



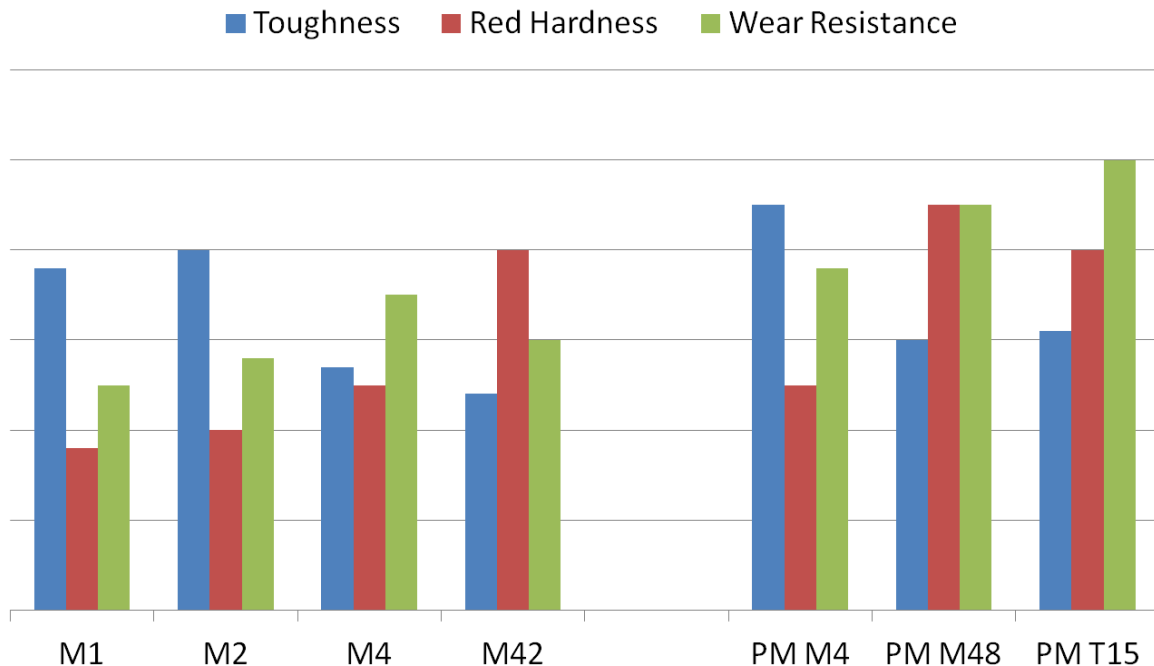
Technical Information: PM T15

PM T15 is a tungsten-cobalt-vanadium super high speed steel
 PM T15 is produced using the PM (powder metallurgy) process
 The grade has an excellent combination of high red hardness and high wear resistance
 PM steels have better grindability and toughness vs conventional produced steels

Typical Chemical Composition

Carbon	1.55%	Chromium	4.50%
Molybdenum	1.00% Max	Tungsten	12.25%
Vanadium	4.75%	Cobalt	5.00%

SBSM High Speed Steel Properties Comparison



Physical Properties

Modulus of Elasticity.....31 psi x 10⁶(207 GPa)
 Density..... 0.296 lb/in³
 Annealed Hardness.....245-275 Brinell Hardness (BHN)
 Machinability.....Similar to M42 High Speed 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)

2150/2250°F for 5 to 10 minutes at heat.
Higher Austenitizing temperatures require less time 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 (HRC)

Tempering Temp °F	Hardening Temp 2150°F	Hardening Temp 2200°F	Hardening Temp 2250°F
As Quenched	66	65	64
1000	66	66	68
1025	65	66	67
1050	64	65	67
1075	63	64	65
1100	62	63	64

Longitudinal
Size Change

Approximately: plus 0.20%