



Designation: A411 – 08 (Reapproved 2022)

Standard Specification for Zinc-Coated (Galvanized) Low-Carbon Steel Armor Wire¹

This standard is issued under the fixed designation A411; 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.

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

1. Scope

1.1 This specification covers zinc-coated low-carbon steel wire for use in armoring for protection against damage of submarine and underground cables used for communication, control, or power purposes.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
A938 Test Method for Torsion Testing of Wire
B6 Specification for Zinc
E8/E8M Test Methods for Tension Testing of Metallic Materials

3. Ordering Information

3.1 It shall be the responsibility of the purchaser to specify all requirements that are necessary for material under this specification. Such requirements may include, but are not limited to, the following information:

3.1.1 Quantity of each size,

¹ 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.

Current edition approved April 1, 2022. Published May 2022. Originally approved in 1957. Last previous edition approved in 2017 as A411 – 08(2017). DOI: 10.1520/A0411-08R22.

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.

3.1.2 Wire size, diameter in inches or (millimetres) (Section 12), and

3.1.3 Weight (Mass), inside diameter, and method of banding of coils.

4. Zinc for Coating

4.1 The slab zinc used for the coating shall be any grade of zinc conforming to Specification B6.

5. Base Metal

5.1 The base metal shall be manufactured by any commercially accepted steel making practice, and of such quality that, when processed and zinc-coated, the finished wire shall have the properties prescribed in this specification.

6. Joints

6.1 The wire shall be furnished in coils of one continuous length. Welds made prior to final wire drawing shall be permitted.

7. Tensile Strength

7.1 The zinc-coated wire shall have a tensile strength of not less than 50 000 psi (345 MPa), nor more than 70 000 psi (483 MPa). The tensile strength of the zinc-coated wire shall be determined in accordance with Test Methods E8/E8M. The diameter of the wire shall be measured over the zinc coating for the purpose of calculating the tensile strength.

8. Elongation

8.1 The zinc-coated wire shall have an elongation of not less than 10 % in 10 in. (254 mm) for nominal sizes 0.284 in. (7.21 mm) and smaller. Nominal sizes larger than 0.284 in. shall have an elongation of not less than 9 % in 10 in. The elongation shall be determined as the permanent increase in length after failure of a marked section of the wire originally 10 in. in length.

9. Torsion Test

9.1 The zinc-coated wire shall withstand without fracture the minimum number of turns specified in Table 1. This test shall be done in accordance with Test Method A938 and the number of turns to failure shall meet the requirements of Table 1.