



Designation: A917 – 08 (Reapproved 2020)

Standard Specification for Steel Sheet, Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface (General Requirements)¹

This standard is issued under the fixed designation A917; 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 hot-rolled and cold-rolled steel sheet coated by the electrolytic process. Coatings can be comprised of pure metals or metal alloys. For specific coatings, refer to Specifications [A879/A879M](#) and [A918](#).

1.2 The product shall be coated on one or both surfaces with equal or differential coating masses on the two surfaces. Sheet-coated with equal coating masses on each surface has similar levels of corrosion protection on each surface. Often, however, a higher level of corrosion protection is required on one surface than is required on the other. In these situations, one surface shall be specified with a heavier coating mass than the other. Either surface, when specified to be painted, will provide additional corrosion protection as compared to an unpainted surface.

1.3 This coating process has essentially no effect on the base metal mechanical properties, and use is permitted on any grade of hot-rolled or cold-rolled steel sheet. The coated sheet is available as Commercial Steel (CS), Drawing Steel (DS), Deep Drawing Steel (DDS), Extra-Deep Drawing Steel (EDDS), Structural Steel (SS) High-Strength Low-Alloy Steel (HSLAS), High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Solution-Hardened Steel (SHS), or Bake-Hardenable Steel (BHS).

1.4 The values stated in SI units are to be regarded as the standard.

1.5 *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.

Current edition approved Jan. 1, 2020. Published January 2020. Originally approved in 1993. Last previous edition approved in 2015 as [A917 – 08\(2015\)](#). DOI: 10.1520/A0917-08R20.

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
[A370](#) Test Methods and Definitions for Mechanical Testing of Steel Products

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

[A879/A879M](#) Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

[A902](#) Terminology Relating to Metallic Coated Steel Products

[A918](#) Specification for Steel Sheet, Zinc-Nickel Alloy Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

[A1008/A1008M](#) Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

[A1011/A1011M](#) Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

[B504](#) Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method

3. Terminology

3.1 *Definitions*—For definitions of terms and abbreviations used in this specification, see Terminology [A902](#).

4. Ordering Information

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

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.

5. Coating Designation (Mass and Type)

5.1 The following seven-character format shall be used to identify the coating mass required:

5.1.1 *First and Second Characters*—Minimum coating mass of the surface with the less critical surface quality requirements;

5.1.2 *Third Character*—A letter, as designated in the appropriate product specification, to denote the kind of coating; G for pure zinc and N for zinc-nickel alloy;

5.1.3 *Fourth and Fifth Characters*—Minimum coating mass of the surface with the more critical surface quality requirements;

5.1.4 *Sixth Character*—A letter, as designated in the appropriate product specification, to denote the kind of coating; G for pure zinc and N for zinc-nickel alloy;

5.1.5 *Seventh Character*—Either E or U, designating an exposed or unexposed application, respectively.

| | | | | | |
|--------------|-------|-------|-------|-------|-------|
| Example: | 60 | G | 20 | G | E |
| | ↓ | ↓ | ↓ | ↓ | ↓ |
| See Section: | 5.1.1 | 5.1.2 | 5.1.3 | 5.1.4 | 5.1.5 |

NOTE 1—The terms “exposed” and “unexposed” describe the intended application as either hidden or exposed to view and is an indicator of the degree of freedom from surface imperfections that affect the cosmetic characteristics of the coated surface.

6. Chemical Requirements

6.1 The heat analysis of the steel shall conform to the requirements of the specification for the steel ordered or as specified by negotiations.

7. Base Metal Requirements

7.1 The steel shall conform to all of the requirements of the appropriate specification listed as follows for the steel ordered. Where reference is made to a combined standard (such as Specification **A1011/A1011M**), conformance shall be to the metric portion, using SI units of measurement as standard.

7.1.1 Hot Rolled:

7.1.1.1 *Commercial Steel (CS), Drawing Steel (DS), Structural Steel (SS), High-Strength Low-Alloy Steel (HSLAS), and High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F)*—Specification **A1011/A1011M**.

7.1.2 Cold Rolled:

7.1.2.1 *Commercial Steel (CS), Drawing Steel (DS), Deep Drawing Steel (DDS), Extra-Deep Drawing Steel (EDDS), Structural Steel (SS), High-Strength Low-Alloy Steel (HSLAS), High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Solution-Hardened Steel (SHS), and Bake-Hardenable Steel (BHS)*—Specification **A1008/A1008M**.

7.2 Base Metal Specimens:

7.2.1 Test specimens shall be prepared from finished material and tested in accordance with Test Methods and Definitions **A370**.

7.2.2 In determining the base metal mechanical properties, one of the following methods shall be used. Unless specified in the order, the producer shall determine the method to be used; however, in the event of a dispute the method in **7.2.2.1** shall be used.

7.2.2.1 The base metal thickness shall be measured after stripping the coating from the ends of the specimen contacting the grips of the tension testing machine before testing.

7.2.2.2 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 mass test.

7.2.3 When the percent elongation in the tension test is less than the specified minimum and any part of the fracture is outside the middle half of the gage length as scribed before the test, the test shall be discarded and a retest shall be permitted.

7.3 *Retests for Base Metal Mechanical Properties*—If one test fails for base metal mechanical requirements, retesting shall conform to the provisions of the applicable base metal specification.

8. Coating Mass Requirements

8.1 Coating Mass:

8.1.1 Coating mass shall conform to the requirements prescribed in the individual coating specification.

8.1.2 The mass of the coating is the single spot value on each surface of the sheet expressed in grams per square metre.

8.2 Coating Mass Tests:

8.2.1 *Test Method **A90/A90M***—The weigh-strip-weigh method is a destructive test that determines coating mass by measuring the difference in weight between a coated and a stripped (uncoated) sample. If one surface is protected suitably during the initial stripping, coating mass can be determined for each surface independently. Conversion of the coating to coating thickness is only possible if the density of the coating is known precisely.

8.2.2 *Test Method **A754/A754M***—Measurement by X-ray fluorescence is a nondestructive test that determines coating mass by converting X-ray fluorescence measurements to coating mass values. This test method is readily adaptable to the continuous monitoring of coating mass during the electroplating process. Thus, modern electroplating facilities are frequently equipped with X-ray fluorescence gages that provide feedback to control the coating mass. These devices are used as a basis for determining suitability for shipment provided that they have been calibrated properly.

8.2.3 *Test Method **B504***—Measurement of the coating mass by the coulometric method is a destructive test that determines coating mass or thickness, or both, electrochemically. This test method is rapid and versatile for lighter coating mass applications.

8.2.4 The referee method to be used shall be as agreed upon between the producer and the consumer. In the absence of such agreement, Test Method **A90/A90M**, the weigh-strip-weigh method, shall be used as the referee method.

8.3 Sampling for Coated Mass Test:

8.3.1 One test specimen shall be taken from the lift of cut lengths or coils such that no portion of the specimen is closer than 25 mm to the edge of the as-received sheet.

8.3.2 The coating mass of this specimen shall conform to both the minimum and maximum values shown in the applicable coating specification for the coating mass specified. If