Designation: A 459 – 08

Standard Specification for Zinc-Coated Flat Steel Armoring Tape[1]

This standard is issued under the fixed designation A 459; 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 requirements for zinc-coated flat steel tape in coils for use as interlocking armor and flat armor for electrical cables. The zinc-coated tape is produced with three classes of zinc coating weight.

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.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 90/A 90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

A 902 Terminology Relating to Metallic Coated Steel Products

B 6 Specification for Zinc

3. Terminology

3.1 *Definitions*—See Terminology A 902 for definitions of general terminology relating to metallic-coated steel products.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Quantity of each size,

4.1.2 Width and thickness (see 13),

4.1.3 Class of coating (see 11), and

4.1.4 Packaging requirements (see 17).

5. Materials and Manufacture

5.1 The base metal shall be steel made by the basic-oxygen, or electric-furnace process and of such quality that when processed and coated with zinc, the finished tape shall have the properties and characteristics prescribed in this specification.

5.2 The uncoated tape shall have a mill finish and may have either a mill or slit edge. If the uncoated tape is manufactured by slitting or shearing, slitting burrs shall be kept to a minimum consistent with good commercial practice.

5.3 The zinc shall be applied by either the hot-dip or the electrogalvanizing process by a final operation so that all surfaces including edges are coated.

5.4 The slab zinc when used shall conform to any grade of zinc described in Specification B 6.

6. Joints

6.1 The zinc-coated tape shall be furnished in coils of one continuous length, with not more than an average of one weld/50 lb (23 kg). Only welds made prior to the zinc coating operation shall be permitted and the area of such welds shall conform to the standard tolerance for thickness. The welds shall be smooth and free of sharp projections.

7. Sampling

7.1 During the visual inspection specified in Section 16, the inspector shall select at random, 1 sample coil from every 10 coils in the first 100 coils of the lot and 1 sample coil for every additional 35 coils, but not less than 3 coils from the entire lot.

7.2 From each coil of zinc-coated tape thus selected, a sample of suitable length shall be taken for the weight of coating and the mechanical tests as specified in Sections 8 to 12.

7.3 Any sample that indicates the presence of a weld shall be discarded and another sample shall be taken from the coil for testing.

8. Tensile Strength

8.1 The zinc-coated tape shall have a tensile strength of 70 ksi (483 MPa), maximum. The tensile strength shall be determined on longitudinal specimens consisting of the full width of the tape when practical, or a straight specimen cut or sheared from the center of the tape.

9. Elongation

9.1 The zinc-coated tape shall have an elongation of not less than 10 % in 10 in. (254 mm). The elongation shall be determined as the permanent increase in length, after failure of a marked section of the tape specimen originally 10 in. in length.

[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 A05.11 on Sheet Specifications.

Current edition approved May 1, 2008. Published May 2008. Originally approved in 1961. Last previous edition approved in 2003 as A 459 – 97 (2003).

[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.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

10. Ductility

10.1 The tape shall be capable of being bent flat on itself, either lengthwise or crosswise, without indication of failure. There shall be no base metal cracks along any bend visible to the naked eye. Cracks at sheared edges and coarse grains on the bends of any specimens may be disregarded. Flaking or cracking of the galvanized finish shall not be interpreted as a failure of the material.

11. Weight of Coating

11.1 The weight of zinc coating shall not be less than that prescribed for the class specified, as follows:

Class	Weight of Zinc Coating, oz/ft^2 (g/m^2) (Total of Both Surfaces and Both Edges)
Class I	0.35 (110)
Class II	0.70 (210)
Class III	1.00 (300)

11.2 The weight of zinc coating specified is the total amount on both surfaces and both edges of the tape in ounces per square foot (grams per square metre). The weight of zinc coating shall be calculated in accordance with the section on zinc-coated articles other than sheet or wire of Test Method A 90/A 90M, using the following equation:

$$C = [(W_1 - W_2)/A) \times N$$

11.3 The weight of coating shall be determined by the Hydrochloric Acid-Antimony Chloride Method prescribed in Test Method A 90.

