

METRIC

A-A-59917

October 02, 2012

COMMERCIAL ITEM DESCRIPTION

SPLICE, MECHANICAL, SIMPLEX FIBER OPTIC CABLE, SHIPBOARD

The General Services Administration has authorized the use of this commercial item description, for all federal agencies.

1. **SCOPE.** This Commercial Item Description (CID) covers the general requirements for mechanical fiber optic splices with the following attributes: low optical loss performance, high reliability, field-installable, compatible with loose tube, tight buffered, and blown optical multimode and single mode optical fiber, and compatible with being housed inside MIL-DTL-24728/8 fusion splice trays.

2. **CLASSIFICATION.** This CID uses a classification system that is included in the Part or Identification Number (PIN) as shown in section 7.2.

3. **SALIENT CHARACTERISTICS.**

3.1 Design, construction, and dimensions. Design, construction, and dimensions shall be as specified on [figure 1](#) and in [table I](#).

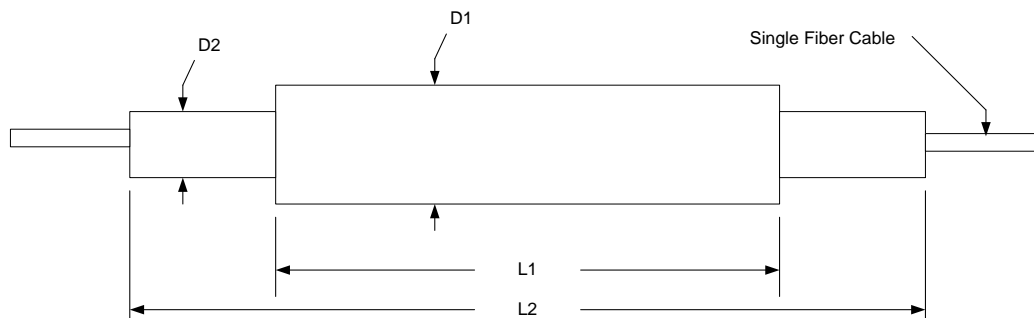


FIGURE 1. Splice, mechanical, simplex fiber optic cable, shipboard.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil, with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

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TABLE I. Envelope dimensions.

Designation	Description	Dimension (mm)
L1	Body Section (fits between splice holder)	16 (max.)
L2	Total Splice Length	28.0 (min.) 40.5 (max.)
D1	Body Section (fits between splice holder)	4.5 (max.)
D2	Strain Relief Section (snaps into splice holder)	3.1 (max.)

3.2 Materials.

3.2.1 Nonmetallic materials. Nonmetallic materials shall not be affected by the use of solvents, adhesives, or alcohol based cleaning solutions. Nonmetallic materials shall not degrade when operated under the environmental conditions defined herein.

3.2.2 Metallic materials. Metallic materials shall be corrosion resistant. Dissimilar metals shall not be used in intimate contact unless suitably finished to prevent electrolytic corrosion.

3.2.3 Toxic and hazardous products and formulations. The products used in the splice construction shall not give off toxic or explosive fumes when exposed to flame. Materials used shall have no adverse effect on the health of personnel when used for the intended purpose.

3.2.4 Fungus. When tested in accordance with MIL-STD-1678-3, Measurement 3401.1, for the duration of 28 days, polymeric materials shall show sparse or very restricted microbial growth and reproduction with minor or inhibited substrate utilization. There shall be little or no chemical, physical, or structural change detectable.

3.2.5 Index matching. Index matching material shall be in accordance with MIL-PRF-24794 or equivalent and shall be preloaded into the mechanical splice.

3.3 Mechanical properties.

3.3.1 Fiber pullout force. When tested by applying an axial tensile load of 2.0 Newton (N) (0.45 pound) between the fiber and the fiber splice housing, the minimum fiber-to-fiber pullout strength shall be 2.0 Newton (N) (0.45 pound). The splice shall hold the load for a duration of 1 minute. The splice shall meet change in optical transmittance requirements during and after the test.

3.3.2 Impact. When tested in accordance with Method C of TIA-455-2, the splice body shall show no visual evidence of physical damage detrimental to the operation of the splice. The splice shall meet change in optical transmittance requirements specified herein after the test.

3.4 Environmental properties.

3.4.1 Temperature ranges. The splice shall operate over a temperature range from -28 to +65 °C and shall be capable of withstanding storage under temperatures from -40 to +70 °C.

