METRIC

DOD-HDBK-282 (NAVY)

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MILITARY HANDBOOK

FIBER OPTIC CABLE INSTALLATION PROCEDURES

FSC 6015

DEPARTMENT OF DEFENSE

Washington, DC 20301

Installation Procedures for Fiber Optic Cable
DOD-HDBK-282(NAVY)

1. This handbook is approved for use by Navy-SH, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

2. This publication was approved on 28 February 1985 for printing and inclusion in the military standardization handbook series.

3. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FOREWARD

1. This document provides general and specific information concerning the installation of fiber optic cable in shipyard environments. Guidance is provided within covering all aspects of installation from receipt of materials through transit, warehouse storage, cable preparation and final installation. The intended use of this handbook is to provide guidance in the development of shipyard procedure manuals which will be utilized at all levels of installation. In many cases details are generalized and attention should be directed to the specific manufacturers instruction sheets.

2. Every effort has been made to ensure the technical accuracy and currency of information concerning the handling and installation of fiber optic cables. It is the intent that periodic review and update of this handbook will ensure its completeness and currency.

CONTENTS

1. SCOPE

1.1 Scope. This handbook is concerned with fiber optic cable and shipyard installation procedures. Many applicable uses and requirements are contained in this document.

2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and handbook. Unless otherwise specified, the following specifications and handbook of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation form a part of this handbook to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-I-17695	-	Insulation Tape, Electrical, Filler Type, Flameproof, Synthetic.
MIL-S-19622	-	Stuffing Tube, Nylon, General Specification For.
MIL-C-28876	-	Connector, Fiber Optic, Circular Threaded, High Density, High Shock, Shipboard.
MIL-I-81765	-	Insulating Components, Molded, Electrical, Heat Shrinkable, General Specification For.
MIL-A-82569	-	Adhesive, Neoprene Base, Medium Viscosity.
MIL-T-83523/6	-	Tools, Fiber Optic, Polishing, Fixture Assembly, Type IV.
DOD-C-85045	-	Cable, Fiber Optic (For Inboard and Outboard Submarine Use), General Specification For.

HANDBOOK

MILITARY

MIL-HDBK-278 - Fiber Optic System Design Guide.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this handbook to the extent specified herein.

NAVSEA 803-5001027 - Electrical Plant Installation.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

3. DEFINITIONS

3.1 Terms and definitions. The terms and definitions used in this handbook are defined as follows.

a. Buffer, fiber. A layer of material which may be used to provide mechanial protection for the fiber.

b. Cladding, fiber. Fiber cladding is that part of a fiber which concentrically surrounds the core of the fiber and has a lower refractive index than the core.

c. Coating, fiber. Fiber coating is that part of a fiber which surrounds the cladding and provides physical protection from exposure to the atmosphere.

d. Core, fiber. The fiber core is the center region of a fiber which has a higher refractive index than the cladding surrounding it and which transmits the optical signal.

e. Fiber, optical. A fiber is a single discrete optical transmission element usually comprised of a fiber core, fiber cladding, and coating.

f. Fiber optic cable. A single fiber or group of optical fibers enclosed by a common protective jacket and usually including an aramid strength member.

g. Filler. A fibrous or nonfibrous material used to fill voids in a cable. A filler can be used to maintain the shape of the cable, to maintain the watertight integrity of the cable, or to protect the optical fibers.

h. Jacket. The cable jacket is the material which is the external protective covering common to all internal cable elements.

i. Microbending. Random unintentional microscopic bends of a fiber axis usually caused by compressive or bending forces applied to the cable or fiber.

j. Nonwatertight cable. A fiber optic cable which contains no internal water blocking materials.

k. Watertight cable. A fiber optic cable which contains internal water blocking materials.

4. GENERAL REQUIREMENTS

4.1 Safety.

a. WARNING: PERMANENT EYE DAMAGE CAN RESULT FROM LOOKING DIRECTLY INTO A LIGHT BEAM GENERATED BY AN LED OR LASER SOURCE OR INTO THE END OF A CABLE FIBER CONNECTED TO ONE OF THESE SOURCES.

CAUTION: Light generated by these sources may not be visible, yet remain hazardous to the eye. Look for warning labels on source devices.

b. Observe all warning signs on handling solvents and epoxies. Be familiar with the first aid instructions for these agents.

c. Observe all warning signs on equipment and all written safety precautions in the instruction manual or equipment technical manual.

d. Ensure that no voltage is present on metallic members within the fiber cable.

e. Do not use assembly methods requiring flame or arcing in potentially explosive areas containing warning signs where explosive glasses or fumes may be present.

f. Always handle cable carefully to avoid personal injury. Care should be taken with individual fibers to prevent injury to the eyes or penetration of the fibers into the skin.

