Designation: A 491 – 07

# Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric[1]

This standard is issued under the fixed designation A 491; 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 aluminum-coated steel chain-link fence fabric, aluminum-coated before weaving.

1.2 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:* [2]

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

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

A 817 Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire

2.2 *Federal Standard:*[3]

Fed. Std. No. 123 Marking for Shipment, Civil Agencies

2.3 *Military Standards:*[3]

MIL-STD-129 Marking for Shipment and Storage

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

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *chain link fence fabric*—a fencing material made from steel wire helically wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling or of twisting the ends of the wires to form the selvage of the fabric.

3.1.2 *diamond count*—the number of diamond openings from one edge of the fabric to the other. The diamond count of a given fabric shall begin at the first completed diamond at one edge and continue to the unfinished (½) or full opening at the other edge.

3.1.3 *knuckling*—a term used to describe the type of selvage obtained by interlocking adjacent pairs of wire ends and then bending the wire ends back into a loop. The loop shall be closed or nearly closed to a measurement less than the diameter of the wire.

3.1.4 *twisting*—a term used to describe the type of selvage obtained by twisting adjacent pairs of wire ends together in a close helix of 1½ machine turns, which is equivalent to 3 full twists, and cutting the wire ends at an angle. The wire ends beyond the twist shall be at least ¼ in. [6.4 mm] long. This type of selvage is not used on fabric with a mesh size of less than 2 in. [50.8 mm].

## 4. Ordering Information

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

4.1.1 Quantity (Section 14),

4.1.2 Size of mesh (Section 7),

4.1.3 Size of wire (Section 8),

4.1.4 Height of fabric (Section 9),

4.1.5 Diamond count, if specified (Section 6),

4.1.6 Type of selvage (Section 10),

4.1.7 Certification if required (Section 17), and

4.1.8 ASTM designation and year of issue.

4.2 All rolls of fencing accepted by the purchaser shall be billed on the basis of the original footage of the rolls before sampling, unless changed by contractual arrangement.

NOTE 1—A typical ordering description is as follows: 25 rolls, 50 ft each, chain-link fence fabric, aluminum-coated, 2 in. mesh. 0.148 in. wire, 60 in. high, knuckled both selvages, to ASTM A 491–XX.

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

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## 5. Materials

5.1 The wire from which the fabric is woven shall conform to all requirements of Specification A 817 for Type I coating.

## 6. Weave

6.1 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 10.

6.2 Typical diamond count for each standard height is shown in Table 1. Other diamond counts are permissible provided that they are consistent within a lot. The purchaser has the option to specify the diamond count (4.1.5).

## 7. Size of Mesh

7.1 The size of mesh shall be as indicated in Table 2 (see Fig. 1).

7.2 The permissible variation from the specified size of mesh shall be ±⅛ 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. [25.4 mm] and under.

7.3 The size of mesh shall be determined by measuring the minimum clear distance between the wires forming the parallel sides of the mesh, and determined as the average of two readings taken at right angles to each other.

## 8. Size of Wire

8.1 Chain-link fabric shall be fabricated from wire diameters as listed in Specification A 817, with a permissible variation from the specified diameter of the coated wire of ±0.005 in. [±0.13 mm].

## 9. Height of Fabric

9.1 Chain-link fabric shall be furnished in the standard heights shown in Table 2. Custom order fabric is available in heights to and including 20 ft. [6.56 m]. The height of fabric shall be the overall dimension from ends of twists or knuckles. The permissible variation 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].

## 10. Selvage

10.1 Unless otherwise specified by the purchaser, fabrics with 2- or 2⅛-in. [50- or 54-mm] mesh, in heights 60 in. [1520 mm] and under shall be knuckled at both selvages. Fabric 72 in. [1830 mm] high and over shall be knuckled at one selvage and twisted at the other.

10.2 The selvages of fabrics with meshes of less than 2 in. [50 mm] shall be knuckled.

NOTE 2—**Caution:** Twisted selvages for fence fabric under 72 in. [1830 mm] in height are not recommended because of consumer safety considerations.

## 11. Weight of Aluminum Coating

11.1 The weight of aluminum coating on the wire in the fabric shall be as specified in Specification A 817, for the wire diameter used (see Table 3).

## 12. Breaking Strength

12.1 Wire constituting the fabric shall meet the minimum breaking strength listed in the Breaking Strength Table of Specification A 817 (see Table 4) when tested in accordance with Test Methods and Definitions A 370. Specimens used to establish conformance with this requirement shall consist of individual pickets from a section of the fence fabric. The specimen shall be of sufficient length so as to be firmly gripped in the testing machine after straightening. The actual gage length (distance between jaws) of the specimen shall be limited to the undeformed length of wire between two adjacent straightened bends.