TABLE II. Applicable temperature ranges.

Conditions	Minimum Temperature (°C)	Maximum Temperature (°C)
Operating	-28	65
Storage	-40	70

3.4.2 Temperature cycling. When tested for 5 cycles in accordance with MIL-STD-1678-3, Measurement 3301, the splice shall withstand exposure to cyclical temperatures between the operating temperature extremes. The splice shall meet change in optical transmittance requirements specified herein during and after the test. Upon visual examination, there shall be no evidence of physical damage detrimental to the operation of the splice.

3.4.3 Temperature/humidity cycling. When tested for 10 cycles in accordance with TIA/EIA-455-5, Method B, the splice shall withstand exposure to cyclical temperature in the presence of high humidity. The sub-cycle shall be included in the test. The splice shall meet change in optical transmittance requirements specified herein during and after the test. Upon visual examination, there shall be no evidence of deterioration of component parts or materials, physical distortion, corrosion of metals, separation of bonded surfaces, or other physical damage detrimental to the operation of the splice.

3.4.4 Life aging. When tested for 240 hours at 85 °C in accordance with MIL-STD-1678-3, Measurement 3303, the splice shall withstand exposure to accelerated aging conditions. Only the splice and the portions of the test cables nearest the splice shall be exposed to the test environment. Pretest and post test measurements of the splice outer diameter shall be made and reported. Visual inspection of the splice shall be made using 3× magnification. The splice shall meet change in optical transmittance requirements specified herein during and after the test. The splice shall also meet the fiber pullout force requirements specified herein after the test.

3.4.5 Thermal shock, unspliced. When tested for 5 cycles over the storage temperature extremes in accordance with MIL-STD-1678-3, Measurement 3304, test condition C-0, the splice shall withstand cyclical exposure to the defined storage temperature extremes. The splice shall be tested in its original packaging. If applicable, a post test visual examination of the splice body shall reveal neither leakage of waterproofing compounds or index matching gel, other apparent loss of sealing capability, nor any damage detrimental to the operation of the splice. After the exposure, the splice shall meet the insertion loss requirements as specified herein.

3.4.6 Thermal shock, spliced. When tested for 5 cycles over the storage temperature extremes in accordance with MIL-STD-1678-3, Measurement 3304, test condition C-0, the splice shall withstand cyclical exposure to the defined storage temperature extremes. The splice shall meet the change in transmittance requirements as specified herein after the test.

3.4.7 Vibration. When tested in accordance with TIA-455-11, test condition I, the splice shall withstand exposure to sinusoidal vibration over frequencies from 5 to 55 Hertz (the frequency range for test condition I shall be extended to a low frequency of 5 Hertz). The splice shall exhibit no visual evidence of loosening parts, relative motion between splice and cable parts, or any other damage which can produce physical distortion or wear and may result in fatigue of the mechanical parts or failure of the splice operation. The splice shall meet the discontinuity requirements specified herein during the test.

3.4.8 Shock. When tested in accordance with MIL-S-901, Grade A, Class I, Type C, the splice shall not be damaged and there shall be no loosening of parts. Testing shall be conducted on optical fiber splices assembled on M85045/16-02 cable. The splices shall be tested in a MIL-DTL-24728/8 splice tray and splice tray holder inside of a MIL-I-24728 fiber optic interconnection box. The completed splice shall fit into the splice holders within the splice tray without any adverse effect to the splice itself or the other splices in the tray. The splice shall meet the discontinuity requirements as specified herein during the test and change in transmittance requirements as specified herein after the test.

3.5 Optical requirements.

3.5.1 Insertion loss. The initial insertion loss shall not exceed 0.5 decibels (dB).

3.5.2 Change in optical transmittance. When measured in accordance with MIL-STD-1678-3, Measurement 2102, the change in optical transmittance during or after any specified environmental or mechanical requirement shall not be greater than 0.3 decibels (dB).

3.5.3 Return loss. When measured in accordance with MIL-STD-1678-3, Measurement 2105, return loss shall not be greater than -40 decibels (dB) for single mode.

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3.5.4 Discontinuity. When measured in accordance with MIL-STD-1678-3, Measurement 2104, no discontinuity shall occur. A discontinuity is considered a reduction in signal strength of 0.3 decibels (dB) or more for a duration of 50 microseconds or more.

