Designation: ~~F1138 – 98 (Reapproved 2014)~~ F1138 – 21

An American National Standard

Standard Specification for Spray Shields for Mechanical Joints[1]

This standard is issued under the fixed designation F1138; 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 U.S. Department of Defense.

1. Scope

1.1 This specification describes the manufacturing requirements for spray shield stock and the fabrication and installation requirements for spray shields made from that stock.

1.1.1 Sections 2 – 14 address the manufacturing requirements for the spray shield stock. Annex A1 addresses the fabrication and installation requirements for the spray shields.

1.1.2 Fig. 1 shows the typical construction of a spray shield. Figs. 2-6 show methods of installation of a spray shield on various mechanical joints.

1.2 The shields are intended for use around mechanical joints (flanged, bolted unions, and so forth) in liquid piping systems with an internal pressure exceeding 26.1 psi (0.18 N/mm^2) to prevent the impingement of flammable liquid on hot surfaces or fluids onto electrical switchboards and components resulting from a leak in the mechanical ~~joint.~~ joint, unless otherwise invoked by contractual requirements. Spray Shields are excluded on all suction lines with a head pressure less than 26.1 psi (0.18 N/mm^2) and mechanical joints in non-flammable liquid systems in excess of 10 ft of an electrical switchboard, unless otherwise invoked by contractual requirements.[2]

1.3 The values stated in inch-pound units are to be regarded as ~~the~~ standard. The values given in parentheses are ~~for information only.~~ mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

A176 Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip (Withdrawn 2015)[4]

A276 Specification for Stainless Steel Bars and Shapes

A580/A580M Specification for Stainless Steel Wire

---

[1] This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.07 on General Requirements.

Current edition approved ~~Feb. 1, 2014~~Sept. 1, 2021. Published ~~February 2014~~September 2021. Originally approved in 1988. Last previous edition approved in ~~2007~~2014 as F1138 – 98 ~~(2007).~~(2014). DOI: ~~10.1520/F1138-98R14.~~10.1520/F1138-21.

[2] Reference IMO MSC Circ 1321, IMO MSC Circ 647, and IMO MSC Circ 851 for specific installation requirements and locations.

[3] 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~~standard's Document Summary page on the ASTM website.

[4] The last approved version of this historical standard is referenced on www.astm.org.

