



Standard Specification for Steel Sheet, Metallic Coated and Polymer Precoated for Corrugated Steel Pipe¹

This standard is issued under the fixed designation A 742/A 742M; 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 Department of Defense.

1. Scope *

1.1 This specification covers polymer precoated steel sheet for corrugated steel pipe (CSP) which is coated after metallic coating on continuous lines by coil coating (roller coating or laminating) processes. The metallic coating is either zinc, 55 % aluminum-zinc alloy, or zinc-5 % aluminum-mischmetal alloy. Sheet for this purpose is furnished flat in coils, flat in cut lengths, or corrugated in cut lengths, all being protected by a mill-applied polymer coating on both sides.

1.2 This specification is applicable to orders in either inch-pound units (as A 742) or acceptable SI units (as A 742M). Inch-pound units and SI units are not necessarily equivalent. SI units are shown in brackets in the text, but they are the applicable values when the material is ordered to A 742M.

1.3 The following precautionary caveat refers only to the test method portion, Section 9, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- A 929/A 929M Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe²
- D 543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents³
- D 658 Test Method for Abrasion Resistance of Organic Coatings by the Air-Blast Abrasion Test⁴
- D 1005 Test Methods for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers⁴
- D 2794 Test Method for Resistance of Organic Coatings on the Effects of Rapid Deformation (Impact)⁴

¹ This specification is under the jurisdiction of ASTM Committee A-5 on Metallic Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.11 on Sheet Specifications.

Current edition approved Dec. 10, 1998. Published April 1999. Originally published as A 742 – 77. Last previous edition A 742/A 742M – 95.

² Annual Book of ASTM Standards, Vol 01.06.

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 06.01.

G 22 Practice for Determining Resistance of Plastics to Bacteria⁵

G 23 Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials³

G 62 Test Methods for Holiday Detection in Pipeline Coatings⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *fabricator*—in this specification, fabricator refers to the producer of the pipe.

3.1.2 *manufacturer*—in this specification, manufacturer refers to the producer of the sheet.

3.1.3 *purchaser*—in this specification, purchaser refers to the purchaser of the finished pipe.

3.2 Abbreviations:

3.2.1 55 Al-Zn—55 % aluminum-zinc.

3.2.2 MM—mischmetal.

3.2.3 Zn-5 Al-MM—zinc-5 % aluminum-mischmetal.

4. Classification

4.1 The polymer coating is classified by grade corresponding to the thickness in mils (thousandths inch) on each side in inch-pound units and the thickness in micrometres on each side in SI units.

Grade	Coating Thickness	
	in.	[μm]
10/10 [250/250]	0.010/0.010	[250/250]

4.2 Any combination of polymer coating thickness other than shown above is subject to agreement between the manufacturer and purchaser or fabricator.

5. Ordering Information

5.1 The polymer precoated sheet covered by this specification shall be ordered only to the specified thickness listed in Table 1. The specified thickness is based on the thickness of the metallic-coated steel sheet, not including the thickness of the polymer coating.

5.2 Orders for material to this specification shall include the

⁵ Annual Book of ASTM Standards, Vol 14.02.

*A Summary of Changes section appears at the end of this standard.

ASTM A 742/A 742M

TABLE 1 Thicknesses of Metallic-Coated Steel Sheet^A

Specified Thickness, in. [mm]	Specification Designation		
	A 444/A 444M Zinc-Coated	A 806/A 806M 55 Al-Zn Alloy Coated	A 916/A 916M Zn-5 Al-MM Alloy Coated
0.040 [1.02]	X	X	X
0.052 [1.32]	X	X	X
0.064 [1.63]	X	X	X
0.079 [2.01]	X	X	X
0.109 [2.77]	X	X	X
0.138 [3.51]	X	X	X
0.168 [4.27]	X		X

^AAn "X" indicates sheet thicknesses which are available in the corresponding coating type.

following information, as necessary, to adequately describe the desired product.

