Designation: A 918 – 06

Standard Specification for Steel Sheet, Zinc-Nickel Alloy Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface[1]

This standard is issued under the fixed designation A 918; 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 zinc-nickel alloy coatings applied by the electrolytic process to hot-rolled and cold-rolled steel sheet. The coating has a smooth, spangle-free surface. The zinc-nickel-coated sheet covered in this specification is produced in a 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. The composition range is from 9 to 16 % nickel, by weight, with the balance being zinc.

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- 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.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 754/A 754M Test Method for Coating Weight (Mass) of Metallic Coatings on Steel by X-Ray Fluorescence

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

E 1659 Test Methods for Coating Weight and Chemical Analysis of Zinc-Nickel Alloy Electrolytically Coated on Steel Sheet

3. Classification

3.1 Coatings shall be designated as in Specification A 917. The letter N shall be used to designate zinc-nickel 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-nickel alloy-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), High-Strength Low-Alloy Steel (HSLAS), High-Strength Low-Alloy with Improved Formability (HSLAS-F), Solution-Hardened Steel (SHS), or Bake-Hardenable Steel (BHS)}.

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).

[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] 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.**

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NOTE 1—Steel sheet 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 lengths).

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

4.1.10 Application (part name and description).

4.1.11 Special requirements, if 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 Test Methods E 1659 describes 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 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/A 754M) is a nondestructive test method 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 coating. Thus, modern electroplating facilities are frequently equipped with X-ray fluorescence gauges that provide feedback to control the coating mass. These devices are used as a basis for determining the suitability for shipment provided that they have been calibrated properly in accordance with Test Method A 754/A 754M.

5.2.3 Sampling and retests for coating mass determinations shall be as given in Specification A 917.

5.2.4 The referee test methods for measurement of the coating mass are Test Methods E 1659.

TABLE 1 Coating Masses for Steel Sheet, Zinc-Nickel Alloy-Coated by the Electrolytic Process[A]

Coating Designation[B]	Surface, g/m^2	
	Minimum	Maximum
00N	no coating	no coating
20N	20	40
30N	30	50
40N	40	60
50N	50	70

[A]The product shall be coated on at least one surface; therefore, the combination 00/00 shall not be specified.

[B]See Specification A 917.

6. Coating Composition

6.1 *Coating Composition Tests*:

6.1.1 The test for chemical determination of the coating composition by atomic absorption spectroscopy is a destructive test that requires stripping of the coating from a specimen. If one surface is protected suitably during the stripping, coating compositions can be determined for each surface independently.

6.1.2 Sampling and retests for coating composition determinations shall be as given in Specification A 917.

6.1.3 The referee test methods for determination of the coating composition are Test Methods E 1659.

7. Keywords

7.1 electrolytic coating; steel sheet-zinc nickel alloy coated; zinc-nickel alloy coated; zinc-nickel alloy coated steel sheet

SUMMARY OF CHANGES

Committee A05 has identified the location of selected changes to this standard since the last issue (A 918 – 00(2005)) that may impact the use of this standard. (November 1, 2006)

(*1*) Revised 1.3 and 4.1.4 to include Solution-Hardened Steel (SHS) and Bake-Hardenable Steel (BHS) designations.

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