



Designation: F 1665 – 01

Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used With Chain-Link Fence¹

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1. Scope

1.1 This specification covers poly(vinyl chloride) and other conforming organic polymer-coated steel barbed wire consisting of two polymer-coated strands, with four-point barbs of zinc-coated steel or aluminum alloy wire. Poly(vinyl chloride) and other organic polymer coatings hereinafter will be designated as polymer coating.

1.2 Barbed wire strand wire, produced from three classes of wire coatings, is covered as follows:

1.2.1 *Class 1*, consisting of a polymer coating extruded over zinc-coated or aluminum-coated or zinc-5 % aluminum-mischmetal alloy-coated steel wire;

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

1.2.3 *Class 2b*, consisting of a polymer coating fused and adhered to zinc-coated or 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 for information only.

2. Referenced Documents

2.1 ASTM Standards:

A 90/A90M 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 Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles²

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment⁴

¹ This specification is under the jurisdiction of ASTM Committee F14 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 01.05.

D 1499 Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics⁵

F 552 Terminology Relating to Chain Link Fencing²

F 934 Specification for Standard Colors for Polymer Coated Chain Link Fence Materials²

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 *Federal Standard:*⁷

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

2.3 *Military Standards:*⁷

MIL-STD-129 Marking for Shipment and Storage

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

3. Terminology

3.1 Definitions—For definitions of terms such as fabric (chain-link fence), PVC, and polymer coating, see Terminology F 552.

4. Classification

4.1 Polymer-coated steel barbed wire is supplied in a choice of two types as follows:

4.1.1 *Type I (Standard)*, with barbs spaced on 5-in. (127-mm) centers; and

4.1.2 *Type II (High Security)*, with barbs spaced on 3-in. (76-mm) centers.

5. Ordering Information

5.1 Orders for barbed wire purchased in accordance with this specification shall include the following information:

5.1.1 Quantity (expressed in number of spools);

⁵ Annual Book of ASTM Standards, Vol 08.01.

⁶ Annual Book of ASTM Standards, Vol 06.01.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

5.1.2 Length of spools (1320 or 1000 ft (402 or 305 m); see 9.4);

5.1.3 Class of a polymer coating to be applied to metallic-coated steel strand wire;

5.1.4 Color of coating;

5.1.5 Type of barbs (galvanized steel or aluminum alloy; see 6.3);

5.1.6 Type of barbed wire (Type I or II; see 4.1.1 and 4.1.2);

5.1.7 Selection of type of metallic coating on the steel strand wire substrate, which shall be the choice of the producer unless otherwise specified;

5.1.8 Packaging requirements;

5.1.9 ASTM designation and year of issue; and

5.1.10 Certification, if required;

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

5.3 All spools of barbed wire accepted by the purchaser shall be billed on the basis of the number and original length.

NOTE 1—A typical ordering description is as follows: 20 spools polymer-coated steel barbed wire, 1000-ft (305-m) spools, Class 2b coating, olive green color, aluminum alloy barbs, Type II (high security), on pallets, certified to ASTM F1665.

6. Materials

6.1 *Base Metal*—The base metal shall be steel of such quality and purity that, when drawn to the size of wire specified, it shall be of uniform quality and have properties and characteristics as prescribed in this specification.

6.2 Wire used for the manufacture of strand wire shall meet the requirements of this specification. The polymer coating shall be formulated and produced properly to conform to the requirements of this specification.

6.3 *Materials for Barbs*:

6.3.1 *Zinc-Coated Steel Wire*, if used for the barbs, shall be 14 gage, 0.080 in. (2.03 mm), having a Class 3 zinc coating, minimum 0.70 oz/ft (215 g/m) when tested in accordance with Test Method A 90/A 90M.

6.3.2 *Aluminum Alloy Wire*, if used for the barbs, shall be 14 gage, 0.080 in. (2.03 mm), Alloy 5000-H38, 6061-T94, or equal, as agreed upon between the manufacturer and the purchaser at the time of purchase.

6.3.3 The choice of either zinc-coated steel wire or aluminum alloy wire for the barbs shall be that of the manufacturer, unless otherwise specified by the purchaser.

7. Manufacture

7.1 Class 1 polymer-coated wire shall have the coating extruded onto the strand wire that conforms to the requirements as given in Table 1.

7.2 Class 2a polymer-coated wire shall have the coating extruded and adhered to the strand wire that conforms to the requirements as given in Table 1.

7.3 Class 2b polymer-coated wire shall have the coating fused and adhered to the strand wire that conforms to the requirements as given in Table 1.

8. Size and Construction

8.1 All barbed wire furnished in accordance with this specification shall be fabricated from two strands of 14 gage, 0.080-in. (2.03-mm) metallic-coated core, polymer-coated steel wire, with four-point barbs of 14 gage, 0.080-in. zinc-coated steel or aluminum alloy wire.

9. Size and Permissible Variations

9.1 *Line Wire*—The permissible variation from the nominal diameter of the wire shall be ± 0.004 in. (0.10 mm).

9.2 *Barbs*—Due to the mechanics of the manufacture when forming the barbs, a certain amount of out-of-roundness can be expected, and this precludes barbs from being subjected to checks for other than nominal diameter and length. Measured from the center of the two strand wires, the barb length shall be $\frac{3}{8}$ in. (9.5 mm), minimum.

9.3 *Spacing of Barbs*—Barbs shall be spaced as indicated in 4.1.1 or 4.1.2. The individual barb spacing shall be measured from the edge of one barb at the strand to the corresponding edge of the adjacent barb. Cumulative spacing is established by counting the total number of barbs in a 25-ft (7.6-m) length of barbed wire. Barbs are subject to relocation during fabrication and handling; therefore, a rigid interpretation of the spacing requirement may lead to undue rejections. Any sample with 93.5 % of the individual barb spacings conforming to the specified spacing ($\pm \frac{3}{4}$ in. (19 mm)) and containing a minimum of 55 barbs (5-in. (127-mm) spacing) or a minimum of 86 barbs (3-in. (76-mm) spacing) in 25 ft shall be considered acceptable.

9.4 The length of barbed wire in each spool shall be 80 rods (402 m). This is equivalent to one-quarter mile, or 1320 ft. At the option of the manufacturer, 1000-ft (305-m) spools may be offered.

10. Joints and Workmanship

10.1 Splicing of individual wires by means of a wrap joint or an electric butt weld is permitted. Not more than three splices or joints shall exist in any spool of barbed wire. Such splices or joints shall be made in a workmanlike manner.

10.2 The strands shall be twisted with a uniform length of lay. The direction of twisting may be either right or left hand. Alternate left and right hand twisting is not permitted.

10.3 The barbs shall be sharp, well-formed, wrapped tightly, and spaced in accordance with 9.3.

11. Weight of Metallic Coating

11.1 The minimum weight of zinc coating for the galvanized barbs shall be 0.70 oz/ft (215 g/m). The minimum weight of the strand wire metallic coating shall conform to Table 1 when tested in accordance with Test Method A 90/A 90M or Test Method A 428, as applicable.

TABLE 1 Weight of Strand Wire Metallic Coatings

Specified Core Diameter of Strand Wire, in. (mm)	Minimum Weight of Zinc Coating, oz/ft (g/m)	Minimum Weight of Aluminum Coating, oz/ft ² (g/m ²)	Minimum Weight of
			Zinc-5 % Aluminum-Mischmetal Coating, oz/ft (g/m)
0.080 (2.03)	0.25 (75)	0.20 (61)	0.25 (75)