Designation: A924/A924M – 14

Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process[1]

This standard is issued under the fixed designation A924/A924M; 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 the general requirements that, unless otherwise specified in the product specification, apply to steel sheet in coils and cut lengths, metallic-coated on continuous lines by the hot-dip process. The product is intended for applications requiring corrosion resistance. The product specifications contain requirements for specific strength levels, heat resistance, paintability, or formability, or a combination thereof.

1.2 Subject to individual product specification provisions, steel sheet is available as Commercial Steel (CS) Types A, B, and C, Forming Steel (FS), Drawing Steel (DS), Deep Drawing Steel (DDS), Extra Deep Drawing Steel (EDDS), High Temperature Steel (HTS), Structural Steel (SS), and High Strength Low Alloy Steel (HSLAS). Steel sheet is produced with the following metallic coatings. Specific information on each of the following is contained in the individual product specification:

1.2.1 Zinc or zinc-iron alloy coated,

1.2.2 Zinc-5 % aluminum alloy coated,

1.2.3 55 % aluminum–zinc alloy coated,

1.2.4 Aluminum–coated,

1.2.5 Terne (lead-tin alloy) coated, and

1.2.6 Zinc-aluminum-magnesium alloy coated.

1.3 Products covered by this general requirements specification are described in the following product standards: Specifications A308/A308M; A463/A463M; A653/A653M; A755/A755M; A792/A792M; A875/A875M; A929/A929M; A1046/A1046M; A1057/A1057M; A1063/A1063M; and A1079.

1.4 Metallic-coated steel sheet is produced to various coating designations, as shown in the individual product specifications. Except for differentially coated sheet, the coating is always expressed as the total coating of both surfaces.

1.5 In case of any conflict in requirements, the requirements of the individual product specifications shall prevail over those of this general specification.

1.6 The purchaser is permitted to specify additional requirements that do not negate any of the provisions of this general specification or of the individual product specifications. Such additional requirements, the acceptance of which are subject to negotiation with the supplier, shall be included in the order information.

1.7 For purposes of determining conformance with this specification and the various product specifications referenced in 1.3, values shall be rounded to the nearest unit in the right-hand place of figures used in expressing the limiting values (except to the nearest 5 MPa for SI strength values) in accordance with the rounding method of Practice E29.

1.8 Metallic-coated steel sheet covered by this specification is produced to thickness requirements expressed to 0.001 in. [0.01 mm] for both coils and cut lengths. The thickness is the total of the base steel and the coating.

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

1.10 The values stated in inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other.

1.11 This specification and some of the applicable product specifications are expressed in both inch-pound and SI units. However, unless the order specifies the applicable "M" specification designation (SI units), the product shall be furnished to inch-pound units.

1.12 *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.*

[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.

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

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

A308/A308M Specification for Steel Sheet, Terne (Lead-Tin Alloy) Coated by the Hot-Dip Process

A309 Test Method for Weight and Composition of Coating on Terne Sheet by the Triple-Spot Test

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A428/A428M Test Method for Weight [Mass] of Coating on Aluminum-Coated Iron or Steel Articles

A463/A463M Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process

A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment (Withdrawn 2014)[3]

A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

A754/A754M Test Method for Coating Weight (Mass) of Metallic Coatings on Steel by X-Ray Fluorescence

A755/A755M Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products

A792/A792M Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

A875/A875M Specification for Steel Sheet, Zinc-5 % Aluminum Alloy-Coated by the Hot-Dip Process

A902 Terminology Relating to Metallic Coated Steel Products

A929/A929M Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe

A1030/A1030M Practice for Measuring Flatness Characteristics of Steel Sheet Products

A1046/A1046M Specification for Steel Sheet, Zinc-Aluminum-Magnesium Alloy-Coated by the Hot-Dip Process

A1057/A1057M Specification for Steel, Structural Tubing, Cold Formed, Welded, Carbon, Zinc-Coated (Galvanized) by the Hot-Dip Process

A1063/A1063M Specification for Steel Sheet, Twin-Roll Cast, Zinc-Coated (Galvanized) by the Hot-Dip Process

A1079 Specification for Steel Sheet, Complex Phase (CP), Dual Phase (DP) and Transformation Induced Plasticity (TRIP), Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Testing Methods

2.2 *Federal Standard:*[4]

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)

3. Terminology

3.1 *Definitions*—For definitions of items used in this specification, refer to Terminology A902.

4. Ordering Information

4.1 Ordering information for all products are shown in the individual product specifications.

5. Materials and Manufacture

5.1 Hot-dip metallic coatings are used to provide corrosion protection to steel sheets. Hot-dip metallic coatings are available in six different types, zinc and zinc-iron alloy, lead-tin alloy (Terne), aluminum, 55 % aluminum-zinc alloy, zinc-5 % aluminum alloy, and zinc-aluminum-magnesium alloy. Each coating type is available in various coating weights which provide varying degrees of corrosion protection and the consumer should consult the individual producers for applicability to the intended application and to obtain product information.

5.2 Hot-dip metallic coated products may be subject to changes in mechanical properties after coating. As such changes are functions of the chemistry and processing history of the material, the consumer should consult the individual producers for applicability to the intended application.

6. Chemical Composition

6.1 *Base Steel:*

6.1.1 Chemical composition requirements of the base steel are shown in the individual product specifications.

6.1.2 An analysis of each heat shall be made by the manufacturer to determine the percentage of carbon, manganese, phosphorus, sulfur, and any other elements specified or restricted by the individual product specification.

6.1.3 When desired, product analysis shall be made by the purchaser on finished product. The product analysis so determined shall meet the tolerances shown in Table 1.

6.1.3.1 Capped or rimmed steels are not technologically suited to product analysis due to the nonuniform character of their chemical composition, and therefore, the tolerances in Table 1 do not apply. Product analysis is appropriate on these steels only when misapplication is apparent.

6.1.3.2 Product analysis for phosphorus or sulfur is not technologically appropriate because of segregation of these elements in non-killed steels. Product analysis is appropriate only when misapplication is apparent.

