



Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire¹

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1. Scope

1.1 This specification covers zinc-coated steel barbed wire, consisting of a strand of two wires, 80 rods in length, in a number of sizes and constructions. It is furnished in two grades and with two classes (weights) of zinc coating (Section 6).

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:

A 90 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles²

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment³

B 6 Specification for Zinc (Slab Zinc)⁴

2.2 Federal Standard:

Fed. Std. No. 123 Marking for Shipments (Civil Agencies)⁵

2.3 Military Standards:

MIL-STD-129 Marking for Shipment and Storage⁵

MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage⁵

3. Ordering Information

3.1 Orders for barbed wire purchased under this specification shall include the following information:

3.1.1 Quantity of barbed wire (number of spools),

3.1.2 Size and construction (Table 1),

3.1.3 Class of coating in Standard Grade or Chain Link Fence Grade (Section 6),

3.1.4 Certification, if required, and

3.1.5 ASTM designation and year of issue.

3.2 All spools of barbed wire accepted by the purchaser shall be billed on the basis of the original length of the spools before sampling unless changed by contractual arrangement.

NOTE 1—A typical ordering description is as follows: 20 spools barbed wire, 12½ gage, 2 point, 4-in. spacing, 14-gage round barbs, Class 1 coating, Standard Grade, certified, to ASTM A 121 – _____.

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² Annual Book of ASTM Standards, Vol 01.06.

³ Annual Book of ASTM Standards, Vol 01.05.

⁴ Annual Book of ASTM Standards, Vol 02.04.

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

4. Materials and Manufacture

4.1 *Base Metal*—The base metal of the barbed wire shall be of a good commercial quality steel wire.

4.2 *Zinc-Coated Wire*—The wire shall be zinc-coated before fabrication.

4.3 *Zinc for Coating*—Slab zinc, when used for coating, shall be of any grade of zinc conforming to Specification B 6.

4.4 The sizes and construction of barbed wire covered by this specification shall be in accordance with those shown in Table 1.

4.5 The barbed wire shall be packaged on spools in lengths of 80 rod.

4.6 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.

4.7 The strands shall be twisted with a uniform length of lay. The direction of twisting may be in one direction or alternately in left and right directions.

4.8 The barbs shall be sharp, well-formed, tightly wrapped, and normally spaced 4 or 5 in. (102 or 127 mm) apart.

5. Breaking Strength

5.1 The breaking strength of the stranded barbed wire shall be in accordance with Table 2.

6. Weight of Coating

6.1 The zinc-coated barbed wire, as represented by the test specimens tested in accordance with Section 8 and Test Method A 90, shall conform to the requirements of Table 3 for minimum weight of zinc coating for the class ordered.

6.2 *Standard Grade*—For Standard Grade the requirements of Table 3 refer to the line wire only. The wire for barbs must have a minimum Class 1 coating weight.

6.3 *Chain Link Fence Grade*—For Chain Link Fence Grade both line wire and wire for barbs must have minimum Class 3 coating weight.

6.4 The coating weight of the wire for barbs must be tested and certified prior to fabrication.

7. Size and Permissible Variations

7.1 *Line Wire*—The size of the zinc-coated wire shall be expressed in terms of the wire gages in Table 1. The permissible variations from the nominal diameter of the wire shall be ± 0.005 in. (0.13 mm).

7.2 *Barbs*—The size of the zinc-coated wire used for the barbs shall be as described in Table 1. The permissible variations from the nominal diameter of the wire shall be ± 0.005

TABLE 1 Standard Sizes and Construction of Barbed Wire

Size, Steel Wire Gage	Nominal Diameter of Zinc-Coated Wire in Strand		Number of Points	Spacing of Barbs, in. (mm)	Diameter of Barbs, Steel Wire Gage ^A	Shape of Barbs
	in.	(mm)				
12½	0.099	(2.51)	2	5 (127)	12½	flat
12½	0.099	(2.51)	2	4 (102)	13 ^B	flat
12½	0.099	(2.51)	2	4 (102)	14	round
12½	0.099	(2.51)	4	5 (127)	14	round
12½	0.099	(2.51)	4	5 (127)	14 ^B	half-round
12½	0.099	(2.51)	2	5 (127)	14	round
12½	0.099	(2.51)	2	4 (102)	12½ ^B	flat
13½	0.086	(2.18)	2	4 (102)	14	round
13½	0.086	(2.18)	4	5 (127)	14	round
15½	0.067	(1.70)	2	5 (127)	13¾ ^B	flat
15½	0.067	(1.70)	4	5 (127)	16½	round

^A The nominal diameter of wire used in making barbs shall be as follows:

12½ gage	0.099 in. (2.51 mm)
13 gage	0.092 in. (2.32 mm)
13¾ gage	0.083 in. (2.11 mm)
14 gage	0.080 in. (2.03 mm)
16½ gage	0.058 in. (1.47 mm)

^B The gage of the half-round and flat barbs is designated by the gage of the round wire from which the barbs are rolled.

in. (0.13 mm). Due to mechanics of manufacture when forming the barb, a certain amount of out-of-roundness can be expected. The size and condition preclude barbs from being subjected to diameter checks. The barb length, measured from the center of the two strand wires, shall be ¾ in. (9.5 mm) minimum.

