

ASTM A36 Structural Carbon Steel — Material Data Sheet

ASTM A36 / A36M · UNS K02600 · ASTM A36

Structural carbon steel, 36 ksi yield

The structural steel: 36 ksi yield, 58 to 80 ksi tensile, weldable and available in every shape — for anchor bolts, stay rods, U-bolts, plates and brackets made from bar and plate.

TENSILE	58–80 ksi	CARBON (BARS $\leq \frac{3}{4}$ IN.)	0.26 % max
YIELD POINT	36 ksi min	WELDABLE	Yes, with a procedure suited to the thickness (A36 clause 1.3)
ELONGATION IN 2 IN.	23 % min (bars)	USUAL FINISH	Hot-dip galvanized

Nominal composition

■ Fe balance ~ 98.5% ■ Mn ~ 0.75% ■ C, C, C, C, P, S, Si trace

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

Chemical composition — A36 (UNS K02600)

Element	Symbol	Min %	Max %
Carbon (bars $\leq \frac{3}{4}$ in.)	C	—	0.26
Carbon (bars over $\frac{3}{4}$ to 1½ in.)	C	—	0.27
Carbon (bars over 1½ to 4 in.)	C	—	0.28
Carbon (bars over 4 in.)	C	—	0.29
Manganese (bars over $\frac{3}{4}$ in.)	Mn	0.60	0.90
Phosphorus	P	—	0.04
Sulfur	S	—	0.05
Silicon	Si	—	0.40

Values per ASTM A36/A36M-19 Table 3 for bars (verified against the specification). Manganese is required only for bars over $\frac{3}{4}$ in.; for each 0.01 % carbon below the maximum, manganese may rise 0.06 % to 1.35 % max (footnote B); copper 0.20 % min when copper steel is specified.

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 μ in/in·°F
MAGNETIC	Yes

Heat treatment

Supplied as rolled; not heat treated. Can be normalized for improved toughness in thick sections.

Mechanical properties — A36

Condition and nominal diameter (in.)	Tensile strength, min (ksi)	Yield point, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness
Bars and plates to 8 in. thick	58 (80 max)	36	23 in 2 in. · 20 in 8 in.	—	—
Plates over 8 in. thick	58 (80 max)	32	23 in 2 in. (less 2 points over 24 in. wide)	—	—

Values per ASTM A36/A36M-19 Table 2 (verified against the specification). A36 specifies a yield point, not a 0.2 % offset yield strength.

Applicable standards

ASTM A36 / A36M	Carbon structural steel
ASTM F1554 GRADE 36	Anchor bolts made from A36-type steel
ASTM A307	Carbon steel bolts and threaded rod of comparable strength
ASTM F2329 / A153	Hot-dip galvanizing of fasteners

Forms we supply in A36

- Machined components from certified bar
- Studs, threaded rod and U-bolts
- Hex bolts and cap screws
- Nuts, washers and spacers
- Pins, shafts and bushings

Typical applications

- Anchor bolts and stay rods
- U-bolts and pipe supports
- Threaded rod and tie bars
- Brackets, plates and structural fabrications
- Waterworks and transmission hardware