



Designation: B 535 – 99

Standard Specification for Nickel-Iron-Chromium-Silicon Alloys (UNS N08330 and N08332) Seamless Pipe and Tube¹

This standard is issued under the fixed designation B 535; 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 specification² covers alloys UNS N08330 and N08332 in the form of hot-finished and cold-finished seamless pipe and tube intended for heat resisting applications and general corrosive service.

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

2. Referenced Documents

2.1 *ASTM Standards:*

B 829 Specification for General Requirements for Nickel and Nickel Alloy Seamless Pipe and Tube³

3. General Requirement

3.1 Material furnished under this specification shall conform to the applicable requirements of Specification B 829 unless otherwise provided herein.

4. Ordering Information

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

4.1.1 Alloy name or UNS number,

4.1.2 ASTM designation and year of issue,

4.1.3 *Dimensions:*

4.1.3.1 *Pipe*—Specify standard pipe size and schedule,

4.1.3.2 *Tube*—Specify outside diameter and nominal or minimum wall,

4.1.3.3 *Length* (specific or random),

4.1.4 *Finish:*

4.1.4.1 *Pipe*—Specify cold-worked or hot-worked,

4.1.4.2 *Tube*—Specify cold-worked or hot-finished,

4.1.5 *Quantity* (feet or meters 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 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 test or inspections are to be witnessed.

5. Materials and Manufacture

5.1 *Heat Treatment*—The material shall be furnished in the annealed condition. The final heat treatment of UNS N08330 shall be 1900°F (1040°C) minimum. The final heat treatment of UNS N08332 shall be 2100°F (1150°C) minimum.

6. Chemical Composition

6.1 The material shall conform to the composition limits specified in Table 1.

6.1.1 A chemical analysis shall be made on each lot of material as described in Specification B 829.

TABLE 1 Chemical Requirements

Element	Composition Limits, %
C	... ^A
Mn	2.00 max
P	0.03 max
S	0.03 max
Si	0.75–1.50
Cr	17.0–20.0
Ni	34.0–37.0
Cu	1.00 max
Pb	0.005 max
Sn	0.025 max
Fe	remainder ^B

^AAlloy UNS N08330: 0.08 max.

Alloy UNS N08332: 0.05 to 0.10.

^BElement shall be determined arithmetically by difference.

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product analysis variations prescribed in Specification B 829.

7. Mechanical and Other Properties

7.1 The material shall conform to the mechanical properties listed in Table 2.

¹This specification is under the jurisdiction of ASTM Committee B-2 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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²For ASME Boiler and Pressure Vessel Code applications see related Specification SB-535 in Section II of that Code.

³*Annual Book of ASTM Standards*, Vol 02.04.