5.2.1 Name of material (polymer precoated steel sheet for CSP),

5.2.2 Type of metallic coating (see 6.1),

5.2.3 ASTM designation and year of issue, as A 742 — ____ for inch-pound units or A 742M — ____ for SI units,

5.2.4 Corrugation size, if corrugated (see 6.3),

5.2.5 Substrate dimensions (specified thickness; width, either flat or overall corrugated; and length, if cut length),

5.2.6 Grade of polymer coating (see Section 4), indicating thickness on each side,

5.2.7 Coil size requirements (specify maximum outside diameter (OD), acceptable inside diameter (ID), and maximum weight),

5.2.8 Certification, if required (see 11.1), and

5.2.9 Special requirements.

NOTE 1—Typical ordering descriptions are as follows:

Polymer precoated steel sheet, zinc-coated for CSP, conforming to ASTM A 742 — ____, 2 $\frac{3}{8}$ by $\frac{1}{2}$ -in. corrugations, 0.064 by 25 $\frac{1}{2}$ by 60 in., with Grade 10/10 polymer coating (0.010 in./0.010 in.), certified with test report.

[Polymer precoated steel sheet, aluminum-zinc alloy coated for CSP, conforming to ASTM A 742M — ____, 2.77 by 700 mm by coil, with Grade 250/250 polymer coating; coil 1200-mm max outside diameter, 600-mm inside diameter, 10 000-kg max coil weight.]

6. General Requirements

6.1 The metallic-coated substrate shall conform to all applicable requirements of Specification A 929/A 929M for zinc coating, 55 % aluminum-zinc alloy coating, or zinc-5 % aluminum-mischmetal alloy coating, whichever is stated in the order. If the type of metallic coating is not stated in the order, zinc-coated steel sheet shall be furnished.

6.2 The polymer coating shall be capable of being applied to the sheet specified in 6.1. After application, the polymer coating shall be free of holes, tears, and discontinuities, and shall be sufficiently flexible so that it will withstand the corrugating, forming, and lockseaming operations, and punching of holes for rivets or perforations.

6.3 If the polymer-coated sheet is to be furnished with corrugations, the corrugations shall conform to the requirements stated in Specification A 929/A 929M.

7. Requirements for Polymer Coating

7.1 *Adhesion*—There shall be no spalling or cracking of the

coating, or disbonding of the coating at the cut, when tested in accordance with 9.1.

7.2 *Impact*—There shall be no break in the polymer coating when tested in accordance with 9.2.

7.3 *Thickness of Coating*—The thickness of the polymer coating shall meet the requirements of Section 4, or as specified in the purchase order, when tested in accordance with 9.3. The thicknesses indicated are minimum values at any point not less than $\frac{3}{8}$ in. [10 mm] from an edge.

7.4 *Holidays*—The polymer coating on the steel shall be substantially free of holidays when tested in accordance with 9.4. An average of two holidays per square foot [22 holidays per square metre] of actual surface area on the test specimen shall be permitted.

NOTE 2—Holidays are pinholes or voids in the polymer coating that are not visually discernible.

7.5 *Abrasion Resistance*—The average abrasion coefficient when tested in accordance with 9.5, shall be a minimum of 100 (expressed in g/mil of thickness) or 3.9 [expressed in g/ μ m of thickness].

7.6 *Imperviousness*—There shall be no loosening or separation of the polymer coating from the metallic-coated steel substrate when tested in accordance with 9.6.

7.7 *Freeze-Thaw Resistance*—The specimen shall withstand 100 freeze-thaw cycles, as described in 9.7, without spalling, disbonding, or other detrimental effects.

7.8 *Weatherability*—The specimens shall withstand 100 h of weathering with no observable delamination or cracking, when tested in accordance with 9.8.

7.9 *Resistance to Microbial Attack*—There shall be no effect of microbial attack of the polymer coating when tested in accordance with 9.9.

NOTE 3—Tests 7.1 through 7.4 are suggested as quality control tests. When these tests are used for quality control, they may be run at room temperature only. Tests 7.5 through 7.9 are suggested as qualifying tests. However, the purchaser may use any of the tests listed to verify compliance.

8. Sampling and Testing

8.1 The manufacturer shall make adequate tests and measurements to ensure that the material produced complies with this specification.

8.1.1 Test results to show compliance with this specification shall be retained by the manufacturer for seven years and shall be made available to the fabricator and purchaser upon request.

8.2 The fabricator or purchaser may conduct such of the tests as are determined necessary to determine the acceptability of the material or to verify the correctness of a certification.

8.3 Flat samples of polymer precoated steel shall be taken by the manufacturer from each coil or in accordance with the sampling procedure as mutually agreed upon between the manufacturer and the purchaser. Each sample shall be at least 24 in. [600 mm] long by the coil width and shall carry an identification to relate it to the coil from which it was taken.

9. Test Methods for Polymer Coatings

9.1 *Adhesion*:

9.1.1 *Scope*—This procedure measures the adhesion of the polymer coating to the metallic-coated substrate.