3.6 Size. When visually inspected in accordance with MIL-STD-1678-3, Measurement 3101, splice dimensions shall be in accordance with [figure 1](#) and [table I](#). Strain relief boots or fittings may be used provided that the maximum width/diameter in the strain relief section does not exceed measurement D2 in [table I](#) and the strain relief is utilized during all testing specified in this CID.

3.7 Mass. When measured with scales, the mass of an unassembled mechanical splice shall not exceed 2.0 grams.

3.8 Fiber preparation. Fiber preparation and assembly of the splice shall be achievable utilizing tools and supplies available in the standard Navy shipboard fiber optic toolkit, as described in 6872811, 6872813, or 7085185, supplemented with parts and tools provided with the splice kit.

3.9 Cleaver.

3.9.1 High precision cleaver. Assembly of the splice shall be achievable utilizing a high precision cleaver which shall be provided with the splicing equipment.

3.9.2 Cleave angle. The cleaver shall meet the requirements of cleave angle distribution and cleave angle maximum in accordance with GR-264.

3.10 Marking. When visually inspected, splices or splice packages shall be identified with markings that are permanent, clearly visible, and legible. Identification marking information shall include the PIN (see 7.2) and either the manufacturer's Contractor and Government Entity (CAGE) code, name, or logo, and the manufacturer's part number.

3.11 Workmanship. When visually inspected, the splice shall be dimensionally uniform, and free of manufacturing flaws that would degrade performance that would inhibit proper assembly or mating or would otherwise yield an inferior product.

4. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. PRODUCT CONFORMANCE PROVISIONS.

5.1 Product conformance. The contractor shall certify and maintain objective quality evidence that the product offered meets the requirements of this CID, and that the product conforms to the producer's own drawings, specifications, standards, quality assurance practices, and is the same as the product provided as a bid sample. The Government reserves the right to require proof of such conformance prior to the first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

5.2 Market acceptability. The item offered must have been sold to the Government or commercial market for a minimum of one year.

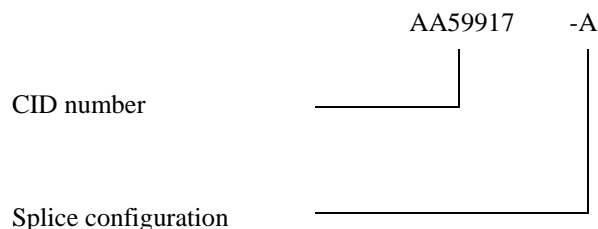
6. PACKAGING. Preservation, packaging, and marking shall be as specified in the contract or order.

7. NOTES.

7.1 Intended use. Splices in accordance with this CID are intended to be used as a damage control repair replacement for an existing fusion splice. The completed splices are intended to be stored in a qualified MIL-DTL-24728/8 splice tray and splice tray holder mounted inside a qualified MIL-I-24728 fiber optic interconnection box.

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7.2 Part or identification number (PIN). The following part or identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.



7.3 Source of documents.

7.3.1 Defense specifications and standards. Defense specifications and standards are available online at <https://assist.dla.mil/quicksearch/>.

7.3.2 EIA/TIA. EIA/TIA standards are available from the Telecommunications Industry Association, 2500 Wilson Blvd. Suite 300, Arlington, VA 22201-3834 or at <http://www.tiaonline.org>.

7.3.3 FAR. The Federal Acquisition Regulation may be available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 or online at <https://www.acquisition.gov/far>.

7.3.4 GR. These documents are available from Telcordia Customer Service, Piscataway, NJ 08854-4156, or online at <http://telecom-info.telcordia.com>.

7.4 Ordering data. The contract or order should specify the following:

- a. CID document number, revision, and CID PIN.
- b. Product conformance provisions.
- c. Packaging requirements.

7.5 Suggested sources of supply. As part of the market analysis and research effort, this CID was coordinated with manufacturers of commercial products. For a list of manufacturers known to meet the requirements of this CID, see the Navy Recommended Fiber Optic Components Parts List website at <https://fiberoptics.nswc.navy.mil>. (NOTE: This information should not be considered as a list of approved manufacturers or be used to restrict procurement to only those manufacturers.)

7.6 Key words.

Repair

Splice, fusion

MILITARY INTERESTS

Custodians:

Army – CR

Navy – SH

Air Force – 11

Review Activities:

Air Force – 13, 19, 93, 99

Misc – DI

CIVIL AGENCY COORDINATING ACTIVITY:

GSA – FAS

Preparing Activity:

Navy – SH

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