



Designation: **B705 – 05 (Reapproved 2014) B705 – 17**

Standard Specification for Nickel-Alloy (UNS N06625, N06219 and N08825) Welded Pipe¹

This standard is issued under the fixed designation B705; 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—Scope*

1.1 This specification covers welded UNS N06625,² UNS N06219² and UNS N08825² pipe in the annealed condition (temper) for general corrosion applications.

1.2 This specification covers pipe sizes in schedules shown in the Permissible Variations in Outside Diameter and Wall Thickness for Welded Pipe table of Specification **B775**.

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 The following precautionary caveat pertains only to the test methods portion, Section 8, 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 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, establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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:³

B751 Specification for General Requirements for Nickel and Nickel Alloy Welded Tube

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

B880 Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys

2.2 ASME Boiler and Pressure Vessel Code:⁴

Section IX Welding and Brazing Qualifications

3. General Requirement

3.1 Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification **B775** unless otherwise provided herein.

4. Definition of Terms

4.1 *Class 1*—Welded, cold-worked, annealed, and nondestructively tested in accordance with **9.1**.

4.2 *Class 2*—Welded, cold-worked, annealed, and nondestructively tested in accordance with **9.2**.

4.3 *Grade 1*—Annealed condition, relevant for UNS N06625.

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 New designation established in accordance with Practice E527 and SAE J 1086, 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 Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, http://www.asme.org.

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

4.4 *Grade 2*—Solution annealed condition, relevant for UNS N06625.

5. Ordering Information

5.1 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:

- 5.1.1 Alloy name or UNS number,
- 5.1.2 ASTM designation,
- 5.1.3 *Dimensions*:
 - 5.1.3.1 Pipe size,
 - 5.1.3.2 Length (specific or random),
- 5.1.4 Class (see Section 3),
- 5.1.5 Grade if UNS N06625 is specified. If neither grade of N06625 is specified, grade 1 will be supplied.
- 5.1.6 Quantity (feet or number of pieces),
- 5.1.7 *Certification*—State if certification is required,
- 5.1.8 *Samples for Product (Check) Analysis*—State whether samples for product (check) analysis should be furnished (7.2), and
- 5.1.9 *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 witnesses.

6. Material 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 annealing, the material shall be cold-worked in either the weld metal only or both weld and base metal.

6.2 Pipe shall be furnished with oxide removed. When bright annealing is used, descaling is not necessary.

7. Chemical Composition

7.1 The material shall conform to the composition limits specified in Table 1. One test per lot shall be performed.

7.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis variations per Specification B880.

8. Mechanical Properties and Other Requirements

8.1 *Mechanical Properties*—The material shall conform to the mechanical properties specified in Table 2. One pipe per lot shall be examined.

8.2 *Flattening Test*—A section of pipe not less than 4 in. (102 mm) in length shall be capable of withstanding, without cracking, flattening under a load applied gradually at room temperature until the distance between the platens is five times the wall thickness. The weld shall be positioned 90° from the direction of the applied flattening force. One pipe per lot shall be examined.

8.2.1 Superficial ruptures resulting from surface imperfections shall not be a cause for rejection.

8.3 *Transverse Guided Bend Test*:

TABLE 1 Chemical Requirements

		Composition Limits, %		
		UNS N06625	UNS N06219	UNS N08825
Ni	58.0 min ^A	Bal	38.0–46.0	
Cr	20.0–23.0	18.0–22.0	19.5–23.5	
Fe	5.0 max	2.0–4.0	22.0 min ^A	
Mo	8.0–10.0	7.0–9.0	2.5 3.5	
Cb + Ta	3.15–4.15	
C	0.10 max	0.05 max	0.05 max	
Mn	0.50 max	0.50 max	1.0 max	
Si	0.5 max	0.70–1.10	0.5 max	
P	0.015 max	0.020 max	...	
S	0.015 max	0.010 max	0.03 max	
Al	0.4 max	0.50 max	0.2 max	
Ti	0.40 max	0.50 max	0.6–1.2	
Co (if determined)	1.0 max	1.0 max	...	
Cu	...	0.50 max	1.5–3.0	

^A Element may be determined arithmetically by difference.