



Designation: F 1712 – 96a02

## Standard Specification for Steel Chain-Link Fencing Materials Used in Detention and Correctional Facilities<sup>1</sup>

This standard is issued under the fixed designation F 1712; 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.

### 1. Scope

1.1 This specification covers chain-link fencing material applications for detention and correctional facilities.

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

### 2. Referenced Documents

2.1 *ASTM Standards:*

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<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F-14 on Fences and is the direct responsibility of Subcommittee F14.10 on Specific Applications. Current edition approved ~~Nov. 10, 1996~~, July 10, 2002. Published ~~December 1997~~, September 2002. Originally published as F 1712 – 96. Last previous edition F 1712 – 96a.

- A 121 Specification for Zinc-Coated (Galvanized) Steel Barbed Wire<sup>2</sup>
- A 392 Specification for Zinc-Coated Steel Chain-Link Fence Fabric<sup>2</sup>
- A 491 Specification for Aluminum-Coated Steel Chain-Link Fence Fabric<sup>2</sup>
- ~~A 585 Specification for Aluminum-Coated Steel Barbed Wire<sup>2</sup>~~
- ~~A 824 Specification~~ 824 Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link Fence<sup>2</sup>
- F 626 Specification for Fence Fittings<sup>2</sup>
- F 668 Specification for Poly (Vinyl Chloride) (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric<sup>2</sup>
- F 900 Specification for Industrial and Commercial Swing Gates<sup>2</sup>
- F 934 Specification for Standard Colors for  
Polymer-Coated Chain Link Fence Materials<sup>2</sup>
- F 1043 Specification for Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework<sup>2</sup>
- F 1184 Specification for Industrial and Commercial Horizontal Slide Gates<sup>2</sup>
- F 1345 Specification for Zinc-5 % Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric<sup>2</sup>
- F 1379 Terminology Relating to Barbed Tape<sup>2</sup>
- F 1664 Specification for Poly (Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence<sup>2</sup>
- F 1665 Specification for Poly (Vinyl Chloride) (PVC) and Other Conforming Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence<sup>2</sup>
- F 1910 Specification for Long Barbed Tape Obstacles<sup>2</sup>
- F 1911 Practice for Installation of Barbed Tape<sup>2</sup>
- F 1916 Specifications for Selecting Chain Link Barrier Systems with Coated Chain Link Fence Fabric and Round Posts for Detention Applications<sup>3</sup>
- 2.2 Other Standard:
- UL 325 Door, Drapery, Gate, Louver, and Window Operators and Systems<sup>4</sup>

### 3. Significance and Use

3.1 Typical end users of this specification are detention and correctional facilities.

### 4. Materials and Manufacture

4.1 *Framework*—Shall meet the size and strength requirements in Specification F 1043 for heavy industrial fence framework. Where icing conditions and high wind loads are prevalent or fences are higher than 12 ft (3.7 m), strength requirements shall be determined through engineering calculations. Horizontal top, mid or bottom rails if specified shall be 1.660 in. (42 mm) O.D., or roll-formed section 1¼ by 1⅝ in. (32 by 41 mm). Framework may be ~~PVC-coated~~ polymer-coated and color shall be one of the choices listed in Specification F 934. Framework coatings shall be in accordance with Specification F 1043.

4.2 *Fabric*—Mesh larger than 1 in. (25 mm) shall be 6 gage, 0.192 in. (4.88 mm) or 9 gage, 0.148 in. (3.76 mm); 1-in. mesh shall be 9-gage coated steel wire conforming to Specifications A 392, A 491, or F 1345 as selected if metallic-coated, or conforming to Specification F 668 if ~~poly(vinyl chloride)-coated~~ polymer-coated. Mesh smaller than 1 in. shall be 11 gage, 0.120 in. (3.05 mm) conforming to Specifications A 491, F 668, or F 1345 as selected.

NOTE 1—~~The various chain link fabric specifications list fabric heights up to and including 12 ft (3.7 m) height. Some fabrics are available up to 20 ft (6.1 m) is available. Where m). Reference Specification F 1916 for fabric installation especially where two fabric heights are spliced horizontally; Cheyain link fabric shall be joined by sandwiching between two ⅜-in. (5-mm) minimum by 3-in. (76-mm) galvanized steel straps punched or drilled to accommodate ⅝-in. (8-mm) diameter carriage bolts at 12 in. (305 mm) installed on-center and bolted through each line post with ⅜-in. (10-mm) minimum diameter bolts. Fabrics shall be overlapped at least one diamond to allow the carriage bolts to pass through both fabrics. Another method for making horizontal splices is to overlap secure side of the fabric 6 in. (152 mm) and securely tie the upper and lower fabric to a rail 12 in. on-center fence per Specification F 1916.~~

4.3 *Fittings*, shall be galvanized steel conforming to Specification F 626.

4.3.1 Fittings may be ~~poly(vinyl chloride) (PVC)-coated~~ polymer-coated after galvanizing.

4.3.2 Tie wires shall be 9-gage, 0.148 in. (3.76 mm), metallic-coated steel or ~~poly(vinyl chloride) (PVC)-coated~~ polymer-coated over 9-gage, 0.148 in. (3.76 mm), galvanized steel core wire in accordance with Specification F 626. The finish coating shall match the finish coating of the fabric.