## 13. Workmanship, Finish, and Appearance

13.1 Chain-link fence fabric shall be produced by methods recognized as good commercial practices.

13.2 Excessive roughness, blisters, and flaking shall be noted. These and other defects, if present to any considerable extent, shall provide a basis for rejection.

NOTE 3—Rust formations on the cut ends of the wire at the fabric selvages are inherent characteristics of this material and do not warrant rejection of the fabric.

## 14. Standard Length of Rolls

14.1 The standard length of roll shall be 50 ft [15.24 m] ± 1 % except as otherwise agreed upon at the time of purchase.

**TABLE 1 Typical Diamond Count[A]**

NOTE 1—Other diamond counts are permitted (see 6.2).
NOTE 2— For fabric heights over 144 in., see Section 9.

| Nominal Diameter Coated 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 | 13½ | 17½ | 20½ | 24½ | 27½ | 31½ | 34½ | 41½ |
| 0.148 | 1 | 20 | 23 | 27 | 33 | 39 | 45 | 53 | 61 | 67 | 79 |
| 0.148 | 1¼ | . . . | . . . | 23 | 29 | 35 | 41 | 46 | 52 | 56 | 70 |
| 0.135 | 2 | 10½ | 12½ | 13½ | 17½ | 20½ | 24½ | 27½ | 31½ | 34½ | 41½ |
| 0.120 | 2 | 10½ | 12½ | 14½ | 17½ | 20½ | 24½ | . . . | . . . | . . . | . . . |
| 0.120 | 1¾ | . . . | . . . | . . . | . . . | . . . | . . . | 31½ | 35½ | 39½ | 47½ |
| 0.120 | 1¼ | . . . | . . . | 23 | 29 | 35 | 41 | 46 | 52 | 58 | 70 |
| 0.120 | 1 | 20 | 23 | 27 | 33 | 39 | 45 | 53 | 61 | 67 | 79 |
| 0.113 | 2⅛ | 9½ | 11½ | 13½ | 16½ | 19½ | . . . | . . . | . . . | . . . | . . . |

[A] See Appendix X1 for metric equivalents.



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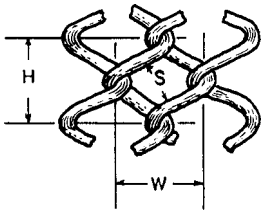
**TABLE 2 Sizes of Wire and Mesh[A]**

NOTE— For fabric heights over 144 in., see 9.1.

| Specified Diameter of Coated Wire, in. | Size, Coated Wire Gage | Size of Mesh, in.[B] | Height of Fence Fabric, in. |
|---|---|---|---|
| 0.192 | 6 | 2 | 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[C] | 9 | 1¼ | ..., ..., 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.148 | 9 | 1 | 36, 42, 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.135 | 10 | 2 | 36, 42, 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.120 | 11 | 2 | 36, 42, 48, 60, 72, 84 . . . . . |
| 0.120 | 11 | 1¾ | . . . . . 96, 108, 120, 144 |
| 0.120[C] | 11 | 1¼ | ..., ..., 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 | ⅝[D] | 36, 42, 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.120 | 11 | ½[D] | 36, 42, 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.120 | 11 | ⅜[D] | 36, 42, 48, 60, 72, 84, 96, 108, 120, 144 |
| 0.113 | 11½ | 2⅛ | 36, 42, 48, 60, 72 . . . . . |

[A] See Appendix X1 for metric equivalents.
[B] See Fig. 1 for mesh dimensions for ⅝ in., ½ in., and ⅜ in. fence fabric.
[C] This mesh size and smaller is recommended for swimming pools.
[D] These sizes are designed for security purposes.




| Selvage, S | Height, H, in. | Width, W, in. |
|---|---|---|
| ⅜ in. mesh | ¾ | ¾ |
| ½ in. mesh | 15⁄16 | 15⁄16 |
| ⅝ in. mesh | 1⅛ | 1⅛ |

**FIG. 1 Mesh Dimensions for ⅜ in., ½ in., and ⅝ in. Fence Fabric**

**TABLE 3 Minimum Weight of Aluminum Coating for Type I**

| Specified Diameter of Coated Wire, in. [mm] | Minimum Weight of Coating, oz/ft² [g/m²] of uncoated wire surface |
|---|---|
| 0.192 [4.88] | 0.40 [122] |
| 0.148 [3.76] | 0.40 [122] |
| 0.135 [3.43] | 0.40 [122] |
| 0.120 [3.05] | 0.35 [107] |
| 0.113 [2.87] | 0.30 [92] |

