



Standard Specification for Iron-Nickel Sealing Alloys¹

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1. Scope

1.1 This specification covers iron-nickel alloys that are intended primarily for sealing to glass in electronic applications.

NOTE 1—Some of these alloys may be used for sealing to ceramics, but this specification in its present form is not intended to cover material for metal-to-ceramic seals.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address 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.* The hazard statement pertains only to the test method sections, Sections 10 and 12.

2. Referenced Documents

2.1 ASTM Standards:

- E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials²
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specification³
- E 112 Test Methods for Determining Average Grain Size²
- E 228 Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer³
- F 14 Practice for Making and Testing Reference Glass-Metal Bead-Seal⁴
- F 140 Practice for Making Reference Glass-Metal Butt Seals and Testing for Expansion Characteristics by Polarimetric Methods⁴
- F 144 Practice for Making Reference Glass-Metal Sandwich Seal and Testing for Expansion Characteristics by Polarimetric Methods⁴

3. Ordering Information

3.1 Orders for material under this specification shall include the following information:

- 3.1.1 Size,
- 3.1.2 Temper (Section 6),
- 3.1.3 Surface finish (Section 8),
- 3.1.4 Marking and packaging (Section 16), and
- 3.1.5 Certification if required.

4. Chemical Composition

4.1 The material shall conform to the requirements as to chemical composition prescribed in Table 1.

5. Surface Lubricants

5.1 All lubricants used in processing shall be thoroughly removed. Protective coatings present on the material as shipped shall be readily removable by any of the common organic degreasing solvents.

6. Temper

6.1 The desired temper of the material shall be specified on the purchase order. Unless otherwise specified, wire, rod, bar, and tubing shall be given a final bright anneal by the manufacturer. Strip and sheet shall be annealed properly to develop deep drawing properties. For deep drawing the hardness shall not exceed Rockwell B82 for material 0.100 in. (2.54 mm) and less in thickness, and B85 for material over 0.100 in. thick when determined in accordance with Test Methods E 18.

7. Grain Size

7.1 Strip and sheet for deep drawing applications shall have an average grain size not larger than ASTM No. 5 (Note 2) and no more than 10 % of the grains shall be larger than No. 5 when measured in accordance with Test Methods E 112. For materials less than 0.005 in. (0.13 mm) in thickness the grain size shall be such that there are no less than 4 grains across the thickness.

NOTE 2—This corresponds to a grain size of 0.065 mm or 16 grains/in.² of image of 100×.

8. Surface Finish

8.1 The standard surface finishes available shall be those resulting from the following operations:

¹ This specification is under the jurisdiction of ASTM Committee F01 on Electronics and is the direct responsibility of Subcommittee F01.03 on Metallic Materials.

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² Annual Book of ASTM Standards, Vol 03.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Annual Book of ASTM Standards, Vol 15.02.