



Standard Specification for Chromium-Iron Sealing Alloys with 18 or 28 Percent Chromium¹

This standard is issued under the fixed designation F256; 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 two chromium-iron alloys, the former, (UNS K91800), nominally 18 % chromium, balance iron, the latter, (UNS K92801), nominally 28 % chromium, in strip, bar, wire, and rod forms intended primarily for sealing to glass in electronic applications.

NOTE 1—UNS K92801 should only be considered for use at service temperatures below 300°C. The alloy is prone to sigma phase formation at temperatures close to 620°C, and exhibits brittle mechanical behavior after prolonged exposures at temperatures close to 475°C.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The following hazard caveat pertains only to the test method portion, Sections 16 and 17, of this specification. *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- A370 Test Methods and Definitions for Mechanical Testing of Steel Products
- E3 Guide for Preparation of Metallographic Specimens
- E18 Test Methods for Rockwell Hardness of Metallic Materials
- E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E38 Methods for Chemical Analysis of Nickel-Chromium

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, Wire Bonding, and Flip Chip.

Current edition approved July 1, 2015. Published October 2015. Originally approved in 1951 as F256 – 51 T. Last previous edition approved in 2010 as F256 – 94 (2010). Consolidated with F257 in 1972. DOI: 10.1520/F0256-05R15.

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.

and Nickel-Chromium-Iron Alloys

E228 Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer

F14 Practice for Making and Testing Reference Glass-Metal Bead-Seal

F140 Practice for Making Reference Glass-Metal Butt Seals and Testing for Expansion Characteristics by Polarimetric Methods

F144 Practice for Making Reference Glass-Metal Sandwich Seal and Testing for Expansion Characteristics by Polarimetric Methods

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 bar:

3.1.1.1 hot-finished rounds, squares, and hexagons, ¼ in. (6.4 mm) and over in diameter or size.

3.1.1.2 hot-finished flats, ¼ in. to 10 in. (6.4 to 254 mm), inclusive, in width and ⅛ in. (3.2 mm) and over in thickness.

3.1.1.3 cold-finished rounds, squares, octagons, hexagons and shapes, over ½ in. (12.7 mm) in diameter or size.

3.1.1.4 cold-finished flats, ⅜ in. (9.5 mm) and over in width and ⅛ in. (3.2 mm) and over in thickness (see Discussions).

Discussion—Widths less than ⅜ in. (9.5 mm) and thicknesses less than ⅜ in. (4.8 mm) are generally described as flat wire.

Discussion—Thicknesses of ⅛ in. (3.2 mm) to under ⅜ in. (4.8 mm) can also be described as cold-rolled strip or, if in cut lengths, bar.

3.1.2 rod—hot-rolled, or hot-rolled, annealed, and pickled, rounds, squares, octagons, hexagons and shapes, in coils, for subsequent cold drawing or cold rolling, ¼ in. or ⅜ in. (6.4 or 19.0 mm) in diameter or size.

3.1.3 strip—cold-finished coils or cut lengths, under 24 in. (610 mm) down to and including ⅜ in. (4.8 mm) in width, and under ⅜ in. down to and including 0.005 in. (0.13 mm) in thickness.

3.1.4 No. 1 edge—a rolled edge either round or square as specified.

3.1.5 No. 3 edge—an edge produced by slitting.

3.1.6 No. 5 edge—an approximately square edge produced by rolling or filing after slitting.