

SCAN 10

MIL-S-19622E(SH)
24 June 1986
SUPERSEDING
MIL-S-19622D(SHIPS)
10 November 1966
(See 6.5)

MILITARY SPECIFICATION

STUFFING TUBES, NYLON; AND PACKING ASSEMBLIES;
GENERAL SPECIFICATION FOR

This specification is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

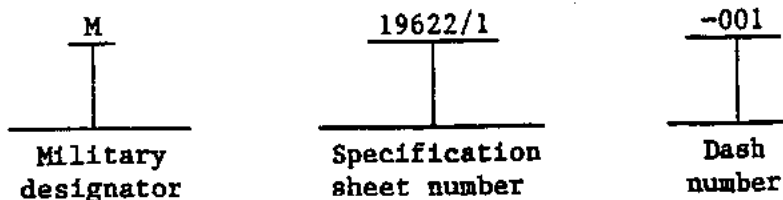
1. SCOPE

1.1 Scope. This specification covers the general requirements for nylon stuffing tubes for shipboard electrical cables, which includes tube types suitable for both thin wall enclosures up to 3/16-inch thick and wall enclosures of 3/16 to 3/4-inch thick.

1.2 Classification. Nylon stuffing tubes shall be of the following types as specified (see 3.1 and 6.2.1):

- Straight - Unified form thread
- 90 degrees - Unified form thread
- NPT - American Standard Pipe Thread
- Y - Unified form thread

1.2.1 Military part number. The military part number shall consist of the letter "M", the basic number of the specification sheet, and an assigned dash number (see 3.1) as shown in the following example:



1.2.2 Sizes. Sizes shall be as specified (see 3.1 and 6.2.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, 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.

AMSC N3858

DISTRIBUTION STATEMENT A

Approved for public release; distribution unlimited

FSC 5975

FSC 5330

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

- MIL-S-901 - Shock Tests, H.I. (High Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-R-6855 - Rubber, Synthetic, Sheets, Strips, Molded or Extruded Shapes.
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Provisional Items (Repair Parts): Packaging of.

(See Supplement 1 for a list of associated specification sheets.)

STANDARDS

FEDERAL

- FED-STD-H28/2 - Screw-Thread Standards for Federal Services Section 2 Unified Inch Screw Threads - UN and UNR Thread Forms.
- FED-STD-H28/6 - Screw-Thread Standards for Federal Services Section 6 Gages and Gaging for Unified Screw Threads - UN and UNR Thread Forms.
- FED-STD-H28/7 - Screw-Thread Standards for Federal Services Section 7 Pipe Threads, General Purpose.

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-108 - Definitions of and Basic Requirements for Enclosures for Electrical and Electronic Equipment.
- MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.

2.1.2 Other Government drawing. The following other Government drawing forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWING

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

803-5001027 - Electric Plant Installation Standard Methods,
Section 3, Group C.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 3029 - Sheeting, Rigid Plastic, or Parts by Means of a Tup (Falling Weight) Impact Resistance of. (DoD adopted)
- D 4066 - Nylon Injection and Extrusion Materials (AA) Specification for. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.4 and 6.3).

3.3 Materials.

3.3.1 Polyamide (nylon). Polyamide (nylon) molding plastic material shall be group 1, class 8, grade 1 as specified in ASTM D 4066.

3.3.1.1 Plastic material certification. Material certification shall be required from the manufacturer of the plastic material to ensure the material was manufactured, sampled, tested and inspected in accordance with ASTM D 4066. Material identity, traceable to this certification, shall be maintained throughout the manufacturing process.

3.3.2 Synthetic rubber (neoprene). Synthetic rubber (neoprene) shall be class 2, type A, grade 40 as specified in MIL-R-6855.

3.3.3 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.4 Design and construction. The stuffing tubes and packing assemblies shall be of the design, construction and physical dimensions as specified (see 3.1).

3.4.1 Molded nylon parts. Molded nylon parts (body, washers, locknut and cap) shall meet the requirements specified herein.

3.4.1.1 Stress relief. Adequate measures shall be taken in molding or processing plastic to ensure that stress build-up does not occur or is satisfactorily treated to relieve these stresses to prevent deterioration or failure of a part or assembly. The stress-relieving process shall be as required by the technical data furnished by the contractor of the raw materials.

