Designation: A 895 – 89 (Reapproved 2004)

Standard Specification for Free-Machining Stainless Steel Plate, Sheet, and Strip[1]

This standard is issued under the fixed designation A 895; 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 covers hot-finished or cold-finished plate, sheet, and strip in the more commonly used types of stainless free machining steels designed especially for optimum machinability and for general corrosion and high temperature service. Stainless and heat-resisting plate, sheet, and strip, other than free-machining types, are covered in separate specifications.

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

2. Referenced Documents

2.1 *ASTM Standards:* [2]

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

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

E 527 Practice for Numbering Metals and Alloys (UNS)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *plate*—material 3⁄16 in. (4.8 mm) and over in thickness and over 10 in. (250 mm) in width.

3.1.2 *sheet*—material under 3⁄16 in. (5.0 mm) in thickness and 24 in. (600 mm) and over in width.

3.1.3 *strip*—material under 3⁄16 in. (5.0 mm) in thickness and under 24 in. (600 mm) in width.

4. Process

4.1 The steel shall be made by one or more of the following processes: electric-arc, electric-induction, or other suitable commercial processes.

TABLE 1 Condition

Type	Condition A (Annealed)	Condition T (Intermediate Temper)	Condition H (Hard Temper)
303	A	. . .	. . .
303Se	A	. . .	. . .
416	A	T	H
416Se	A	T	H
420F	A	. . .	. . .
420FSe	A	T	. . .
430F	A	. . .	. . .
430FSe	A	. . .	. . .

4.2 Plate, sheet, and strip may be furnished in one of the conditions listed in Table 1.

5. Ordering Information

5.1 Orders for material under this specification should include the following information:

5.1.1 Quantity (weight or number of pieces),

5.1.2 Type or UNS designation (Table 2),

5.1.3 Form (plate, sheet, or strip),

5.1.4 Condition (Table 2),

5.1.5 Finish (9.2),

5.1.6 Dimensions (thickness, width, and length),

5.1.7 Edge, strip only (see Specification A 480/A 480M),

5.1.8 ASTM designation and date of issue,

5.1.9 Additions to specification or special requirements,

5.1.10 Preparation for delivery, and

5.1.11 Marking requirements.

6. Chemical Composition

6.1 The chemical composition shall conform to the requirements specified in Table 2.

6.2 Methods and practices relating to chemical analysis required by this specification shall be in accordance with Test Methods, Practices, and Terminology A 751.

7. Hardness Requirement

7.1 The material shall conform to the hardness requirements as specified in Table 3.

7.2 The hardness test shall be determined in accordance with Test Methods and Definitions A 370.

[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.

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TABLE 2 Chemical Requirements

UNS Designation[A]	Chemical Composition, %								
	Type	Carbon[B]	Manganese, max	Phosphorus, max	Sulfur[B]	Silicon, max	Chromium	Nickel	Other Elements
S30300	303	0.15	2.00	0.20	0.15 min	1.00	17.00–19.00	8.00–10.00	. . .
S30323	303Se	0.15	2.00	0.20	0.06	1.00	17.00–19.00	8.00–10.00	Se 0.15 min
S41600	416	0.15	1.25	0.06	0.15 min	1.00	12.00–14.00	. . .	. . .
S41623	416Se	0.15	1.25	0.06	0.06	1.00	12.00–14.00	. . .	Se 0.15 min
S42020	420F	0.30–0.40	1.25	0.06	0.15 min	1.00	12.00–14.00	0.50[C]	Cu 0.60 max[C]
S42023	420FSe	0.20–0.40	1.25	0.06	0.06	1.00	12.00–14.00	0.50[C]	Cu 0.60 max[C] Se 0.15 min
S43020	430F	0.12	1.25	0.06	0.15 min	1.00	16.00–18.00	. . .	. . .
S43023	430FSe	0.12	1.25	0.06	0.06	1.00	16.00–18.00	. . .	Se 0.15 min

[A] New designation established in accordance with Practice E 527 and SAE J 1086, Practice for Numbering Metals and Alloys (UNS).
[B] Maximum unless otherwise noted.
[C] At manufacturer's option, reported only when intentionally added.

TABLE 3 Mechanical Test Requirements

Types	Condition	Hardness (HBN)
303, 303Se	A	202 max
All (except 303, 303Se)	A	262 max
416, 416Se and 420FSe	T	248 to 302
416 and 416Se	H	293 to 352

8. General Requirements for Delivery

8.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 480/A 480M. In case of conflict, the requirements of this specification shall prevail.

9. Workmanship, Finish, and Appearance

9.1 The material shall be of uniform quality consistent with good manufacturing and inspection practices. The steel quality shall be satisfactory for the production or fabrication of finished parts.

NOTE 1—Free-machining stainless steels may not equal the quality of non-free-machining stainless steels because of the inclusions present to impart free-machining.

9.2 Plates and sheets may be ground to remove surface defects, provided such grinding does not reduce the thickness or width at any point beyond the allowable dimensional tolerances. An iron-free abrasive wheel shall be used for such grinding and shall be operated at a speed ample to ensure that defective areas are cleanly cut out.

10. Product Marking

10.1 Each sheet, strip, or plate shall be marked on one face, in the locations indicated below with the designation number and its suffix, type, heat number, and the name or mark of the manufacturer. The characters shall be of such size as to be clearly legible. The marking shall be sufficiently stable to withstand normal handling. Unless otherwise specified by the purchaser, the marking, at the producer's option, may be done with: *(1)* marking fluid, *(2)* low-stress blunt-nosed-continuous or low-stress blunt-nosed-interrupted-dot die stamp, *(3)* a vibratory tool with a minimum tip radius of 0.005 in. (0.01 mm), or *(4)* electrochemical etching.

10.1.1 Flat sheet, strip in cut lengths, and plate shall be marked in two places near the ends or may be continuously line marked along one edge.

10.1.2 Sheet and strip in coils shall be marked near the outside end of the coil. The inside of the coil shall also be marked or shall have a tag or label attached and marked with the information in 10.1. Alternatively, the coils may be continuously line marked.

10.1.3 Material less than ¼ in. (6.4 mm) in thickness shall not be marked with die stamps.

10.2 Marking for identification for U.S. Government procurement shall be in accordance with Specification A 480/A 480M.

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