



Designation: A 121 – 99 (Reapproved 2004)

## Standard Specification for Metallic-Coated Carbon Steel Barbed Wire<sup>1</sup>

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*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 This specification covers metallic-coated steel barbed wire, consisting of a strand of two wires.

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

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in brackets are for information only.

1.4 The text of this specification references notes and footnotes that provide explanatory information. These notes and footnotes (excluding those in tables) shall not be considered as requirements of the specification.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

- A 90/A 90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
- A 428/A 428M Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles
- A 641/A 641M Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment
- A 809 Specification for Aluminum-Coated (Aluminized) Carbon Steel Wire
- A 856/A 856M Specification for Zinc-5 % Aluminum-Mischmetal Alloy-Coated Carbon Steel Wire
- A 902 Terminology Relating to Metallic Coated Steel Products

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A05 on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.12 on Wire Specifications.

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<sup>2</sup> 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.

#### 2.2 Federal Standard:

Fed. Std. No. 123 Marking for Shipments (Civil Agencies)<sup>3</sup>

#### 2.3 Military Standards:

MIL-STD-129 Marking for Shipment and Storage<sup>3</sup>

MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage<sup>3</sup>

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology A 902.

### 4. Classification

4.1 The barbed wire covered by this specification is classified as described in this section.

4.2 *Design Number*—Numbers describing standard sizes and constructions, as listed in Table 1.

#### 4.3 Metallic Coating Type:

4.3.1 *Coating Type A*—Made from aluminum-coated strand wire.

4.3.2 *Coating Type Z*—Made from zinc-coated strand wire.

4.3.3 *Coating Type ZA*—Made from zinc-5 % aluminum-mischmetal alloy (Zn-5AL-MM) coated strand wire.

4.4 *Metallic Coating Class*—The specified amount of coating (coating weight [mass]) on the strand wire.

4.4.1 For Coating Type A, see 6.3. (Only one coating weight for each wire size.)

4.4.2 For Coating Type Z, see Table 2.

4.4.3 For Coating Type AZ, see Table 3.

#### 4.5 Grades:

4.5.1 *Standard Grade*—Barbs spaced on 4 or 5-in. [102 or 127-mm] centers as indicated in Table 1.

4.5.2 *High-Security Grade*—Barbs spaced on 3-in. [76-mm] centers (for Coating Type A only).

NOTE 1—The design numbers are related to the characteristics of the construction of the barbed wire, with the number groups related, in order, to the steel wire gage of the strand wires, number of barb points, spacing of barbs, steel wire gage of the barbs, and a letter indicating the shape of the barbs.

<sup>3</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098



TABLE 1 Standard Sizes and Constructions for Barbed Wire

| Design Number                       | Size, Steel Wire Gage | Nominal Diameter of Coated Wire, in. [mm] | Number of Barb Points | Spacing of Barbs, in. [mm] | Diameter of Barbs, Steel Wire Gage <sup>A</sup> | Shape of Barbs |
|-------------------------------------|-----------------------|-------------------------------------------|-----------------------|----------------------------|-------------------------------------------------|----------------|
| Metallic Coating Type A             |                       |                                           |                       |                            |                                                 |                |
| 12-4-3-14R <sup>B</sup>             | 12½                   | 0.099 [2.51]                              | 4                     | 3 [76]                     | 14                                              | Round          |
| 12-4-5-14R                          | 12½                   | 0.099 [2.51]                              | 4                     | 5 [127]                    | 14                                              | Round          |
| Metallic Coating Type Z and Type ZA |                       |                                           |                       |                            |                                                 |                |
| 12-2-4-12F                          | 12½                   | 0.099 [2.51]                              | 2                     | 4 [102]                    | 12½ <sup>C</sup>                                | Flat           |
| 12-2-4-13F                          | 12½                   | 0.099 [2.51]                              | 2                     | 4 [102]                    | 13 <sup>C</sup>                                 | Flat           |
| 12-2-4-14R                          | 12½                   | 0.099 [2.51]                              | 2                     | 4 [102]                    | 14                                              | Round          |
| 12-2-5-12F                          | 12½                   | 0.099 [2.51]                              | 2                     | 5 [127]                    | 12½ <sup>C</sup>                                | Flat           |
| 12-2-5-14R                          | 12½                   | 0.099 [2.51]                              | 2                     | 5 [127]                    | 14                                              | Round          |
| 12-4-5-14H                          | 12½                   | 0.099 [2.51]                              | 4                     | 5 [127]                    | 14 <sup>C</sup>                                 | Half-round     |
| 12-4-5-14R                          | 12½                   | 0.099 [2.51]                              | 4                     | 5 [127]                    | 14                                              | Round          |
| 13-2-4-14R                          | 13½                   | 0.086 [2.18]                              | 2                     | 4 [102]                    | 14                                              | Round          |
| 13-4-5-14R                          | 13½                   | 0.086 [2.18]                              | 4                     | 5 [127]                    | 14                                              | Round          |
| 15-2-5-13F                          | 15½                   | 0.067 [1.70]                              | 2                     | 5 [127]                    | 13¾ <sup>C</sup>                                | Flat           |
| 15-2-5-14R                          | 15½                   | 0.067 [1.70]                              | 2                     | 5 [127]                    | 14                                              | Round          |
| 15-4-5-16R                          | 15½                   | 0.067 [1.70]                              | 4                     | 5 [127]                    | 16½                                             | Round          |

<sup>A</sup>The nominal diameter of the wire used in making the 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] |

<sup>B</sup>Design Number 12-4-3-12R, Metallic Coated Type A, is High-Security Grade. All other design numbers are for standard grade.