4.2 Tools required to terminate fiber optic cable.

a. Tools required: See appendix.

b. Fiber stripper: Math Associates, Inc., Model No. A-4060 or equivalent.

c. Diamond-edge cutter: Majestic Diamond Tool Co., Model No. 3599 or equivalent.

d. Microscope (50 power, or greater): Math Associates, Inc., Model No. A-4000 or equivalent.

e. Fusion splicer: Power Technology Incorporated, Model PFS-200 or equivalent.

f. Knife.

g. Hand crimping tool: AMP Incorporated, Part No. 90364-1 or 220193-1 or equivalent.

h. Hot air gun (sealed): Alpha Wire Corporation Model No. HG-1 or equivalent.

i. Polishing tool fixture assembly, MIL-T-83523/6.

j. Insertion tool for MIL-C-28876 Connectors, M28876/19-01.

k. Removal tool for MIL-C-28876 Connectors, M28876/20-01.

4.3. Materials. The following material is required:

a. Buffer solvent (as specified by cable contractor).

b. Cotton or wiping cloths.

c. Adhesive: LOCTITE 414, LOCTITE 495, or equivalent and as specified by connector and cable contractor.

d. Epoxy adhesive: TRA-CON, Inc., Part No. TRA-BOND F120 or equivalent.

e. Heat shrinkable tubing: AMP special industries part no. 54021-2 or equivalent.

f. Gaco type N29 adhesive: Gates Engineering Co., Inc.

g. Gaco type N3SG cured neoprene rubber: Gates Engineering Co., Inc.

h. End cap material: MIL-I-81765.

i. Filler tape: MIL-I-17695.

j. Heat shrinkable tape: AMP special industries part no. 603300-1 or equivalent.

k. Pressure sensitive vinyl tape.

l. Silicon carbide finishing paper: Carbimet, Buehler Ltd.

m. Swell Strip 37: American Fiber Optics Corporation.

n. Ultraviolet-curable bond 007 epoxy acrylate: American Fiber Optics Corporation.

o. Capillary splicing tubes: American Fiber Optics Corporation.

p. Ultraviolent lamp (800 microwatt/centimeter^2): American Fiber Optics Corporation or equivalent.

q. Protective splice sleeve: American Fiber Optics Corporation.

r. Isopropyl alcohol: CMC Inc., Nashville, Tennessee 37202 or equivalent.

s. Dow corning no stick: Dow Corning Corporation.

See appendix for a sample list of manufacturers; however, they are not necessarily recommended or endorsed.

4.4 Cable storage.

4.4.1 Warehouse. Cables shall be stored in a dry place, protected from the weather and limited to a range of temperatures not to exceed -40°C to +71°C. Flammable materials and chemicals located in the same area with cables shall be stored in proper containers. A cable that has been in storage for a year or longer may be installed if visual inspection at the warehouse shows that it has sustained no mechanical damage that would impair the watertight integrity of its outer sheath, or the integrity of the optical fibers. Cables shall be stored on reels. A cable shall not be stored by hanging on hooks, dowels, or pegs. When cables are stored or set

aside for installation, the ends of the cable shall be sealed against moisture absorption by the cable end sealing method shown herein (see 5.1). Ensure that end seals are secured before transfer of cables from a cold to a warm, high humidity location.

NOTE: Do not rereel fiber optic cable on a reel that has a smaller diameter than twice the minimum bend radius of the cable. Rereel on fiber optic cable reels only.

4.4.2 Transit. Cables shall be transited on a reel or coiled without exceeding minimum bend radius. Cables in transit from storage to pierside shall be handled in such a manner as to avoid abrasion, crushing, twisting or kinking. Twisting or kinking is most likely to occur when a cable is removed from a reel or unwound from a coil. Cables shall be transported in such a manner as to avoid the possibility of having heavy objects placed on top of them or being crushed by sliding equipment.

4.4.3 Pierside. Pierside cables shall be stored in a protective structure at pierside and shall be protected from kinks, twists, sharp bends and crushing.

