



Designation: F 668 – 99a

Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric¹

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1. Scope

1.1 This specification covers polyvinyl chloride and other conforming organic polymer-coated steel chain-link fabric, coated before weaving. Polyvinyl chloride and other organic polymer coating hereinafter will be designated as polymer coating.

1.2 Fabric produced from three classes of wire coatings are covered as follows:

1.2.1 *Class 1* consists of polymer coatings extruded over zinc-coated, aluminum-coated, or zinc-5 % aluminum-mischmetal alloy-coated, or zinc-5 % aluminum-mischmetal alloy-coated steel wire.

1.2.2 *Class 2a* consists of polymer coating extruded and adhered to zinc-coated, aluminum-coated, or zinc-5 % aluminum-mischmetal alloy-coated steel wire.

1.2.3 *Class 2b* consists of polymer coating fused and adhered to zinc-coated, aluminum-coated, or zinc-5 % aluminum-mischmetal alloy-coated steel wire.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

2. Referenced Documents

2.1 ASTM Standards:

A 90/A 90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings²

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

A 428/A 428M Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles²

D 1499 Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics⁴

D 1535 Practice for Specifying Color by the Munsell System⁵

¹ This specification is under the jurisdiction of ASTM Committee F-14 on Fences and is the direct responsibility of Subcommittee F14.40 on Chain Link Fence and Wire Accessories.

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² *Annual Book of ASTM Standards*, Vol 01.06.

³ *Annual Book of ASTM Standards*, Vol 01.03.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

⁵ *Annual Book of ASTM Standards*, Vol 06.01.

D 1729 Practice for Visual Evaluation of Color Differences of Opaque Materials⁵

F 552 Terminology Relating to Chain Link Fencing²

G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials⁶

G 26 Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials⁶

2.2 *U.S. Federal Standard:*

Fed. Std. No. 123 Marking for Shipments (Civil Agencies)⁷

2.3 *U.S. Military Standards:*

MIL-STD-129 Marking for Shipment and Storage⁷

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage⁷

3. Terminology

3.1 *Definitions*—For definitions of terms such as chain-link fence fabric, selvage, knuckle, twist, and diamond count, see Terminology F 552.

4. Ordering Information

4.1 Orders for chain-link fence fabric purchased to this specification shall include the following information:

4.1.1 Quantity.

4.1.2 Class of polymer coating to be applied to the metallic-coated core wire.

4.1.3 Color of coating (see Table 1).

4.1.4 Size of mesh (see Table 2).

4.1.5 Finished outside diameter of metallic-coated core wire or minimum breaking strength, or both (see Tables 2-4).

4.1.6 Height of fabric (see Table 1).

4.1.7 Type of selvage if nonstandard (see 12.1 and 12.2).

4.1.8 Diamond count if nonstandard (see 9.1 and Table 3).

4.1.9 Certification, if required.

4.2 Any tests required other than those specifically covered in this specification must be stipulated by the purchaser in the order or contract.

⁶ *Annual Book of ASTM Standards*, Vol 14.02.

⁷ Available from the procuring activity or as directed by the contracting office or from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

TABLE 1 Standard Polymer Colors

NOTE 1—Values are in Munsell units (see Test Method D 1535 and Practice D 1729).

	Green	Olive Green	Brown	Black
Hue	8.8G	2.0G	7YR	1.8PB
Value	2.63	3.02	2.4	1.26
Chroma	5.8	2.35	1.75	0.5

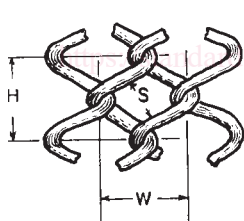
TABLE 2 Sizes of Wire and Mesh^A

NOTE 1—For custom fabric heights, see Section 11.

Specified Diameter of Core Wire, in.	Size Core Wire Gage	Size of Mesh, in.	Height of Fence Fabric, in.										
0.192	6	2	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.192	6	1¾	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.148	9	2	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.148	9	1¾	96, 108, 120, 144										
0.148	9	1	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	2½	36, 42, 48, 60, 72,										
0.120	11	2	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	1¾	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	1	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	¾	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	½	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.120	11	⅜	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.105 ^B	12	¾	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.105 ^B	12	½	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.105 ^B	12	⅜	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.080 ^B	14	¾	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.080 ^B	14	½	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										
0.080 ^B	14	⅜	36, 42, 48, 60, 72, 84, 96, 108, 120, 144										

^ASee Table X1.1 for metric equivalents.