4.4 *Barbed Tape Obstacles*—~~At present there are no ASTM standards—~~Barbed tape, when specified, shall conform for Specification F 1910. Barbed tape shall be installed in conformance with Practice F 1911. When specifying barbed tape, Consult the manufacturer for recommendations. See tape, use descriptions as listed in Terminology F 1379 for barbed tape terminology. F 1379.

<sup>2</sup> Annual Book of ASTM Standards, Vol 01.06.

<sup>3</sup> Annual Book of ASTM Standards, Vol 15.08.

<sup>4</sup> Available from Underwriters Laboratories (UL) Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062-2096.

4.5 *Barbed Wire*—~~B~~Metallic-coated barbed wire shall conform to Specification A 121, chain link fence grade 12½ gage, 0.099 in. (2.51 mm) diameter strand wire, 14 gage, 0.030 in. (2.02 mm) barbs.

4.5.1 Aluminum-coated, coating Type A, Coating Class 40, Design Number 12-4-3-14R or Specification A 585, 12-4-5-14R.

4.5.2 Zinc-coated (galvanized), Coating Type II, high security grade-Z, Coating Class 3, Design Number 12-4-5-14R.

4.5.3 5 % Aluminum-mischmetal, Coating Type ZA, Coating Class 60, Design Number 12-4-5-14R.

4.5.4 Polymer-coated barbed wire shall conform to Specification F 1665.

4.6 *Tension Wire*—~~S~~Metallic tension wire shall conform to Specification A 824.

4.6.1 Type I Aluminum-coated.

4.6.2 Type II Class 2 Zinc-coated.

4.6.3 Type III Zinc-5 % Aluminum Mischmetal.

4.6.4 Polymer-coated tension wire shall conform to Specification F 1664.

4.7 If a ~~poly(vinyl chloride) (PVC)-coated~~ polymer-coated fence system is selected, the color selection shall be in accordance with Specification F 934.

4.8 *Gates*—The gates shall be in accordance with Specification F 900 swing gates or Specification F 1184 slide gates. All bolts used with gates shall be peened to prevent removal of nut per Specification F 1916.

4.8.1 Pedestrian gates shall be a galvanized steel material 1.900-in. (48-mm) outside diameter tubular or 2 in. (51 mm) square. Typical gate size shall be 4 ft (1.2 m) wide by 7 ft (2.1 m) high complete with transom. Manual or electric security locks shall be installed in swing gate frames using a lock box and weatherproof enclosure.

4.8.2 *Vehicular Gates*—~~Sma~~Vehicular gates such as those used for sally ports shall be single leaf or double leaf overhead slide gates per Specification F 1184. Consult correctional specialists for motor type, controls, locking capabilities and related security issues, per Specifications F 1916. Electric operators shall comply with Underwriters Laboratories 325.

4.9 *Accessories*—If accessories such as electronic sensors, gate operators, etc., are to be employed, the designer is encouraged to contact various producers of these products for product information and performance criteria per Specification F 1916.

## 5. Fabric Attachments

5.1 *Line Post*—Fabric shall be attached with tie wires or other appropriate fasteners per Specification F 1916.

5.2 *Rails*—Fabric shall be attached with tie wires or other appropriate fasteners per Specification F 1916.

5.3 *Terminal Post:*

5.3.1 *Fabric (1-in. (25-mm) Mesh and Larger)*, shall be attached with ~~3/16~~ 3/4-in. (5 by 19-mm) tension bars and tension bands at intervals not to exceed 12 in. (305 mm).

5.3.2 *Fabric (less than 1-in. (25 mm) Mesh)*, shall be attached by sandwiching the fabric between the terminal post and a ~~3/16~~ 3-in. (5 by 76-mm) galvanized steel strip punched using tension bars with tension bands or drilled to accept ½-in. (13-mm) diameter carriage bolts and drilled through the terminal post at intervals not to exceed 12 in. (305 mm). vertical straps, per Specification F 1916.

## 6. Rails

6.1 Top, intermediate, and bottom rails may be specified at the discretion of the designer per Specification F 1916.

## 7. Barbed Wire

7.1 Barbed wire shall be installed, in accordance with Specification F 1916, with one or more strands, depending on the degree of security required, or in conjunction with the use of barbed tape obstacles.

7.2 Supporting arms for barbed wire, when supplied, shall be used on all line posts and all corner posts up to 4-in. (102-mm) outside diameter. All end and gate posts or line posts or corner posts, or both, greater than 4-in. outside diameter shall be meet the requirements of sufficient length to accommodate barbed wire. Barbed wire shall be attached to posts using bands, nuts, and carriage bolts. See 4.4 for barbed tape obstacle. Specification F 626.

## 8. Tension Wire

8.1 Fabric shall be secured to tension wire ~~with 9-gage~~ as directed in Specification F 1916, using steel hog rings spaced 12 in., maximum, on-center rings, per Specification F 626.

8.2 Tension wire shall be stretched independently from the fabric and not interwoven with the fabric, in accordance with Specification F 1916.

## 9. Keywords

9.1 barbed tape obstacles; barbed wire; chain-link fence fabric; chain-link fence framework; high security; wire coating; wire gage

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