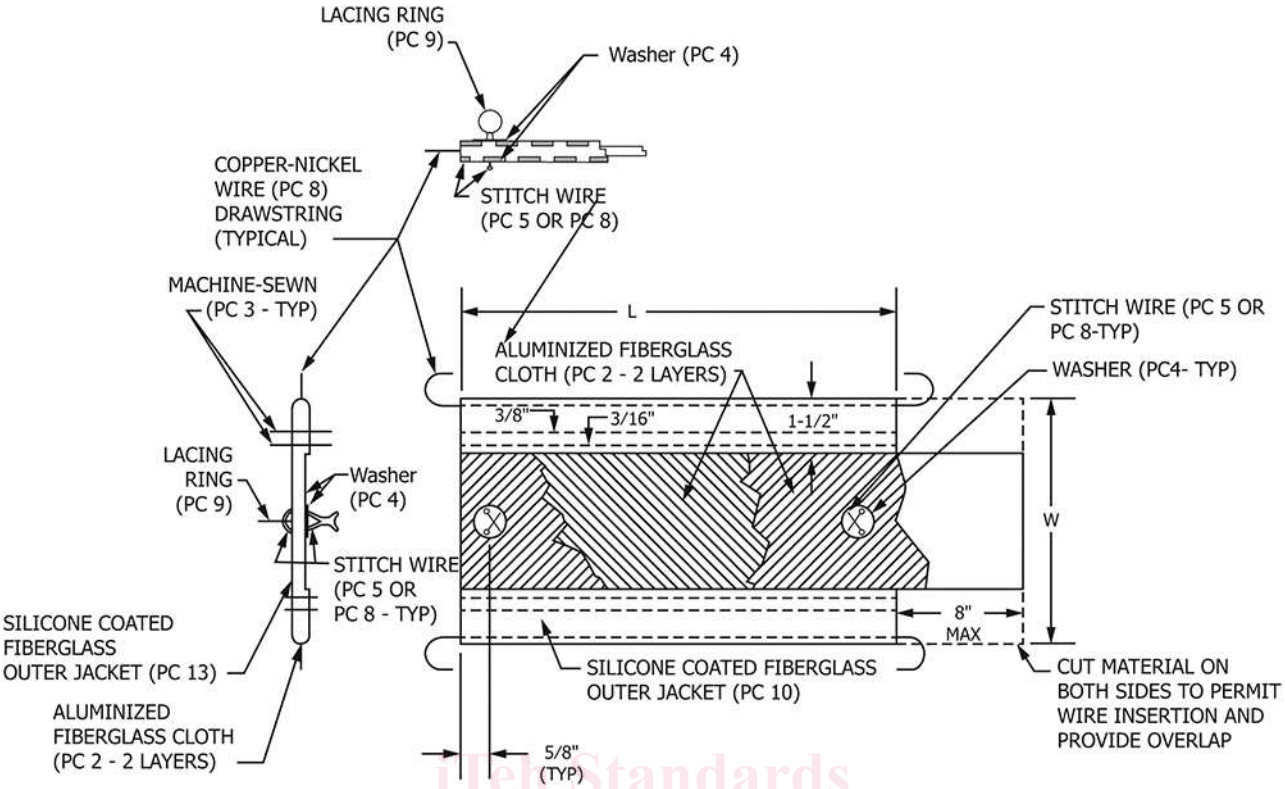

FIG. 1 Spray Shield Construction (Typical)