<sup>C</sup>The gage of the half-round and flat barbs is designated by the gage of the round wire from which the barbs are rolled.

TABLE 2 Minimum Weight of Coating on Type Z Barbed Wire

| Size, Steel Wire Gage | Nominal Diameter of Type Z |        | Minimum Weight of Coating of Uncoated Wire Surface, oz/ft <sup>2</sup> [g/m <sup>2</sup> ] |            |
|-----------------------|----------------------------|--------|--------------------------------------------------------------------------------------------|------------|
|                       | 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] | <sup>A</sup>                                                                               | 0.70 [215] |
| 14                    | 0.080                      | [2.03] | 0.25 [75]                                                                                  | 0.70 [215] |
| 15½                   | 0.067                      | [1.70] | <sup>A</sup>                                                                               | 0.65 [200] |
| 16½                   | 0.058                      | [1.47] | <sup>A</sup>                                                                               | 0.60 [200] |

<sup>A</sup>These sizes only furnished with Class 3 Coating (Section 8).

TABLE 3 Minimum Weight of Coating on Type ZA Barbed Wire

| Size Wire Gage | Nominal Diameter of Type ZA Wire |        | Minimum Weight of Coating of Uncoated Wire Surface, oz/ft <sup>2</sup> [g/m <sup>2</sup> ] Class <sup>A</sup> |    |    |    |     |     |
|----------------|----------------------------------|--------|---------------------------------------------------------------------------------------------------------------|----|----|----|-----|-----|
|                | in.                              | [mm]   | 20                                                                                                            | 40 | 60 | 80 | 100 | 120 |
| 12½            | 0.099                            | [2.51] | X <sup>B</sup>                                                                                                | X  | X  | X  | X   | X   |
| 13             | 0.092                            | [2.32] | X                                                                                                             | X  | X  | X  | X   | X   |
| 13½            | 0.086                            | [2.18] | X                                                                                                             | X  | X  | X  | X   | X   |
| 13¾            | 0.083                            | [2.11] | X                                                                                                             | X  | X  | X  | X   | X   |
| 14             | 0.080                            | [2.03] | X                                                                                                             | X  | X  | X  | X   | X   |
| 15½            | 0.067                            | [1.70] | X                                                                                                             | X  | X  | X  | X   | X   |
| 16½            | 0.058                            | [1.47] | X                                                                                                             | X  | X  | X  | X   | X   |

|                            |      |      |      |      |      |      |
|----------------------------|------|------|------|------|------|------|
| <sup>A</sup> Coating Class | 20   | 40   | 60   | 80   | 100  | 120  |
| Coating Weight             |      |      |      |      |      |      |
| oz/ft <sup>2</sup>         | 0.20 | 0.40 | 0.60 | 0.80 | 1.00 | 1.20 |
| (g/m) <sup>2</sup>         | 61   | 122  | 183  | 244  | 305  | 366  |

<sup>B</sup>X denotes availability.

## 5. Ordering Information

5.1 Orders for material under this specification shall include the following information, as necessary to describe the desired product.

5.1.1 Name of material (steel barbed wire),

5.1.2 Quantity (number of spools and length of barbed wire on each, or total length) (see 7.5 for standard size of spools),

5.1.3 Metallic coating type (see 4.3),

5.1.4 Metallic coating class (for Types Z and ZA) (see Table 2 or Table 3),

5.1.5 Design Number (see Table 1),

5.1.6 For Coating Type A barbed wire, whether aluminum alloy barbs are required or prohibited (see 6.2.1). If not stated, the choice shall be at the manufacturer's option,

5.1.7 ASTM designation and year of issue, and

5.1.8 Certification or test report, or both, if required.

NOTE 2—A typical ordering description is as follows: Steel barbed wire, 20 spools of 80 rods each, Coating Type Z, Coating Class 3, Design Number 12-2-4-14R, to ASTM Specification A 121-99, with certification.

5.2 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 agreement.

## 6. Material

6.1 *Base Metal*—The base metal of the steel strand wires and steel barbs shall be of good commercial quality carbon steel, capable of meeting the breaking strength requirement in 7.7. The base metal for aluminum barbs (permitted with metallic Coating Type A) shall be aluminum alloy wire conforming to Alloy 5000-H38, Alloy 6061-T94, or equal.

6.1.1 For Coating Type A barbed wire, the choice of whether aluminum-coated steel wire or aluminum alloy wire for the barbs shall be that of the manufacturer, unless otherwise specified by the purchaser. If aluminum alloy wire is used, the particular alloy shall be agreed upon between the manufacturer and the purchaser at the time the order is placed.

6.2 *Coating Materials*—The coating on the wire shall conform with the requirements of the following specifications:

6.2.1 *Coating Type A*—Aluminum-coated wire in accordance with Specification A 809.

6.2.2 *Coating Type Z*—Zinc-coated wire in accordance with Specification A 641/A 641M.

6.2.3 *Coating Type ZA*—Zinc-5 % aluminum-mischmetal alloy (Zn-5Al-MM) coated wire in accordance with Specification A 856/A 856M.

