



Standard Specification for Stuffing Tubes, Nylon, and Packing Assemblies (Metric)¹

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1. Scope

1.1 This specification covers the general requirements for nylon stuffing tubes and packing assemblies. Nylon stuffing tubes are intended for making electric cable penetrations in marine shipboard enclosures for electrical equipment. The following types are suitable for both thin-wall enclosures up to 5 mm ($\frac{3}{16}$ in.) thick and thick-wall enclosures, bulkheads, and decks of 5 to 19 mm ($\frac{3}{16}$ to $\frac{3}{4}$ in.) thick.

1.2 This specification does not cover metal stuffing tubes.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to its use.*

2. Referenced Documents

2.1 ASTM Standards:

D 2000 Classification System for Rubber Products in Automotive Applications²

D 4066 Specification for Nylon Injection and Extrusion Materials (PA)³

2.2 NEMA Standards:

Standard 250 Enclosures for Electrical Equipment (1000 V Max)⁴

2.3 ASME Standard:

ASME B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)⁵

2.4 IEC Standard

Standard 68-2-6 Environmental Testing—Part 2: Tests—Test FC: Vibration (Sinusoidal) Sixth Edition⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.10 on Electrical.

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² *Annual Book of ASTM Standards*, Vol 09.02.

³ *Annual Book of ASTM Standards*, Vol 08.02.

⁴ Available from the National Electrical Manufacturers Association, 1300 N. 17th St., Suite 1847, Rosslyn, VA 22209.

⁵ Available from the International Electrotechnical Commission, 3 rue de Varembe, Case postale 131, CH-1211, Geneva 20, Switzerland.

⁶ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990.

3.1.1 *nylon stuffing tube, n*—a marine electrical fitting used for the sealing of cable penetration into shipboard enclosures while maintaining or exceeding the degree of protection for which the enclosure is rated.

3.1.2 *packing assembly, n*—the compressible insert for the nylon stuffing tube. It consists of one neoprene bushing and three nylon washers.

3.1.3 *enclosure, n*—an electrical panel, cabinet, junction box, light fixture, electrical equipment, control box, or panel.

4. Classification

4.1 Nylon stuffing tubes shall be of the following types (see Fig. 1):

4.1.1 *Type 1*—straight—Unified Form Thread.

4.1.2 *Type 2*—90°—Unified Form Thread.

4.1.3 *Type 3*—NPT—American Standard Pipe Thread.

4.1.4 *Type 4*—Y—Unified Form Thread.

5. Ordering Information

5.1 Orders for stuffing tubes under this specification shall include the following:

5.1.1 Type (see 4.1).

5.1.2 Part number (see Table 1).

5.1.3 Packing assembly size (see Fig. 2 and Table 2).

5.1.4 The O-ring included in the stuffing tube assembly has a finite shelf life. If the stuffing tube assembly is used after the shelf life has expired, the O-ring should be replaced, using the appropriate size listed in Table 1.

6. Materials and Manufacture

6.1 Materials:

6.1.1 Polyamide (nylon) molding plastic material shall be Group 1, Class 8, Grade 1 in accordance with Specification D 4066.

6.1.2 Synthetic rubber (neoprene) shall be in accordance with Classification D 2000, M2, BC, 410, A14, B14, C12, and F19.

