



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

This standard is issued under the fixed designation F 1836M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

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:*²

D 2000 Classification System for Rubber Products in Automotive Applications

D 4066 Classification System for Nylon Injection and Extrusion Materials (PA)

2.2 *NEMA Standards:*

Standard 250 Enclosures for Electrical Equipment (1000 V Max)³

2.3 *ASME Standard:*

ASME B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)⁴

2.4 *IEC Standard*

Standard 68-2-6 Environmental Testing—Part 2: Tests—Test FC: Vibration (Sinusoidal) Sixth Edition⁵

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

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:*

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 For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from National Electrical Manufacturers Association (NEMA), 1300 N. 17th St., Suite 1752, Rosslyn, VA 22209, http://www.nema.org.

⁴ Available from the International Electrotechnical Commission, 3 rue de Varembe, Case postale 131, CH-1211, Geneva 20, Switzerland.

⁵ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, http://www.asme.org.

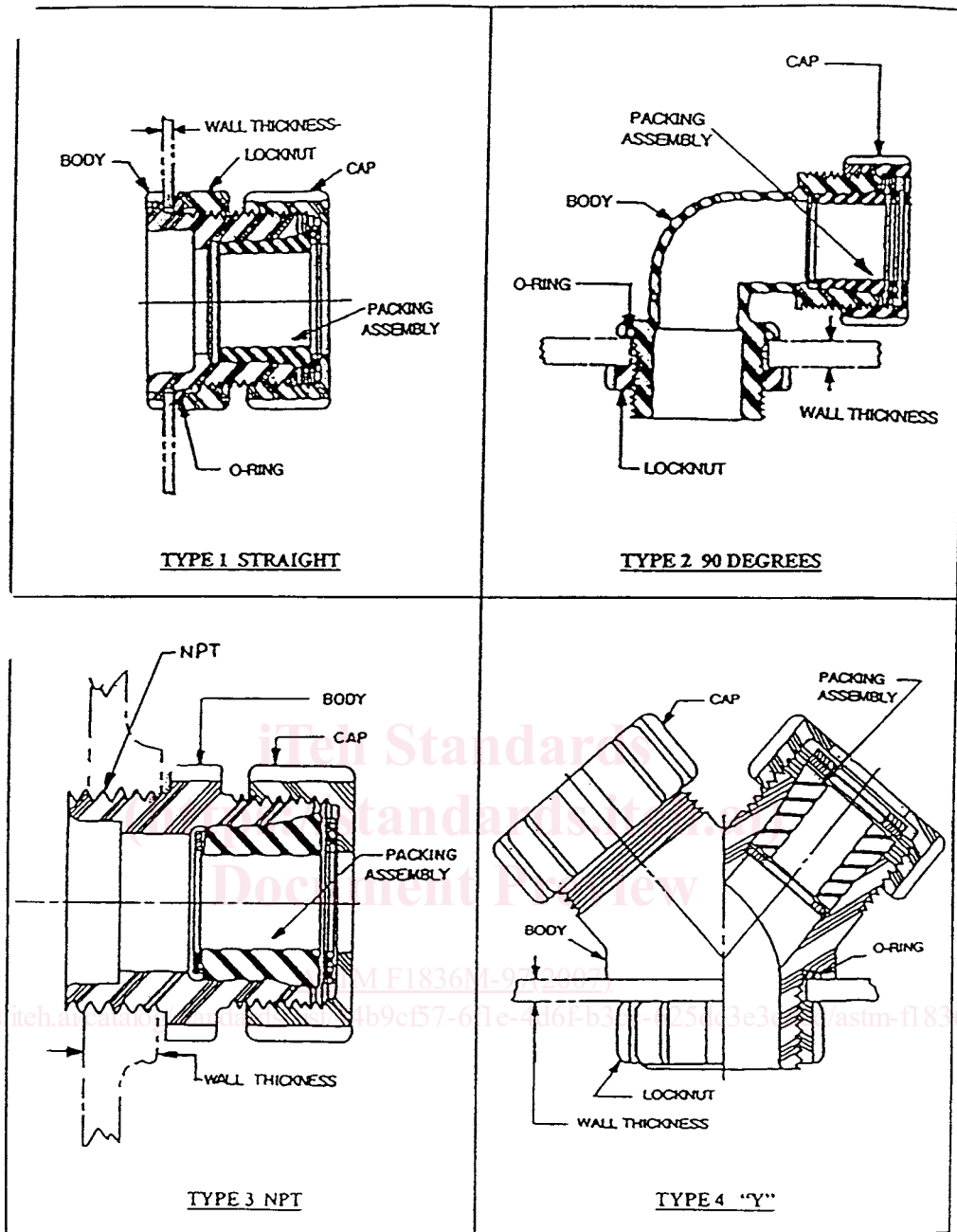


FIG. 1 Stuffing Tube Types

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 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.