7.3 Spacing of Barbs—Barbs shall be spaced at a nominal 4 or 5 in. (102 or 127 mm) as shown in Table 1. 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 spacing requirement may lead to undue rejections. Any sample, with 93.5 % of the individual barb spacings conforming to the specified spacing ±¼ in. (±19 mm), and containing a minimum of 69 barbs (4-in. spacing) or 55 barbs (5-in. spacing) in 25 ft (7.6-m), shall be considered acceptable.

7.4 The length of barbed wire in each spool shall be 80 rods (402-m) minimum. This length is equivalent to one quarter mile or 1320 ft.

8. Sampling

8.1 For the purpose of tests, one spool from every 50 spools or fraction thereof in a lot shall be selected at random, or a total of seven samples, whichever is less. A lot shall consist of all the spools of a single type of barbed wire offered for delivery at the same time.

8.2 Instead of testing wire from the completed barbed

TABLE 2 Breaking Strength of Zinc-Coated Strand

NOTE—Breaking strength values reflect both wires tested together.

Size, Steel Wire Gage	Wire Diameter		Minimum Strand Breaking Strength	
	in.	(mm)	lbf	(N)
12½	0.099	(2.51)	950	(4230)
13½	0.086	(2.18)	950	(4230)
15½	0.067	(1.70)	950	(4230)

wire in accordance with 8.1, the manufacturer may elect to establish compliance with Sections 5 and 6, breaking strength and weight of coating, by tests made on wire prior to fabrication. If the manufacturer makes this election, the purchaser still reserves the right to test wire from the completed barbed wire for compliance. It is recognized that during fabrication the barb is mechanically deformed and scraped and there may be some slight differences in zinc weight results on barbs from before and after fabrication.

8.3 For the purpose of inspection, a maximum of two spools from the lot (as described in 8.1) may be subjected to observations for barb length and spacing, overall length, and general workmanship.

8.4 Instead of inspecting for length by unrolling full spools in accordance with 8.3, the purchaser and manufacturer may agree on a weight per spool related to wire size or measuring tools employed during manufacturing. The purchaser still reserves the right to confirm length by actual measurements.

8.5 Inspection for barb spacing is normally performed on the outer 25-ft (7.6-m) length of a spool; this permits repackaging of the spool. Any other selection shall be as agreed upon between the manufacturer and the purchaser.

9. Test Specimens and Retests

9.1 Test Specimens—A 4-ft (1.2-m) length of barbed wire shall be cut from the end of each spool selected in Section 8 for the tests prescribed in Sections 5 and 6. Each strand wire will be tested for weight of coating. The breaking strength value shall be determined by testing the twisted strand as a composite.

9.2 Should one or more of the individual wire specimens fail the coating weight test, or a strand specimen fail the breaking strength test, the lot shall be subjected to retest. For retest purposes, four additional spools of barbed wire for each 50 spools offered shall be sampled. The lot size then becomes 50, except this lot size may vary slightly to accommodate pallet count when the barbed wire is palletized.

9.3 Retesting for Coating Weight—Should more than two of the individual strand wires of the retest specimens fail to meet the requirements of Table 3, or if any of the retest specimens has less than 75 % of the specified coating weight, the entire lot represented by the retest may be rejected.

9.4 Retesting for Breaking Strength—Should any of the retest specimens fail to meet the minimum breaking strength values of Table 2, the entire lot represented by the specimens may be rejected.

TABLE 3 Minimum Weight of Coating on Zinc-Coated Barbed Wire

Size, Steel Wire Gage	Nominal Diameter of Zinc-Coated Wire		Minimum Weight of Coating of Uncoated Wire Surface, oz/ft ² (g/m ²)	
	in.	(mm)	Class 1	Class 3
12½	0.099	(2.51)	0.28 (85)	0.80 (245)
13	0.092	(2.32)	0.28 (85)	0.75 (230)
13½	0.086	(2.18)	0.25 (75)	0.70 (215)
13¾	0.083	(2.11)	^A	0.70 (215)
14	0.080	(2.03)	0.25 (75)	0.70 (215)
15½	0.067	(1.70)	^A	0.65 (200)
16½	0.058	(1.47)	^A	0.60 (185)

^A These sizes only furnished Class 3 Coating, Chain Link Fence Grade (Section 6.3).

9.5 *Reinspection for Barbs, Spacing of Barbs, and Overall Length*—Should either of the sample spools fail to meet the requirements of 7.2, 7.3, or 7.4, two additional spools shall be selected for inspection. If either of these spools fails to meet the requirements, the lot may be rejected.

10. Inspection

10.1 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 contract or purchase order, 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.

11. Rejection and Rehearing

11.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection 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.

11.2 Instead of rejecting the entire lot as provided for in 9.3 and 9.4, the producer may test specimens from every spool, as provided for in 9.1, and reject only those spools

failing the weight of coating or breaking strength requirements.

12. Certification

12.1 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.

13. Packaging and Marking

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

13.2 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 the Level A requirement of MIL-STD-163.

13.3 When specified in the contract or order, and for the 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 U.S. Government civil agencies.

14. Keywords

14.1 barbed wire; galvanized barbed wire

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