3.4.1.2 Threads. Threads shall be unified form (UN), class 2A or 2B or taper pipe thread (NPT) as specified in FED-STD-H28/2 and FED-STD-H28/7, respectively. Type (UN or NPT), nominal size and threads per inch shall be as specified on the applicable specification sheet. The UN thread gauging shall be GO-NOT GO as specified in FED-STD-H28/6. The NPT gauging shall be as specified in FED-STD-H28/7.

3.4.2 Neoprene parts. Neoprene parts (bushing and plug) shall meet the requirements specified in MIL-R-6855 and, when assembled in a stuffing tube, shall meet the performance requirements specified herein.

3.4.3 O-ring (preformed packing). The O-ring is identified on the applicable specification sheet but shall not be furnished with the stuffing tube or stuffing tube assembly. The O-ring shall be provided separately by the installing activity in accordance with Drawing 803-5001027, section 3, group C, sheet 3.

3.4.4 Level of effectiveness. A complete stuffing tube with O-ring installed and properly assembled to a cable or with plug installed shall be submersed (15 foot) as specified in MIL-STD-108.

3.5 Performance.

3.5.1 Vibration. When stuffing tubes are tested as specified in 4.7.1, there shall be no evidence of cracking, or loosening of parts.

3.5.2 Shock. When stuffing tubes are tested as specified in 4.7.2, there shall be no evidence of cracking, breaking, distortion, or loosening of parts.

3.5.3 Falling ball impact. When stuffing tubes or nylon parts are tested as specified in 4.7.3, there shall be no evidence of mechanical damage.

3.5.4 Torsion. When stuffing tubes are tested as specified in 4.7.4, there shall be no evidence of cracking, breaking, distortion or damage to the threads.

3.5.5 Effectiveness of seal. When stuffing tubes are tested as specified in 4.7.5, there shall be no evidence of leakage through or around the stuffing tubes.

3.5.6 Porosity. When stuffing tubes or nylon parts are tested as specified in 4.7.6, there shall be no evidence of air or gas pockets, resin pockets, solvent areas, area lacking resin, uncured areas, delaminations and soft spots. Some inner porosity is permitted provided that the stuffing tube is not weakened excessively as determined by the shock and falling ball impact tests specified in 4.7.2 and 4.7.3. This porosity shall not penetrate the outer surface of the stuffing tube.

3.6 Identification. Identification of part numbers shall be as shown on the applicable specification sheet in 1/8-inch high raised letters. Except where molds have been built with the identification markings of a superseded drawing or specification sheet, these markings will be accepted. New molds or molds that require rework shall contain markings as specified on the applicable specification sheet.

3.7 Workmanship. Stuffing tubes shall be free from warp, cracks, chipped edges or surfaces, blisters, uneven surfaces, scratches, dents and heat marks. They shall be free from fins, burrs and from unsightly finish caused by chipping, filing, or grinding without subsequent buffing or polishing. All molded nylon parts shall be thoroughly cleaned of annealing mediums. Packing assemblies shall be free of voids, pin holes, flash or other imperfections which may impair their serviceability.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- (a) First article inspection (see 4.4).
- (b) Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions as specified in MIL-STD-202.

4.4 First article inspection. First article inspection shall be performed on sample units which have been produced with equipment and procedures normally used in production (see 6.2.2). Acceptance will be allowed for all sizes of the individual parts that make up the stuffing tube assembly of the type tested and accepted (see 4.4.1).

4.4.1 Sample size. Two stuffing tubes of each type (see 1.2) shall be subjected to first article inspection. One tube shall be one of the two smallest sizes and the other tube shall be one of the two largest sizes specified on the applicable specification sheets.

4.4.2 Inspection routine. The sample shall be subjected to the inspections as specified in table I in the order shown.

TABLE I. First article inspection.

Inspection	Requirement	Test method
Visual and dimensional examination	3.1, 3.3, 3.4, 3.6 and 3.7	4.6.1
Vibration	3.5.1	4.7.1
Shock	3.5.2	4.7.2
Falling ball impact (nylon parts)	3.5.3	4.7.3
Torsion	3.5.4	4.7.4
Effectiveness of seal	3.5.5	4.7.5
Porosity (nylon parts)	3.5.6	4.7.6

4.5 Quality conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of a nylon product for delivery shall consist of groups A and B inspection (see 4.5.2 and 4.5.3). Inspection of a neoprene product for delivery shall be as specified in MIL-R-6855.

