

Standard Specification for Plates, Carbon Steel, Structural Quality, Furnished to Chemical Composition Requirements¹

This standard is issued under the fixed designation A830/A830M; 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 structural quality carbon steel plates furnished to chemical composition requirements.

1.2 The plates are available in several standard steel grades and non-standard grades.

1.3 The plates are usually furnished in the as-rolled (hot-rolled) condition.

1.4 Supplementary requirements are provided for additional requirements that may be specified on the order.

1.5 When the steel is to be welded, it is presupposed that a welding procedure suitable for the grade of steel and intended use or service will be utilized. See Appendix X3 of Specification A6/A6M for information on weldability.

1.6 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.

2. Referenced Documents

2.1 ASTM Standards:²

A6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

3. Ordering Information

3.1 In addition to the information required by Specification A6/A6M, the order shall include the following, if applicable:

3.1.1 Silicon requirements (see 5.3 and Supplementary Requirement S96), and

3.1.2 Limitation on rimmed or capped steel.

4. Materials and Manufacture

4.1 The steel shall be killed.

5. Chemical Composition

5.1 The heat analysis shall conform to the requirements for the applicable grade listed in Table 1, unless otherwise specified as permitted in 5.2.

5.2 The chemical requirements for heat analysis may be specified in accordance with the ranges and limits listed in Table 2. In such instances, the heat analysis shall conform to the requirements specified on the order.

5.3 When silicon is required, the range on heat analysis shall be from 0.15 to 0.40 % unless otherwise specified on the order (see Supplementary Requirement S96).

6. General Requirements

6.1 Material furnished under this specification shall conform to the requirements of the current edition of Specification A6/A6M, for the ordered material, unless a conflict exists in which case this specification shall prevail.

7. Keywords

7.1 carbon; chemical composition; non-standard grades; plates; standard grades; steel; structural 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 1 Carbon Plate Compositions, Standard Steels^A

| Grade Number | Chemical Composition Limits, % | | | |
|-----------------|--------------------------------|--------------|------------------|-------------|
| | Carbon | Manganese | Phosphorous, max | Sulfur, max |
| 1006 | 0.08 may | 0.45 max | 0.030 | 0.030 |
| 1008 | 0.10 max | 0.50 max | 0.030 | 0.030 |
| 1000 | 0.10 max | 0.50 max | 0.030 | 0.030 |
| 1009 | 0.15 max | 0.60 max | 0.030 | 0.030 |
| 1010 | 0.08 to 0.13 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1012 | 0.10 to 0.15 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1015 | 0.13 to 0.18 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1016 | 0.13 to 0.18 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1017 | 0 15 to 0 20 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1018 | 0.15 to 0.20 | 0.60 to 0.90 | 0.030 | 0.000 |
| 1010 | 0.15 to 0.20 | 0.00 to 0.90 | 0.030 | 0.030 |
| 1019 | 0.15 10 0.20 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1020 | 0.18 to 0.23 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1021 | 0.18 to 0.23 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1022 | 0.18 to 0.23 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1023 | 0.20 to 0.25 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1025 | 0.22 to 0.28 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1025 | 0.22 to 0.28 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1020 | 0.22 10 0.28 | 0.00 10 0.90 | 0.030 | 0.050 |
| 1030 | 0.28 to 0.34 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1033 | 0.30 to 0.36 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1035 | 0.32 to 0.38 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1037 | 0.32 to 0.38 | 0 70 to 1 00 | 0.030 | 0.030 |
| 1038 | 0.35 to 0.42 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1050 | 0.00 10 0.42 | 0.00 10 0.30 | 0.000 | 0.000 |
| 1039 | 0.37 to 0.44 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1040 | 0.37 to 0.44 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1042 | 0.40 to 0.47 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1043 | 0.40 to 0.47 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1045 | 0.42 to 0.50 | 0.60 to 0.00 | 0.030 | 0.020 |
| 1045 | 0.43 to 0.50 | 0.00 to 0.90 | 0.030 | 0.030 |
| 1046 | 0.43 10 0.50 | 0.70 10 1.00 | 0.030 | 0.030 |
| 1049 | 0.46 to 0.53 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1050 | 0.48 to 0.55 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1055 | 0.50 to 0.60 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1060 | 0.55 to 0.65 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1064 | 0.60 to 0.70 | 0.50 to 0.80 | 0.030 | 0.030 |
| 1065 | 0.60 to 0.70 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1005 | 0.65 to 0.75 | 0.60 to 0.90 | 0.000 | 0.000 |
| 1074 | 0.05 to 0.75 | 0.00 to 0.90 | 0.000 | 0.000 |
| 1074 | 0.70 10 0.80 | 0.50 10 0.60 | 0.030 | 0.030 |
| 1078 | 0.72 to 0.85 | 0.30 to 0.60 | 0.030 | 0.030 |
| 1080 | 0.75 to 0.88 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1084 | 0.80 to 0.93 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1085 | 0.80 to 0.93 | 0.70 to 1.00 | 0.030 | 0.030 |
| 1086 | 0.80 to 0.93 | 0.30 to 0.50 | 0.030 | 0.030 |
| | | | | |
| 1090 | 0.85 to 0.98 | 0.60 to 0.90 | 0.030 | 0.030 |
| 1095 | 0.90 to 1.03 | 0.30 to 0.50 | 0.030 | 0.030 |
| 1504 | 0.19 to 0.25 | 1 35 to 1 65 | 0.030 | 0.030 |
| 1024 | 0.13 10 0.23 | | 0.000 | 0.030 |
| 1527 | 0.22 10 0.29 | 1.20 to 1.50 | 0.030 | 0.030 |
| 1536 | 0.30 to 0.37 | 1.20 to 1.50 | 0.030 | 0.030 |
| 1541 | 0.36 to 0.44 | 1.35 to 1.65 | 0.030 | 0.030 |
| 1548 | 0.44 to 0.52 | 1.10 to 1.40 | 0.030 | 0.030 |
| 1552 | 0.47 to 0.55 | 1.20 to 1.50 | 0.030 | 0.030 |