12. Adherence of Coating

12.1 The zinc coating shall remain adherent without flaking or spalling when the tape is subjected to a 180° bend over a mandrel of the following diameter:

Class	Diameter of Mandrel, in. (mm)
Classes I and II	1/8 (3.18)
Class III	5/8 (15.88)

12.2 The zinc coating shall be considered as meeting this requirement if, when the tape is bent around the specified mandrel, the coating does not flake and none of it can be removed from the tape by rubbing with the fingers. Loosening or detachment during the adherence test of superficial small particles of zinc formed by mechanical polishing of the surface of the zinc-coated tape shall not constitute failure in this test.

13. Permissible Variations in Dimensions

13.1 *Width and Thickness*—The width and thickness of the finished tape shall be expressed in decimal fractions of an inch. The variations in the width and thickness of zinc-coated armoring tape shall be within the limits specified in Table 1.

13.2 *Camber*—The permissible camber for zinc-coated tape shall not exceed the amounts specified in Table 2.

14. Workmanship and Finish

14.1 The surface of the tape shall be free of injurious scale, flaws, seams and splits, and other imperfections not consistent with good commercial practice. The zinc coating shall be smooth and continuous.

15. Inspection

15.1 The manufacturer shall afford the inspector representing the purchaser all reasonable facilities, without charge, to satisfy him that the material is being furnished in accordance with this specification. All tests and inspections shall be made at the place of manufacture prior to shipment, unless otherwise agreed upon at the time of the purchase, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

16. Rejection

16.1 The inspector shall visually examine the entire shipment or lot of coils for surface imperfections. The purchaser may reject the entire lot if after visual examination, more than 3 % of the coils in the entire lot are found defective, or if more than 3 % of the samples selected in accordance with Section 6 fail to pass any of the tests specified in Sections 8 to 13. If not more than 3 % of the samples fail, a second set of samples, consisting of two specimens from each of the coils from which the original nonconforming samples were taken, shall be cut and tested for the nonconforming properties. If any of these samples fail, the purchaser may reject the entire lot.

17. Packaging

17.1 The finished zinc-coated tape shall be furnished in compact coils reasonably symmetrical in shape. The weight, inside diameter, and method of banding of the coils shall be agreed upon between the manufacturer and the purchaser.

TABLE 1 Permissible Variations in Dimensions of Zinc-Coated Tape

Nominal Ordered Width, in. (mm)	Width Tolerance, in. (mm)	Nominal Ordered Thickness, in. (mm)	Thickness Tolerance, in. (mm)
0 to 1.500 (0 to 38.100), incl	±0.008 (±0.20)	0.020 to 0.025 (0.51 to 0.635)	+0.002 (+0.05) −0.001 (−0.03)
		0.0251 to 0.035 (0.64 to 0.889)	+0.0025 (+0.06) −0.0015 (−0.04)
		0.0351 to 0.045 (0.892 to 1.143)	+0.003 (+0.08) −0.002 (−0.05)
		0.0451 to 0.063 (1.15 to 1.600)	+0.0035 (+0.09) −0.0025 (−0.06)
1.5001 to 3.000 (38.103 to 76.20), incl	±0.010 (±0.25)	0.020 to 0.025 (0.51 to 0.635)	+0.002 (+0.05) −0.002 (−0.05)
		0.0251 to 0.035 (0.64 to 0.889)	+0.003 (+0.08) −0.002 (−0.02)
		0.0351 to 0.045 (0.892 to 1.143)	+0.003 (+0.08) +0.004 (+0.01)
		0.0451 to 0.063 (1.15 to 1.600)	−0.003 (−0.08)

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

TABLE 2 Permissible Camber of Zinc-Coated Tape

Nominal Ordered Width, in. (mm)	Permissible Camber, in. in 8 ft
0 to 1.500 (0 to 38.100), incl	0.50
1.501 to 3.000 (38.103 to 76.20), incl	0.25

18. Marking

18.1 A durable tag showing the nominal size of tape and the name or mark of the manufacturer shall be securely attached to one coil on each pallet. The starting end of each coil shall be indicated by a suitable tag.

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS

Not for Resale