6.1.3.3 Samples for product analysis shall be drillings through areas stripped free of coating. At least three pieces shall be selected, but if the product of more than one mill lift or coil is involved, at least six pieces shall be selected.

[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] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from Yale University Library, Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111–5094, Attn: NPODS.

TABLE 1 Product Analysis Tolerances

Element	Limited or Maximum of Specified Element, %	Tolerance	
		Under Minimum Limit	Over Maximum Limit
Carbon	To 0.15, incl	0.02	0.03
	Over 0.15 to 0.40, incl	0.03	0.04
	Over 0.40 to 0.80, incl	0.03	0.05
Manganese	To 0.60, incl	0.03	0.03
	Over 0.60 to 1.15, incl	0.04	0.04
	Over 1.15 to 1.65, incl	0.05	0.05
Phosphorus	. . .	. . .	0.01
Sulfur	. . .	. . .	0.01
Silicon	To 0.30, incl	0.02	0.03
	Over 0.30 to 0.60	0.05	0.05
Copper	. . .	0.02	. . .
Titanium	To 0.10, incl	0.01[A]	0.01
Vanadium	To 0.10, incl	0.01[A]	0.01
	Over 0.10 to 0.25, incl	0.02	0.02
	Minimum only specified	0.01	. . .
Columbium	To 0.10, incl	0.01[A]	0.01

[A]If the minimum of the range is 0.01 %, the under tolerance is 0.005 %.

6.1.3.4 When supplying High-Strength Low-Alloy Steel (HSLA), some producers use one or more microalloying elements as strengthening agents or use alloy additions to effect inclusion control, or both. The producer shall be consulted for the specific chemical composition applied. If any alloying addition is known to be of concern to the user, the producer shall be notified of this concern.

6.1.4 *Method of Analysis*—The determination of chemical composition is permitted to be made by any test method, except in case of dispute, where the referee test methods listed in the section on test methods of Test Methods A751 shall be used.

6.2 *Coating:*

6.2.1 *Coating Analysis*—The nominal composition of the coating is described in the individual product specification.

6.2.2 *Method of Analysis*—The determination of chemical composition shall be made in accordance with acceptable chemical, spectrochemical, or other test methods.

7. Tests for Mechanical Properties

7.1 Test specimens shall be prepared from finished metallic-coated product.

7.2 *Mechanical Properties-Base Metal*—When base metal mechanical properties are specified, tests shall be conducted in accordance with Test Methods A370. Requirements for all mechanical properties are included in the individual product specifications.

7.2.1 *Tension Tests*—Specimens for base-metal tension tests shall be taken longitudinally, approximately midway between the center and edge of the product as rolled, and shall conform to the requirements for the sheet-type test specimen in the figure for rectangular tension test specimens of Test Methods A370.

7.2.1.1 The determination of the yield strength and tensile strength values shall be based on the as-produced base-metal thickness that shall be obtained by one of the following methods. Unless specified in the order, the producer shall determine the method to be used; however, in the event of a dispute the method in 7.2.1.2 shall be used.

7.2.1.2 The base metal thickness shall be determined by stripping the coating from the ends of the specimen contacting the grips of the tension testing machine. The thickness measurement shall be made before testing on an end of the specimen that has been stripped free of coating.

7.2.1.3 The base metal thickness shall be determined by subtracting the coating thickness from the measured thickness of the tension test specimen. The coating thickness shall be calculated from the coating weight [mass] test.

8. Tests for Coating Properties

8.1 *Coating Weight [Mass]:*

8.1.1 Coating weight [mass] shall conform to the requirements prescribed in the individual product specifications (see 1.3).

8.1.2 The coating weight [mass] is ordered as total both sides requirements, or if requested on those product specifications permitting it, to single side/single spot coating mass requirements.

8.1.3 Total both sides requirements

8.1.3.1 The coating weight [mass] of equally coated product is the total amount on both sides of the sheet, expressed in ounces per square foot [grams per square metre] of sheet.

8.1.3.2 For differentially coated product, the coating weight [mass] on each surface is nominally one half of the stated coating designation.

8.1.4 Single side/single spot requirements

8.1.4.1 The coating mass for each surface shall be specified separately, for example, 60G60G, and each single spot test shall meet the specified requirements for the coating designation.

8.2 *Coating Weight [Mass] Tests*—One of the following test methods shall be used:

8.3 *Weigh-Strip-Weigh Method:*

8.3.1 The weigh-strip-weigh method, described in Test Methods A90/A90M, A309, and A428/A428M, is a destructive test that determines coating weight [mass] by measuring the difference in weight [mass] between a coated and a stripped (uncoated) sample. If one surface is protected suitably during the initial stripping, coating weight [mass] can be determined for each surface independently.

8.3.2 Test specimens for product over 18 in. [450 mm] in width shall be taken from a representative sample piece approximately 1 ft [300 mm] in length by the associated width. Three test specimens shall be taken from the sample, one from the middle of the width and one from each edge. The edge samples shall not be taken closer than 2 in. [50 mm] from each edge. The test specimen shall have a minimum area of 5 in.^{2} [3200 mm^2].

8.3.3 For product 18 in. [450 mm] in width and narrower, only one test specimen is required. Specimens shall be at least 2 in. [50 mm] from the edge, when possible. For product narrower than 2.25 in. [60 mm] the test specimen shall be chosen to give a minimum area of 5 in.^{2} [3200 mm^2].

8.3.4 The triple-spot coating weight [mass] shall be the average of the determinations of the three tests done in accordance with the procedures in 8.3.2.

8.3.5 The total both sides minimum single-spot coating weight [mass] shall be that test result that is the lightest coating weight [mass], or in those cases where only one test is needed, it shall be that single test result.

8.3.6 The single side/single spot coating mass shall meet both the lower and upper limits of the specified coating designation.

8.3.7 The frequency of sampling shall be sufficient to adequately characterize the lot of material being tested.

8.4 *X-Ray Fluorescence Method:*

8.4.1 The X-ray fluorescence method is a nondestructive test that determines coating weight [mass] by converting X-ray fluorescence measurements to coating weight [mass] values. X-ray fluorescence gages can be used as off-line laboratory instruments or as a means of continuous on-line testing for conformance to coating weight [mass] requirements, or both.

