testing of the splice. The initial insertion loss for tunable splices shall not exceed 0.6 dB (untuned) and 0.2 dB (tuned).

Untuned < 0.6 dB  
Tuned < 0.2 dB "

PAGE 9

3.6.5: Delete and substitute:

" 3.6.5 Crosstalk. When tested in accordance with 4.6.2.6, the signal power level, or the sum of the power levels in the passive output channel or channels, shall be below the output signal level of the active channel by not less than 50 dB."

3.7.1, second sentence: Delete "as specified" and substitute "as specified (see 3.1)."

Table 1: Delete in its entirety and substitute:

"TABLE 1. Temperature ranges.

Range	Operating temperature (°C)	Non-operating temperature (°C)	Storage temperature (°C)
1	-46 to +85	-54 to +85	-62 to +85
2	-55 to +125	-55 to +125	-65 to +200

"

3.7.4, title: Delete "cycling".

PAGE 10

3.7.6, first sentence: Delete "indicator dye" and substitute "water".

3.7.11, first sentence: Delete "condition B" and substitute "condition C".

3.7.12, first sentence: Delete "4.6.3.12" and substitute "4.6.3.11".

3.8: Delete the first sentence and substitute "All details of workmanship shall be as specified herein, when examined in accordance with 4.7."

PAGE 12

Table 11, inspection column, group I: Delete "Mass" and substitute "Weight".

Table 11, inspection column, group I: Delete "Crosswalk" and substitute "Crosstalk".

Table 11, inspection column, group II: Delete "Group II (2 sample units) 3/" and substitute "Group II (2 sample units per test)".

Table 11, inspection column, group II: Delete "Fluid immersion" and substitute "Fluid immersion 3/".

Table 11, inspection column, group III: Delete "Fiber dynamic strength" and substitute "Fiber pull out".

Table 11, footnote 1/, first sentence: Delete "assembled spice" and substitute "unassembled splice".

Table 11, note 2/, first sentence: Delete "group V" and substitute "group IV".

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Table II, note 2/, second sentence: Delete "group V" and substitute "group IV".

Table II, note 3/: Delete "will" and substitute "shall".

## PAGE 13

4.4.2: Delete the second and third sentences and substitute "In group 1, the sequence is not important; however, insertion loss shall be the first optical test performed."

4.4.2, sixth sentence: Delete "testing may be performed".

## PAGE 14

4.5.1.1.4, second sentence: Delete "of the type in DOD-C-85045 as noted" and substitute "of the MIL-C-85045 type noted".

4.5.1.1.4, fifth sentence: Delete "fiber/splices" and substitute "fiber splices".

## PAGE 15

Table III, inspection column: Delete "Mass" and substitute "Weight".

Table IV: Delete in its entirety and substitute:

" TABLE IV. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Insertion loss	3.6.1	4.6.2.2

## PAGE 16

4.5.2: Delete in its entirety and substitute:

" 4.5.2 Periodic inspection (group C). Inspection of product for qualification verification shall consist of group C inspections, as specified in table V. The inspections shall be run in the order shown on sample units which have passed groups A and B inspections. Except where the results of the inspections show non-compliance with the applicable requirements (see 4.5.2.4), delivery of inspection lots which have passed group B inspection shall not be delayed pending the results of group C inspection. Group C inspection shall be performed every 36 months following notification of qualification acceptance."

4.5.2.2, first sentence: Delete "three" and substitute "twelve".

4.5.2.3, first sentence: Delete "specimen" and substitute "specimens".

## PAGE 17

Table V, inspection column, group I: Delete "Crosswalk" and substitute "Crosstalk".

Table V, inspection column, group III: Delete "Fiber dynamic strength" and substitute "Fiber pull out".

## PAGE 18

4.6.1.1, title: Delete "Mass" and substitute "Weight".

4.6.1.5, title: Delete in its entirety and substitute "Cable seal flexing (for cable splice only) (see 3.5.5)."

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4.6.1.6, title: Delete in its entirety and substitute "Twist (for cable splice only) (see 3.5.6)."

4.6.1.7, title: Delete in its entirety and substitute "Axial compressive loading (for cable splice only) (see 3.5.7)."

PAGE 19

4.6.1.8: Add the following after the second sentence:

"Rubber pads shall not be used on the two bearing surfaces."

4.6.1.9.1, first sentence: Delete "EIA-455-2" and substitute "method B of EIA-455-2."

4.6.1.9.1.a, add as second sentence: "A steel plate with a minimum thickness of 12.7 mm (.50 inch) may be used in lieu of a concrete block."

4.6.1.10, first sentence: Delete "condition letter C".

4.6.1.10, add as second sentence: "Test condition VI shall be performed to condition letter C for a duration of 1.5 hours."

4.6.1.11, first sentence: Delete "type B" and substitute "type A".

4.6.1.12: Delete in its entirety and substitute:

" 4.6.1.12 Fiber pull out force (see 3.5.12). The fiber pull out force shall be tested by applying the axial tensile load specified between the fiber and the splice housing for a duration of one minute. The change in optical transmittance shall be monitored during and after the test (see 4.6.2.5). At the completion of the test, the splice shall be visually examined in accordance with 4.6.1."