4.5 Cable handling.

a. When handling cables, both before and during installation, avoid abrading, crushing, twisting, kinking or pulling around sharp edges. Twisting or kinking is most likely to occur when a cable is removed from a reel or unwound from a coil.

b. The use of block and tackle, chain falls, or other mechanical devices to pull fiber optic cables is prohibited. Cables shall not be left laying on decks where they are subjected to damage. Cables and cable ends shall be kept coiled and suspended above the deck until installation can be completed.

4.6 Cable support.

4.6.1 Bending.

a. Cables may be easily damaged during installation by careless shaping or forming that could result in an unreliable operational system.

b. Cables shall be formed in a sweep bend in which the bend radius is not less than the minimum bending radius of the cable. Bends at terminal entrances, where stuffing tubes are required, shall be made via angle stuffing tubes in accordance with MIL-S-19622. Straight stuffing tubes may be used in place of angle stuffing tubes if the bend in the cable is not less than the minimum bend radius specified for that cable.

c. The minimum bend radius for fiber optic cable shall be as specified in DOD-C-85045.

d. Care shall be taken while pulling the cable into wireways to avoid momentary sharp bends.

4.6.2 Wireways.

a. Cables required for shipboard fiber optic systems shall be installed using the appropriate methods shown herein for the following:

b. Cable penetration of decks and bulkheads (see 5.9).

c. Installation of stuffing tubes, multiple cable bulkhead penetrators, hull penetrators, and bulkhead penetrators (see 5.8).

d. Cable shall be installed in wireways in accordance with drawing no. 803-500127.

5. DETAIL REQUIREMENTS

5.1 Cable end seal preparation. Cable ends shall be prepared and sealed in accordance with the methods described herein:

a. Cable end sealing with heat shrinkable tubing and end caps.

b. The cable jacket and fiber coating shall be cleaned of any foreign matter.

c. Slide the correct size end cap over cable section to be sealed in accordance with MIL-I-81765/1. Position the end cap to insure 25 mm minimum overlap on cable jacket.

d. Shrink the end cap by applying heat, using a hot air blower (heat gun), or other source. Minimum recovery temperature is 125°C (250°F).

e. As heat is applied, move the heat source back and forth over the part to be shrunk. Shrink the end cap from closed-end to open-end to avoid trapping air.

f. When end cap has recovered enough to assume the configuration of the item covered and adhesive appears at the end of the cap, discontinue heating.

5.2 Cable/fiber preparation.

a. Approximately 300 mm ±10 mm from the cable end, bend the cable and cut around the cable through the outer jacket with a sharp knife. Take care not to cut any elements inside the jacket.

NOTE: If the elements are damaged, the fibers must be cut off below the damage and process started again.

Gently pull the outer jacket off the cable. If tape is used between the outer jacket and the strength members, unwind the tape back to the outer jacket and cut it off with a sharp knife.

b. Separate the strength members from the fibers and either cut them off with a knife or tie them back if they are to be used for strain relief.

c. If the cable has two jackets, cut around the inner jacket with a sharp knife at the same location the outer jacket was cut. Cut only deep enough to penetrate the jacket so that the fibers will not be damaged. Carefully slit the jacket parallel to the fibers and remove it. Gently twist the jacket until it loosens and then pull it off.

d. If strength members are used between the inner jacket, and the fiber or fiber buffer, separate the members from the fiber and either cut them off or tie them off if they are to be used for strain relief.

5.3 Cable termination to connectors. Fiber optic cables shall be terminated to connectors in accordance with the methods contained herein.

5.3.1 Cable termination to single-contact AMP optimate connector.

a. Prepare fiber end in accordance with 5.1 and 5.2 herein.

b. Use a fiber stripper that fits the fiber jacket diameter and remove the jacket exposing approximately 200 mm ±10 mm bare fiber.

c. Use cotton or other soft, lint-free material dipped in the coating solvent recommended by the cable manufacturer (such as alcohol, Freon, etc.) and wipe along the fiber to remove the coating. If the coating is nonsoluble it can be removed by using a wire stripper that fits the fiber diameter.

d. Secure each fiber to a flat surface and put it under tension by pulling on it. A diamond-edge cutting tool or equivalent is then used to nick the fiber. Increasing tension is applied to the fiber by pulling it with force sufficient to snap the fiber.

e. Examine the end face with an inspection microscope to determine the quality of the break. The end face of the fiber should be flat and perpendicular to the axis of the fiber. If the end face is not satisfactory repeat step 4.

f. Slide crimp ring and retaining cap onto cable and strip 15 mm of jacket from end of cable using the procedures described in 5.1 and 5.2 herein. Remove all strength members unless they are to be used for strain relief.

g. For a glass fiber apply one drop of adhesive to the jacket. Insert cable in the ferrule as far as it will go. (Recommended adhesives for glass fibers are Loctite 414, Loctite 495, or equivalent.)