^BThese wire sizes should only be used on ¾ in., ½ in., and ⅜ in. mesh fabrics. See Fig. 1 for criteria on mesh dimensions.



S	H	W
⅜ in. MESH	¾ in.	¾ in.
½ in. MESH	15/16 in.	15/16 in.
5/8 in. MESH	1 1/8 in.	1 1/8 in.

FIG. 1 Mesh Dimensions for 5/8-in., ½-in., and ⅜-in. Fabric

4.3 All rolls of fabric accepted by the purchaser shall be billed to him on the basis of the original footage of the rolls before sampling, unless changed by contractual agreement.

5. Materials

5.1 *Base Metal*—The base metal shall be steel of such quality and purity that, when drawn to the size of wire specified and coated with an organic polymer, the finished fencing shall be of uniform quality and have properties and characteristics as prescribed in the specification.

5.2 Wire used for the manufacture of fabric shall meet the requirements of this specification and shall be capable of being woven into fabric without the polymer coating cracking or peeling. The polymer coating shall be formulated and produced properly to conform to the requirements of this specification.

6. Manufacture

6.1 Class 1 polymer-coated wire shall have the polymer coating extruded onto wire that conforms to the requirements as shown in Table 4.

6.2 Class 2a polymer-coated wire shall have the polymer coating extruded and adhered to wire that is zinc-coated by the hot-dip method, zinc-coated by the electrolytic process, or aluminum-coated by the hot-dip method.

6.3 Class 2b polymer-coated wire shall have the polymer coating fused and adhered to wire that is zinc-coated by the hot-dip method, zinc-coated by the electrolytic process, or aluminum-coated by the hot-dip method. The use of a primer prior to the application of a polymer coating may be recommended by the polymer manufacturer.

NOTE 1—Under current practice, the fusion bonded process for PVC wire coating requires the use of a primer to attain chemical bonding to the substrate, in any event, the polymer manufacturer’s recommendation should be followed.

6.4 Type of metallic coating on the steel wire substrate shall be the choice of the producer unless otherwise specified.

7. Weave

7.1 The wire shall be woven throughout in the form of approximately uniform square mesh, having parallel sides and horizontal and vertical diagonals of approximately uniform dimensions. The top and bottom of the fabric shall be knuckled or twisted as specified in Section 12.

8. Size of Mesh

8.1 The size of mesh shall conform to the requirements as shown in Table 2.

8.2 The permissible variation from the specified size of mesh shall be ± 1/8 in. (3.2 mm) for all mesh sizes over 1 in. (25 mm) and ± 1/16 in. (1.6 mm) for all mesh sizes 1 in. (25 mm) and under.

8.3 Size of mesh shall be determined by unrolling a roll of fabric on a flat surface and exerting tension in accordance with the requirements of 18.2, then measuring the minimum clear distance between the wires forming the parallel sides of the mesh.

9. Diamond Count

9.1 Typical diamond count for each standard height is shown in Table 3. Other diamond counts are permissible, provided that they are consistent within a lot. The purchaser has the option to specify the typical diamond count of 4.1.8.

10. Size of Wire

10.1 Chain-link fabric shall be fabricated from wire diameters as necessary to meet the requirements of Table 2. The diameter shall be determined as the average of two readings taken at right angles to each other on the straight portion of the parallel sides of the mesh and measured to the nearest 0.001 in. (0.03 mm).

10.2 The permissible variation from the specified diameter of the core wire over 0.105 in. (2.67 mm) shall be ± 0.005 in. (0.13 mm). The permissible variation for the specified diameter on core wires 0.105 in. (2.67 mm) or less shall be ± 0.004 in. (0.10 mm).

TABLE 3 Typical Diamond Count^A

NOTE 1—Other diamond counts are permitted (see Section 9 on Diamond Count).

NOTE 2— For fabric heights over 144 in., see Section 9.

