

Barbed Wire

Under the state specification 710.01, ASTM A 121 is called out.

Under the state specification 710.01, ASTM A 585 is called out.

Go to the steel and fencing certification manual for more information about the basic properties of steel.

Dimension Requirements

Dimensions should be verified to assure the delivered product meets what you ordered.

The spacing, size, and diameter of the wire should meet these requirements.

Standard Sized and Constructions for Barbed Wire

Design Number	Size, Steel Wire Gage	Nominal Diameter of Coated Wire, in. (cm)	Number of Barb Points	Spacing of Barbs, in. (mm)	Diameter of Barbs, Steel Wire Gage ^A	Shape of Barbs
Metallic Coating Type A						
12-4-3-14R ^B	12 ½	0.099 (2.51)	4	3 (76)	14	Round
12-4-5-14R	12 ½	0.099 (2.51)	4	5 (127)	14	Round
Metallic Coating Type Z and Type ZA						
12-2-4-12F	12 ½	0.099 (2.51)	2	4 (102)	12 ½ ^C	Flat
12-2-4-13F	12 ½	0.099 (2.51)	2	4 (102)	13 ^C	Flat
12-2-4-14R	12 ½	0.099 (2.51)	2	5 (127)	14	Round
12-2-5-12F	12 ½	0.099 (2.51)	2	5 (127)	12 ½ ^C	Flat
12-2-5-14R	12 ½	0.099 (2.51)	2	5 (127)	14	Round
12-4-5-14H	12 ½	0.099 (2.51)	4	5 (127)	14 ^C	Half-Round
12-4-5-14R	12 ½	0.099 (2.51)	4	5 (127)	14	Round
13-2-4-14R	13 ½	0.086 (2.18)	2	5 (127)	14	Round
13-4-5-14R	13 ½	0.086 (2.18)	4	5 (127)	14	Round
15-2-5-13F	15 ½	0.067 (1.70)	2	5 (127)	13 ¾ ^C	Flat
15-2-5-14R	15 ½	0.067 (1.70)	2	5 (127)	14	Round
15-4-5-16R	15 ½	0.067 (1.70)	4	5 (127)	16 ½	Round

^AThe nominal diameter of the wire used in making the barbs shall be as follows:

- 12 ½ gage 0.099 in. (2.51 mm)
- 13 gage 0.092 in. (2.32 mm)
- 13 ¾ gage 0.083 in. (2.11 mm)
- 14 gage 0.080 in. (2.03 mm)
- 16 ½ gage 0.058 in. (1.47 mm)

^BDesign Number 12-4-3-12R, Metallic Coated Type A, is High-Security Grade. All other design numbers are for standard grade.

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

An example of a sample barb wire would be design number 12-4-5-14R. Which has a wire gage size of 12 ½ with a nominal diameter of 0.099 inches with 4 barb points and 5 inches between each barb.



The permissible variation from the nominal diameter of the wire, for both line wires and barbs, for all types, shall be ± 0.005 inches.

The barbs shall be sharp, well-formed, and tightly wrapped. Splicing of individual wires by means of a wrap joint or an electric butt weld is permitted. The strands shall be twisted with a uniform length of lay.. The direction of twisting may be either right or left hand. Alternated left and right twisting is not permitted. The minimum barb length, measured from the center of the two strand wires, shall be **d** inches. Due to the mechanics of manufacture when forming the barbs, a certain amount of out-of-roundness is expected.

Mechanical Requirements

Along with Dimensional requirements another key issue is the mechanical properties of the material. Listed below is the information that can be found in the applicable specification for barb wire.

The base metal of the steel strand wires and steel barbs is required to meet the breaking strength requirement. The breaking strength of the stranded barb wire, for all types, shall be not less than 950 lbf.

Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Laboratory.

The purchaser shall be furnished written certification that the barbed wire was manufactured, sampled, tested, and inspected in accordance with A 121 and has been found to meet the requirements. The purchase order is required to report test results for the material.