6.2 Manufacture:

6.2.1 Molded nylon parts, such as body, washers, locknut, and cap, shall meet the requirements specified herein.

6.2.2 Threads shall be unified form UN 2A or 2B or taper pipe thread (NPT) as specified in ASME Standard B1.1.

6.2.3 Neoprene parts, such as bushing and plug, shall meet the requirements specified in Classification D 2000, and when

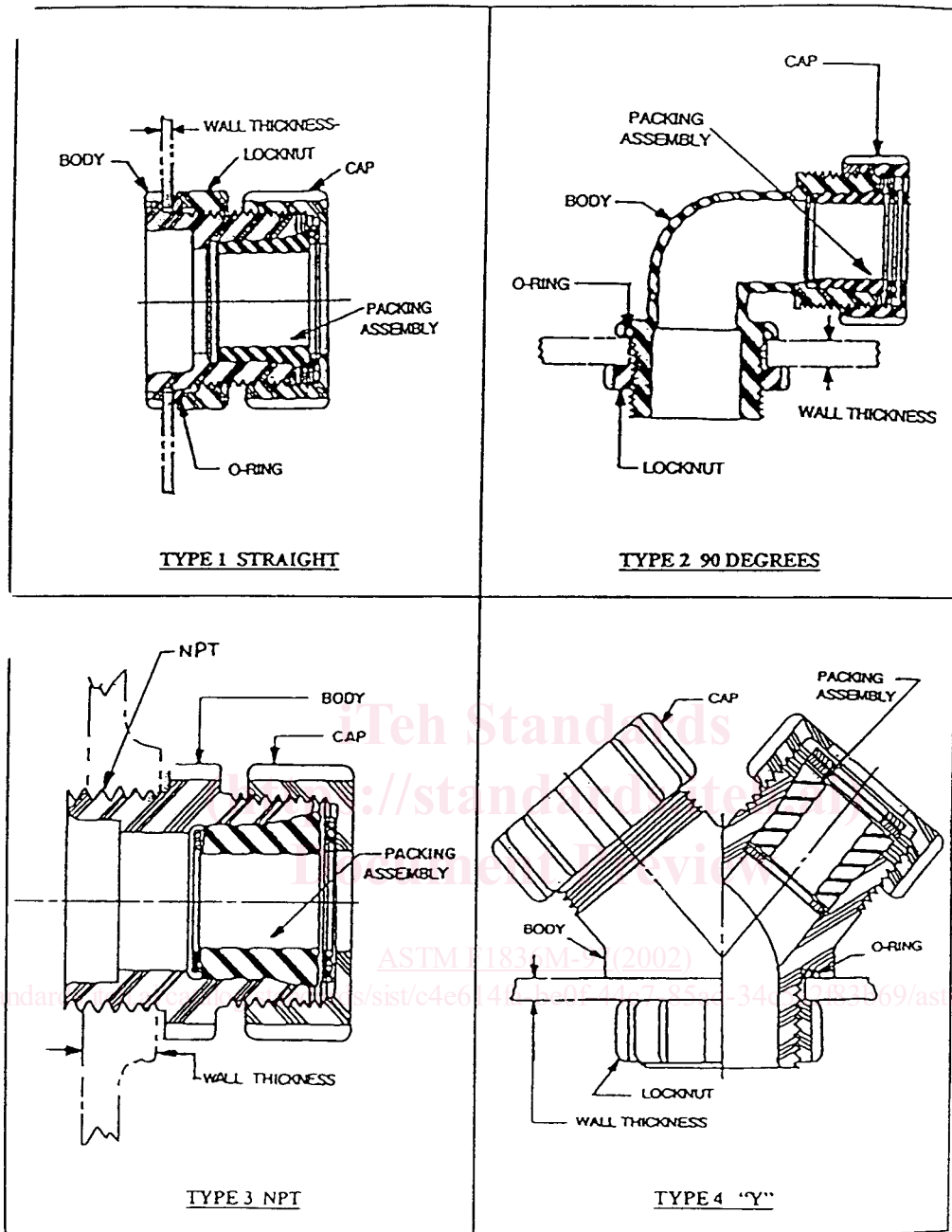


FIG. 1 Stuffing Tube Types

assembled in a stuffing tube, shall meet the performance requirements specified herein.

7. Other Requirements

7.1 Performance Requirements:

7.1.1 Vibration resistance—When stuffing tubes are tested as specified in 9.1, there shall be no evidence of cracking or loosening of parts.

7.1.2 Ruggedness—When stuffing tubes are subjected to a mechanical abuse test as specified in 9.2, there shall be no cracking, breaking, distortion, or damage to the sample.

7.1.3 Effectiveness of seal—When stuffing tubes are tested as specified in 9.3, there shall be no evidence of leakage through or around the stuffing tubes.

8. Workmanship, Finish, and Appearance

8.1 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 unsightly finish caused by chipping, filing, or grinding without subsequent buffing or polishing. All molded nylon parts shall be cleaned thoroughly of annealing mediums. Packing assemblies shall be free of voids, pin holes, flash, or other imperfections, that may impair their serviceability.

9. Test Methods

9.1 Conformance testing of a random sample may be requested by the purchaser to verify that selected performance characteristics specified herein have been incorporated in the