

ASTM A453/A453M is a bolting material specification for use in high temperature applications. Grade 660 which is precipitation hardening austenitic stainless steel having high creep and excellent corrosion resistance and scaling resistance in air up to approximately 800°C. These standard applies to product such as bars, headed bolts, screws, studs and stud bolts, threaded bars, nuts and washers.



**Chemical Composition (Alloy A286 / UNS S66286 / 1.4980)**

Element	C	Mn	P	S	Si	Ni	Cr	Mo	Ti	Al	V	B
Min	...	...	...	...	...	24.000	13.500	1.000	1.900	...	0.100	0.001
Max	0.080	2.000	0.040	0.030	1.000	27.000	16.000	1.500	2.350	0.350	0.500	0.010

**Heat Treatment**

Solution annealing @ 1650 +/- 25 °F [900 +/- 14 °C], hold 2 h, min, and liquid quench, followed by reheating @ 1325 +/- 25 °F [720 +/- 14 °C], hold 16 h, air cool for hardening

**Mechanical Properties**

Attributes (Q&T)	Value
Ultimate Tensile Strength, ksi (Mpa)	130 (895)
0.2% Yield strength, ksi (Mpa)	85 (585)
% Elongation in 2 Inch (min)	15
% Reduction of Area (min)	18
Hardness HBW (HRC)	248 - 341 (24 - 37)

**Stress Rupture Requirement**

Attributes (Q&T)	Value
Test Temperature °F (°C)	1200 (650)
Stress, ksi (MPa), min	56 (385)
Time to Rupture, min, hA	100
Elongation, min, %	5



**Products**

Bolts    Screws    Studs    Nuts    Washers

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