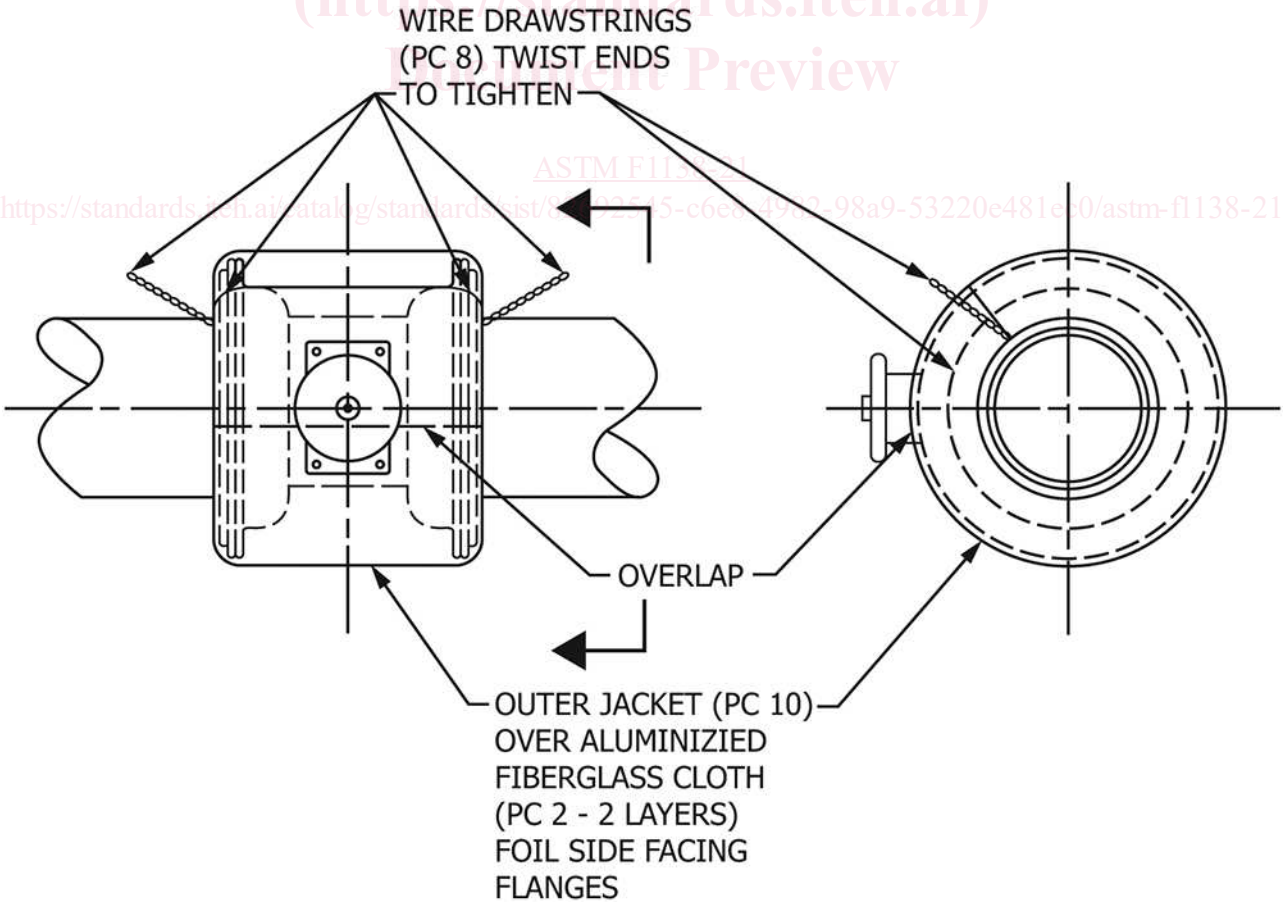

FIG. 2 Installation of Butterfly Valve Shield

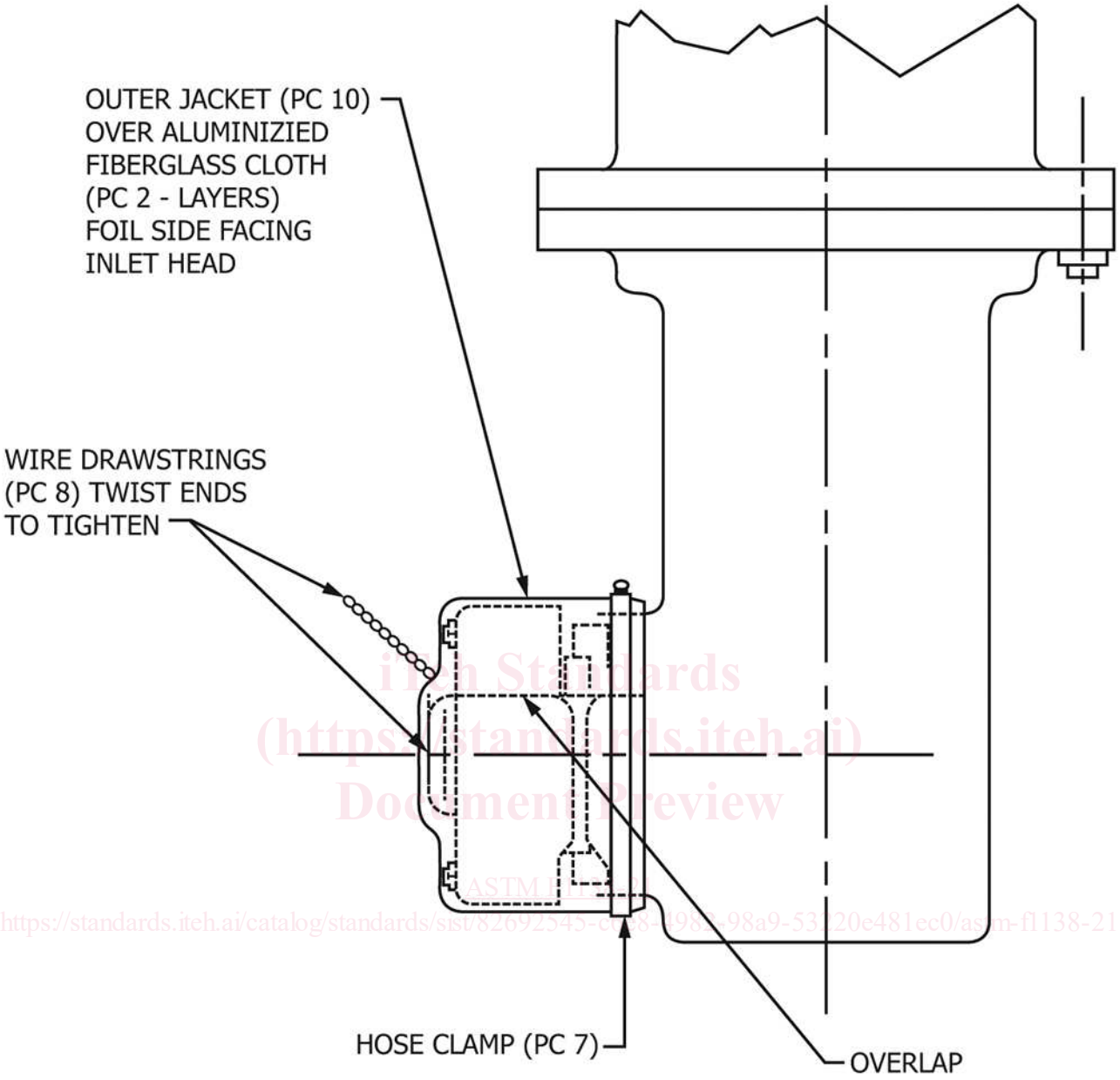

FIG. 3 Spray Shield for Pump Inlet Head

B134/B134M Specification for Brass Wire
B164 Specification for Nickel-Copper Alloy Rod, Bar, and Wire
B166 Specification for Nickel-Chromium-Aluminum Alloy, Nickel-Chromium-Iron Alloys, Nickel-Chromium-Cobalt-Molybdenum Alloy, Nickel-Iron-Chromium-Tungsten Alloy, and Nickel-Chromium-Molybdenum-Copper Alloy Rod, Bar, and Wire
D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems
D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus
D1682 Test Method for Breaking Load and Elongation of Textile Fabric (Withdrawn 1992)[4]
D1777 Test Method for Thickness of Textile Materials
D3389 Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader)
D3776 Test Methods for Mass Per Unit Area (Weight) of Fabric
D3786 Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method
D3951 Practice for Commercial Packaging
F501 Test Method for Aerospace Materials Response to Flame, with Vertical Test Specimen (for Aerospace Vehicles Standard Conditions) (Withdrawn 1998)[4]