NOTE: Do not use adhesives that have exceeded the manufacturers recommendations on shelf life.

h. For plastic fibers apply one drop of solventless epoxy glue (2 part, 100 percent solids) such as Tra-bond F120 or equivalent to the fiber and one drop to the jacket. Insert cable into ferrule as far as it will go. Recommended curing time for Tra-bond F120 is 10 minutes for initial bonding. Follow the manufacturers recommendations for curing for equivalent epoxies.

NOTE: Use only solventless, 2 part, 100 percent solids, epoxy glue. Any other type will damage the fiber cladding.

i. Slide the retaining cap over the ferrule, followed by the crimp ring. Position crimp ring about 1.5 mm behind cap so that the cap can rotate freely when installed. Crimp with AMP hand crimping tool P/N 90364-1 or P/N 220193-1, or equal.

j. Carefully trim the fiber so that it protrudes 2 mm (approximately) from tip of the ferrule. Do not break the fiber.

k. Screw polishing bushing AMP P/N 530522-1 into the retaining cap until ferrule is firmly bottomed. Tip of the ferrule will protrude approximately 0.50 mm from bushing.

l. Place 5 grades of silicon carbide finishing paper (320, 400, 600, 3 µm, and .3 µm grits) on a firm flat surface.

m. Work from the coarsest to the finest grit and polish the end of the fiber and ferrule down to the surface of the polishing bushing. Hold the bushing firmly and alternate among circular, elliptical and "figure 8" patterns while polishing. Gently brush off face of polishing bushing before starting any finer grit paper.

Note: Do not use fine grit lapping films beyond their normal life span.

n. The polishing is completed when the surface of the polishing bushing immediately surrounding the ferrule is polished to a glossy finish.

NOTE: Discard the polishing bushing after use.

5.4 Cable termination to MIL-C-28876 connector.

a. Clean the entire contact using isopropyl alcohol and allow to dry.

b. Prepare the cable ends in accordance with 5.1 and 5.2 herein.

c. Slip heat shrink tubing over the cable and past strength member.

d. Trim strength member as close as possible to outer jacket.

e. Backfill contact with an epoxy adhesive, Tra-bond F120 or equivalent until it extrudes out the front end of the contact.

f. Slide the contact over the fiber until the end protrudes through the contact, approximately 0.80 mm.

g. Slide the heat shrink tubing flush with the first shoulder of the contact and heat with hot air gun. Start recovery on connector body and move toward cable.

h. Allow adhesive to cure for 1 hour at 23°C.

i. After adhesive has cured, contact end must be polished using polishing fixture in accordance with M28876/22.

j. Contacts may now be inserted in a MIL-C-28876 connector.

NOTE: The following contacts are to be used with this method:

Pin: M28876/16.
Socket: M28876/17.

5.5 Cable jacket repair. The outer jacket of fiber optic cable may be repaired in accordance with the methods noted below. These methods are to be used when the fibers and watersealing compounds are undamaged. Refer to Fiber Optic Shipboard Installation MIL-HDBK-278 (check out procedure) for damage.

5.5.1 Jacket repair using neoprene rubber.

a. Trim damaged jacket material to remove frayed areas.

b. Sand the jacket in the area to be repaired providing a rough surface that extends three inches each side of the damaged area.

c. Apply successive layers of Gaco Type N29 adhesive and type N3SG 1.50 mm thick cured neoprene rubber, or equal, to obtain a resultant thickness greater than that of the damaged material.

d. The final layer of neoprene rubber should extend 75.0 mm each side of the damaged area.

e. Apply a sufficient amount of Gaco Type N29 adhesive coating, or equal, to cover the repair.

5.5.2 Jacket repair using heat shrinkable tape.

a. Trim damaged jacket material to remove frayed areas.

b. Sand jacket in the area to be repaired providing a rough surface that extends 75.0 mm each side of the damaged area.

c. Fill the indents with filler tape in accordance with MIL-I-17695 restoring the contour of the sheath to provide a taping surface and jacket material.

d. Apply two half-lapped layers of ampliseal heat shrinkable self-sealing tape, type 2. Tape to within 15 mm of the rough surface area of the jacket. Shrink the tape with the application of heat sources capable of delivering at least 135°C (275°F).

e. Apply two half-lapped layers of Scotch, or equal plastic pressure sensitive tape over the heat shrinkable tape and the remainder of the rough surface area of the jacket.

