



# Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface<sup>1</sup>

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## 1. Scope

1.1 This specification covers zinc coatings applied by the electrolytic process to hot-rolled and cold-rolled steel sheet. The coating has a smooth, spangle-free surface. The zinc-coated sheet covered in this specification is produced in a wide range of coating masses to provide coatings that are compatible with the anticipated service life required. The coating mass varies, from very thin coatings that are usually painted to provide good service, to relatively heavy masses that provide good corrosion resistance in the bare (unpainted) condition.

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. Thus one surface is specified to have 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- 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), or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F).

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

## 2. Referenced Documents

### 2.1 ASTM Standards:

A 90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings<sup>2</sup>

<sup>1</sup> 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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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 01.06.

A 754 Test Method for Coating Thickness by X-Ray Fluorescence<sup>2</sup>

A 917 Specification for Steel Sheet, Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface (General Requirements)<sup>2</sup>

B 504 Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method<sup>3</sup>

## 3. Classification

3.1 Coating shall be designated in accordance with Specification A 917. The letter G shall be used to designate pure zinc coatings.

## 4. Ordering Information

4.1 Orders for products to this specification shall include the following information, as necessary to adequately describe the desired product:

4.1.1 Name of product (electrolytic zinc-coated steel sheet).

4.1.2 ASTM designation and year of issue.

4.1.3 Base metal type (hot rolled or cold rolled).

4.1.4 Base metal designation (Commercial Steel (CS), Drawing Steel (DS), Deep Drawing Steel (DDS), Extra Deep Drawing Steel (EDDS), Structural Steel (SS), High-Strength Low-Alloy Steel (HSLAS), or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F)).

4.1.5 Formability type, strength, grade or class, or combination, thereof, as required for structural or high-strength low-alloy steels.

4.1.6 Coating designation (see 3.1).

4.1.7 Surface treatments required (see Note 1).

NOTE 1—Steel short is available without surface treatment (dry) or with surface treatments designated as chemical treatment, oiled, or phosphatized. Unless otherwise specified sheet is furnished oiled.

4.1.8 Dimensions [show thickness (minimum or nominal), width, and length, if cut length].

4.1.9 Coil size (must include inside diameter, outside diameter, and maximum coil weight).

4.1.10 Application (part name and description).

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 02.05.

4.1.11 Special Requirements, is applicable.

4.1.12 Certification, if required, heat analysis and mechanical property report.

## 5. Coating Mass

5.1 Coating mass shall conform to the requirements for coating designation (mass and type) as given in Specification A 917 and in Table 1 for the specific coating designation. The mass of the coating is the single spot value on each surface of the sheet in grams per square metre.

### 5.2 Coating Mass Tests:

5.2.1 The weigh-strip-weigh method (see Test Method A 90/A 90M) 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 mass to coating thickness is possible only if the density of the coating is known precisely.

5.2.2 Coating thickness measurements by X-ray fluorescence (see Test Method A 754) is a nondestructive test that determines coating mass by converting X-ray fluorescence measurements to coating mass values. This method is readily adaptable to the continuous monitoring of coating mass during coating. Thus modern electroplating facilities are frequently equipped with X-ray fluorescence gages that provide feedback to control the coating mass. These devices may be used as a basis for determining suitability for shipment provided that they have been calibrated properly.

5.2.3 Measurement by Coulometric Method (see Test Method B 504) is a destructive test that determines lighter coating mass applications.

5.3 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 A 90/A 90M shall be used as the referee method.

**TABLE 1 Coating Mass per Surface, g/m<sup>2</sup>,<sup>A</sup> for Steel Sheet, Zinc Coated by the Electrolytic Process<sup>B</sup>**

Coating Designation <sup>C</sup>	Minimum	Maximum
00G	no coating	no coating
20G	20	40
40G	40	70
60G	60	90
70G	70	110
90G	90	130
98G	98	140

<sup>A</sup>Conversion for coating mass in ounces per square foot is g/m<sup>2</sup> × 0.00328.

<sup>B</sup>The product shall be coated on at least one surface; therefore, the combination 00/00 shall not be specified.

<sup>C</sup> See Specification A 917.

## 6. Keywords

6.1 electrolytic zinc coated; zinc coated; zinc coated steel sheet

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