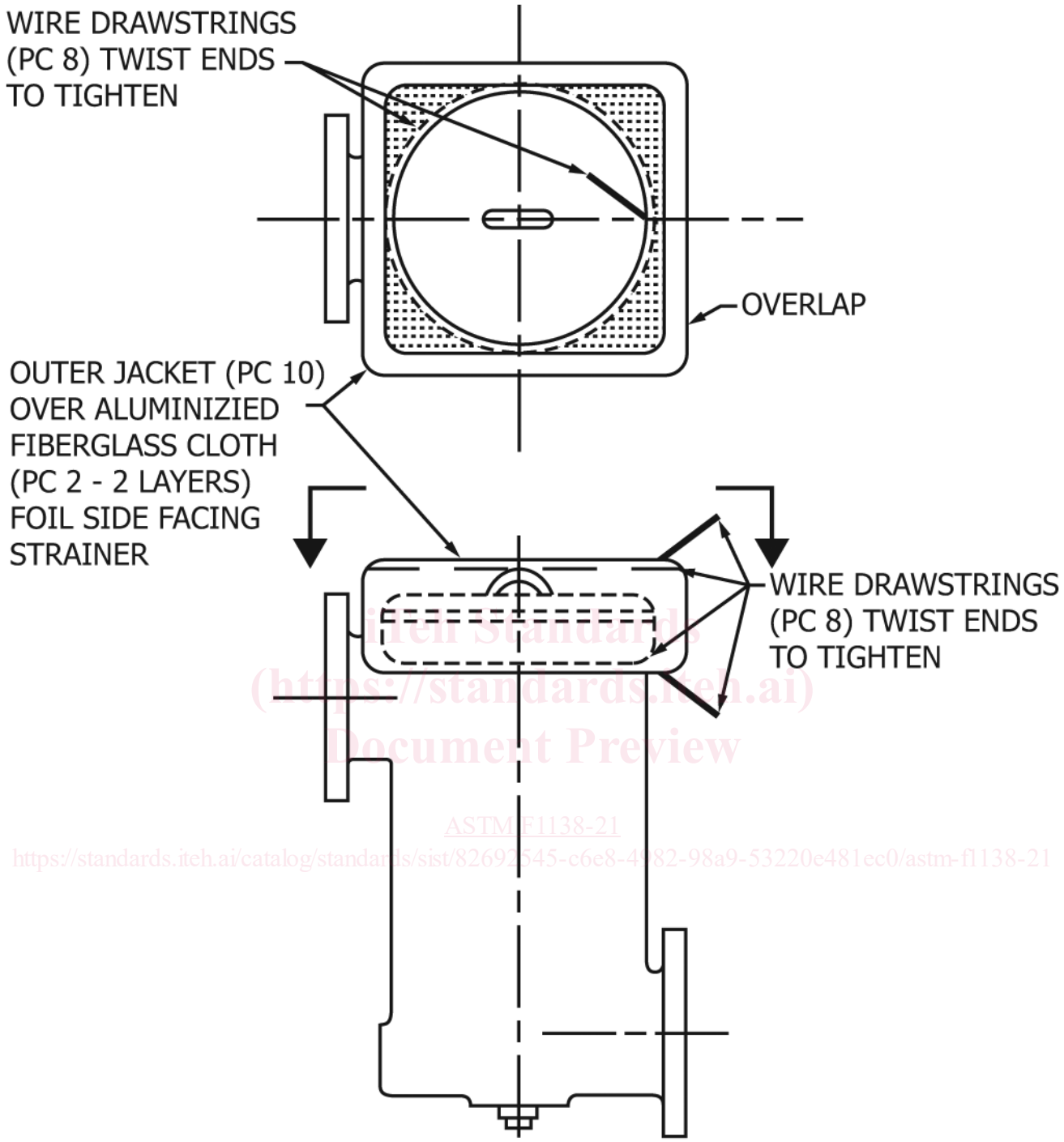

FIG. 4 Spray Shield for Simplex Strainer

2.2 *American Association of Textile Chemists and Colorists Standards:*[5]
AATCC-22 Water Repellency, Spray Test
AATCC-35 Water Resistance, Rain Test
AATCC-127 Water Resistance, Hydrostatic Pressure Test

[5] Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC ~~27709,~~27709-2215, http://www.aatcc.org.