4.6.1.13, title: Delete "3.5.14" and substitute "3.5.13".

PAGE 20

Figure 2: Delete "CONCRETE BLOCK" and substitute "CONCRETE BLOCK OR STEEL PLATE".

PAGE 21

Figure 3: Delete in its entirety.

PAGE 22

Table VII: Delete "70/70 restricted or equivalent" and substitute "Uniform overfill (initial insertion loss only) and 70/70 restricted or equivalent".

4.6.2.2: Delete in its entirety and substitute:

" 4.6.2.2 Insertion loss (see 3.6.1). The initial insertion loss shall be measured in accordance with method C of EIA-455-34, using both 70/70 and overfill launch conditions. For subsequent insertion loss tests, 70/70 launch conditions or equivalent shall be used."

4.6.2.5, add to end of first sentence: "using equipment having a time resolution sufficient to resolve discontinuities of 50 microseconds ( $\mu$ s) duration."

4.6.2.7: Add after the second sentence:

"The measurement shall be performed at the maximum specified irradiance of 100 mW/cm<sup>2</sup>."

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4.6.3.3, add after first sentence: "The temperature extremes shall be the operating temperature extremes (see 3.1). The subcycle shall be included in the test."

4.6.3.4, title: Delete in its entirety and substitute "Salt spray (corrosion) (for cable splices only) (see 3.7.5)."

4.6.3.5, first sentence: Delete "aqueous dye penetrant solution" and substitute "water".

4.6.3.5, second sentence: Delete "solution" and substitute "water".

4.6.3.5: Delete the third sentence in its entirety.

4.6.3.5, fourth sentence: Delete "dye" and substitute "water".

## PAGE 24

4.6.3.8: Delete in its entirety and substitute:

" 4.6.3.8 Nuclear radiation resistance (see 3.7.9). The lensed splice shall be tested in accordance with EIA-455-49. The splice shall be subjected to a total dose as specified by the qualifying activity at a dose rate of 50 +0, -20 rads(Si)/sec. The change in optical transmittance (see 4.6.2.3) shall be measured during and after the test. The test shall be conducted at the low operating temperature and at +25°C. If the change in optical transmittance at +25°C is greater than the change in optical transmittance at the low operating temperature, the lensed splice shall be tested at the high operating temperature."

4.6.3.9: Delete in its entirety and substitute:

" 4.6.3.9 Fluid immersion (see 3.7.10). A cable splice shall be tested for 24 contiguous hours in each fluid specified in table VIII. Sample preconditioning shall be done under ambient conditions for at least 4 hours. After each of the 24 hour immersions in each fluid, the splices shall be cleaned and examined for possible fluid penetration."

Table VIII: Delete in its entirety and substitute:

"TABLE VIII. Fluid immersion temperatures and conditions.

Fluids	Specification	Test temperature(°C)	Time (hours)
Fuel oil	MIL-F-16884	33-37	24
Turbine fuel (JP-4) Turbine fuel (JP-5)	MIL-T-5624	20-25	24
Isopropyl alcohol	IT-I-735	20-25	24
Hydraulic fluids	MIL-H-5606	48-50	24
Lubricating oils	MIL-L-17331 MIL-L-23699	73-77	24
Coolant	1/	20-25	24
Seawater	ASTM-D-1141	20-25	24

1/ Monsanto Coolanol 25 or equivalent."

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4.6.3.11: Delete in its entirety and substitute:

" 4.6.3.11 Operating temperature (see 3.7.12). The splice shall be subjected to the specified operating temperature extremes as indicated. The change in optical transmittance (see 4.6.2.3) shall be determined at the end of each temperature plateau.

<u>Step</u>	<u>Duration</u>
1. Maintain +25°C ±2°C	1 hour minimum.
2. Optical transmittance measurement	
3. Ramp to high operating temperature	2 hours maximum.
4. Maintain high operating temperature	24 hours minimum.
5. Optical transmittance measurement	
6. Ramp to +25°C ±2°C	2 hours maximum.
7. Maintain +25°C ±2°C	1 hour minimum.
8. Optical transmittance measurement	
9. Ramp to low operating temperature	2 hours maximum.
10. Maintain low operating temperature	24 hours minimum.
11. Optical transmittance measurement	
12. Ramp to +25°C ±2°C	2 hours maximum.
13. Maintain +25°C ±2°C	1 hour minimum.
14. Optical transmittance measurement	"

4.6.3.11.1: Delete in its entirety.

4.6.3.11.2: Delete in its entirety.

PAGE 25

6.3, third sentence: Delete "and information pertaining to qualification of products may be obtained from the activity."

PAGE 27

6.4.17: Delete in its entirety.

6.6, example: Delete "sequentially assigned PIN" and substitute "Two or three character alpha-numeric (see 3.1)".

## CONCLUDING MATERIAL

## Custodians:

Army - CR  
Navy - SH  
Air Force - 85  
NASA - NA

## Preparing activity:

Navy - SH

## Agent:

DLA - ES

## Review activities:

Army - MI  
Navy - AS, EC  
Air Force - 17, 19, 80, 90, 99  
DLA - ES

(Project 6060-0110)