8.4.2 *Off-Line Testing*—X-ray fluorescence gages can be used as off-line laboratory instruments to test for coating weight [mass] provided that they have been calibrated in accordance with Test Method A754/A754M and use the sample test locations as described in 8.3.2 or 8.3.3.

8.4.3 *On-Line Testing*—When X-ray fluorescence gages are used for on-line testing, they shall be operated in accordance with Test Method A754/A754M. A minimum of five random full-width traverses shall be used to characterize each coil tested.

8.4.3.1 The triple-spot coating weight [mass] of a coil shall be determined using the following procedure: from the individual edge, center, edge readings provided by the minimum five full width traverses, compute the average of one edge, the average of the center, and the average of the other edge. These three results shall then be averaged to obtain the triple-spot average of the coil.

8.4.3.2 The total both sides minimum single-spot coating weight [mass] shall be the lightest coating weight [mass] obtained from the individual edge, center, edge measurements provided by the minimum five full width traverses (lightest of at least fifteen readings—five from one edge, five from the center, and five from the other edge).

8.4.3.3 The single side/single spot minimum coating mass shall be the lightest coating mass obtained from the readings provided by the minimum five full width traverses.

8.4.3.4 The single side/single spot maximum coating mass shall be the heaviest coating mass obtained from the readings provided by the minimum five full width traverses.

8.5 *Coating Bend Test*—Refer to the individual product specification.

8.5.1 Coating bend test specimens shall be 2 to 4 in. [50 to 100 mm] wide. The specimen shall be cut not less than 2 in. [50 mm] from the edges of the test sheet.

9. Dimensions and Permissible Variations

9.1 The permissible variations for dimensions shall comply with the applicable limits in Tables 2-15.

9.2 The table of tolerances for thickness for measurements taken ⅜ in. from the edge are found in the Supplementary Requirements Section S1 of this specification. See the appropriate product specification for instructions on how to specify this table.

9.3 *Coil Winding:*

9.3.1 Metallic coated coils are typically wound with the intention that the sidewalls be nominally straight, i.e., that the

TABLE 2 Thickness Tolerances for Hot-Dip Metallic-Coated Sheet—1-in. [25–mm] Minimum Edge Distance

NOTE 1—The coated sheet thickness includes the base metal and coating and is measured at any point across the width of the coated sheet not less than 1 in. [25 mm] from a side edge.

NOTE 2—Micrometers used for measurement of thickness shall be constructed with anvils and spindles having minimum diameters of 0.188 in. [4.80 mm]. The tip of the anvil shall be flat or rounded with a minimum radius of curvature of 0.10 in. [2.55 mm] and the tip of the spindle shall be flat. Micrometers with conical tips shall not be used for thickness measurements of sheet steels.

Inch-Pound Units								
Specified Width, in.	Specified Ordered Thickness, in.[A]							
	0.023 and thinner	Over 0.023 through 0.043	Over 0.043 through 0.061	Over 0.061 through 0.075[B]	Over 0.075 through 0.101	Over 0.101 through 0.187	Over 0.187 through 0.229	Over 0.229 through 0.250
	Thickness Tolerances, Over, in., No Tolerance Under[C]							
To 32, inclusive	0.003	0.004	0.005	0.006	0.010	0.012	0.014	0.018
Over 32 to 40, inclusive	0.003	0.004	0.005	0.006	0.012	0.012	0.014	0.018
Over 40 to 60, inclusive	0.003	0.004	0.005	0.006	0.012	0.014	0.016	0.020
Over 60 to 72, inclusive	0.003	0.004	0.005	0.006	0.014	0.014	0.018	0.022
SI Units								
Specified Width, mm	Specified Ordered Thickness, mm[A]							
	0.4 and thinner	Over 0.4 through 1.0, inclusive	Over 1.0 through 1.5, inclusive	Over 1.5 through 2.0, inclusive[B]	Over 2.0 through 2.5, inclusive	Over 2.5 through 5.0, inclusive	Over 5.0 through 6.0, inclusive	Over 6.0 through 6.3, inclusive
	Thickness Tolerances, Over, mm, No Tolerance Under[C]							
To 1500, inclusive	0.08	0.10	0.13	0.15	0.30	0.34	0.42	0.50
Over 1500	0.08	0.10	0.13	0.15	0.34	0.34	0.46	0.52

[A] The specified thickness range captions apply independently of whether the ordered thickness is stated as a nominal or minimum. B

[B] If hot rolled substrate is used, it is permissible for the seller to provide total thickness tolerance 0.009 in. [0.23 mm], provided that the purchaser is notified and agrees.

[C] The tolerances provided in the table are based on minimum thickness (tolerance over, no tolerance under). For nominal thickness, the tolerance is divided equally over and under (tolerance over, tolerance under).

TABLE 3 Width Tolerances for Hot-Dip Metallic-Coated Sheet, Coils, and Cut Lengths, Not Resquared

Inch-Pound Units		
Specified Width, in.		Tolerance Over Specified Width, No Tolerance Under, in.
Over	Through	
12	30	1/8
30	48	3/16
48	60	1/4
60	72	5/16
SI Units		
Specified Width, mm		Tolerance Over Specified Width, No Tolerance Under, mm
Over	Through	
300	600	3
600	1200	5
1200	1500	6
1500	1800	8

TABLE 4 Length Tolerances for Hot-Dip Metallic-Coated Sheet, Cut Lengths, Not Resquared

Inch-Pound Units		
Specified Length, in.		Tolerance Over Specified Length, No Tolerance Under, in.
Over	Through	
12	30	1/8
30	60	1/4
60	96	1/2
96	120	3/4
120	156	1
156	192	1 1/4
192	240	1 1/2
240	. . .	1 3/4
SI Units		
Specified Length, mm		Tolerance Over Specified Length, No Tolerance Under, mm
Over	Through	
300	1500	6
1500	3000	20
3000	6000	35
6000	. . .	45

edges of each lap in the coil be nominally flush with each other throughout both walls of the coil. However, circumstances sometimes make it necessary to produce coils that have an intentional, back and forth, cyclic, stagger wound pattern on both sidewalls throughout the entire coil. The purchaser should contact the producer regarding any required limits on, or need for, stagger wound coils.

