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# Standard Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence[1]

This standard is issued under the fixed designation A 824; 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 0.177 in. (4.50 mm) diameter metallic-coated carbon steel marcelled tension wire for use with chain-link fence. The 0.177 in. (4.50 mm) diameter metallic-coated wire shall be produced in accordance with Specification A 817. Three types of coatings are covered:

1.1.1 *Type I*—Aluminum-coated (aluminized),

1.1.2 *Type II*—Zinc-coated (galvanized), and

1.1.3 *Type III*—Zinc-5 % Aluminum Mischmetal (Zn5Al-MM) alloy-coated.

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 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

A 902 Terminology Relating to Metallic Coated Steel Products

## 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this specification, refer to Terminology A 902.

3.2 *Definitions of Terms Specific to This Standard:* Description of Term Specific to This Standard:

3.2.1 *marcelling*—a process whereby either a uniform helix or a series of waves is put in a wire to facilitate tensioning the wire when installed to support the top or bottom, or both, of the chain-link fabric (see 5.2.1).

## 4. Ordering Information

4.1 Orders for metallic-coated steel tension wire should include the following information:

4.1.1 Quantity (expressed in number of coils),

4.1.2 Name of product,

4.1.3 Type of coating (see 5.3),

4.1.4 Class of coating if applicable (see 5.3.2 and 5.3.3),

4.1.5 Packaging requirements (see Section 14),

4.1.6 Certification or test report, or both, if specified (see Section 13), and

4.1.7 ASTM designation and year of issue.

NOTE 1—A typical ordering description is as follows: 20 coils metallic-coated steel tension wire, Type II, Class 2, in 100-lb coils, to ASTM A 824 – ___ .

## 5. Materials and Manufacture

5.1 The steel rod from which the wire is drawn shall be manufactured by the open-hearth, electric-furnace, or basic-oxygen process.

5.2 The 0.177 in. (4.50 mm) diameter wire shall be cold-drawn, metallic-coated at finished size to produce the specified mechanical properties per Specification A 817, then marcelled as specified in 5.2.1.

5.2.1 Marcelling shall produce a helix or series of waves in the wire with the offset distance from the wire axis to the wave peaks or the helix not less than 0.125 in. (3.18 mm) (measured to the center of the wire). The pitch (distance between successive points on the waves or helix) shall be not more than 12 in. (305 mm). Prior to making measurements of the marcelling, curvature from coiling shall be removed by the application of a 500-lbf (2225-N) tensile load. Maintain the load while measuring the offset distance and pitch. Measurements shall be made on a section of wire with a length at least two times the pitch length.

5.2.1.1 Measurement of offset distance may be performed by placing a straightedge against two adjacent peaks or corresponding points on a helix, measuring the distance to the inside of the wire 180° opposite, and dividing the value by two.

[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.

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5.3 The 0.177 in. (4.50 mm) diameter wire shall be furnished with one of three types of coating, per Specification A 817 as specified:

5.3.1 *Type I—Aluminum-Coated (Aluminized)*, with coating weight specified.

5.3.2 *Type II—Zinc-Coated (Galvanized)*, in three classes of coating weights as specified.

5.3.3 *Type III—Zinc-5 % Aluminum-Mischmetal Alloy Coated (Zn-5Al-MM)*, in two classes of coating weights as specified.

## 6. Mechanical Properties

6.1 The breaking strength shall meet the requirement of Specification A 817 for 0.177 in. (4.50 mm) diameter wire.

## 7. Size and Tolerance

7.1 The diameter shall meet the requirements of Specification A 817 for 0.177 in. (4.50 mm) diameter wire.

NOTE 2—It is recognized that the surfaces of heavy metallic coatings, particularly those produced by the hot-dip process, are not perfectly smooth. If the tolerance specified is rigidly applied to such irregularities that are inherent to the product, unjustified rejections of wire that would actually be satisfactory for use would occur. Therefore, it is intended that this tolerance be used in gaging the uniform areas of the coated wire.

## 8. Weight of Coating

8.1 The weight of coating shall meet the requirements of Specification A 817 for the Type and Class of coating specified.

## 9. Adherence of Coating

9.1 The adherence of coating shall meet the requirements of Specification A 817 for 0.177 in. (4.50 mm) wire.

## 10. Number of Tests and Retests

10.1 A lot shall consist of all of the coils of wire of the same size, type, and class, and shall be offered for inspection at one time. A wire sample of sufficient length, approximately 4 ft (1.2 m), shall be cut from either end of each coil selected for tests described in Sections 6, 8, and 9.

10.2 The number of test specimens taken from the ends of coils during production to ensure compliance with Sections 6 and 7 varies with the quality control procedures and the manufacturing facilities of each manufacturer, but is generally not less than 10 % of the coils produced. For the purpose of final product testing, one specimen from every ten coils or fraction thereof in a lot shall be selected at random, or a total of seven specimens, whichever is less.

10.3 Should one or more of the wire specimens fail any requirement, the lot shall be subjected to retest. For retest purposes the original lot shall be regrouped into 50 coil lots or fractions thereof. Each lot shall be tested for the property in which the original sample failed to comply at a frequency of 10 % or more so that the total number of tests is at least double the original. Any lot that exhibits a failure shall be rejected. If during retesting an additional quality parameter is observed to be defective, the lot of 50 is subject to rejection for that cause. The manufacturer may test each coil in the failed lot for the property in which failure occurred and reject only the nonconforming coils.

10.4 If any test specimen shows the presence of a weld or an obvious defect, it may be discarded and another specimen substituted.

10.5 Test specimens shall also be tested for compliance with marcelling dimensions (see 5.2.1). For this purpose, the test specimen shall contain at least three peaks and three valleys.

## 11. Inspection

11.1 Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements of this specification. Except as otherwise specified in the contract or purchase order, the producer 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 inspections and tests prescribed in this specification when such inspections and tests are deemed necessary to ensure that the material conforms to prescribed requirements.

## 12. Rejection and Rehearing

12.1 Material that fails to conform to the requirements of this specification may be rejected. Rejections should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

12.2 The material must be adequately protected and correctly identified in order that the producer or supplier may make a proper investigation.

## 13. Certification

13.1 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 contract or purchase order, a report of the test results shall be furnished.

## 14. Packaging, Package Marking, and Loading

14.1 Marking shall be by a tag securely attached to each coil of tension wire and shall show the identity of the producer, quantity, type of coating, class of coating (if applicable), and ASTM designation.

14.2 Packaging of the coils of wire shall be agreed upon between the producer and the purchaser. This agreement may include coil dimensions and weight.

14.3 Unless otherwise specified, the packaging, package marking, and loading shall be in accordance with Practices A 700.

## 15. Keywords

15.1 chain link fence; marcelled wire; metallic coated steel wire; steel wire; wire



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