4.5.1.1 Inspection lot. An inspection lot may consist of one of the following products that are produced under essentially the same conditions, and offered for inspection at one time:

- (a) A part covered by a single specification sheet (see 3.1).
- (b) A stuffing tube consisting of a body, locknut and cap (see 3.1).

4.5.2 Group A inspection. Group A inspection shall consist of the inspections as specified in table II.

TABLE II. Group A inspection.

Inspection	Requirement	Test method
Visual and dimensional examination	3.1, 3.3, 3.4, 3.6 and 3.7	4.6.1

4.5.2.1 Sampling plan. Samples shall be selected from each lot as specified in MIL-STD-105 for general inspection level II. Acceptable quality levels (AQL) shall be 1.5 percent defective.

4.5.3 Group B inspection. Group B inspection shall consist of the inspections as specified in table III with samples selected from inspection lots that have passed group A inspection.

4.5.3.1 Sampling plan. The sampling plan shall be as specified in MIL-STD-105 for special inspection level S-4. The AQL shall be 4.0 percent defective.

TABLE III. Group B inspection.

Inspection	Requirement	Test method
Falling ball impact	3.5.3	4.7.3
Torsion ^{1/}	3.5.4	4.7.4
Effectiveness of seal ^{1/}	3.5.5	4.7.5
Porosity	3.5.6	4.7.6

^{1/} Required only when the inspection lot consists of a stuffing tube.

4.6 Examination.

4.6.1 Visual and dimensional examination. Samples shall be visually examined to verify that the materials, design, construction, physical dimensions, marking and workmanship are as specified in the applicable requirements (see 3.1, 3.3, 3.4, 3.6 and 3.7).

4.7 Tests.

4.7.1 Vibration. The stuffing tubes shall be subjected to the type I vibration test as specified in MIL-STD-167-1. The following details shall apply:

- (a) The stuffing tubes shall be complete with O-rings and 3 to 6 foot lengths of cable of the types specified in Drawing 803-5001027.
- (b) The free end of the cables shall be secured to prevent excessive cable whipping action during the test.
- (c) Nonconformance to requirements of 3.5.1 shall be cause for rejection.

4.7.2 Shock. The stuffing tubes shall be subjected to the high-impact shock test for grade A, type A, class I equipment as specified in MIL-S-901. The details specified in 4.7.1(a) and (b) shall apply. Nonconformance to the requirements of 3.5.2 shall be cause for rejection.

4.7.3 Falling ball impact. The stuffing tubes or nylon parts shall be subjected to the falling ball impact test specified in ASTM D 3029. Nonconformance to the requirements of 3.5.3 shall be cause for rejection.

4.7.4 Torsion. Torsion tests shall be conducted as follows:

- (a) Straight, 90 degree and Y stuffing tubes - the stuffing tubes shall be inserted through a suitable size opening in a 1/16-inch steel panel and the stuffing tube locknuts, with O-rings in place, shall be tightened with a torque wrench to the measured value of torque, respectively, for the stuffing tube sizes shown in table IV.
- (b) NPT stuffing tubes - the NPT type bodies shall be installed in a 1/2-inch thick plate tapped with mating NPT threads. The correct size packing assemblies and cable, as specified in Drawing 803-5001027, shall be installed in the tube. The caps shall then be torqued to the values shown in table IV.
- (c) Nonconformance to the requirements of 3.5.4 shall be cause for rejection.

TABLE IV. Torque values.

Size (MIL-S-19622/5, /6, /7 and /8)	Applied torque values	
	Locknut MIL-S-19622/9 and /15 and body, MIL-S-19622/7	Cap MIL-S-19622/10
	Pound-Inches	Pound-Inches
1	100	50
2 and 3	120	75
4 and 4T	150	75
5	480	210
6	480	210
7	480	210
8	600	240
9	840	300

4.7.5 Effectiveness of seal. Stuffing tubes assembled as specified in 3.4.4 shall be subjected to the submersible (15 foot) test as specified in MIL-STD-108. Rejection criteria shall be as specified in MIL-STD-108 and 3.5.5.