9.4 *Flatness Tolerances:*

9.4.1 Flatness tolerances for sheet are contained in Table 9 and in Table 10 for sheet specified to restricted flatness. Tables 11 and 12 contain flatness tolerances for SS, HSLAS, and HSLAS-F.

9.4.2 Measurement techniques for flatness characteristics are described in Practice A1030/A1030M.

9.4.3 Two alternative methods for flatness determination are the use of I-Units and % Steepness. A description of these two alternative methods is contained in Practice A1030/A1030M.

9.4.3.1 The use of I-Units or % Steepness as a flatness standard is subject to negotiation between the purchaser and the producer.

9.4.3.2 Measurement techniques for I-Units and % Steepness and rejection limits are subject to negotiation between the purchaser and producer.

TABLE 5 Camber Tolerances for Hot-Dip Metallic-Coated Sheet

NOTE 1—Camber is the greatest deviation of a side edge from a straight line, the measurement being taken on the concave side with a straightedge.

NOTE 2—The camber tolerances for sheet in cut lengths, not resquared, are as shown in this table.

Inch-Pound Units		
For Coils Over 12 in. in Width		
Cut Length, ft		Camber Tolerance,[A] in.
Over	Through	
. . .	4	1/8
4	6	3/16
6	8	1/4
8	10	5/16
10	12	3/8
12	14	1/2
14	16	5/8
16	18	3/4
18	20	7/8
20	30	1 1/4
30	40	1 1/2
SI Units		
For Coils Over 300 mm in Width		
Cut Length, mm		Camber Tolerance,[B] mm
Over	Through	
. . .	1200	4
1200	1800	5
1800	2400	6
2400	3000	8
3000	3700	10
3700	4300	13
4300	4900	16
4900	5500	19
5500	6000	22
6000	9000	32
9000	12 200	38

[A]The camber tolerance for sheet in coils is 1 in. in any 20 ft, except as shown in Table 14.
[B]The camber tolerance for sheet in coils is 25 mm in any 6000 mm, except as shown in Table 14.

TABLE 6 Diameter Tolerances for Hot-Dip Metallic-Coated Sheet, Sheared Circles

Inch-Pound Units				
Specified Thickness, in.		Tolerance Over Specified Diameter, No Tolerance Under, in.		
		Diameters		
Over	Through	Under 30	30 through 48	Over 48
. . .	0.61	1/16	1/8	3/16
0.061	0.101	3/32	5/32	7/32
0.101	. . .	1/8	3/16	1/4
SI Units				
Specified Thickness, mm		Tolerance Over Specified Diameter, No Tolerance Under, mm		
		Diameters		
Over	Through	Through 600	Over 600 Through 1200	Over 1200
. . .	1.5	1.5	3.0	5.0
1.5	2.5	2.5	4.0	5.5
2.5	. . .	3.0	5.0	6.5

10. Finish and Condition

10.1 Metallic-coated sheet intended for applications where surface appearance and controlled surface texture is of primary importance shall be ordered as “extra smooth”.

10.2 Metallic-coated sheet, when ordered as regular spangle or minimized spangle, is not subject to restrictions on surface texture.

TABLE 7 Out-of-Square Tolerances for Hot-Dip Metallic-Coated Sheet Cut Lengths, Not Resquared

NOTE 1—Out-of-square is the greatest deviation of an end edge from a straight line at right angles to a side and touching one corner. It is also obtained by measuring the difference between the diagonals of the cut length. The out-of-square deviation is one half of that difference.

Inch-Pound Units
For Coils Over 12 in. in Width
The tolerance for cut lengths of all thicknesses and all sizes is 1/16 in. in each 6 in. of width or fraction thereof.
SI Units
The tolerances for cut lengths of all thicknesses and all sizes is 1.0 mm in each 100 mm of width or fraction thereof.

TABLE 8 Resquared Tolerances for Hot-Dip Metallic-Coated Sheet

NOTE 1—When cut lengths are specified resquared, the width and length are not less than the dimensions specified. The individual tolerance for over-width, over-length, camber, or out-of-square shall not exceed the stated values.

Inch-Pound Units
For Cut-lengths Over 12 in. in Width
Shall not exceed 1/16 in. for cut lengths up to and including 48 in. in width and up to and including 120 in. in length. For cut lengths wider or longer the applicable tolerance is 1/8 in.
SI Units
Shall not exceed 1.6 mm for cut lengths up to and including 1200 mm in width and up to and including 3000 mm in length. For cut lengths wider or longer, the applicable tolerance is 3.2 mm.

TABLE 9 Flatness Tolerances for Hot-Dip Metallic-Coated Sheet, Cut Lengths

NOTE 1—This table applies to all designations except SS, HSLAS and HSLAS-F.

NOTE 2—This table also applies to sheet cut to length from coils by the consumer when adequate flattening measures are performed

Inch-Pound Units			
Specified Thickness, in.	Specified Width, in.		Flatness Tolerance,[A] in.
	Over	Through	
Through 0.048	12	36	3/8
	36	60	5/8
	60	72	7/8
Over 0.048	12	36	1/4
	36	60	3/8
	60	72	5/8
SI Units			
Specified Thickness, mm	Specified Width, mm		Flatness Tolerance,[A] mm
	Over	Through	
Through 1.0	300	900	10
	900	1500	15
	1500	. . .	20
Over 1.0	300	900	8
	900	1500	10
	1500	1800	15
	1800	. . .	20

[A]Maximum deviation from a horizontal flat surface.

10.3 Coil breaks, strain, and fluting may occur in such materials and the consumer should contact the individual producer for applicability to the intended application.

10.4 Metallic-coated sheet in coils is subject to coil breaks when coiled to a smaller inside diameter than is compatible with the thickness of the sheet. Other factors also affect this tendency for coil breaks. The consumer should contact the individual producer for the applicability of the intended application.

