Designation: A 167 – 99 (Reapproved 2009)

# Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip[1]

This standard is issued under the fixed designation A 167; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope

1.1 This specification covers stainless and heat-resisting chromium-nickel steel plate, sheet, and strip.

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

NOTE 1—Grades that were previously covered in both Specifications A 167 and A 240/A 240M have been removed from this specification and may now be supplied and purchased in compliance with Specification A 240/A 240M. The chemical and mechanical property requirements of these grades were identical in Specifications A 167 and A 240/A 240M at the time of removal from Specification A 167.

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

A 240/A 240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products

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

E 527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

2.2 *SAE Standard:*[3]

J 1086 Numbering Metals and Alloys (UNS)

## 3. Chemical Composition

3.1 The steel shall conform to the requirements as to chemical composition specified in Table 1, and shall conform to applicable requirements specified in Specification A 480/A 480M.

## 4. Mechanical Properties

4.1 The material shall conform to the mechanical properties specified in Table 2.

## 5. General Requirements

5.1 The following requirements for orders for material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 480/A 480M.

5.1.1 Definitions,
5.1.2 General requirements for delivery,
5.1.3 Ordering information,
5.1.4 Process,
5.1.5 Heat treatment,
5.1.6 Special tests,
5.1.7 Dimensions and permissible variations,
5.1.8 Workmanship, finish, and appearance,
5.1.9 Number of tests,
5.1.10 Specimen preparation,
5.1.11 Retreatment,
5.1.12 Inspection,
5.1.13 Rejection and rehearing,
5.1.14 Material test report,
5.1.15 Certification, and
5.1.16 Packaging, marking, and loading.

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[1] This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.17 on Flat-Rolled and Wrought Stainless Steel.

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[2] 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.

[3] Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, http://www.sae.org.

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**TABLE 1 Chemical Requirements[A]**

| UNS Designation[B] | Type | Composition, % | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon | Manganese | Phosphorus | Sulfur | Silicon | Chromium | Nickel | Molybdenum | Other Elements |
| S30215 | 302B | 0.15 | 2.00 | 0.045 | 0.030 | 2.00–3.00 | 17.0–19.0 | 8.00–10.0 | . . . | N 0.10 |
| S30800 | 308 | 0.08 | 2.00 | 0.045 | 0.030 | 0.75 | 19.0–21.0 | 10.0–12.0 | . . . | . . . |
| S30900 | 309 | 0.20 | 2.00 | 0.045 | 0.030 | 0.75 | 22.0–24.0 | 12.0–15.0 | . . . | . . . |
| S31000 | 310 | 0.25 | 2.00 | 0.045 | 0.030 | 1.50 | 24.0–26.0 | 19.0–22.0 | . . . | . . . |

[A] Maximum unless range or minimum is indicated.
[B] New designation established in accordance with Practice E 527 and SAE J 1086.

**TABLE 2 Mechanical Property Requirements**

| UNS Designation[A] | Type | Tensile Strength, min | | Yield Strength, min[B] | | Elongation in 2 in. or 50 mm, min, % | Hardness, max[C] | |
|---|---|---|---|---|---|---|---|---|
| | | ksi | MPa | ksi | MPa | | Brinell | Rockwell B |
| S30215 | 302B | 75 | 515 | 30 | 205 | 40.0 | 217 | 95 |
| S30800 | 308 | 75 | 515 | 30 | 205 | 40.0 | 183 | 88 |
| S30900 | 309 | 75 | 515 | 30 | 205 | 40.0 | 217 | 95 |
| S31000 | 310 | 75 | 515 | 30 | 205 | 40.0 | 217 | 95 |

[A] New designation established in accordance with Practice E 527 and SAE J 1086.
[B] Yield strength shall be determined by the offset method at 0.2 % in accordance with Test Methods and Definitions A 370. Unless otherwise specified, an alternative method of determining yield strength may be based on a total extension under load of 0.5 %.
[C] Either Brinell or Rockwell B hardness is permissible.

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