

1144 Free-Machining Carbon Steel (UNS G11440) — Material Data Sheet

ASTM A108 / A29 / A311 bar · UNS G11440 · AISI/SAE 1144

Resulfurized medium-carbon steel, high strength as drawn

Medium-carbon free-machining steel that is strong straight from the bar: about 108 ksi cold drawn, machines well, hardens by induction — the Stressproof® family grade for shafts and studs without heat treatment.

TENSILE, COLD DRAWN (TYPICAL)	108 ksi	SULFUR	0.24–0.33 %
YIELD, COLD DRAWN (TYPICAL)	90 ksi	INDUCTION HARDENABLE	Yes
CARBON	0.40–0.48 %	WELDABLE	No

Nominal composition

■ Fe balance ~ 97.8% ■ Mn ~ 1.50% ■ C, P, S trace

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

Chemical composition — 1144 (UNS G11440)

Element	Symbol	Min %	Max %
Carbon	C	0.40	0.48
Manganese	Mn	1.35	1.65
Phosphorus	P	—	0.040
Sulfur	S	0.24	0.33

Per SAE J403 / ASTM A29, confirmed by ASTM A311 Table 1, Alro, Niagara LaSalle, AZoM and Eaton Steel Bar.

Physical properties (typical)

DENSITY	0.284 lb/in ³ (7.85 g/cm ³)
MODULUS OF ELASTICITY	29.0 × 10 ⁶ psi (200 GPa)
MAGNETIC	Yes

Heat treatment

Used as cold drawn and stress relieved. Induction hardening is used for wear surfaces, though the sulfides can contribute to quench cracking.

Mechanical properties — 1144

Condition and size	Tensile strength (ksi)	Yield strength 0.2% offset (ksi)	Elongation (%)	Reduction of area (%)	Hardness
Cold drawn, ¾–1½ in. round (typical)	108	90	10	30	217 HB
A311 Class B minimum, heavy-draft cold drawn and stress relieved, rounds to 2 in.	115	100	8	25	—

Cold-drawn typical values from Alro (1-in. average), Niagara LaSalle, AZoM and Capital Steel. ASTM A311 Class B minimums confirmed by the A311 table, AED Metals and Alro; for 2 to 3 in. the minimums are 8 % elongation and 20 % reduction of area. Hexagons to 1½ in.

Applicable standards

ASTM A311	Cold-drawn, stress-relieved carbon steel bars (Classes A and B)
ASTM A108	Cold-finished carbon steel bars
ASTM A29 / SAE J403	Chemical composition of carbon steel bars

Forms we supply in 1144

- Machined components from certified bar
- Studs and threaded rod
- Pins, shafts and bushings
- Hydraulic rods and spindles

Typical applications

- Shafts, spindles and axles made without heat treatment
- Studs, threaded rod and tie bars in medium-high strength
- Hydraulic rods and pistons
- Precision turned parts that must stay straight
- Induction-hardened wear parts