TABLE 10 Flatness Tolerances Specified to Restricted Flatness for Hot-Dip Metallic-Coated Sheet, Cut Lengths

NOTE 1—This table applies to all designations except SS, HSLAS and HSLAS-F.

Inch-Pound Units			
Specified Thickness, in.	Specified Width, in.	Specified Length, in.	Flatness Tolerance,[A] in.
Over 0.019 through 0.032	over 12 through 36	through 120, inclusive	1/4
	wider or longer		3/8
Over 0.032	over 12 through 48	through 120, inclusive	1/8
	wider or longer		1/4
SI Units			
Specified Thickness, mm	Specified Width, mm	Specified Length, mm	Flatness Tolerance,[A] mm
0.35 through 0.8	through 900	through 3000	8
	wider or longer		10
Over 0.8	through 1200	through 3000	5
	wider or longer		8

[A]Maximum deviation from a horizontal flat surface.

TABLE 11 Structural Steel—Flatness Tolerances (Cut Lengths Only)

NOTE 1—This table also applies to sheets cut to length from coils by the consumer when adequate flattening measures are performed.

NOTE 2—For Grade 50 [340] (Classes 1, 2, 3, and 4) use 1½ times the values given in this table.

NOTE 3—For Grade 80 [550], there are no defined flatness standards.

Specified Thickness, in. [mm]	Specified Width, in. [mm]	Flatness Tolerance (Maximum Deviation from a Horizontal Flat Surface), in. [mm]
Over 0.060 [1.5]	to 60 [1500], inclusive	½ [12]
	over 60 [1500] to 72 [1800], inclusive	¾ [20]
0.060 [1.5] and thinner	to 36 [900], inclusive	½ [12]
	over 36 [900] to 60 [1500], inclusive	¾ [20]
	over 60 [1500] to 72 [1800], inclusive	1 [25]

11. Oiling

11.1 Metallic-coated products covered by this specification can be furnished oiled or not oiled as specified.

12. Workmanship

12.1 *Surface Conditions:*

12.1.1 Metallic-coated cut lengths (sheets) shall have a workmanlike appearance and shall not have imperfections of a nature or degree for the product, grade, class, and designation ordered that will be detrimental to the fabrication, or functionality, or both, of the finished part.

12.1.2 Metallic-coated coils may contain some abnormal imperfections that render a portion of the coil unusable since the inspection of coils does not afford the producer the same

TABLE 12 High-Strength Low-Alloy Steel and High-Strength Low-Alloy Steel with Improved Formability—Flatness Tolerances (Cut Lengths Only)

NOTE 1—This table also applies to sheets cut to length from coils by the consumer when adequate flattening measures are performed.

Specified Thickness, in.	Specified Width, in.	Flatness Tolerances (Maximum Deviation from a Horizontal Flat Surface), in.				
		Grade				
		40	50	55 (Classes 1 and 2) 60	70	80
Over 0.060	to 60, inclusive	5/8	3/4	7/8	1	1 1/8
	over 60	1	1 1/8	1 1/4	1 3/8	1 1/2
0.060 and thinner	to 36, inclusive	5/8	3/4	7/8	1	1 1/8
	over 36 to 60, inclusive	1	1 1/8	1 1/4	1 3/8	1 1/2
	over 60	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8
SI Units						
		Flatness Tolerances (Maximum Deviation from a Horizontal Flat Surface), mm				
		Grade				
		275	340	380 (Classes 1 and 2) 410	480	550
Over 1.5	to 1500, inclusive	15	20	22	25	30
	over 1500	25	30	32	35	38
1.5 and thinner	to 900, inclusive	15	20	22	25	30
	over 900 to 1500, inclusive	25	30	32	35	33
	over 1500	35	38	40	45	48

TABLE 13 Width Tolerances—Narrow Widths for Hot-Dip Metallic-Coated Sheet, Coil and Cut Lengths, Not Resquared

NOTE 1—This table applies to widths produced by slitting from wider sheet.

NOTE 2—The specified width range captions noted as follows are also applied when sheet is specified to width tolerance all over, nothing under. In such cases, the stated tolerances are doubled.

NOTE 3—Tolerances based upon practice found to be generally followed by producers.

Inch-Pound Units				
Specified Thickness, in.		Tolerances Over and Under Specified Width, in.		
Over	Through	From 2 through 6	Over 6 through 9	Over 9 through 12
0.014	0.068	0.008	0.016	0.032
0.068	0.083	0.012	0.016	0.032
0.083	0.110	0.016	0.032	0.032
0.110	0.250	0.032	0.032	0.032
SI Units				
Specified Width, mm		Width Tolerance, Over and Under, mm		
Over	Through			
50	100	0.3		
100	200	0.4		
200	300	0.8		

opportunity to remove portions containing imperfections as in the case with cut lengths.

13. Retests and Disposition of Non-Conforming Material

13.1 *Retests:*

TABLE 14 Length Tolerances—Narrow Widths for Hot-Dip Metallic-Coated Sheet, Cut Lengths, Not Resquared

NOTE 1—This table applies to widths of 2 to 12 in. [50 to 300 mm] incl, that have been produced by slitting from wider sheet.

Inch-Pound Units		
Specified Length, in.		Tolerance Over Specified Length, No Tolerance Under, in.
Over	Through	
from 24	60	1/2
60	120	3/4
120	240	1
SI Units		
Specified Length, mm		Tolerance Over Specified Length, No Tolerance Under, mm
Over	Through	
600	1500	15
1500	3000	20
3000	6000	25

TABLE 15 Camber Tolerances—Narrow Widths for Hot-Dip Metallic-Coated Sheet, in Coils

NOTE 1—This table applies to widths of 2 to 12 in. [50 to 300 mm] incl, that have been produced by slitting from wider sheet.

Inch-Pound Units
The camber tolerance is 1/4 in. in any 8 ft.
SI Units
The camber tolerance is 5.0 mm in any 2000 mm.