TABLE 1 Stuffing Tubes Part Numbers and Dimensional Data

Tube Size	Part No.	Cable Range				Packing Assembly ^A	Clearance Hole Diameter		O-Ring Buna-N Size	
		in.		mm			for Tube Install			
		min.	max.	min.	max.		in.	mm		
Straight Type 1	Type-1-001	0.077	0.300	1.96	7.62	-16	0.885	22.48	212	
	-002	0.275	0.472	6.99	11.99	-17	1.010	25.65	214	
	-003	0.410	0.472	10.41	11.99	-18	1.135	28.83	216	
	-004	0.450	0.777	11.43	19.74	-19	1.260	32.00	218	
	4T	-005	0.450	0.777	11.43	19.74	-19	1.385	35.18	220
	-006	0.752	1.113	19.10	28.27	-20	2.010	51.05	226	
	-007	0.806	1.390	20.47	35.31	-21	2.510	63.75	230	
	-008	1.433	1.610	36.40	40.89	-22	2.760	70.10	232	
	-009	1.625	2.00	41.28	50.80	-23	3.260	82.80	236	
9	-010	2.030	2.700	51.56	68.58	-24	4.010	101.85	242	

Tube Size	Part No.	Cable Range				Packing Assembly ^A	Clearance Hole Diameter		O-Ring Buna-N Size	
		in.		mm			for Tube Install			
		min.	max.	min.	max.		in.	mm		
90° Type 2	Type-2-001	0.077	0.300	1.96	7.62	-16	0.885	22.48	212	
	-002	0.275	0.472	6.99	11.99	-17	0.885	22.48	212	
	-003	0.410	0.472	10.41	11.99	-18	1.135	28.83	216	
	4T	-005	0.450	0.777	11.43	19.74	-19	1.260	32.00	218
	-006	0.752	1.113	19.10	28.27	-20	2.010	51.05	220	
	-007	0.806	1.390	20.47	35.31	-21	2.510	63.75	230	

Tube Size	Part No.	Cable Range				Packing Assembly ^A	NPT		
		in.		mm					
		min.	max.	min.	max.				
NPT Type 3	Type-3-001	0.077	0.300	1.96	7.62	-16	0.5		
	-002	0.275	0.472	6.99	11.99	-17	0.75		
	-003	0.410	0.472	10.41	11.99	-18	1.0		
	4T	-004	0.450	0.777	11.43	19.74	-19	1.0	
	-005	0.752	1.113	19.10	28.27	-20	1.5		
	-006	0.806	1.390	20.47	35.31	-21	2		
	-007	1.433	1.610	36.40	40.89	-22	2.5		
	-008	1.625	2.00	41.28	50.80	-23	3		
	-009	2.030	2.700	51.56	68.58	-24	3.5		

Tube Size	Part No.	Cable Ranges				Packing Assembly ^A	Clearance Hole Diameter		O-Ring Buna-N Size
		in.		mm			for Tube Install		
		min.	max.	min.	max.		in.	mm	
Y Type 4	Type-4-001	0.077	0.300	1.96	7.62	-16	0.885	22.48	212
	-002	0.275	0.472	6.99	11.99	-17	1.010	25.65	214
	-003	0.410	0.472	10.41	11.99	-18	1.135	28.83	216
	4T	-004	0.450	0.777	11.43	19.74	-19	1.385	35.18

^A See Table 2 size selection.

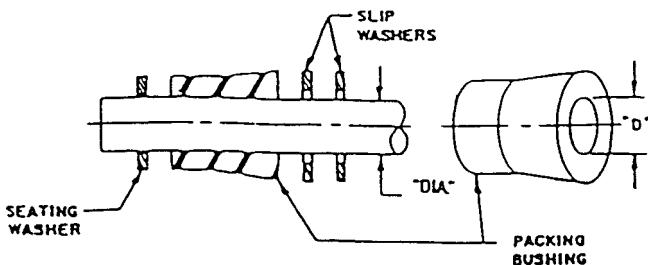


FIG. 2 Typical Packing Assembly

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.