



SB Specialty Metals LLC

Your *First Choice* for Specialty Metals

PM32CO – Technical Data

General Descriptions:

PM32CO is made by the Particle Metallurgy (PM) steel making process. It is an 8% cobalt super high speed steel which has excellent hot hardness along with good wear resistance and toughness. This grade has good machinability and grindability characteristics.

Examples of applications:

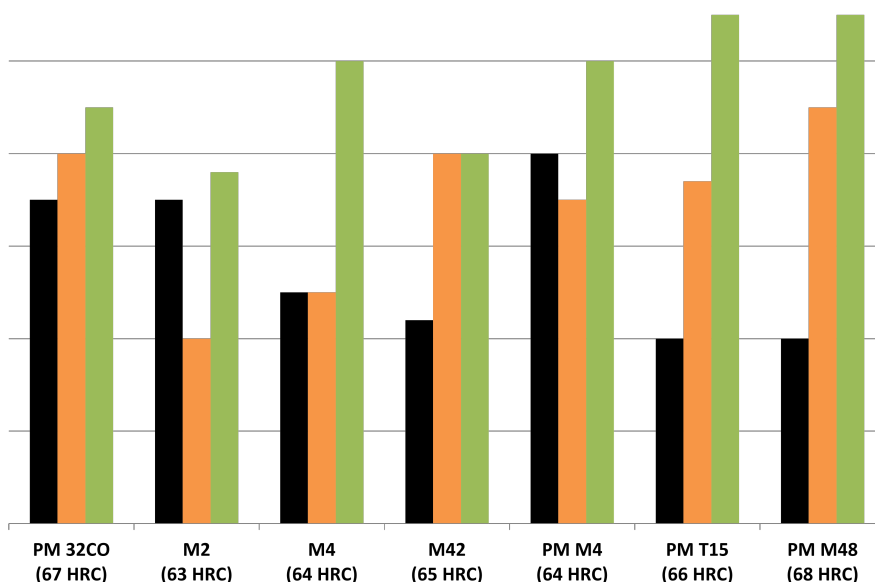
Broaches, end mills, form tools, gear hobs, milling cutters, extrusion punches, shaper cutters, taps.

Chemical Composition

Carbon	Manganese	Phosphorous	Sulphur	Silicon	Molybdenum	Chromium	Vanadium	Tungsten	Cobalt
1.25-1.35%	0.20-0.75%	0.030% Max	0.25% Max	0.45-0.70%	4.80-5.10%	3.75-4.25%	2.75-3.25%	5.75-6.50%	7.75-8.25%

Comparison Chart

■ Toughness ■ Red Hardness ■ Wear Resistance



Typical Heat Treat Response

Tempering Temp °F	Hardening Temp °F / HRC				
	2100	2125	2150	2175	2190
As Quenched	66	67	67	66	65.5
1000	65	66	67	67.5	68
1025	64.5	65.5	66.5	67	68
1050	63.5	64.5	65.5	66.5	67
1100	61	62	63.5	65	66
1150	57	59	61	63	64
1200	52	54	56	58	60

Size Changes During Hardening

Hardening Temp °F	Tempering Temp °F	HRC	Longitudinal Size Change %
2175	1025	67	+0.20%

Surface Treatment

PM32CO can be nitrided or titanium-nitride coated. If the CVD TiN treatment is use, care is required in vacuum hardening.



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Heat Treatment

Annealing

1600 °F, hold 2 hours, slow cool (30°F/hour max) to 1000 °F, then air or furnace cool.
Hardness BHN 255/285.

Stress Relieving

After machining: 1100-1300 °F, hold 2 hour and air or furnace cool.

Hardening

Preheat to 1500-1550 °F, equalize. A second preheat at 1800-1900 °F is suggested for vacuum or atmosphere hardening.

High Heat (Austenitizing)

2100-2190 °F. Standard recommendation to achieve HRc 66-68 is to use 2175 °F.

Quench

Oil or atmosphere quench to 1000-1100 °F, equalize, then air cool to below 125 °F. Vacuum or atmosphere quench rate through 1850-1300 °F range critical to achieve optimum heat treat response.

Tempering

1000 °F minimum recommended. Triple tempering is required.

Physical Properties

Modulus of Elasticity	31 x 10 ⁶ psi (214 GPa)	Density	0.291 lb.in ³
Annealed Hardness	255 - 285 BHN	Machinability	30% of O1