Standard Specification for Nickel Seamless Pipe and Tube

This standard is issued under the fixed designation B 161; 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 nickel (UNS N02200)* and low-carbon nickel (UNS N02201)* in the form of cold-worked seamless pipe and tube in the conditions shown in Table 1 and Table X1.1.

1.1.1 Hot-worked material is available. Properties to be agreed upon between the manufacturer and purchaser.

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 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.

2. Referenced Documents

2.1 ASTM Standards:3

B 829 Specification for General Requirements for Nickel and Nickel Alloys Seamless Pipe and Tube

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 Condition (see Appendix X2).

4.1.4 Finish (see Appendix X2).

4.1.5 Dimensions:

4.1.5.1 Tube—Specify outside diameter and nominal or minimum wall.

4.1.5.2 Pipe—Specify standard pipe size and schedule.

4.1.5.3 Length—Cut to length or random.

4.1.6 Quantity—Feet or number of pieces.

4.1.7 Hydrostatic Test or Nondestructive Electric Test—Specify test (see 6.2).

4.1.8 Hydrostatic Pressure Requirements—Specify test pressure if other than required by Specification B 829.

4.1.9 Certification—State if certification is required.

4.1.10 Samples for Product (Check) Analysis—State whether samples for product (check) analysis should be furnished (see 5.2).

4.1.11 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.

4.1.12 Small-Diameter and Light-Wall Tube (Converter Sizes)—See Appendix X1.

5. Chemical Composition

5.1 The material shall conform to the composition limits specified in Table 2.

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

6. Mechanical and Other Properties

6.1 Tension Test—The material shall conform to the tensile properties specified in Table 1. The sampling and specimen preparation are as covered in Specification B 829.

6.1.1 Tensile properties for material specified as small-diameter and light-wall tube (converter sizes) shall be as prescribed in Table X1.1.

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*A Summary of Changes section appears at the end of this standard.
6.2 Hydrostatic Test or Nondestructive Electric Test—Each pipe or tube shall be subjected to the Nondestructive Electric Test or the Hydrostatic Test. Unless specified by the purchaser, either test may be used at the option of the producer.

7. Dimensions and Permissible Variations

7.1 Permissible variations for material specified as small-diameter and light-wall tube (converter size) shall conform to the permissible variations prescribed in Table X1.2.

8. Number of Tests

8.1 Chemical Analysis—One test per lot.
8.2 Tension—One test per lot.

8.3 Hydrostatic or Nondestructive Electric Test—Each piece in each lot.

9. Test Methods

9.1 Hydrostatic Test—Each pipe or tube with an outside diameter 1/8 in. (3 mm) and larger and with wall thickness of 0.015 in. (0.38 mm) and over shall be tested in accordance with Specification B 829. The allowable fiber stress, for material in the condition furnished, is as follows:

<table>
<thead>
<tr>
<th>Condition and Size</th>
<th>Nickel (UNS N02200)</th>
<th>Low-Carbon Nickel (UNS N02201)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annealed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 in. (127 mm) and under outside diameter</td>
<td>55 000 (380)</td>
<td>50 000 (345)</td>
</tr>
<tr>
<td>Over 5 in. (127 mm) in outside diameter</td>
<td>55 000 (380)</td>
<td>50 000 (345)</td>
</tr>
<tr>
<td>Stress-Relieved:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sizes</td>
<td>65 000 (450)</td>
<td>60 000 (415)</td>
</tr>
</tbody>
</table>

9.1.1 When so agreed upon by the manufacturer and purchaser, pipe or tube may be tested to 1½ times the allowable fiber stress given above.

9.1.2 If any pipe or tube shows leaks during hydrostatic testing, it shall be rejected.

9.2 Nondestructive Electric Test—Each pipe or tube shall be examined with a nondestructive electric test as prescribed in Specification B 829.

10. Keywords

10.1 seamless pipe; seamless tube; N02200; N02201

APPENDIXES

(Nonmandatory Information)

X1. CONVERTER SIZES

X1.1 Small-diameter and light-wall tube in outside diameters 1¼ in. (31.8 mm) and under may be furnished in the conditions listed in Table X1.1 when so specified. The material is furnished in a limited range of sizes and the manufacturer should be consulted as to the various outside diameters and wall thicknesses that may be furnished. Material will have a bright finish. Such material shall conform to the applicable requirements in Table X1.1 and Table X1.2.
X2. CONDITIONS AND FINISHES NORMALLY SUPPLIED

X2.1 Scope

X2.1.1 This appendix lists the conditions and finishes in which pipe and tube (other than converter sizes) are normally supplied. These are subject to change, and the manufacturer should be consulted for the latest information available.

X2.2 Nickel (UNS N02200)

X2.2.1 Annealed—Soft, with a dull matte finish.

X2.2.2 Stress-Relieved—Thermally treated below the annealing temperature to relieve the major portion of the internal stresses, with a thin, light to medium-dark surface.

X2.3 Low-Carbon Nickel (UNS N02201)

X2.3.1 Annealed—Similar to X2.2.1.

X2.3.2 Stress-Relieved—Similar to X2.2.2.
SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B 161 – 03) that may impact the use of this standard.

(1) To make reference to Specification B 829 instead of Practice E 426 and Practice E 571 for nondestructive electric test examination.

(2) Revisions of 2.1 and 9.2.

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