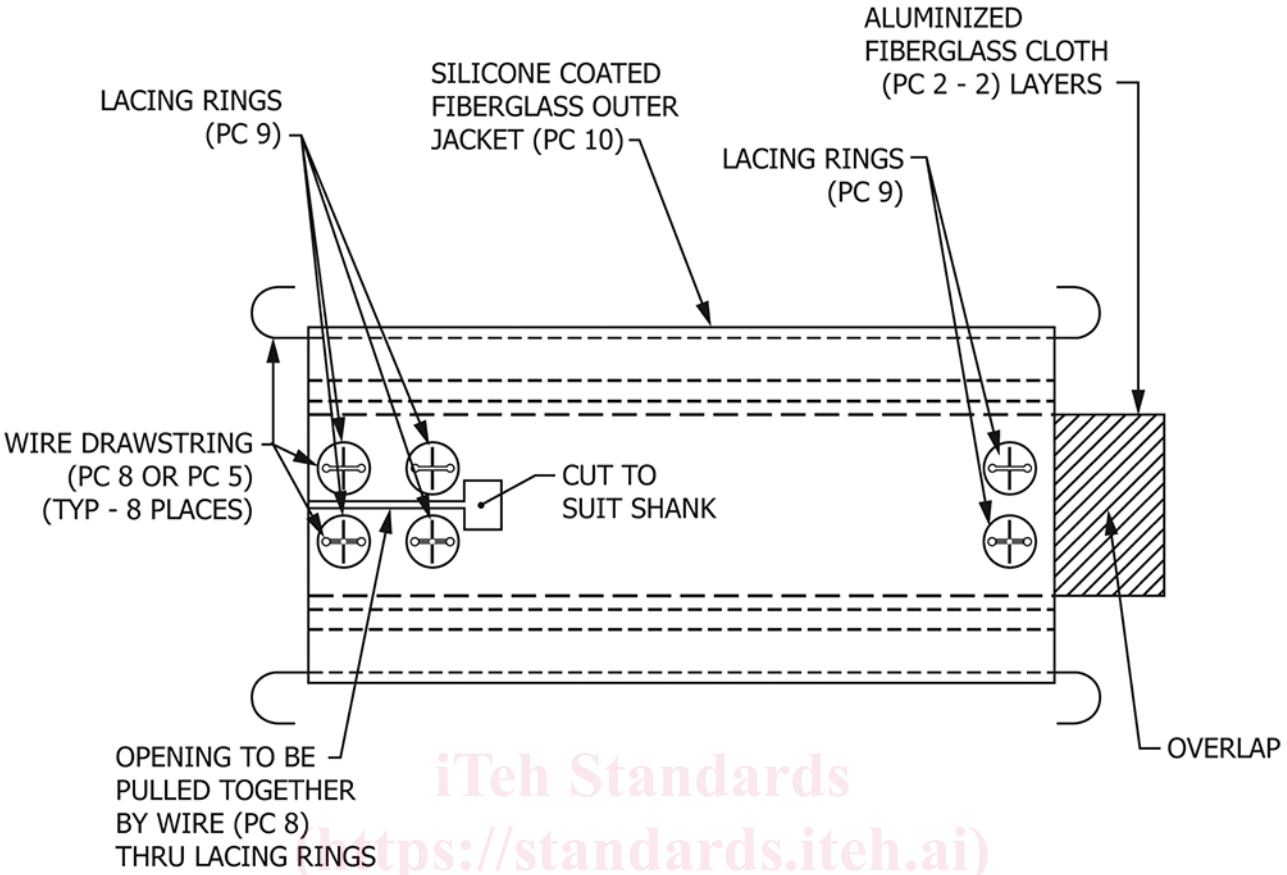

FIG. 5 Spray Shield for Butterfly Valve

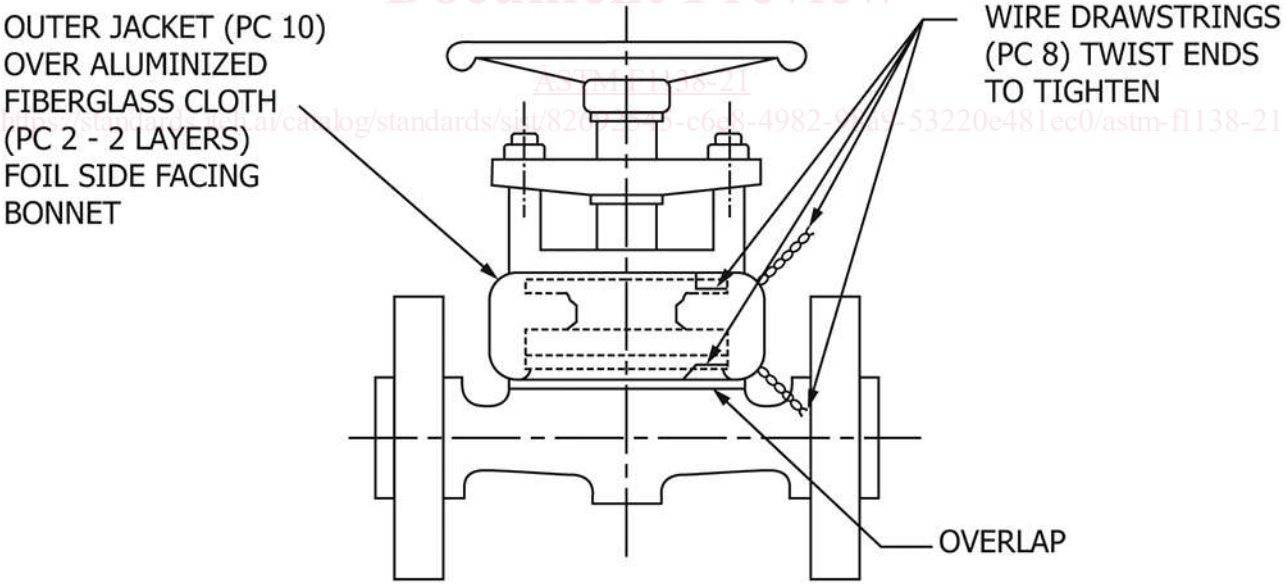

FIG. 6 Spray Shield for Valve Bonnet

2.3 *Military Standards:*[6]

