



Designation: A 789/A 789M – 02

An American National Standard

## Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Service<sup>1</sup>

This standard is issued under the fixed designation A 789/A 789M; 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<sup>2</sup> covers grades of nominal wall thickness, stainless steel tubing for services requiring general corrosion resistance, with particular emphasis on resistance to stress corrosion cracking. These steels are susceptible to embrittlement if used for prolonged periods at elevated temperatures.

NOTE 1—For tubing smaller than ½ in. [12.7 mm] in outside diameter, the elongation values given for strip specimens in Table 1 shall apply. Mechanical property requirements do not apply to tubing smaller than ⅝ in. [3.2 mm] in outside diameter or with walls thinner than 0.015 in. [0.4 mm].

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. The inch-pound units shall apply unless the *M* designation of this specification is specified in the order.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 480/A 480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip<sup>3</sup>

A 1016/A 1016M Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes<sup>4</sup>

E 527 Practice for Numbering Metals and Alloys (UNS)<sup>4</sup>

#### 2.2 SAE Standard:<sup>5</sup>

SAE J 1086 Practice for Numbering Metals and Alloys (UNS)

TABLE 1 Tensile and Hardness Requirements

| UNS Designation                 | Tensile Strength, min, ksi [MPa] | Yield Strength, min, ksi [MPa] | Elongation in 2 in. or 50 mm, min, % | Hardness, max |            |
|---------------------------------|----------------------------------|--------------------------------|--------------------------------------|---------------|------------|
|                                 |                                  |                                |                                      | Brinell       | Rockwell C |
| S31803                          | 90 [620]                         | 65 [450]                       | 25                                   | 290           | 30.5       |
| S32205                          | 95 [655]                         | 70 [485]                       | 25                                   | 290           | 30.5       |
| S31500                          | 92 [630]                         | 64 [440]                       | 30                                   | 290           | 30.5       |
| S32550                          | 110 [760]                        | 80 [550]                       | 15                                   | 297           | 31.5       |
| S31200                          | 100 [690]                        | 65 [450]                       | 25                                   | 280           | ...        |
| S31260 <sup>A</sup>             | 100 [690]                        | 65 [450]                       | 25                                   | 290           | 30.5       |
| S32001                          | 90 [620]                         | 65 [450]                       | 25                                   | 290           | 30         |
| S32304                          |                                  |                                |                                      |               |            |
| OD 1 in. [25 mm] and Under      | 100 [690]                        | 65 [450]                       | 25                                   | ...           | ...        |
| OD over 1 in. [25 mm]           | 87 [600]                         | 58 [400]                       | 25                                   | 290           | 30.5       |
| S39274                          | 116 [800]                        | 80 [550]                       | 15                                   | 310           | ...        |
| S32750                          | 116 [800]                        | 80 [550]                       | 15                                   | 310           | 32         |
| S32760                          | 109 [750]                        | 80 [550]                       | 25                                   | 300           | ...        |
| S32900                          | 90 [620]                         | 70 [485]                       | 20                                   | 271           | 28         |
| S32950 <sup>B</sup>             | 100 [690]                        | 70 [480]                       | 20                                   | 290           | 30.5       |
| S39277                          | 120 [825]                        | 90 [620]                       | 25                                   | 290           | 30         |
| S32520                          | 112 [770]                        | 80 [550]                       | 25                                   | 310           | ...        |
| S32906                          |                                  |                                |                                      |               |            |
| Wall below 0.40 in. (10 mm)     | 116 [800]                        | 94 [650]                       | 25                                   | 310           | 32         |
| Wall 0.40 in. (10 mm) and above | 109 [750]                        | 80 [550]                       | 25                                   | 310           | 32         |
| S32003                          | 90 [620]                         | 65 [450]                       | 25                                   | 290           | 30         |

<sup>A</sup> Prior to A 789/A 789M – 87, the values for S31260 were: 92 ksi tensile strength, 54 ksi yield strength, and 30 % elongation.

<sup>B</sup> Prior to A 789/A 789M – 89, the tensile strength value was 90 ksi for UNS S32950.

### 3. Ordering Information

3.1 Orders for product under this specification should include the following, as required, to describe the desired material adequately:

3.1.1 Quantity (feet, metres, or number of lengths),

3.1.2 Name of product (seamless or welded tubes),

3.1.3 Grade (see Table 2),

3.1.4 Size (outside diameter and nominal wall thickness),

3.1.5 Length (specific or random),

3.1.6 Optional requirements (product analysis for welded tubes, Section 8; hydrostatic test or nondestructive electric test, Section 10),

3.1.7 Test report required (section on inspection of Specification A 1016/A 1016M),

3.1.8 Specification designation, and

3.1.9 Special requirements.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.10 on Stainless and Alloy Steel Tubular Products.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications, see related Specification SA-789 in Section II of that Code.

<sup>3</sup> Annual Book of ASTM Standards, Vol 01.03.

<sup>4</sup> Annual Book of ASTM Standards, Vol 01.01.

<sup>5</sup> Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001.

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