13.1.1 Unless otherwise prohibited by the product specification, retests are permitted under the following circumstances:

13.1.1.1 If any tension test specimen shows defective machining or develops flaws, it must be discarded and another specimen substituted.

13.1.1.2 If the percent elongation of any tension test specimen is less than that specified, and any part of the fracture is more than 3/4 in. [20 mm] from the center of the gauge length of a 2-in. [50 mm] specimen, or is outside the middle half of the gauge length of an 8-in. [200 mm] specimen, as indicated by scribe scratches marked on the specimen before testing, a retest is allowed.

13.1.1.3 If the test result of any tension test specimen fails to meet the specification requirements and the failure is the result of improper adherence to tension test procedures, a retest is permitted.

13.1.1.4 If the test result of an original tension test specimen fails to meet the specification requirements and the failure is not related to the conditions described in 13.1.1.1, 13.1.1.2, and 13.1.1.3, but the results are within 2 ksi [14 Mpa] of the required yield strength, within 2 ksi [14 MPa] of the required tensile strength, or within 2 percentage points of the required elongation, one retest shall be permitted to replace the failing test.

13.1.2 The retest specimen shall be taken either adjacent to the first failed specimen, or selected at random from the material to be certified to the specification.

13.1.3 If the results of a retest satisfy the specified tension test requirements and all other requirements of the applicable specification are satisfied, the material shall be accepted.

13.2 *Disposition of Non-Conforming Material:*

13.2.1 In those cases where the lot is found to be non-conforming, and resampling of non-conforming material is not prohibited by the specification. resampling is permitted under the following circumstances and using the following practices:

13.2.1.1 If the results of an original tension test or retest specimen fail to satisfy the specification requirements and the failed test results are not related to the conditions described in 13.1, the lot shall be quarantined and resampled for certification of the non-conforming material to the specification requirements.

13.2.1.2 Resampling for certification of the non-conforming material shall include the discarding of out of-specification material and the resampling of the lot. The resampling shall be appropriate to the specific out-of-specification condition and the processing history of the lot.

13.2.1.3 A maximum of two resampling efforts shall he permitted. If, after conducting two resampling efforts, the material does not satisfy the specification requirements, the lot shall be rejected.

14. Inspection

14.1 The producer shall afford the purchaser's inspector reasonable access to facilities to ensure that the product is being produced in compliance with this specification. Unless otherwise specified, all inspection and tests, except product analysis, shall be made at the producer's facilities prior to shipment. Such inspection or sampling shall be made concurrently with the producer's regular inspection and test operations unless it causes interference with normal operations or is otherwise specified.

14.2 *Responsibility for Inspection* —Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the producer's facilities, or any other facilities suitable for the performance of the inspection requirements, shall be used. The purchaser reserves the right to perform any of the inspections set forth in this specification to ensure supplies and services conform to the prescribed requirements.

15. Rejection and Rehearing

15.1 Unless otherwise specified, any rejection shall be reported to the producer within a reasonable time after receipt of product by the purchaser.

15.2 Product that is reported to be unacceptable subsequent to the shipment to the purchaser's plant, shall be set aside, adequately protected, and correctly identified. The producer shall be notified as soon as possible to permit a timely investigation.

15.3 Samples that are representative of the rejected product shall be made available to the producer. In the event that the producer is dissatisfied with the rejection, a rehearing shall be requested.

16. Certification

16.1 When required by the purchase order, a certificate of compliance or a test report, or both, shall be furnished to the purchaser.

16.1.1 The certificate of compliance shall include a certification that the product has been manufactured and tested in accordance with the requirements of the product specification, and that the test results conform to the requirements of that specification.

16.1.2 The test report shall show the heat analysis and the results of all tests required by the product specification and the order.

16.1.3 These documents shall provide information necessary to identify the product represented; for example, the manufacturer's name or brand, ASTM specification, coating designation, grade (when required), ordered thickness, width, length (if cut length), and unit identification (heat number, coil number, etc.).

16.1.4 A signature is not required. However, the certification documents shall clearly identify the organization submitting the information. Notwithstanding the absence of a signature, the organization submitting the documents is responsible for the accuracy of the information.

16.2 The furnishing of a certificate of compliance or test report, or both, shall not restrict the right of the purchaser to sample and test the product furnished.

17. Packaging and Package Marking

17.1 It is common practice to use the methods of packaging as listed in the latest revision of Practices A700, but the purchaser is permitted to specify other packaging methods.

17.2 As a minimum requirement, the product shall be identified by having the manufacturer's name or brand, ASTM specification, coating designation, grade, size, unit weight, purchaser's order number, and unit identification (that is, ticket number, coil number, etc.) legibly shown on a tag attached to each coil or shipping unit.

17.3 Most producers are able to ink stamp metallic-coated sheet with their logo and the pertinent ASTM specification when ordered in either coil or cut lengths. Since many of the metallic-coated products are stamped with a permanent ink (not water soluble), the purchaser shall be very specific when placing an order as to the requirements on sheet marking.

17.4 The purchase order shall include the specific loading instructions.

17.5 When specified in the contract or order, and for direct shipments to the U.S. Federal government, marking for shipment shall be in accordance with Fed. Std. No. 123 for civil agencies.

18. Keywords

18.1 aluminum-coated iron/steel; aluminum-zinc alloy-coated steel, 55 %; coating; coatings—55 % aluminum-zinc; coatings—aluminum; coatings—hot-dip; coatings—metallic; coatings—terne metal; coatings—zinc-5 % aluminum; coatings—zinc (hot-dip); coatings—zinc-aluminum-magnesium; corrosion; hot-dip; metallic-coated; sheet; steel;

steel products—hot-dip coatings; steel sheet—aluminum-coated; steel sheet—terne coated; steel sheet—zinc-aluminum-magnesium alloy-coated; steel sheet—zinc-coated (galvanized); zinc-aluminum-magnesium alloy-coated steel; zinc-coated iron/steel

SUPPLEMENTARY REQUIREMENTS

THICKNESS TOLERANCES

The following supplementary requirements shall apply only when specified by the purchase order or contract

APPENDIXES

TABLE S1.1 Thickness Tolerances for Hot-Dip Metallic-Coated Sheet—⅜-in. [10-mm] Minimum Edge Distance

NOTE 1—The coated sheet thickness includes the base metal and coating and is measured at any point across the width of the coated sheet not less than ⅜ in. [10 mm] from a side edge.