Nominal Diameter Core Wire, in.	Size of Mesh, in.	Height of Fence Fabric, in.									
		36	42	48	60	72	84	96	108	120	144
0.192	2	10½	12½	13½	17½	20½	24½	27½	31½	34½	41½
0.148	2	10½	12½	13	17½	20½	24½	27½	31½	34½	41½
0.120	2	10½	12½	14½	17½	20½	24½				
0.120	2½	9½	11½	13½	16½	19½					
0.120	1¾	11½	13½	15½	19½	23½	27½	31½	35½	39½	47½
0.120	1	20	23	27	33	45	53	61	67	69	
0.120	¾										
0.120	½										
0.120	⅜										
0.105	⅝										
0.105	½	see Fig. 1									
0.105	⅜										
0.080	⅝										
0.080	½										
0.080	⅜										

^ASee Table X1.1 for metric equivalents.

TABLE 4 Breaking Strength of Core Wire

Specified Diameter of Core Wire, in. (mm)	Minimum Breaking Strength	
	lbf	(N)
0.192 (4.88)	2170	(9650)
0.148 (4.76)	1290	(5740)
0.120 (3.05)	850	(3780)
0.105 (2.67)	650	(2890)
0.080 (2.03)	380	(1690)

11. Height of Fabric

11.1 Chain-link fabric, unless otherwise specified by the purchaser, shall be furnished in the standard heights shown in Table 2. Custom order fabric is available in heights to and including 240 ft. (6.56 m). The height of the fabric shall be the overall dimension from the ends of twists or knuckles. Permissible variations from the specified height shall be ± 1 in. (25 mm) for standard selvage on fabric with mesh sizes 1 in. (25 mm) and over and ± ½ in. (13 mm) for all fabric with mesh sizes less than 1 in. (25 mm).

12. Selvage

12.1 Fabric with 2-in. (50.8-mm) or 2 ⅛-in. (54.0-mm) mesh, in heights less than 72 in. (1829 mm), shall be knuckled at both selvages. Fabric 72 in. (1829 mm) high and over shall be knuckled at one selvage and twisted at the other. These are the standard selvages. Other selvage combinations will be supplied only if specified by the purchaser.

NOTE 2—**Caution:** Twisted selvages for fences under 72 in. (1829 mm) in height are not recommended because of consumer safety considerations.

12.2 The selvages of fabrics with meshes of less than 2 in. (50.8 mm) shall be knuckled on both edges.

13. Breaking Strength

13.1 Wire constituting the fabric shall meet the minimum breaking strength shown in Table 4, as determined in accordance with Test Methods and Definitions A 370.

13.2 Specimens to establish conformance to this requirement shall comprise individual pickets from a section of the fence fabric. The specimens shall be of sufficient length so as to be firmly gripped in the testing machine after straightening. Polymer coating may be removed from the sample by chemical or mechanical means before testing. The actual gage length (distance between jaws) of the specimen shall be limited to the undeformed length of wire between the two adjacent bends.

14. Weight of Zinc, Aluminum, or Zinc-5 % Aluminum-Mischmetal Alloy Coatings

14.1 The weight of zinc or aluminum coating shall conform to Table 5.

14.2 The weight of coating shall be determined on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12 in. (305 mm) and shall include both bends and straight sections, but shall not include either twists or knuckles.

14.3 The weight of zinc or zinc-5 % aluminum-mischmetal alloy coating shall be determined by the method contained in Test Method A 90/A 90M after stripping the polymer coating as outlined in Section 15.

14.4 The weight of aluminum coating shall be determined by the method contained in Test Method A 428, after stripping the polymer coating as outlined in Section 15.

15. Thickness of Polymer Coating

15.1 The thickness of the polymer coating shall be in accordance with Table 6.

TABLE 5 Weight of Zinc, Aluminum, or Zinc-5 % Aluminum-Mischmetal Alloy Coatings

Specified Diameter of Core Wire, in. (mm)	Minimum Weight of Zinc or Zinc-5 % Aluminum-Mischmetal Alloy Coating, oz/ft ² (g/m ²)	Minimum Weight of Aluminum Coating, oz/ft ² (g/m ²)
0.192 (4.88)	0.40 (122)	0.20 (61)
0.148 (3.76)	0.30 (92)	0.20 (61)
0.120 (3.05)	0.30 (92)	0.20 (61)
0.105 (2.67)	0.30 (92)	0.20 (61)
0.080 (2.03)	0.25 (76)	0.20 (61)