



52100 – Technical Data

General Descriptions:

AISI 52100 alloy steel is a high carbon, chromium, bearing steel with excellent strength and fatigue properties.

Alloy 52100 is primarily used for the manufacture of aircraft bearings and other highly stressed parts. It has the good rolling fatigue strength required at operating temperatures less than 400 °F.

Examples of applications:

Bearings, draw dies, drills (non-ferrous), forming tools, gauges, mandrels, taps (hand), threading dies (hand).

Chemical Composition

Carbon	Manganese	Silicon	Chromium
0.95-1.05%	0.30-0.40%	0.20-0.30%	1.40-1.60%

Annealing

1440 °F, hold 2 hours at temperature, slow cool (25 °F/hour max) to 1200 °F, then air or furnace cool to room temperature.

Hardness BHN 183-212.

Stress Relieving

1200 °F for two hours, slow cool to room temperature.

Hardening

Atmosphere or vacuum furnace. Preheat to 1200-1250 °F, equalize.

High Heat (Austenitizing)

1500-1550 °F, soak 10-30 minutes. For vacuum or oil hardening, use the high side of the high heat range and soak times.

Quench

Oil quench to room temperature. Temper immediately.

Tempering

Tempering at 300-500 °F for at least 2 hours at temperature is recommended.

Air cool to room temperature after tempering.

Physical Properties

Modulus of Elasticity	30 x 10 ⁶ psi (207 GPa)	Density	0.283 lb/in ³
Annealed Hardness	183-212 BHN	Machinability	95% of O1