



Designation: B739 – 03 (Reapproved 2023)

# Standard Specification for Nickel-Iron-Chromium-Silicon Alloy Welded Tube<sup>1</sup>

This standard is issued under the fixed designation B739; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers alloys UNS N08330 and UNS N08332 in the form of welded tube intended for heat resisting applications and general corrosive service.

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 *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 become familiar with all hazards including those identified in the appropriate Safety Data Sheet (SDS) for this product/material as provided by the manufacturer, to establish appropriate safety, health, and environmental practices, and determine the applicability of regulatory limitations prior to use.*

1.4 *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.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[B536 Specification for Nickel-Iron-Chromium-Silicon Alloys Plate, Sheet, and Strip](#)

[B751 Specification for General Requirements for Nickel and Nickel Alloy Welded Tube](#)

## 3. General Requirement

3.1 Material furnished under this specification shall conform to the applicable requirements of Specification [B751](#) unless otherwise provided herein.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.07 on Refined Nickel and Cobalt and Their Alloys.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

## 4. Ordering Information

4.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Examples of such requirements include, but are not limited to, the following:

4.1.1 Alloy ([Table 1](#)),

4.1.2 ASTM designation and year of issue,

4.1.3 Dimensions (outside or inside diameter and nominal wall thickness),

4.1.4 Length (specific or random),

4.1.5 Quantity (feet or number of pieces),

4.1.6 *Certification*—State if certification is required,

4.1.7 *Samples for Product (Check) Analysis*—State whether samples for product (check) analysis should be furnished, and

4.1.8 *Purchaser Inspection*—If purchaser wishes to witness tests or inspection of material at place of manufacture, the purchase order must so state indicating which tests or inspections are to be witnessed.

## 5. Materials and Manufacture

5.1 The tube shall be made from flat-rolled alloy conforming to Specification [B536](#), by an automatic welding process with no addition of filler metal. Subsequent to welding and prior to final heat treatment, the tube shall be cold-worked either in both weld and base metal or in weld metal only.

## 6. Chemical Composition

6.1 The material shall conform to the requirements, as to chemical composition specified in [Table 2](#).

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis variations per Specification [B751](#).

## 7. Mechanical Properties and Other Requirements

7.1 The tensile properties of the material at room temperature shall conform to those shown in [Table 1](#).

7.2 *Grain Size*—Annealed Alloy UNS N08332 shall conform to an average grain size of ASTM No. 5 or coarser.

7.3 *Annealing Temperature*—Alloy UNS N08330 shall be annealed at 1900 °F (1040 °C) minimum. Alloy UNS N08332 shall be annealed at 2050 °F (1120 °C) minimum.

**TABLE 1 Mechanical Properties**

Alloy	Condition	Tensile Strength, min, psi (MPa)	Yield Strength, 0.2 % offset, min, psi (MPa)	Elongation in 2 in. or 50 mm, or 4D, min,%	Hardness <sup>A</sup>
UNS N08330	Annealed	70 000 (483)	30 000 (207)	30	70–90 HRB
UNS N08332	Annealed	67 000 (462)	27 000 (186)	30	65–88 HRB

<sup>A</sup> Hardness values are informative only and not to be construed as the basis for acceptance.

**TABLE 2 Chemical Requirements**

Element	Composition Limits, %
Carbon	... <sup>A</sup>
Manganese	2.00 max
Phosphorus	0.03 max
Sulfur	0.03 max
Silicon	0.75–1.50
Chromium	17.0–20.0
Nickel	34.0–37.0
Copper	1.00 max
Lead	0.005 max
Tin	0.025 max
Iron	remainder <sup>B</sup>

<sup>A</sup> Alloy UNS N08330: 0.08 max.

Alloy UNS N08332: 0.05–0.10.

<sup>B</sup> Element shall be determined arithmetically by difference.

## 8. Keywords

### 8.1 welded tube; N08330; N08332

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