



Designation: A463/A463M – 22

Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process¹

This standard is issued under the fixed designation A463/A463M; 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 aluminum-coated steel sheet in coils and cut lengths available with two types of aluminum coating applied by the hot-dip process, with several coating weights [masses].

1.2 Product furnished under this specification shall conform to the applicable requirements of the latest issue of Specification A924/A924M, unless otherwise provided herein.

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

1.4 *Units*—This specification is applicable to orders in either inch-pound units (as A463) or SI units [as A463M]. Values in inch-pound and SI units are not necessarily equivalent. Within the text, SI units are shown in brackets. Each system shall be used independently of the other.

1.5 Unless the order specifies the “M” designation (SI units), the product shall be furnished to inch-pound units.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *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.*

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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2. Referenced Documents

2.1 *ASTM Standards*:²

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

A480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

A902 Terminology Relating to Metallic Coated Steel Products

A924/A924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

A1122/A1122M Test Method for Bend Testing of Metallic-Coated Steel Sheet to Evaluate Coating Adhesion

E517 Test Method for Plastic Strain Ratio r for Sheet Metal

E646 Test Method for Tensile Strain-Hardening Exponents (n -Values) of Metallic Sheet Materials

3. Terminology

3.1 *Definitions*—See Terminology A902 for definitions of general terminology relating to metallic-coated steel products.

4. Classification

4.1 The steel sheet is available in several designations, as follows:

4.1.1 Commercial Steel (CS Types A, B, and C),

4.1.2 Forming Steel (FS),

4.1.3 Deep Drawing Steel (DDS),

4.1.4 Extra Deep Drawing Steel (EDDS),

4.1.5 Structural Steel (SS),

4.1.6 High Strength-Low Alloy Steel (HSLAS Type A),

4.1.7 High Strength-Low Alloy Steel (HSLAS Type B),

4.1.8 Ferritic Stainless Steel (FSS Type 409), and

4.1.9 Ferritic Stainless Steel (FSS Type 439).

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.

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

4.2 Structural Steel (SS) and High Strength-Low Alloy Steels (HSLAS Types A and B) are available in several grades and classes.

4.3 The aluminum coating is available in two types with several coating weights [masses] with coating designations as shown in **Table 1**.

4.3.1 *Coating Type 1* is manufactured using a coating bath of aluminum–silicon alloy containing 5 to 11 % silicon to promote better adherence. It is intended principally for heat-resisting applications and also for uses where corrosion resistance and heat are involved. It is available as a coating on each of the designations of steel sheet listed in **4.1**.

4.3.2 *Coating Type 2* is a commercially pure aluminum. It is intended principally for use in applications requiring corrosion resistance and is available only as a coating on Commercial Steel, Forming Steel, Structural Steel, and High Strength-Low Alloy Steel.

5. Ordering Information

5.1 Product under this specification shall be ordered to decimal thickness only, and dimensional tolerances of Specification **A924/A924M** shall apply. Specification **A480/A480M** shall apply to FSS (Types 409 and 439) for thickness tolerances only. The following, as required, shall be used to adequately describe the product required.

5.1.1 Name of product (steel sheet, aluminum-coated Type 1 or 2),

5.1.2 Designation of sheet (CS (Types A, B, and C), FS, DDS, EDDS, SS, HSLAS (Type A or B); and FSS (Types 409 and 439)).

TABLE 1 Weight [Mass] of Coating Requirements^{A,B}

Coating Designation	Minimum Requirement	
	Triple-Spot Test, Total Both Sides	Single-Spot Test, Total Both Sides
	Inch-Pound Units	
	oz/ft ²	oz/ft ²
T1-13	0.13	0.10
T1-25	0.25	0.20
T1-40	0.40	0.30
T1-60	0.60	0.50
T1-80	0.80	0.70
T1-100	1.00	0.90
T2-LC	no minimum	no minimum
T2-65	0.65	0.60
T2-100	1.00	0.90
	SI Units	
	g/m ²	g/m ²
T1M 40	40	30
T1M 75	75	60
T1M 120	120	90
T1M 180	180	150
T1M 240	240	210
T1M 300	300	270
T2M LC	no minimum	no minimum
T2M 200	200	180
T2M 300	300	270

^A The coating designation number is the term by which this product is specified. Because of the many variables and changing conditions that are characteristic of continuous hot-dip coating lines, the weight [mass] of coating is not always evenly divided between the two surfaces of a sheet, nor is the coating evenly distributed from edge to edge. However, normally not less than 40 % of the single-spot test limit will be found on either surface.

^B No minimum means that there are no established minimum requirements for triple- and single-spot tests, but aluminum coating shall be present.

5.1.2.1 When a CS type is not specified, Type B will be furnished.

5.1.2.2 When a SS or HSLAS designation is specified, state the type, grade, or class, or combination thereof.

5.1.3 ASTM designation number and year of issue,

5.1.4 Coating designation,

5.1.5 Specify whether oiled or dry or chemically treated, oiled or dry,

5.1.6 Dimensions (show thickness, minimum or nominal; width; and length, if cut lengths). Specification **A480/A480M** shall apply to FSS (Types 409 and 439) for thickness tolerances only.

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

5.1.8 Application (show part identification and description),

5.1.9 Certification, if required, and heat analysis and mechanical property report, and

5.1.10 Special requirements (if required).

5.1.10.1 When the purchaser requires thickness tolerances for 3/8-in. [10-mm] minimum edge distance (see Supplementary Requirement in specification **A924/A924M**), this requirement shall be specified in the purchase order or contract.

NOTE 1—Typical ordering descriptions are as follows: Steel sheet, aluminum-coated, Forming Steel (FS), ASTM A463 – __, Coating Designation T1 40, chemically treated dry, minimum 0.040 in. by 34 in. by coil, 48-in. maximum outside diameter, 20-in. inside diameter, 20 000-lb maximum coil weight, for muffler ends.

Steel Sheet, aluminum-coated, Commercial Steel (CS Type A), ASTM A463M – __, Coating Designation T1M 120, chemically treated dry, minimum 1.00 mm by 920 mm by coil, 1200-mm maximum outside diameter, 500-mm inside diameter, 10 000-kg maximum coil weight, for range heat shield.

NOTE 2—The purchaser should be aware that there are variations in manufacturing practices among the producers and therefore is advised to establish the producer's standard (or default) procedures for thickness tolerances.

6. Chemical Composition

6.1 Base Metal:

6.1.1 The heat analysis of the base metal shall conform to the requirements shown in **Table 2** for CS (Types A, B, and C), FS, DDS, EDDS, and FSS (Types 409 and 439), **Table 3** for SS and HSLAS.

6.1.2 When the amount of copper, nickel, chromium, or molybdenum is less than 0.02 %, report the analysis either as <0.02 % or the actual determined value. When the amount of vanadium, titanium, or columbium is less than 0.008 %, report the analysis as either <0.008 % or the actual determined value. When the amount of boron is less than 0.0005 %, report as <0.0005 % or the actual determined value.

6.1.3 See Specification **A924/A924M** for chemical analysis procedures and product analysis tolerances.

6.1.4 The heat analysis of the base metal for FSS (Types 409 and 439) shall conform to the requirements shown in **Table 2**.

6.1.5 See Specification **A480/A480M** for chemical analysis procedures and product analysis tolerances for FSS (Types 409 and 439).

6.2 Coating Bath Composition: