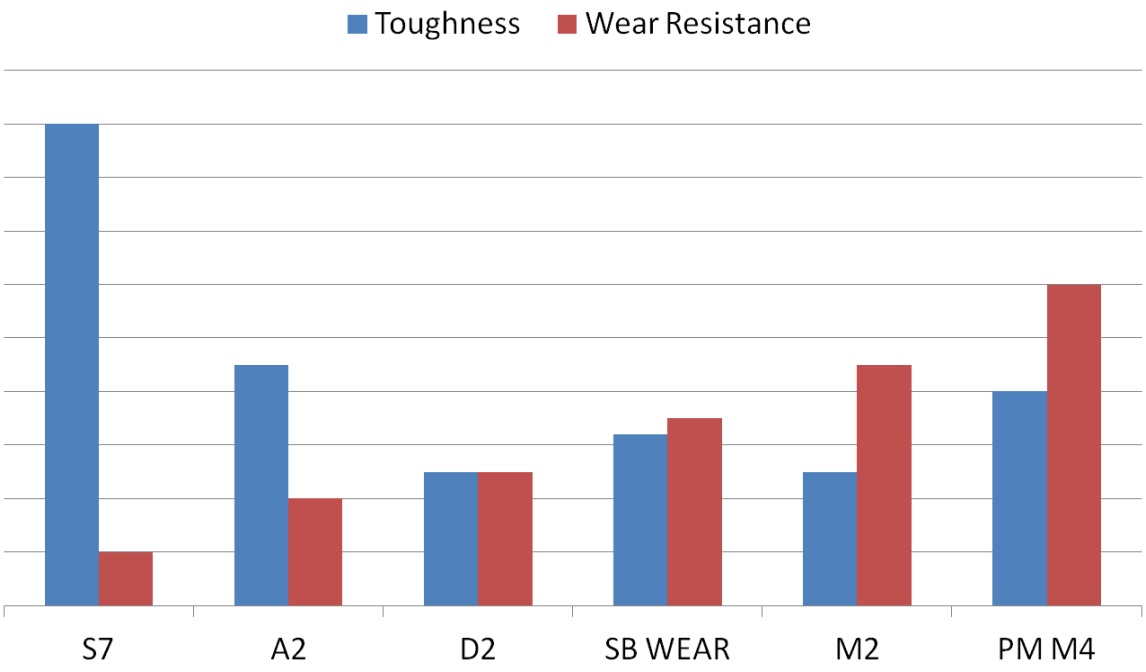
Métaux Solutions

Technical Information: M2

M2 is a general purpose high speed steel and one of the most common high speed steels used.
M2 has a good balance of toughness, wear resistance, and red hardness
M2's balance of wear resistance and toughness also make it a good cold work material for a variety of applications.

Typical Chemical Composition			
Carbon	0.85%	Chromium	4.15%
Molybdenum	5.00%	Silicon	0.30%
Vanadium	1.95%	Manganese	0.30%
Tungsten	6.15%	Sulfur	0.03% Max

Tool Steel Properties Comparison



Physical Properties

Modulus of Elasticity. . . . . 30 psi x 10^6 . . . . . (207 GPa)
Density. . . . . 0.294 lb/in^3
Annealed Hardness. . . . . 215-255 Brinell Hardness (BHN)
Machinability. . . . . Similar to D2 Tool Steel

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Heat Treatment

Annealing

Heat to 1600°F, hold two hours
Slow cool 20°F/hour to 600°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

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

High Heat (Austenitizing)

2050/2250°F for 10-15 minutes at heat.

Quench

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

Tempering

Minimum 1000°F tempering temperature required.
Double tempering is required, triple tempering recommended.
Air cool to room temperature between tempers.

Typical Heat Treat Response

Tempering Temp °F	Hardening Temp 2050°F	Hardening Temp 2150°F	Hardening Temp 2250°F
As Quenched	64	65	65
1000	64	65	66
1025	63	65	67
1050	62	65	66
1075	61	64	64
1100	60	63	64

Longitudinal Size Change

Approximately: plus 0.22%