



SB Specialty Metals LLC

Your *First Choice* for Specialty Metals

PM420 - Technical Data

General Description:

PM420 is a martensitic stainless steel produced using the Particle Metallurgy (PM) steel making process. Vanadium and carbon have been added to significantly improve wear resistance. This grade's high vanadium content promotes the formation of hard vanadium carbides instead of chromium carbides, leaving more free chromium available to provide corrosion resistance.

Examples of applications:

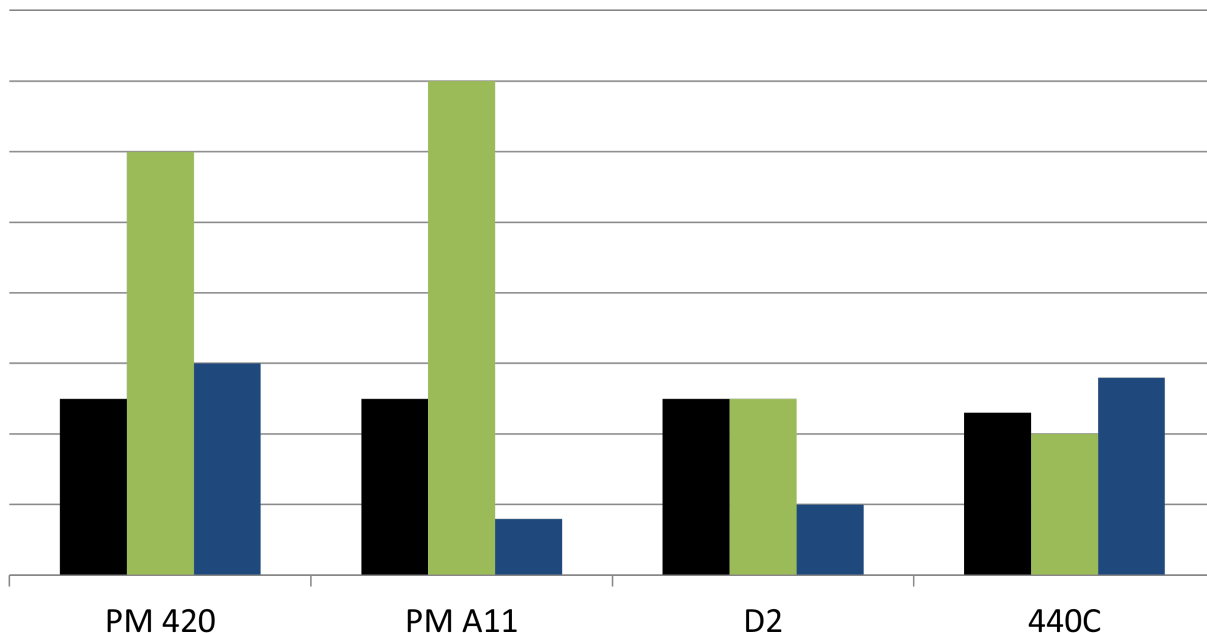
Plastic injection and extrusion feed screws, pelletizing equipment, gate and nozzle inserts, industrial knives, slitters and cutters, long wearing specialty cutlery, wear components for food and chemical processing.

Chemical Composition

Carbon	Molybdenum	Vanadium	Chromium	Silicon	Manganese
2.20-2.35%	1.00-1.30%	8.90-9.25%	13.50-14.50%	0.90%	0.50%

Comparison Chart

■ Toughness ■ Wear Resistance ■ Corrosion Resistance



Typical Heat Treat Response

Tempering Temp °F	Hardening Temp/HRC 2100 °F	Toughness, Charpy C-Notch - Ft.-lbs
As Quenched	61	
400	59-60	28
500	58-59	30
600	57-58	31

Note: Tempering between 800 - 1000 °F is not recommended for stainless steels.

Size Changes During Hardening

Hardening Temp °F	Tempering Temp	HRC	Longitudinal Size Change %
2100	500	58	+0.04

Surface Treatment

Because of its low tempering temperatures, it is not generally suited for surface treatment.



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Heat Treatment

Annealing

Heat to 1650 °F, hold two hours. Slow cool (25 °F/hour) to 1000 °F. Then air or furnace cool to room temperature.

Stress Relieving

Performed prior or after machining to minimize distortion in heat treating. 100-1300 °F, hold two hours, then air cool to room temperature.

Hardening

Protective atmosphere or vacuum furnace equipment preferred.

High Heat (Austenitizing)

Preheat to 1500-1550 °F, let parts equalize. 2100-2150 °F, hold for 10-30 minutes at heat.

Quench

Positive pressure gas quench at a cooling rate of 150 °F per minute to below 1000 °F, followed by forced air cooling to room temperature. Temper immediately after quench.

Tempering

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

Physical Properties

Modulus of Elasticity	30 x 10 ⁶ psi (207 GPa)	Density	0.275 lb/in ³
Annealed Hardness	265-285 BHN	Machinability	50% of O1