^A Grades with a specified maximum carbon content of 0.40 % or higher on heat analysis shall have a silicon content from 0.15 to 0.40 % on heat analysis, unless otherwise specified on the order.

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TABLE 2 Heat Analysis Ranges for Carbon Steel Plates

Note 1-Carbon-When the maximum manganese limit exceeds 1.00 %, add 0.01 to the carbon range shown in Column 3.

NOTE 2-Boron-Boron steels can be expected to have 0.0005 % minimum boron content.

NOTE 3—Lead—Carbon steels can be produced with a lead range from 0.15 to 0.35. A heat analysis for lead is not determinable, since lead is added to the stream while each ingot is poured.

| | Chemical Ranges, % | | | |
|------------|--|-------|--|--|
| Element | When Maximum of Specified Element is | Range | | |
| Carbon | To 0.15, incl | 0.05 | | |
| | Over 0.15 to 0.30, incl | 0.06 | | |
| | Over 0.30 to 0.40, incl | 0.07 | | |
| | Over 0.40 to 0.60, incl | 0.08 | | |
| | Over 0.60 to 0.80, incl | 0.11 | | |
| | Over 0.80 | 0.14 | | |
| Manganese | To 0.50, incl | 0.20 | | |
| J. | Over 0.50 to 1.15, incl | 0.30 | | |
| | Over 1.15 to 1.65, incl | 0.35 | | |
| Phosphorus | To 0.08, incl | 0.03 | | |
| Sulfur | To 0.08, incl | 0.03 | | |
| | Over 0.08 to 0.15, incl | 0.05 | | |
| | Over 0.15 to 0.23, incl | 0.07 | | |
| | Over 0.23 to 0.33, incl | 0.10 | | |
| Silicon | To 0.15, incl | 0.08 | | |
| | Over 0.15 to 0.30, incl | 0.15 | | |
| | Over 0.30 to 0.60, incl | 0.30 | | |
| Copper | When copper is required, 0.20 % minimum is commonly specified. | | | |

SUPPLEMENTARY REQUIREMENTS

Supplementary requirements shall not apply unless specified in the purchase order or contract. Standardized supplementary requirements for use at the option of the purchaser are listed in Specification A6/A6M. Those that are considered suitable for use with this specification are listed by title:

S1. Vacuum Treatment,S2. Product Analysis, and

S8. Ultrasonic Examination.

ADDITIONAL SUPPLEMENTARY REQUIREMENTS

In addition, the following special supplementary requirements are also suitable for use with this specification.

S96. Silicon Requirement

S96.1 When a silicon content, or limitation, of other than from 0.15 to 0.40 % on heat analysis is required, the specific requirements shall be as specified on the order.

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SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this standard since the last issue (A830/A830M - 13) that may impact the use of this standard. (Approved May 1, 2014.)

(1) Modified phosphorus and sulfur levels of Table 1.

Committee A01 has identified the location of selected changes to this standard since the last issue (A830/A830M - 11) that may impact the use of this standard. (Approved May 1, 2013.)

(1) Revised Section 4 to require all steels to be killed.

(2) Removed Supplementary Requirement S97 limiting the use

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of Rimmed or Capped Steels.