NOTE 2—Micrometers used for measurement of thickness shall be constructed with anvils and spindles having minimum diameters of 0.188 in. [4.80 mm]. The tip of the anvil shall be flat or rounded with a minimum radius of curvature of 0.10 in. [2.55 mm] and the tip of the spindle shall be flat. Micrometers with conical tips shall not be used for thickness measurements of sheet steels.

Inch-Pound Units

Specified Width, in.		Specified Ordered Thickness, in.[A,B]							
Over	Through	Through 0.023	Over 0.023 through 0.043	Over 0.043 through 0.061	Over 0.061 through 0.075	Over 0.075 through 0.101	Over 0.101 through 0.187	Over 0.187 through 0.229	Over 0.229 through 0.250
		Thickness Tolerances, Over, in., No Tolerance Under[C]							
. . .	32	0.006	0.008	0.010	0.012	0.014	0.016	0.016	0.024
32	40	0.006	0.008	0.010	0.012	0.016	0.016	0.018	0.024
40	60	0.006	0.008	0.010	0.012	0.016	0.018	0.020	0.026
60	72	0.006	0.008	0.010	0.012	0.018	0.018	0.024	0.028

SI Units

Specified Width, mm		Specified Ordered Thickness, mm[B,D]							
Over	Through	Through 0.4	Over 0.4 through 1.0	Over 1.0 through 1.5	Over 1.5 through 2.0	Over 2.0 through 2.5	Over 2.5 through 5.0	Over 5.0 through 6.0	Over 6.0 through 6.3
		Thickness Tolerances, Over, mm, No Tolerance Under[C]							
. . .	1500	0.16	0.20	0.26	0.30	0.40	0.46	0.56	0.60
1500	. . .	0.16	0.20	0.26	0.30	0.46	0.46	0.60	0.64

[A] Thickness is measured at any point across the width not less than ⅜ in. from a side edge.
[B] The specified thickness range captions apply independently of whether the ordered thickness is stated as nominal or minimum.
[C] The tolerances provided in the table are based on minimum thickness (tolerance over, no tolerance under). For nominal thickness, the tolerance is divided equally over and under (tolerance over, tolerance under).
[D] Thickness is measured at any point across the width not less than 10 mm from a side edge.

(Nonmandatory Information)

X1. PRODUCT INFORMATION

X1.1 *Coating Thickness Measurements with Magnetic Gauges*—A reasonable estimate of weight [mass] of coating may be obtained by converting coating thickness measurements made with magnetic gauges. An accuracy of ±15 % in determining the thickness may be realized by following the recommended practice for magnetic instruments described in Practice E376. This test may be used as a basis for acceptance, but rejection shall be governed by the weight [mass] of coating tests described in Section 8.

X2. MILL-APPLIED CHEMICAL TREATMENTS ON METALLIC COATED SHEET STEELS

X2.1 The chemical treatments for metallic-coated coil described in this section of the appendix are specific to those that require little reaction time, can be roll-applied (flood & squeegee or chemcoater) and dried with simple heating capability at the exit end of the metallic coating line. This is in contrast to those that require several step immersion baths and longer reaction times typically utilized on coil paint lines. The products are divided into three groups based on the following characteristics: (*1*) surface protection only, (*2*) formability enhancement, and (*3*) a combination of surface protection and formability enhancement.

X2.2 Formability Enhancement

X2.2.1 *Dried-in-Place Phosphate Coatings*—These trimetal [Zn-Mn-Ni], tricationic microcrystalline phosphate crystals are applied as a surface treatment within a 0.5–1.5g/m^2 coating weight range. Application is generally performed from an aqueous solution utilizing a pair of rubber rolls. The coated surface is dried using a simple IR or convection oven, heating the strip to a temperature high enough to drive off water. The phosphate coating is often oiled using simple mill oil in order to inhibit corrosion and moisture pickup by the phosphate crystals during transport and storage. This type of coating is applied to aid in formability. Once formed, these products are cleaned, and rephosphated prior to painting.

X2.2.2 *Soap Lubricants*—Alkaline-based soap lubricants can be roll-applied from aqueous solution and dried by driving off water. Coating weights vary by application. These materials are utilized to enhance formability. Moisture uptake is a problem in humid environments that may lead to surface corrosion and short blanking during the forming operation. Soaps are more commonly utilized over heavily pigmented [rough] prepainted surfaces.

X2.3 Surface Protection

X2.3.1 *Chrome Bearing Inorganic Passivation Coatings*—These coatings are spray/squeegee or roll-applied from an aqueous solution containing eitherCr^{+6} or Cr^{+3}. The Cr^{+6} containing coatings are true passivants utilized as a protection against storage stain and transit corrosion and applied between 1-3 gm/m^2. Shortly after application, most of the Cr^{+6} oxidizes to Cr^{+3}. The remaining Cr^{+6} allows for repassivation when the surface is minimally damaged [scratched], providing a unique self-healing capability. However, over long periods of time, the Cr^{+6} oxidizes completely to Cr^{+3}. These materials are generally not considered paintable without extreme removal techniques. The passivation mechanism of Cr^{+3} is similar, but more difficult to achieve. Hence, the less effective Cr^{+3} coatings are applied at coating weights 3-5 times greater than the Cr^{+6} versions. Many of the Cr^{+3} based coatings are paintable utilizing normal cleaning methods.

X2.3.2 *Chrome Bearing Organic Coatings*—Generally applied from acrylic polymer solutions containing Cr^{+6} or Cr^{+3} constituents, these coatings are applied in the 3-5 g/m^2 coating weight range. Roll-application and drying are recommended prior to coiling. Characteristics include the reduction or elimination of storage and transit corrosion. While some of these products are paintable within a prescribed timeframe, it is recommended to check with the supplier regarding durability of post-painted product.

