

12L14 Leaded Free-Machining Steel (UNS G12144) — Material Data Sheet

ASTM A108 / A29 bar · UNS G12144 · AISI/SAE 12L14

Leaded, resulfurized, rephosphorized low-carbon steel

The fastest-machining steel there is: lead, sulfur and phosphorus give short chips and a bright finish at high speed — for high-volume screw-machine fittings, pins and adapters in light duty.

TENSILE, COLD DRAWN (TYPICAL)	78 ksi	SULFUR	0.26–0.35 %
YIELD, COLD DRAWN (TYPICAL)	60 ksi	MACHINABILITY	About 170–190 % of 1212
LEAD	0.15–0.35 %	WELDABLE	No — should not be welded

Nominal composition

■ Fe balance ~ 98.3% ■ Mn ~ 1.00% ■ C, P, S, Pb trace

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

Chemical composition — 12L14 (UNS G12144)

Element	Symbol	Min %	Max %
Carbon	C	—	0.15
Manganese	Mn	0.85	1.15
Phosphorus	P	0.04	0.09
Sulfur	S	0.26	0.35
Lead	Pb	0.15	0.35

Per SAE J403 / ASTM A29, confirmed by Alro, AZoM and Eaton Steel Bar.

Physical properties (typical)

DENSITY	0.284 lb/in ³ (7.87 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

Used as cold drawn. It responds to carburizing, but 1117 or 1018 are the better case-hardening choices, and the leaded steel is normally chosen where no heat treatment is needed.

Mechanical properties — 12L14

Condition (¾–1½ in. round)	Tensile strength, typical (ksi)	Yield strength 0.2% offset, typical (ksi)	Elongation, typical (%)	Reduction of area, typical (%)	Hardness, typical
Cold drawn	78	60	10	35	163 HB

Typical values for cold-drawn bar, confirmed by AZoM and Alro (1-in. average). For reference, Saerstahl's cold-drawn minimums for 16 to 40 mm are 68 ksi tensile and 54 ksi yield. ASTM A108 sets no mechanical requirements.

Applicable standards

ASTM A108	Cold-finished carbon steel bars
ASTM A29 / SAE J403	Chemical composition of carbon steel bars

Forms we supply in 12L14

- Machined components from certified bar
- Fittings, adapters and bushings
- Pins and spacers for light duty

Typical applications

- High-volume screw-machine fittings and adapters
- Pins, spacers and bushings in light duty
- Hydraulic and pneumatic fittings
- Hardware where finish matters more than strength