~~Designation:B 514–05~~ Designation: B514 – 05 (Reapproved 2009)

Standard Specification for Welded Nickel-Iron-Chromium Alloy Pipe[1]

This standard is issued under the fixed designation B514; 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[2] covers nickel-iron-chromium alloys in the form of welded, cold-worked, and annealed pipe for general corrosive service and heat-resisting applications. These products are furnished in three alloys: UNS N08120, UNS N08800, and UNS N08810.* Alloy UNS N08800 is employed normally in service temperatures up to and including 1100°F (593°C). Alloys UNS N08120 and UNS N08810 are employed normally in service temperatures above 1100°F where resistance to creep and rupture is required, and are annealed to develop controlled grain size for optimum properties in this temperature range.

1.2 This specification covers outside diameter and nominal wall pipe shown in ANSI B36.19. Pipe having other dimensions may be furnished provided such pipe complies with all other requirements of the specification.

~~1.3The values stated in inch-pound units are to be regarded as the standard.~~

1.3 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.

1.4 *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 Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ~~*ASTM Standards:*~~

~~B899Terminology Relating to Non-ferrous Metals and Alloys~~ ASTM Standards:[3]

B775 ~~Specification for General Requirements for Nickel and Nickel Alloy Seamless and Welded Pipe~~ Specification for General Requirements for Nickel and Nickel Alloy Welded Pipe

B899 Terminology Relating to Non-ferrous Metals and Alloys

2.2 *ANSI Standard:*

B36.19 Stainless Steel Pipe[4]

3. Terminology

3.1 Terms defined in Terminology ~~B 899~~ B899 shall apply unless defined otherwise in this standard.

4. General Requirement

4.1 Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification ~~B 775~~B775 unless otherwise provided herein.

5. Ordering Information

5.1 Orders for material under this specification should include the following information:

5.1.1 Alloy name or UNS number.

5.1.2 ASTM designation and year of issue.

5.1.3 Condition (temper) (Table 1).

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[1] 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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[2] For ASME Boiler and Pressure Code applications see related Specification SB-514 in Section II of that Code.

* New designation established in accordance with ASTM E527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).

[3] 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.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

***A Summary of Changes section appears at the end of this standard.**

TABLE 2 1 ChMemchanical Property Requirements

Element Alloy N08120	Alloys N08800 and N08810	
Alloy	Cond N08810	
Nickel	35.0 min	30.0 min
Nition (Temper)	Tensile Strength, min, psi (MPa)	Yin
	39.0 max	35.0 max
Chromium	23.0 min	19.0 min
	27.0 max	23.0 max
Iron	remainder39.5 minA	
Iron	reld StrenA	
Manganese, max	1.5	1.5
Mangth, max	1.5	1.5
Carbon	0.02 min	B
	0.10max	
Carbon	0.2 % Offset,	B
	min, psi (MPa)	
Copper, max	0.50 max	0.75
Silicon, max	1.0	1.0
SiElongax	1.0	1.0
Sulfur, max	0.03	0.015
Aluminum	0.40 max	0.15 min
	...	0.60 max
Titanium	0.20 max	0.15 min
Titium	0.20 max	0.15 min
	...	0.60 max
Columbium	0.4 m in	...
	0.9 max	...
Columbium	0.4 mn in	...
	2 in. or 50 max	...m, min, %
Molybdenum	2.50 max	...
UNS N08120	annealed	...
Phosphorus	0. 040 max	...
Phosphorus90 000	40 000 (276)	30
(621)		
Tungsten	2.50 max	...
UNS N08800	annealed	...
Cobalt, max	3.0	...
Cobalt,	30 000 (207)	30
max75 000 (520)		
Nitrogen	0.15 min	...
UNS N08810	annealed	...
	0.30 max	...
65 000 (450)	25 000 (170)	...
Boron	0.010 max	...
Boron	30.010 max	...

[A] Iron shall be determined arithmetically by difference.
[B] Alloy UNS N08800: 0.10 max. Alloy UNS N08810: 0.05 to 0.10.

5.1.4 *Dimensions*:
5.1.4.1 Nominal pipe size or outside diameter and schedule number or nominal wall thickness.
5.1.4.2 Length (specific or random).
5.1.5 Quantity (feet or metres, or number of pieces).
5.1.6 *Certification*—State if certification or a report of test results is required.
5.1.7 *Samples for Product (Check) Analysis*—State whether samples for product (check) analysis should be furnished.
5.1.8 *Purchaser Inspection*—If the purchaser wishes to witness tests or inspection of material at the place of manufacture, the purchase order must so state indicating which tests or inspections are to be witnessed.

6. Materials and Manufacture

6.1 Pipe shall be made from flat-rolled alloy by an automatic welding process with no addition of filler metal. Subsequent to welding and prior to final solution treatment, the material shall be cold worked either in both weld and base metal or in weld metal only.

6.2 Pipe shall be furnished with a scale-free finish. When bright annealing is used, descaling is not necessary.

7. Chemical Composition

7.1 The material shall conform to the requirements as to chemical composition prescribed in Table 2.

7.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis variations in Table 1 Table 1 of Specification B 775B775.

8. Mechanical and Other Requirements

8.1 *Mechanical Properties*—The material shall conform to the requirements for mechanical properties prescribed in Table 1.