MIL-C-20079 Cloth, Glass, Tape, Textile Glass and Thread, Glass

~~MIL-C-20696~~MIL-PRF-20696 Cloth, ~~Coated, Nylon Waterproof~~Waterproof, Weather Resistant

[6] Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, ~~Mail Stop: SDE,~~ Washington, DC ~~20401,~~20401-0001, http://www.access.gpo.gov.

2.4 *Federal Standard:*[6]
WW-C-440 Clamps, Hose (Low Pressure)
2.5 *IMO Standards:*[7]
IMO SOLAS 1974 as amended through 2014, Chapter II-2 Regulation 4
IMO MSC Circ 647 Guidelines to Minimize Leakages From Flammable Liquid Systems
IMO MSC Circ 851 Guidelines on Engine Room Oil Fuel Systems
IMO MSC Circ 1321 Guidelines For Measures to Prevent Fires in Engine-Rooms and Cargo Pump-Rooms

3. Ordering Information

3.1 ASTM designation and year of issue,

3.2 Length and width required (see 7.1), and

3.3 Type of stainless steel (see 4.1).

3.4 Type of lacing hardware required (see 4.1.1).

4. Materials and Manufacture

4.1 ~~Lacing~~ Optional lacing hooks, lacing rings, and lacing washers (see Fig. 7) shall be constructed of stainless steel in accordance with Specifications A176, A276, or A580/A580M.

4.1.1 Lacing rings may be used instead of lacing hooks where practicable or preferable (see 3.3).

4.1.2 Lacing washers for fastening hooks or rings shall be two-hole washers.

4.2 Stitch wire (Piece 5 in Table 1) shall be constructed of stainless steel in accordance with Specification A580/A580M.