5.6 Cable splicing. When system specifications permit the use of splices for fiber optic cable, these splices shall be in accordance with the methods contained herein.

5.6.1 Cable splicing using the fusion technique and a power technology splicer.

WARNING: A FUSION SPLICE SHALL NOT BE MADE IN AN AREA HAVING AN EXPLOSIVE ATMOSPHERE.

a. When a protective sleeve will be used over the cable after splicing is complete, it shall be placed over the end of one of the two cable ends being spliced and slid out of the way in accordance with the splice manufacturer's instructions.

b. The cable shall be prepared in accordance with 5.2 and the splice manufacturer's instructions. The fibers shall be prepared in accordance with 5.2 and the splice manufacturer's instructions.

c. When a protective outer sleeve or splice enclosure is to be used over the individually spliced fibers, it shall be placed over the end of one of the two fiber ends being spliced and slid out of the way in accordance with the splice manufacturer's instructions.

d. Using a method recommended by the fiber manufacturer, strip 50.0 mm (or a length specified in the cleaving tool instructions) of the coating material from the fiber.

e. Clean the fiber with a cloth or towel moistened with Freon or a cleaning agent specified by the fiber manufacturer.

f. Cleave the fiber in accordance with the cleaving tool manufacturer's instructions so that 0.5 to 0.625 inch of bare fiber remains.

g. Place the two fiber ends in the fusion splicer's fiber positioning apparatus in accordance with the splicer manufacturer's instructions and examine the fiber ends to assure that the cleaves are good. The cleaved surfaces should be free of chips or spikes. The fiber end face should be as close to perpendicular to the fiber axis as possible. If either cleave is bad, repeat steps c through f as needed.

h. Using the fiber positioning apparatus, butt the two fibers together and visually examine for proper alinement. If instrumentation is available to measure the attenuation through the splice junction, use the fiber positioning apparatus to minimize the attenuation of the joint.

i. Following the splicer manufacturer's instructions, separate the fibers slightly (approximately 1 fiber diameter) and use a short duration arc to clean the fibers. Using the fiber positioning apparatus, move one fiber end to the edge of the view field and the other fiber end so that its end face is in line with the centerline of the electrodes. Using the time and intensity settings that are in accordance with the fiber and splicer manufacturer's recommendations, discharge the arc to prefuse the fiber end face. The edges of the fiber end face should be slightly rounded. Repeat this procedure for the other fiber end.

j. Reposition the fiber ends for optimum alinement at the centerline of the electrodes. Use loss measurement instruments if available to optimize alinement. Following the fiber and splicer manufacturer's instructions, discharge the arc to fuse the two fiber ends. After fusing there shall be no visible indication of the splice junction. Remove the spliced fiber from the fusion splicer. Following splice manufacturer's instructions, apply buffer/coating material. If a protective outer sleeve or splice enclosure is to be utilized, position device to cover fusion spliced area.

k. Repeat steps c through j for each fiber in the cable which requires splicing.

l. If a protective sleeve or splice enclosure is to be utilized for the cable, position device to cover spliced fibers and cable ends.

m. Follow splice manufacturer's instructions to complete the splice process.

5.6.2 Cable splicing using epoxy method (V-groove).

a. Prepare the cable and fiber in accordance with 5.1 and 5.2 herein.

b. Place all strength materials such as steel tubing and heat shrink tubing over one end of the fiber.

c. With the V-groove guide placed under a microscope, butt both fiber ends together inside the V-groove.

NOTE: Do not introduce any bends at the joint.

d. Apply the epoxy material such as Tra-bond F120 or equivalent, being careful not to disturb the fiber ends.

NOTE: Do not use silicone index-matching fluids.

e. Slide the steel tubing or heatshrink tubing over the bare fiber and source.

f. Refer to procedures of 5.5 for jacket repair methods.

5.6.3 Cable splicing using epoxy ultraviolet curable epoxy.

a. Prepare the cable and fibers in accordance with 5.1 and 5.2 herein.