4.7.6 Porosity. Nylon parts shall be subjected to a fluoroscopic examination for defects specified in 3.5.6. In lieu of a fluoroscopic examination, the stuffing tube parts may be examined internally by two cross sectional cuts, one along the major axis and one perpendicular to the major axis. Nonconformance to the requirements of 3.5.6 shall be cause for rejection.

4.8 Inspection of packaging. Except when commercial packaging is specified, the sampling and inspection of packaging shall be in accordance with section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisitions.)

5.1 Preservation, packing and marking. Preservation, packing and marking shall be level A, B, C or commercial as specified (see 6.2.1), in accordance with MIL-E-17555 and shall include sure date and precautionary markings as specified in MIL-R-6855.

6. NOTES

6.1 Intended use. Nylon stuffing tubes are intended for making electric cable penetration in Naval shipboard enclosures for electrical equipment.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification, and specification sheet, as applicable.
- (b) Type, size, and part number (see 1.2 and 1.2.2).
- (c) When first article inspection is required (see 3.2).
- (d) Level of preservation, packing, and marking required (see 5.1).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraph.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.4	First article inspection report	DI-T-4902	---

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12L., Vol. I, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical items acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 First article. When a first article inspection is required, the items should be a first article sample. The first article should consist of two units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Subject term (key word) listing.

Nylon
Packing assembly
Plastic coating
Porosity
Rubber synthetic
Stuffing tube

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project 5975-N612)

MILITARY SPECIFICATION
STUFFING TUBES, NYLON; AND PACKING ASSEMBLIES;
GENERAL SPECIFICATION FOR

This supplement forms a part of MIL-S-19622E(SH) dated 24 June 1986.

SPECIFICATION SHEETS

- MIL-S-19622/1 - Stuffing Tubes, Straight, Nylon.
- MIL-S-19622/2 - Stuffing Tubes, 90 Degrees, Nylon.
- MIL-S-19622/3 - Stuffing Tubes, NPT, Nylon.
- MIL-S-19622/4 - Stuffing Tubes, "Y"-Type Nylon.
- MIL-S-19622/5 - Stuffing Tube, Nylon: Body, Straight.
- MIL-S-19622/6 - Stuffing Tube, Nylon: Body, 90 Degrees
- MIL-S-19622/7 - Stuffing Tube, Nylon: Body, NPT.
- MIL-S-19622/8 - Stuffing Tube, Nylon: Body "Y" Type.
- MIL-S-19622/9 - Stuffing Tube, Nylon: Locknut, Straight Body.
- MIL-S-19622/10 - Stuffing Tube, Nylon: Cap.
- MIL-S-19622/11 - Stuffing Tube, Nylon: Washer, Nonmetallic Slip.
- MIL-S-19622/12 - Stuffing Tube, Nylon: Washer, Nonmetallic Retainer.
- MIL-S-19622/13 - Stuffing Tube, Nylon: Bushing, Neoprene.
- MIL-S-19622/14 - Stuffing Tube, Nylon: Plug, Neoprene.
- MIL-S-19622/15 - Stuffing Tube, Nylon: Locknut, 90 Degrees.
- MIL-S-19622/16 - Stuffing Tube, Nylon, Size 1: Packing Assemblies for.
- MIL-S-19622/17 - Stuffing Tube, Nylon, Size 2: Packing Assemblies for.
- MIL-S-19622/18 - Stuffing Tube, Nylon, Size 3: Packing Assemblies for.
- MIL-S-19622/19 - Stuffing Tube, Nylon, Sizes 4 and 4T: Packing Assemblies for.
- MIL-S-19622/20 - Stuffing Tube, Nylon, Size 5: Packing Assemblies for.
- MIL-S-19622/21 - Stuffing Tube, Nylon, Size 6: Packing Assemblies for.
- MIL-S-19622/22 - Stuffing Tube, Nylon, Size 7: Packing Assemblies for.
- MIL-S-19622/23 - Stuffing Tube, Nylon, Size 8: Packing Assemblies for.
- MIL-S-19622/24 - Stuffing Tube, Nylon, Size 9: Packing Assemblies for.

Preparing activity:
Navy - SH