



# Standard Specification for Welded UNS N08020 Alloy Pipe<sup>1</sup>

This standard is issued under the fixed designation B464/B464M; 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<sup>2</sup> covers welded UNS N08020 alloy pipe for general corrosion-resisting and low- or high-temperature service.

1.2 The pipe covered is nominal pipe sizes up to and including NPS 6 [168 mm] with the nominal wall thicknesses given as Schedules 5S, 10S, and 40S and nominal pipe sizes up to and including NPS 2 [60 mm] also including Schedule 80S. Table 2 of Specification B775 is based on Table A1 of ANSI B36.19 and gives the nominal dimensions of these sizes. Table 3 of Specification B775 lists the dimensional requirements of these sizes. Pipe having other dimensions may be furnished provided such pipe complies with all other requirements of this specification.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the 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 Safety Data Sheet (SDS) 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:<sup>3</sup>

<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.

Current edition approved Oct. 1, 2015. Published November 2015. Originally approved in 1967. Last previous edition approved in 2010 as B464 – 10. DOI: 10.1520/B0464\_B464M-15.

<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications, see related Specification SB-464 in Section II of that code.

<sup>3</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.

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

B775 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<sup>4</sup>

## 3. Terminology

3.1 *Definitions*—Definitions for terms defined in Terminology B899 shall apply unless otherwise defined by the requirements of this document.

## 4. General Requirement

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

## 5. Ordering Information

5.1 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:

5.1.1 Quantity (feet or number of lengths),

5.1.2 UNS number,

5.1.3 Size (nominal pipe size and schedule),

5.1.4 Length (random or specific),

5.1.5 ASTM designation,

5.1.6 *Product Analysis*—State if required,

5.1.7 *Certification*—State if a certification or a report of test results is required,

5.1.8 *Purchaser Inspection*—State which tests or inspections are to be witnessed, if any, and

5.1.9 Supplementary requirements, if any.

## 6. Materials and Manufacture

6.1 The pipe shall be made from flat-rolled stock by an automatic welding process with no addition of filler metal.

<sup>4</sup> 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

6.2 *Heat Treatment*—Pipe of UNS N08020 alloy shall be furnished in the stabilized-annealed condition.

NOTE 1—The recommended annealing temperatures are 1800 to 1850°F [982 to 1010°C] for UNS N08020.

## 7. Chemical Composition

7.1 The material shall conform to the composition limits specified in **Table 1**. One test is required for each lot as defined in Specification **B775**.

7.2 If a product analysis is performed, it shall meet the chemistry limits prescribed in **Table 1**, subject to the analysis tolerances specified in Specification **B775**.

**TABLE 1 Chemical Requirements**

Element	Composition, %
	UNS N08020
Carbon, max	0.07
Manganese, max	2.00
Phosphorus, max	0.045
Sulfur, max	0.035
Silicon, max	1.00
Nickel	32.00–38.00
Chromium	19.00–21.00
Molybdenum	2.00–3.00
Copper	3.00–4.00
Columbium (Nb) + tantalum	8 × carbon–1.00
Nitrogen	...
Iron <sup>A</sup>	remainder

<sup>A</sup> By difference.

**TABLE 2 Mechanical Property Requirements**

Tensile Strength, min, ksi [MPa]	Yield Strength, min, ksi [MPa]	Elongation in 2 in. [50.8 mm], min, %
80 [551]	35 [241]	30.0

## 8. Mechanical Properties and Other Requirements

8.1 *Mechanical Properties*—The material shall conform to the mechanical property requirements specified in **Table 2**. One test is required for each lot as defined in Specification **B775**.

8.2 *Flattening Test*—A flattening test shall be made on each end of one pipe per lot. Superficial ruptures resulting from surface imperfections shall not be cause for rejection.

8.3 *Nondestructive Test Requirements*—Each pipe shall be subjected to either a pressure test or a nondestructive electric test at the manufacturer’s option. The purchaser may specify which test is to be used.

8.4 *Transverse Guided Bend Test*—At the option of the pipe manufacturer, the transverse guided bend test may be substituted in lieu of the flattening test. Two bend specimens shall be taken transversely from pipe or the test specimens may be taken from a test plate of the same material and heat as pipe, which is attached to the end of the cylinder and welded as a prolongation of the pipe longitudinal seam. One test is required for each lot as defined in Specification **B775**.

## 9. Lengths

9.1 Lengths may be ordered as either random lengths (normally 15 to 24 ft [4.6 to 8.3 m] with some agreed upon allowance for shorts) or specific cut lengths.

## 10. Keywords

10.1 welded pipe; N08020

## SUPPLEMENTARY REQUIREMENTS

The following supplementary requirements shall be applied only when specified by the purchaser in the inquiry, contract, or order:

### S1. Corrosion Tests

S1.1 One intergranular corrosion test per lot shall be performed by the manufacturer on a sensitized specimen and tested in accordance with Practices **A262**. When this supplementary requirement is specified, the specific practice (Practice B or Practice E) shall also be specified. If Practice B is specified, the specimen must pass with a rate of less than 0.002 in. [0.05 mm] per month. A lot for intergranular corrosion testing shall be the same as for mechanical testing.

S1.1.1 In addition to the anneal recommended in **Note 1**, the specimen shall be sensitized for 1 h at 1250°F [677°C] before being subjected to corrosion testing.

S1.1.2 If any corrosion test specimen fails the test, the material represented by such specimen may be reheat-treated and resubmitted for test.



**SUMMARY OF CHANGES**

Committee B02 has identified the location of selected changes to this standard since the last issue (B464–10) that may impact the use of this standard. (Approved October 1, 2015.)

(1) Updated and added metric values.

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; <http://www.copyright.com/>*