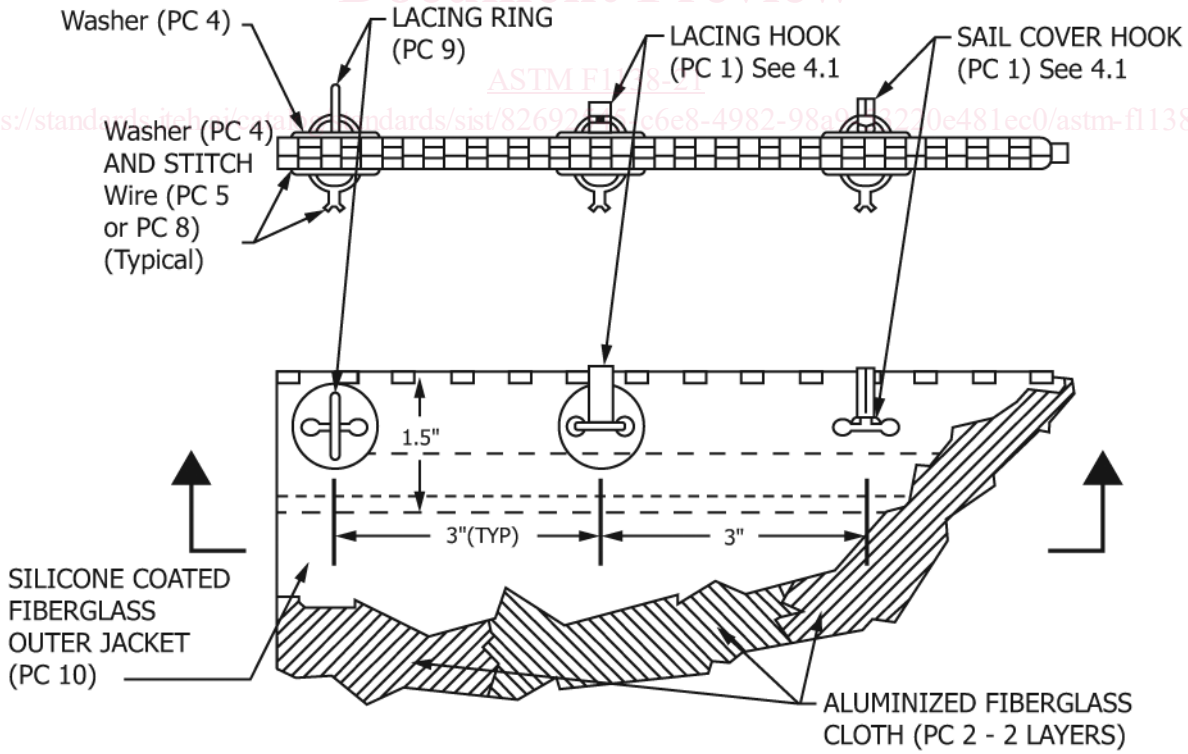

FIG. 7 Optional Lacing Hardware

[7] Available from International Maritime Organization (IMO), 4, Albert Embankment, London SE1 7SR, United Kingdom, http://www.imo.org.

TABLE 1 List of Material

Piece Number	Description	Quality	Material	Specification	Remarks
1	Hook, lacing	as required	stainless steel 302, 304, or 316	ASTM A176, A276, A580/A580M	see 4.1 (Optional)
2	Cloth, aluminum foil, glass	as required	glass/aluminum	MIL-C-20079	Type I, Class 10
3	Thread	as required	glass	MIL-C-20079	Type III, Class 3 (for machine sewing) white, Size 5 Z-twist, three-ply
			nylon		
4	Washer, blank	as required	stainless steel 304 or 316	ASTM A176, A276	¾-in. diameter × 0.030 in. thick (Optional)
5	Wire, stitch	as required	stainless steel 301, 304 or 316	ASTM A580/A580M	see 6.1
6	Label, identification	as required			see 13
7	Clamp, hose	as required	Cres 201	WW-C-440	Type F
~~8~~	~~Wire~~	~~as required~~	~~brass~~	~~ASTM B134/B134M~~	~~17 or 18 gage~~
			~~Cr-Ni-alloy~~	~~ASTM B166~~	~~17 or 18 gage~~
			~~Cu-Ni-alloy~~	~~ASTM B164~~	~~17 or 18 gage~~
			~~stainless steel 304 or 316~~	~~ASTM A580/A580M~~	~~17 or 18 gage~~
8	Wire	as required	brass	ASTM B134/B134M	17 or 18 gauge
			Cr-Ni-alloy	ASTM B166	17 or 18 gauge
			Cu-Ni-alloy	ASTM B164	17 or 18 gauge
			stainless steel 304 or 316	ASTM A580/A580M	17 or 18 gauge
9	Rings, lacing	as required	stainless steel 302, 304, or 316	ASTM A276, A580/A580M	see 4.1.1 (Optional)
10	Fabric, protective outer jacket	as required	fiberglass cloth/silicone coated fiberglass	MIL-PRF-20696	see Table 2

4.3 The aluminized glass cloth, thread, and the protective outer jacket shall be constructed of material as specified in Table 1 and Table 2.

5. Physical and Mechanical Properties

5.1 The physical and mechanical properties for the aluminized glass cloth, thread, and protective outer jacket shall be as specified in Table 1 and Table 2.

6. Requirements

6.1 If lacing hooks or rings are of the type that fasten by stitching, the hooks or rings shall be attached to the backup washers using a wire stitch machine and wire (Pieces 5 or 8 in Table 1).

6.2 Lacing anchor/self-locking washer-type systems shall not be used on spray shields.

7. Dimensions and Permissible Variations

7.1 The material for shields shall be standardized as given in Table 3 tolerances to be +¼ in. (6 mm) and –0 in. for width.

8. Workmanship, Finish, and Appearance

8.1 The seam on both sides of the spray shield shall be intact.

8.1.1 On drawstring-type shields, there shall be ample overlap in the seam to allow wire to be run through the entire length of the shield.

8.2 There shall be no tears in the uncovered aluminum portion of the shield where contact is made with the mechanical joint (see Fig. 1).