

ASTMA514/A514M

ASTM A514/A514M Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding



ASTM A514/A514M standard specification covers high-yield, quenched, and tempered alloy steel plates for use in welded parts and other structures. ASTM A514/A514M Standard main steel grade: ASTM A514 Grade A, B, E, F, H, P, Q, S, (A514GRA, A514GRB, A514GRE, A514GRQ, A514GRF, A514GRH) and so on.

Standard: ASTM A514

Grade : ASTM A514 GRA, B, E, F, H, P, Q, S,

Thickness : 8mm-200mm

Width : 1000mm-4000mm

Length : 1000mm-20000mm

MOQ: 1 PC

Product type : Steel plate

Delivery time : Promptly (Stock) or 10-40 days (Production)

Stock : Available

MTC: Available

Delivery condition: Quenched and Tempered

EMAIL: info@steelguang.com

TEL: 0086-371-55023661

TABLE 1 Chemical Requirements (Heat Analysis)

NOTE: 1—Where “...” appears in this table, there is no requirement.

Element	Chemical Composition, %							
	Grade A	Grade B	Grade E	Grade F	Grade H	Grade P	Grade Q	Grade S
	Maximum Thickness, in. [mm]							
	1¼ [32]	1¼ [32]	6 [150]	2½ [65]	2 [50]	6 [150]	6 [150]	2½ [65]
Carbon	0.15–0.21	0.12–0.21	0.12–0.20	0.10–0.20	0.12–0.21	0.12–0.21	0.14–0.21	0.11–0.21
Manganese	0.80–1.10	0.70–1.00	0.40–0.70	0.60–1.00	0.95–1.30	0.45–0.70	0.95–1.30	1.10–1.50
Phosphorus, max	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
Sulfur, max	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.020
Silicon	0.40–0.80	0.20–0.35	0.20–0.40	0.15–0.35	0.20–0.35	0.20–0.35	0.15–0.35	0.15–0.45
Nickel	...	...	...	0.70–1.00	0.30–0.70	1.20–1.50	1.20–1.50	...
Chromium	0.50–0.80	0.40–0.65	1.40–2.00	0.40–0.65	0.40–0.65	0.85–1.20	1.00–1.50	...
Molybdenum	0.18–0.28	0.15–0.25	0.40–0.60	0.40–0.60	0.20–0.30	0.45–0.60	0.40–0.60	0.10–0.60
Vanadium	...	0.03–0.08	A	0.03–0.08	0.03–0.08	...	0.03–0.08	0.06
Titanium	...	0.01–0.04	0.01–0.10	...	...	...	...	B
Zirconium	0.05–0.15 ^C	...	...	...	...	...	...	...
Copper	...	...	...	0.15–0.50	...	...	...	...
Boron	0.0025 max	0.0005–0.005	0.001–0.005	0.0005–0.006	0.0005–0.005	0.001–0.005	...	0.001–0.005
Columbium, max	...	...	...	...	...	...	...	0.06

^AMay be substituted for part or all of titanium content on a one for one basis.

^BTitanium may be present in levels up to 0.06 % to protect the boron additions.

^CZirconium may be replaced by cerium. When cerium is added, the cerium/sulfur ratio should be approximately 1.5 to 1, based upon heat analysis.

TABLE 2 Tensile and Hardness Requirements

NOTE: 1— See the Orientation and Preparation subsections in the Tension Tests section of Specification A 6/A 6M.

NOTE: 2—Where “...” appears in this table there is no requirement.

Thickness, in. [mm]	Tensile Strength, ksi [MPa]	Yield Strength, min ^A , ksi [MPa]	Elongation in 2 in. [50 mm], min ^{B,C,D} , %	Reduction of Area, min ^{B,C} , %	Brinell Hardness Number ^E
To ¾ [20], incl	110 to 130 [760 to 895]	100 [690]	18	40 ^F	235 to 293 HBW
Over ¾ [20] to 2½ [65], incl	110 to 130 [760 to 895]	100 [690]	18	40 ^F , 50 ^G	...
Over 2½ [65] to 6 [150], incl	100 to 130 [690 to 895]	90 [620]	16	50 ^G	...

^AMeasured at 0.2 % offset or 0.5 % extension under load as described in the Determination of Tensile Properties section of Test Methods and Definitions A 370.

^BElongation and reduction of area need not be determined for floor plates.

^CFor plates tested in the transverse direction, the elongation requirement is reduced by two percentage points and the reduction of area minimum requirement is reduced by five percentage points. See elongation requirement adjustments in the Tension Tests section of Specification A 6/A 6M.

^DIf measured on the Fig. 3 (Test Methods and Definitions A 370) 1½-in. [40-mm] wide tension test specimen, the elongation is determined in a 2-in. [50-mm] gage length that includes the fracture and shows the greatest elongation.

^ESee 7.2.

^FIf measured on the Fig. 3 (Test Methods and Definitions A 370) 1½-in. [40-mm] wide tension test specimen.

^GIf measured on the Fig. 4 (Test Methods and Definitions A 370) ½-in. [12.5-mm] round tension test specimen.

There are eight different grades of products under the ASTM A514 standard: A514Gr.A, A514Gr.B, A514Gr.E, A514Gr.F, A514Gr.H, A514Gr.P, A514Gr.Q, A514Gr.S. The thickness, chemical composition and properties of different grades of A514 steel are different.

Thickness	mm	Inch
A514Gr.A	32	1.25
A514Gr.B	32	1.25
A514Gr.E	150	6
A514Gr.F	65	2.5
A514Gr.H	50	2
A514Gr.P	150	6
A514Gr.Q	150	6

EMAIL: info@steelguang.com

TEL: 0086-371-55023661

A514Gr.S	65	2.5
----------	----	-----

1. Materials and Manufacturing of ASTM A514 Steel Plate

The steel should be killed steel and should meet the fine austenite grain size requirements of A6/A6M.

2. Heat treatment of ASTM A514 Steel Plate

In order to meet the tensile and Brinell hardness requirements specified in Table 2, the steel plates shall be heat treated, that is, the steel plates shall be heated to not less than 1650°F (900°C), quenched in water or oil, and not less than 1150°F (620°C) fire.

3. Application of ASTM A514 Steel Plate

A514 is a quenched and tempered high strength weldable steel plate under ASTM standards. ASTM A514 steel plate is characterized by high strength and good weldability. A514 has high strength, good fatigue resistance; high toughness and low brittle transition temperature; good cold forming performance and welding performance; has good corrosion performance and a certain degree of wear resistance. It is mainly used in places where high tensile strength and high yield are required, such as drilling rigs for mining and various construction projects, lifting gears, oil derricks, coal mine hydraulic supports, electric shovels, electric wheel dump trucks, loaders, bulldozers, and all types of cranes. , engineering vehicles, large excavators, offshore drilling platforms, mining equipment, etc.