Designation: A 830/A 830M – 06

Standard Specification for Plates, Carbon Steel, Structural Quality, Furnished to Chemical Composition Requirements[1]

This standard is issued under the fixed designation A 830/A 830M; 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 A 6/A 6M for information on weldability.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 6/A 6M 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 A 6/A 6M, 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 (see 4.3 and Supplementary Requirement S97).

4. Materials and Manufacture

4.1 Steel specified to a maximum carbon content of 0.39 % or lower on heat analysis may be made to any deoxidation practice unless otherwise specified on the order.

4.2 Steel specified to a maximum carbon content of 0.40 % or higher on heat analysis shall be killed unless otherwise specified on the order.

4.3 If rimmed or capped steel is not acceptable, Supplementary Requirement S97 shall be specified on the order.

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 A 6/A 6M, 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

[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 A01.02 on Structural Steel for Bridges, Buildings, Rolling Stock, and Ships.

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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		Chemical Composition Limits, %			
UNS	Number	Carbon	Manganese	Phosphorous, max	Sulfur, max
G10060	1006	0.08 max	0.45 max	0.035	0.04
G10080	1008	0.10 max	0.50 max	0.035	0.04
G10090	1009	0.15 max	0.60 max	0.035	0.04
G10100	1010	0.08 to 0.13	0.30 to 0.60	0.035	0.04
G10120	1012	0.10 to 0.15	0.30 to 0.60	0.035	0.04
G10150	1015	0.13 to 0.18	0.30 to 0.60	0.035	0.04
G10160	1016	0.13 to 0.18	0.60 to 0.90	0.035	0.04
G10170	1017	0.15 to 0.20	0.30 to 0.60	0.035	0.04
G10180	1018	0.15 to 0.20	0.60 to 0.90	0.035	0.04
G10190	1019	0.15 to 0.20	0.70 to 1.00	0.035	0.04
G10200	1020	0.18 to 0.23	0.30 to 0.60	0.035	0.04
G10210	1021	0.18 to 0.23	0.60 to 0.90	0.035	0.04
G10220	1022	0.18 to 0.23	0.70 to 1.00	0.035	0.04
G10230	1023	0.20 to 0.25	0.30 to 0.60	0.035	0.04
G10250	1025	0.22 to 0.28	0.30 to 0.60	0.035	0.04
G10260	1026	0.22 to 0.28	0.60 to 0.90	0.035	0.04
G10300	1030	0.28 to 0.34	0.60 to 0.90	0.035	0.04
G10330	1033	0.30 to 0.36	0.70 to 1.00	0.035	0.04
G10350	1035	0.32 to 0.38	0.60 to 0.90	0.035	0.04
G10370	1037	0.32 to 0.38	0.70 to 1.00	0.035	0.04
G10380	1038	0.35 to 0.42	0.60 to 0.90	0.035	0.04
G10390	1039	0.37 to 0.44	0.70 to 1.00	0.035	0.04
G10400	1040	0.37 to 0.44	0.60 to 0.90	0.035	0.04
G10420	1042	0.40 to 0.47	0.60 to 0.90	0.035	0.04
G10430	1043	0.40 to 0.47	0.70 to 1.00	0.035	0.04
G10450	1045	0.43 to 0.50	0.60 to 0.90	0.035	0.04
G10460	1046	0.43 to 0.50	0.70 to 1.00	0.035	0.04
G10490	1049	0.46 to 0.53	0.60 to 0.90	0.035	0.04
G10500	1050	0.48 to 0.55	0.60 to 0.90	0.035	0.04
G10550	1055	0.50 to 0.60	0.60 to 0.90	0.035	0.04
G10600	1060	0.55 to 0.65	0.60 to 0.90	0.035	0.04
G10640	1064	0.60 to 0.70	0.50 to 0.80	0.035	0.04
G10650	1065	0.60 to 0.70	0.60 to 0.90	0.035	0.04
G10700	1070	0.65 to 0.75	0.60 to 0.90	0.035	0.04
G10740	1074	0.70 to 0.80	0.50 to 0.80	0.035	0.04
G10780	1078	0.72 to 0.85	0.30 to 0.60	0.035	0.04
G10800	1080	0.75 to 0.88	0.60 to 0.90	0.035	0.04
G10840	1084	0.80 to 0.93	0.60 to 0.90	0.035	0.04
G10850	1085	0.80 to 0.93	0.70 to 1.00	0.035	0.04
G10860	1086	0.80 to 0.93	0.30 to 0.50	0.035	0.04
G10900	1090	0.85 to 0.98	0.60 to 0.90	0.035	0.04
G10950	1095	0.90 to 1.03	0.30 to 0.50	0.035	0.04
G15240	1524	0.19 to 0.25	1.35 to 1.65	0.035	0.04
G15270	1527	0.22 to 0.29	1.20 to 1.50	0.035	0.04
G15360	1536	0.30 to 0.37	1.20 to 1.50	0.035	0.04
G15410	1541	0.36 to 0.44	1.35 to 1.65	0.035	0.04
G15480	1548	0.44 to 0.52	1.10 to 1.40	0.035	0.04
G15520	1552	0.47 to 0.55	1.20 to 1.50	0.035	0.04

[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.

Element	Chemical Ranges, %	
	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
	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 A 6/A 6M. 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.

S97. Limitation on Rimmed or Capped Steel

S97.1 The steel shall be other than rimmed or capped.

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