



## Technical Information: 52100

**52100 is an oil hardening, high carbon steel.**

**52100 is characterized by high hardness and moderate wear resistance**

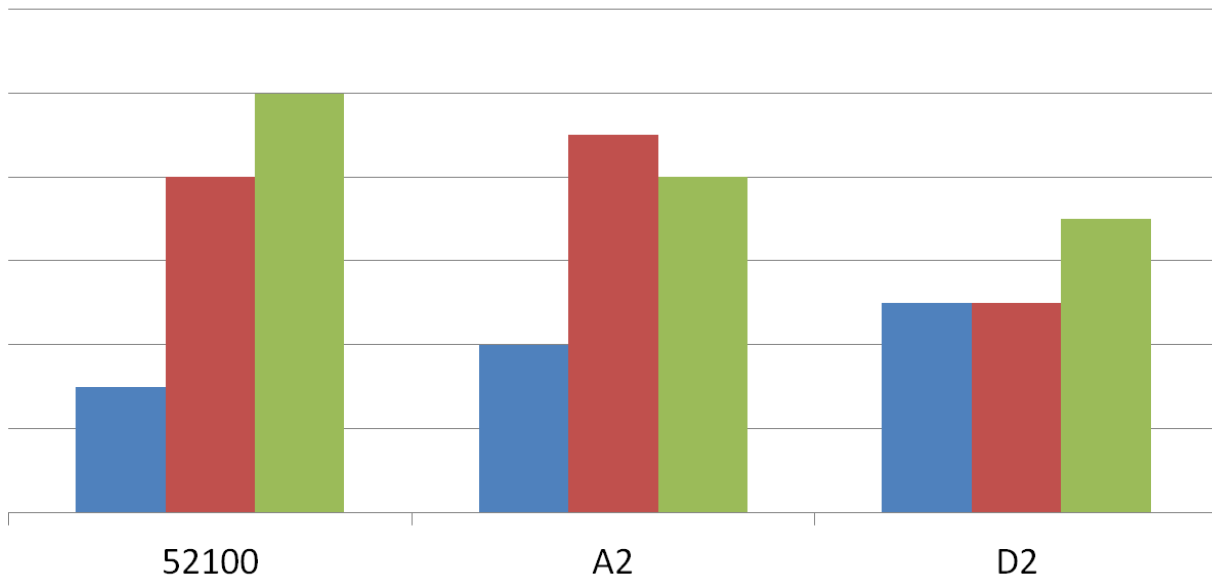
**52100 is used in bearing applications and cold work tooling applications**

### Typical Chemical Composition

Carbon	1.00%	Chromium	1.50%
Manganese	0.30%	Silicon	0.25%
Molybdenum	0.10% max	Nickel	0.25% max

### SBSM Tool Steel Properties Comparison

■ Relative Wear Resistance    
 ■ Chipping Resistance    
 ■ Hardness



### Physical Properties

Modulus of Elasticity.....30 psi x 10<sup>6</sup> .....(207 GPa)  
 Density..... 0.284 lb/in<sup>3</sup>  
 Annealed Hardness.....200-229 Brinell Hardness (BHN)  
 Machinability.....Similar to O1 Tool Steel



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### Heat Treatment

#### Annealing

Heat to 1500°F, hold two hours  
 Slow cool 20°F/hour to 1100°F  
 Then air or furnace cool to room temperature

#### Stress Relieving

Performed prior or after machining to minimize distortion in heat treating  
 1100/1200°F, hold two hours  
 then air cool to room temperature

#### Hardening

Oil quenching required.

#### High Heat (Austenitizing)

1500/1550°F for 20 to 30 minutes at heat.

#### Quench

Quench in oil to 150°F .  
 To minimize distortion, parts may be removed at 400°F then air cooled.  
 Temper immediately following quench when material reaches 150°F or below.

#### Tempering

Minimum 400°F tempering temperature required.  
 Double tempering is required.  
 Air cool to room temperature between tempers.

## Typical Heat Treat Response

Tempering Temp		Hardening Temp
°F	°C	1500°F 815°C
As Quenched		63/65 HRC
400	205	63 HRC
500	260	60 HRC
600	315	57 HRC
700	371	55 HRC
800	427	50 HRC
900	510	47 HRC
1000	538	45 HRC