

ASTM A354 Grade BC Bolts (125 ksi) — Material Data Sheet

ASTM A354 Grade BC · Alloy steel, quenched and tempered

Quenched-and-tempered alloy steel bolting, 125 ksi

Alloy steel bolting between Grade 5 and Grade 8: 125 ksi tensile and 109 ksi yield in sizes to 2½ in., 115 ksi above — the anchor-bolt and large-stud grade that holds its strength in big diameters.

TENSILE, ¼–2½ IN.	125 ksi min	HARDNESS, ¼–2½ IN.	26–36 HRC
TENSILE, OVER 2½ IN.	115 ksi min	HEAD MARKING	BC
YIELD, ¼–2½ IN.	109 ksi min	MATCHING NUT	ASTM A563 Grade C heavy hex (plain) · DH (zinc coated or as a stronger substitute)

Nominal composition

■ Fe balance ~ 98.9% ■ Mn ~ 0.60% ■ C, P, S, B trace

Midpoints of the specification ranges, for orientation only. Limits are in the table.

Chemical composition — ASTM A354 alloy steel (heat analysis)

Element	Symbol	Min %	Max %
Carbon	C	0.30	0.53
Manganese	Mn	0.60	—
Phosphorus	P	—	0.035
Sulfur	S	—	0.040
Boron	B	—	0.003
Alloying elements	—	per F1789 alloy definition	—

Values per ASTM A354-17 Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.284 lb/in³ (7.85 g/cm³)
MODULUS OF ELASTICITY	29.0 × 10 ⁶ psi (200 GPa)
THERMAL EXPANSION (68–212 °F)	6.5 µin/in·°F
MAGNETIC	Yes

Heat treatment

Quenched in liquid from above the transformation temperature and tempered at 800 °F minimum.

Mechanical properties — ASTM A354 Grade BC (machined specimens) and hardness

Grade / condition and size	Tensile strength, min (ksi)	Yield or proof, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness
Grade BC — ¼ to 2½ in.	125	109	16	50	26–36 HRC (255–331 HBW)
Grade BC — over 2½ to 4 in.	115	99	16	45	22–33 HRC (235–311 HBW)

Values per ASTM A354-17 Tables 2 and 4 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM A354	Quenched and tempered alloy steel bolts, studs and other externally threaded fasteners
ASTM A563 GRADE DH	Matching heavy hex nuts
ASTM F2329	Hot-dip galvanizing of fasteners

Forms we supply in A354 BC

- Hex and heavy hex bolts and cap screws
- Studs and threaded rod
- Nuts and washers to match
- Machined specials to drawing

Typical applications

- Large anchor bolts and foundation studs
- Tie rods and tension bars
- Equipment hold-down bolting over 1½ in.
- Crane rail and machinery base bolting