NOTE: Swell strip 37 may be used for stripping optical fibers.

b. Slide a protective sleeve over one of the fibers away from the fiber end.

c. Apply a small amount of ultraviolet-curable bond 007 epoxy acrylate in a capillary splicing tube and insert both ends of the fibers to be spliced.

d. Cure using an ultraviolet light for one minute.

e. Slide the protective sleeve over the splice and apply a small amount of the epoxy to hold it in place.

f. Cure again using the ultraviolet lamp.

5.7 Cable entry to equipment. Cable entry to switchboards, watertight, and of nonwatertight enclosures shall be made in accordance with the methods of drawing no. 803-5001027. Cable entrance to nonwatertight equipment, cable entrance to watertight equipment, strapping and supporting fibers in electrical equipment and attaching cables to sound isolated equipment are examples to be used in this category.

5.8 Cable installation in penetrators. Fiber optic cables shall be installed in multiple cable penetrators, bulkhead penetrators, and stuffing tubes in accordance with the methods contained herein.

5.8.1 Cable installation in multiple cable penetrators.

a. Pull cables through the cable penetrator frame perpendicular to the penetrator. A reasonable amount of slack should be left to facilitate movement of cable within the cable penetrator.

b. Apply a light coat of cable lubricant (Dow corning no stick or equivalent) to all outside surfaces of the insert blocks, the inside portion of the frame and the curved surface of the compression plate.

c. Starting with the heaviest cable in the bottom of the penetrator, place the lower half of the insert block under the cable in the frame. Build up the rest of the frame with appropriate size inserts up to and including the upper half of the insert block for the heaviest cable.

d. Place a stay plate across the top of these insert blocks. Continue with the next row of insert blocks then the stay plate up to maximum height for the size of the penetrator being used.

e. Add the compression plate to the frame.

f. Tighten the compression bolt down on the compression plate to compress entire contents of the frame and provide just enough clearance to insert end packing assembly. Apply cable lubricant to the packing assembly cavity to assist the insertion of the end packing.

g. Disassemble end packing assembly and install in frame around the compression bolt. Reassemble and tighten .375-16 hex nuts evenly until end packing material expands in the cavity and there is a slight roll of material around the end packing metal washers. Back off compression bolt approximately 1/8 of a turn. The packing is now complete.

5.9 Cable protection. Cables passing through decks and bulkheads shall be protected. Protection of cables from mechanical injury and protection of cables penetrating nonwatertight decks are examples of methods in this category.

5.10 Training. Shipyard and Navy personnel involved in the installation of fiber optic components shall have received a training course in fiber optic cable, connector, and splice installation techniques and shall be certified as having successfully completed the course. This course shall be administered by the applicable cognizant Naval activity.

Custodian:
Navy - SH

Review activities:
Navy - AS, EC
DLA - ES

User activity:
Navy - CG, MC

Agent:
DLA - ES

Preparing activity:
Navy - SH

(Project 6015-N007)

APPENDIX

LIST OF MANUFACTURERS

10. GENERAL

10.1 Scope. This appendix supplies a partial list of manufacturers known to supply test equipment recommended by this document. This list is not intended to be exhaustive and may be supplemented by manufacturers of equivalent equipment.

10.2 Manufacturers.

a. Alpha Wire Corporation, 711 Lidgerwood Avenue, Elizabeth, NJ 07207 (201) 925-8000

b. American Fiber Optics Corporation, 1196 East Willow Street, Signal Hill, CA 90052 (213) 595-8797

c. Power Technology Incorporated, 7925 Mablevale Cutoff, Mablevale, AK 72103 (501) 568-1995

d. Buehler Ltd., 2120 Greenwood Street, Evanston, IL 60204

e. Dow Corning Corporation, Midland, MI 48640 (517) 496-4000

f. Majestic Diamond Tool Co., 210 W. 29th Street, NY, 10001

g. AMP Special Industries, Valley Forge, PA 19482 (215) 647-1000

h. Math Associates, Inc., 376 Great Neck Road, Great Neck, NY 11021 (516) 466-9818

i. RPM Inc./Gates Engineering Co. Inc., 100 S. West St., Wilmington, DE 19899 (302) 656-9951

j. Hughes Aircraft Company, 17150 Von Karman Avenue, Irvine, CA 92714 (714) 549-5701

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
DOD-HDBK-282(NAVY)	FIBER OPTIC CABLE INSTALLATION PROCEDURES

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER *(Specify)*: _____
b. ADDRESS *(Street, City, State, ZIP Code)*	

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

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