Coating Thickness

The barbed wire is available with aluminum (Type A), zinc (Type Z), and zinc - 5% aluminum-mischmetal alloy coatings (Type ZA), with a number of different designs, and in two grades. Not all designs are available in all coating types.

When aluminum coating is used, the coating shall conform to the following impurity limits:

Copper, max, %	0.10
Iron, max, %	0.50

For Coating Type A barbed wire, either aluminum-coated steel wire or aluminum alloy wire for the barbs could be used. The strand wires for Type A barbed wire shall have a minimum coating weight of 0.30 oz/ft² on a 12 ½-gage wire. The steel wire for barbs for Type A barbed wire shall have a minimum coating weight of 0.25 oz/ft² on a 14-gage wire.

The weight of coating requirements for Type Z barbed wire is required to meet the following requirements.

Size, Steel Wire Gage	Nominal Diameter of Type Z		Minimum Weight of Coating of Uncoated Wire Surface, oz/ft ² (g/m ²)	
	in.	(mm)	Class	
			Class 1	Class 3
12 ½	0.099	(2.51)	0.28 (85)	0.80 (245)
13	0.092	(2.32)	0.28 (85)	0.75 (230)
13 ½	0.086	(2.18)	0.25 ^A (75)	0.70 (215)
13 ¾	0.083	(2.11)		0.70 (215)
14	0.080	(2.03)	0.25 ^A (75)	0.70 (215)
15 ½	0.067	(1.70)	A	0.65 (200)
16 ½	0.058	(1.47)		0.60 (200)

^AThese sizes furnished with Class 3 Coating (Section 8)

The weight of coating requirements for Type ZA barbed wire is required to meet the following requirements.

Size Wire Gage	Nominal Diameter of Type ZA Wire		Minimum Weight of Coating of Uncoated Wire Surface, oz/ft ² (g/m) Class ^A					
	in.	(mm)	Class					
			20	40	60	80	100	120
12 ½	0.099	(2.51)	X ^B	X	X	X	X	X
13	0.092	(2.32)	X	X	X	X	X	X
13 ½	0.086	(2.18)	X	X	X	X	X	X
13 ¾	0.083	(2.11)	X	X	X	X	X	X
14	0.080	(2.03)	X	X	X	X	X	X
15 ½	0.067	(1.70)	X	X	X	X	X	X
16 ½	0.058	(1.47)	X	X	X	X	X	X

^ACoating Class 20 40 60 80 100 120

Coating Weight
oz/ft² 0.20 0.40 0.60 0.80 1.00 1.20

(g/m)² 61 122 183 244 305 366

^BX denotes availability

Sample Certification

Reference: Product Code 712

Reference 48 Rolls

Gentlemen:

This letter is to certify that the 4-Point Hi-Tensile Barbed Wire shipped on:
Customer Order Number: 1206

was melted and manufactured and melted in the U.S.A. in accordance with ASTM A121 and Class III and has the following physical properties:

4 -Point Hi-Tensile Barbed Wire	Barb Wire	Line Wires
Diameter	.08" +/- .005"	.07" +/- .002"
Tensile	115 KPSI Nominal	165 KSI Nominal
Zinc Weight	.70 oz/sq ft. Min.	.80 oz/sq ft. Min.

This sample certification for barb wire is not to bad but it could be better and here are some of the reasons. The manufacturer didn't specify which diameter they used to figure out the breaking strength of the wires. For barb wire they have the diameter as $.08" \pm .005"$, does that mean $.075"$, $.08"$ or $.085"$. The diameter of the wire will make a difference on how much the breaking strength will be on the wire. The calculations of the breaking strength for the $.075"$ diameter would be 1,016 lbf, for the $.08"$ diameter the breaking strength would be 1,156 lbf and for the $.085"$ diameter the breaking strength would be 1,305 lbf. As you can see, all of the diameters would have passed the test but they should have put down the diameter of the wire. This certification should have specified the breaking strength of the wire they tested.