X2.3.3 *Chrome-Free Coatings*—True chrome free coatings can be manufactured from both organic and inorganic materials that may be pigmented with calcium phosphates, titanium silicon phosphates, etc. These are roll-applied from solution and dried. While most of these coatings accept a post-paint, it is recommended to verify durability of particular systems with the supplier.

X2.4 Formability Enhancement and Surface Protection

X2.4.1 *Acrylic Coatings*—Permanent and alkaline-removable solid film acrylic coatings can be applied from aqueous solutions at coating weights between 144–360 mg/in.^{2}. Note that some of these coatings require a minimum peak metal temperature of 125C for drying in order to drive off water and inhibit moisture migration through the coating that can lead to corrosion of the strip. The low surface friction characteristics of these coatings are excellent for formability enhancement, irrespective of strip surface finish. No oiling of the strip is required. Excellent storage and transit corrosion protection can be expected. The permanent coatings are paintable unless formulated with silicon pigments or wax. The non-permanent coating is easily removed in a standard alkaline cleaner, subsequent to which standard phosphating and painting techniques can be utilized on the metallic coated strip. The removable coatings provide excellent protection from dirt and soil in order to enhance phosphating and painting.

TABLE X2.1 Surface Treatment Property and Characteristic Comparison

CHEMICAL TREATMENT	Properties				Chemical Characteristics						
	Formable	Paintable	Storage Stain Protection	Transit Corrosion Protection	Cr^{+6}	Cr^{+3}	Non-Chrome Solution	Non-Chrome Pigments	Crystalline	Acrylic Polymer Base	Soap Base
Zinc Phosphate and Oil	✓	✓	✓	✓			✓		✓		
Soap Lubricants	✓	After removal	✓	✓			✓				✓
Inorganic [Cr-bearing]	✓	Check with supplier	✓	✓	✓	✓					
Organic [Cr bearing]	✓	Check with supplier	✓	✓	✓	✓				✓	
Organic [Cr Free]	✓	Check with supplier	✓	✓			✓	✓		✓	
Inorganic [Cr Free]	✓	Check with supplier	✓	✓			✓	✓		✓	
Acrylic Solid Film [Permanent]	✓	When without Si or wax	✓	✓						✓	
Acrylic Solid Film [Removable]	✓	✓	✓	✓						✓	
Inorganic [Cr-bearing]	✓	Check with supplier	✓	✓		✓					

Note also that other properties can either be inherent to or incorporated into the chemical treatments listed above. As many properties are formula driven, all cannot be incorporated here. Check with the supplier for product tailoring when properties such as resistivity, weldability, anti-fingerprinting, microbial resistance, tinting or transparency are specified or required.

X3. GUIDE TO CONVERSION BETWEEN COATING WEIGHT [MASS] AND THICKNESS

NOTE X3.1—The values in the tables below are based on the assumed three significant figure relationships shown under the title of each table. This can result in some very small conversion anomalies that are considered to be insignificant given these tables are for information purposes only.

NOTE X3.2—The values apply to total-both-sides measurements, and to single-side measurements in the case of differential coatings.

NOTE X3.3—The values should NOT be used to calculate residual metallic coating thickness after corrosion has occurred in service.

TABLE X3.1 A463/A463M Aluminum-Coated Type 1 Sheet (Assume 1.00 oz/ft ^{2} = 305 g/m^2 = 3.98 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	3.98	101
0.00328	1.00	0.0131	0.331
0.251	76.6	1.00	25.4
0.00989	3.02	0.0394	1.00

TABLE X3.2 A463/A463M Aluminum-Coated Type 2 Sheet (Assume 1.00 oz/ft ^{2} = 305 g/m^2 = 3.74 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	3.74	95.0
0.00328	1.00	0.0123	0.312
0.267	81.4	1.00	25.4
0.0105	3.20	0.0394	1.00

TABLE X3.3 A653/A653M Zinc-Coated (Galvanized/Galvannealed) Sheet, and A1063/A1063M Twin Roll-Cast Zinc-Coated (Galvanized) (Assume 1.00 oz/ft^2 = 305 g/m^2 = 1.68 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	1.68	42.7
0.00328	1.00	0.00551	0.140
0.595	181	1.00	25.4
0.0234	7.14	0.0394	1.00

TABLE X3.4 A792/A792M 55% Aluminum-Zinc Alloy-Coated Sheet (Assume 1.00 oz/ft^2 = 305 g/m^2 = 3.20 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	3.20	81.3
0.00328	1.00	0.0105	0.267
0.313	95.4	1.00	25.4
0.0123	3.75	0.0394	1.00

TABLE X3.5 A875/A875M Zinc-5% Aluminum Alloy-Coated Sheet (Assume 1.00 oz/ft^2 = 305 g/m^2 = 1.75 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	1.75	44.6
0.00328	1.00	0.00574	0.146
0.570	174	1.00	25.4
0.0224	6.83	0.0394	1.00

TABLE X3.6 A1046/A1046M Zinc-Aluminum-Magnesium Alloy-Coated Sheet (5-9% Al)
(Assume 1.00 oz/ft^2 = 305 g/m^2 = 2.00 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	2.00	50.8
0.00328	1.00	0.00656	0.167
0.500	153	1.00	25.4
0.0197	6.01	0.0394	1.00

TABLE X3.7 A1046/A1046M Zinc-Aluminum-Magnesium Alloy-Coated Sheet (9-13% Al)
(Assume 1.00 oz/ft^2 = 305 g/m^2 = 2.10 mils)

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	[g/m^2]	mil	µm
1.00	305	2.10	53.3
0.00328	1.00	0.00689	0.175
0.476	145	1.00	25.4
0.0187	5.70	0.0394	1.00

SUMMARY OF CHANGES

Committee A05 has identified the location of selected changes to this standard since the last issue (A924/A924M - 13) that may impact the use of this standard. (October 1, 2014)

(1) Added heavy thickness tolerances to Table 2 and Table S1.1.

(2) Increased the thickness covered by Table 13 to 0.250 in.