**TABLE 4 Breaking Strength**

| Specified Diameter of Coated Wire, in. [mm] | Breaking Strength, min, lbf [N] |
|---|---|
| 0.192 [4.88] | 2170 [9650] |
| 0.148 [3.76] | 1290 [5740] |
| 0.135 [3.43] | 1290 [5740] |
| 0.120 [3.05] | 850 [3780] |
| 0.113 [2.87] | 750 [3340] |

14.2 The length of roll shall be determined by unrolling a roll of fabric on a flat surface and exerting tension by appropriate means to remove all slack. The tension applied shall not reduce the actual height of the fabric by more than 1⁄16 in./ft [5.3 mm/m] of height or by more than ½ in. [12.7 mm], whichever is less.

## 15. Sampling and Number of Tests

15.1 One roll from every 50 rolls or fraction thereof in a lot shall be taken at random as a sample for test purposes. In no case shall less than two samples be tested except when the lot is less than 10 rolls only one roll shall be selected for the sample.

15.2 Sample rolls selected shall be inspected for weave (Section 6), size of mesh (Section 7), diamond count (6.2), wire size (Section 8), height of fabric (Section 9), selvage (Section 10) and length (Section 14).

15.3 If any specimen tested fails to meet the requirements of this specification, the roll represented by the specimen shall be rejected and two additional rolls shall be inspected, both of



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which shall meet the requirements in every respect; otherwise, the lot represented by the samples may be rejected.

## 16. Inspection

16.1 Unless otherwise specified in the purchase order or contract, the manufacturer is responsible for the performance of all inspection and test requirements specified in this specification. Except as otherwise specified in the purchase order or contract, the manufacturer may use his own or any other suitable facilities for the performance of the inspection and test requirements unless disapproved by the purchaser at the time the order is placed. The purchaser shall have the right to perform any of the inspection and tests set forth in this specification when such inspections and tests are deemed necessary to assure that the material conforms to prescribed requirements.

## 17. Certification

17.1 When specified in the purchase order or contract, a producer's or supplier's certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, and inspected in accordance with this specification and has been found to meet the requirements. When specified in the purchase order or contract, a report of the test results shall be furnished.

## 18. Packaging, Marking, and Loading

18.1 Each length of chain-link fence fabric shall be tightly rolled and firmly tied. Each roll shall carry a tag showing the type of coating, the specified wire size, mesh size, the specified length and height of fabric in the roll, ASTM Designation A 491, and the name or mark of the manufacturer.

18.2 Unless otherwise specified, packaging, marking and loading for shipment shall be in accordance with Practices A 700.

18.3 When specified in the contract or order, and for direct procurement by or direct shipment to the U.S. government, when Level A is specified, preservation, packaging, and packing shall be in accordance with Level A requirements of MIL-STD-163.

18.4 When specified in the contract or order, and for direct procurement by or direct shipment to the U.S. government, marking for shipment, in addition to the requirements specified in the contract or order, shall be in accordance with MIL-STD-129 for U.S. military agencies and in accordance with Fed. Std. No. 123 for civil agencies.

## 19. Keywords

19.1 aluminum coated (aluminized) iron and steel articles; aluminum coated (aluminized) steel chain link fence fabric; chain link fence; steel; coatings; aluminum (aluminized); fence/fencing materials; chain link

## APPENDIX

**(Nonmandatory Information)**

### X1. Approximate Metric Equivalents for Table 1 and Table 2

**TABLE X1.1 Approximate Metric Equivalents for Table 1 and Table 2**

| Sizes of Wire and Mesh | | Height of Fence Fabric | |
|---|---|---|---|
| in. | mm | in. | mm |
| 0.192 | 4.88 | 36 | 910 |
| 0.148 | 3.76 | 42 | 1070 |
| 0.135 | 3.43 | 48 | 1220 |
| 0.120 | 3.05 | 60 | 1520 |
| 0.113 | 2.87 | 72 | 1830 |
| 1 | 25 | 84 | 2130 |
| 1¼ | 32 | ... | ... |
| 1¾ | 44 | 96 | 2440 |
| 2 | 50 | 108 | 2740 |
| 2⅛ | 54 | 120 | 3050 |
| | | 144 | 3660 |



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