



Standard Specification for Structural Carbon Steel Plates of Improved Toughness¹

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1. Scope

1.1 This specification covers structural quality carbon-manganese-silicon steel plates in three tensile strength ranges intended primarily for service at atmospheric temperatures where improved notch toughness is important.

1.2 Plates covered by this specification are limited to a maximum thickness of 1.5 in. [40 mm].

1.3 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 X 3 of Specification A 6/A 6M for information on weldability.

1.4 The values stated in either inch-pound units or SI units are to be regarded as the 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.

2. Referenced Documents

2.1 ASTM Standards:

A 6/A 6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling²

3. General Requirements for Delivery

3.1 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.

4. Materials and Manufacture

4.1 The steel shall be made to fine grain practice.

TABLE 1 Chemical Requirements (Heat Analysis)

	Composition, %		
	Grade 58 [400]	Grade 65 [450]	Grade 70 [485]
Carbon, max:			
½ in. [13 mm] and under	0.23	0.24	0.27
Over ½ in. to 1½ in., [13 to 40 mm], incl	0.23	0.26	0.28
Manganese	0.60–0.90 ^A	0.85–1.20	0.85–1.20
Phosphorus, max	0.035	0.035	0.035
Sulfur, max	0.04	0.04	0.04
Silicon	0.10–0.35	0.15–0.40	0.15–0.40

^AThe upper limit of manganese may be exceeded, provided that the carbon content plus 1/6manganese content does not exceed 0.40 % based on heat analysis.

5. Chemical Composition

5.1 The heat analysis shall conform to the requirements prescribed in Table 1.

5.2 The steel shall conform on product analysis to the requirements as prescribed in Table 1 subject to the product analysis tolerances in Specification A 6/A 6M.

6. Tension Test

6.1 The steel, as represented by the tension test specimens, shall conform to the requirements as to tensile properties prescribed in Table 2.

TABLE 2 Tensile Requirements^A

	Grade 58 [400]	Grade 65 [450]	Grade 70 [485]
Tensile strength, ksi	58–71	65–77	70–90
[MPa]	[400–490]	[450–530]	[485–620]
Yield point, min, ksi	32	35	42
[MPa]	[220]	[240]	[290]
Elongation in 8 in. [200 mm] ^{B,C} min, %	21	20	18
Elongation in 2 in. [50 mm] ^{B,C} min, %	24	23	21

^ASee the Orientation subsection in the Tension Tests section of Specification A 6/A 6M.

^BElongation not required to be determined for floor plate.

^CFor plates wider than 24 in. [600 mm], the elongation requirement is reduced two percentage points. See the Elongation Requirement Adjustments subsection under the Tension Tests section of Specification A 6/A 6M.

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 Annual Book of ASTM Standards, Vol 01.04.

SUPPLEMENTARY REQUIREMENTS

Standardized supplementary requirements for use at the option of the purchaser are listed in Specification A 6/A 6M.

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