

ASTM F1554 Grades 36, 55 and 105 Anchor Bolts — Material Data Sheet

ASTM F1554 · Carbon, HSLA and alloy steel

Anchor bolts, straight, bent and headed, 36 to 105 ksi yield

The anchor-bolt specification: Grade 36 carbon steel, Grade 55 weldable higher strength, and Grade 105 quenched-and-tempered alloy — straight, bent or headed, plain or galvanized, ½ to 4 in. (Grade 105 to 3 in.)

GRADE 36	58–80 ksi tensile · 36 ksi yield	SIZES	½ to 4 in. (Grade 105: ½ to 3 in.)
GRADE 55	75–95 ksi tensile · 55 ksi yield	END COLOUR	Blue · Yellow · Red
GRADE 105	125–150 ksi tensile · 105 ksi yield	MATCHING NUT	A563 A (36) · A (55) · DH (105)

Nominal composition

■ Fe balance ~ 99.2% ■ C, Mn, P, S, Cu trace

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

Chemical composition — ASTM F1554 (heat analysis)

Element	Symbol	Min %	Max %
Carbon, Grade 36	C	—	0.25
Manganese, Grade 36 over 1 [⁄] in.	Mn	—	0.90
Phosphorus, all grades	P	—	0.04
Sulfur, all grades	S	—	0.05
Copper (when specified)	Cu	0.20	—

Values per ASTM F1554-20 Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Grades 55 and 105 are controlled by mechanical properties; only P, S and optional Cu are limited.

Physical properties (typical)

DENSITY	0.284 lb/in ³ (7.85 g/cm ³)
MODULUS OF ELASTICITY	29.0 × 10 ⁶ psi (200 GPa)
THERMAL EXPANSION (68–212 °F)	6.5 µin/in·°F
MAGNETIC	Yes

Heat treatment

Grades 36 and 55: none, supplied as rolled or as drawn.
Grade 105: quenched and tempered alloy steel, tempered at 1100 °F minimum (Grade 55, when heat treated, at 800 °F minimum).

Mechanical properties — ASTM F1554 bars and machined specimens

Grade / condition and size	Tensile strength, min (ksi)	Yield or proof, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness
Grade 36	58 (80 max)	36	23 in 2 in.	40	—
Grade 55	75 (95 max)	55	21 in 2 in.	30	—
Grade 105	125 (150 max)	105	15 in 2 in.	45	—

Values per ASTM F1554-20 Table 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Full-size tensile and yield loads by thread size are in Table 2 of the specification.

Applicable standards

ASTM F1554	Anchor bolts, steel, 36, 55 and 105 ksi yield strength
ASTM F1554 S1	Weldability supplementary requirement for Grade 55
ASTM A563	Matching nuts
ASTM F2329 / A153	Hot-dip galvanizing

Forms we supply in F1554 36 / 55 / 105

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

Typical applications

- Column base plates and equipment foundations
- Light poles, sign structures and transmission towers
- Pump, compressor and turbine skid anchors
- Tank and vessel hold-down bolts