



## PSB27 - Technical Data

### General Description:

PSB27 is a premium spray formed D2 tool steel. It is ideal for many cold work applications requiring higher toughness and higher wear resistance than conventional D2. The spray forming process results in improved toughness and chip resistance compared to conventionally produced tool steels. PSB27 has 3 X the wear resistance of conventional D2.

### Example of applications:

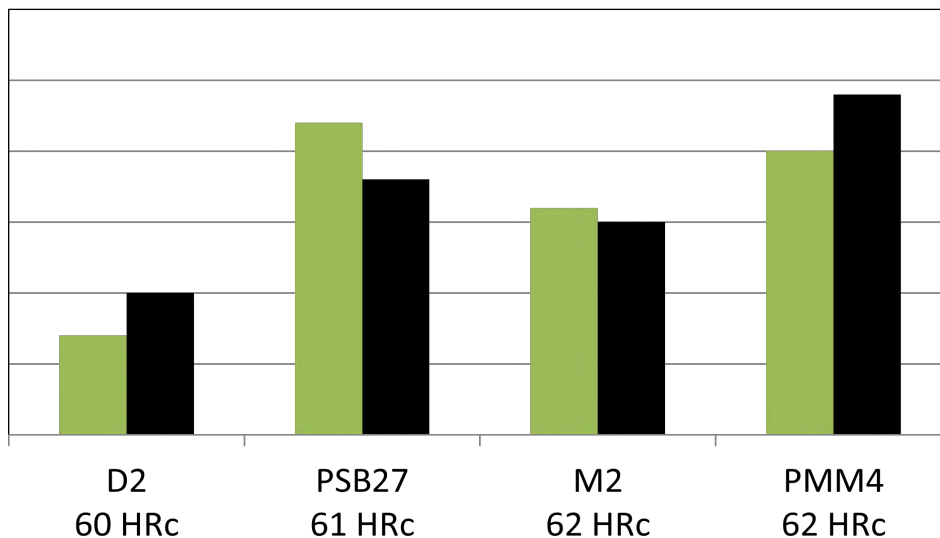
Rotational Cutting Dies, forming rolls and dies, thread roll dies, blanking dies and punches, injection screw components, industrial knives and cutlery knives.

### Chemical Composition

Carbon	Molybdenum	Vanadium	Chromium	Silicon	Manganese
1.50 - 1.60%	0.65 - 0.80%	0.75 - 0.90%	11.00 - 12.50%	0.40 - 0.50%	0.30 - 0.45%

### Comparison Chart

■ Wear Resistance ■ Toughness



### Typical Heat Treat Response

Hardening Temp °F	Tempering Temp °F	Hardness HRC	Charpy C-Notch Ft.-lbs
1900	400	61	24
	500	60	26
	650	59	25
	800	58	24
	950	61	23

### Size Changes During Hardening

Hardening Temp °F	Tempering Temp °F	HRC	Longitudinal Size Change %
1900	500	60.5	+0.03%
1900	950	61	+0.04%

### Surface Treatment

Standard surface treatments such as nitriding, titanium-nitride coating, or hard chrome plating can be used. Prior to nitriding or PVD treatment, must double temper at or above process temperature.



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### Heat Treatment

#### Annealing

Heat to 1600°F, hold for two hours.  
Slow cool 25°F/hour to 1000°F.  
Then air or furnace cool to room temperature.

#### Stress Relieving

Normally performed after machining to minimize distortion in heat treating.  
1100/1200°F, hold two hours.  
Then air cool to room temperature.

#### Hardening

Salt bath, protective atmosphere, or vacuum furnace equipment preferred.

#### High Heat (Austenitizing)

Preheat to 1350-1400°F - let part equalize. Then austenitize at 1870/1900°F for a minimum of 30 minutes at austenitizing temperature.

#### Quench

Salt bath quench to 1000-1100°F, equalize, then air cool to 150°F.  
Vacuum or atmosphere quench rate of a minimum 50 °F per minute down to 1200 °F is critical to achieve best heat treat response.  
Temper immediately following quench.

#### Tempering

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

### Physical Properties

<b>Modulus of Elasticity</b>	30 PSI x 10 <sup>6</sup> .....(207GPa)	<b>Density</b>	0.283 lb/in <sup>3</sup>
<b>Annealed Hardness</b>	215-255 Brinell Hardness (BHN)	<b>Machinability</b>	90% of D2