



## Technical Information: PM 420-CW

PM 420-CW IS A POWDER METALLURGY, HIGH VANADIUM, STAINLESS STEEL. THE GRADE IS USED IN CORROSIVE, HIGH WEAR, ENVIRONMENTS SUCH AS PLASTIC PROCESSING EQUIPMENT.

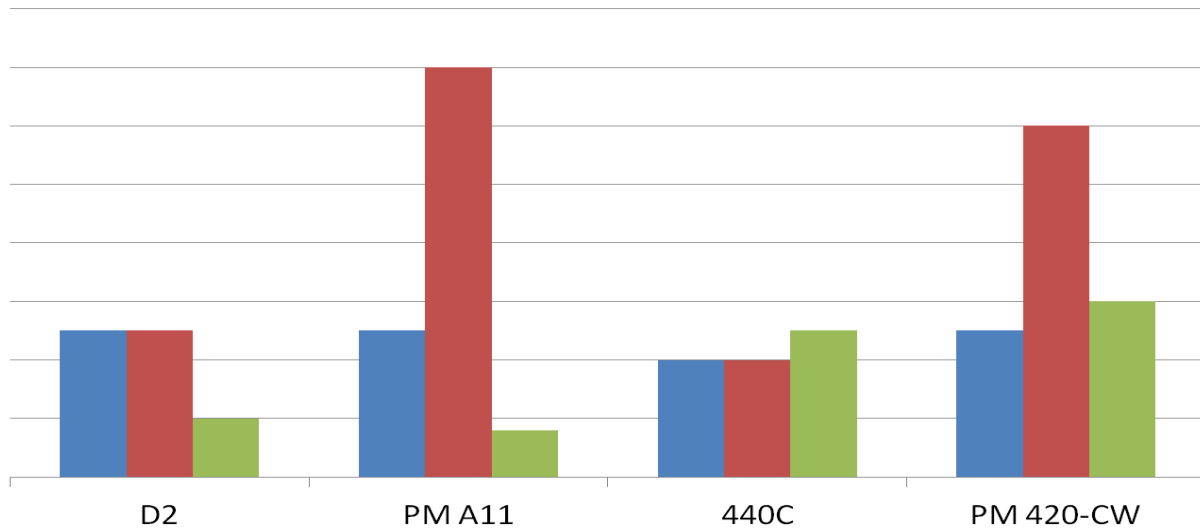
PM 420-CW HAS SIMILAR WEAR RESISTANCE TO PM A11 TOOL STEEL.

### TYPICAL CHEMICAL COMPOSITION

|            |       |           |        |
|------------|-------|-----------|--------|
| CARBON     | 2.25% | CHROMIUM  | 12.80% |
| MOLYBDENUM | 1.30% | SILICON   | 0.90%  |
| VANADIUM   | 9.25% | MANGANESE | 0.50%  |

### SBSM TOOL STEEL PROPERTIES COMPARISON

■ Toughness   ■ Wear Resistance   ■ Corrosion Resistance



### PHYSICAL PROPERTIES

**MODULUS OF ELASTICITY**.....30 PSI X 10<sup>6</sup> .....(207 GPa)  
**DENSITY**..... 0.275 LB/IN<sup>3</sup>  
**ANNEALED HARDNESS**.....230-255 BRINELL HARDNESS (BHN)  
**MACHINABILITY**.....SIMILAR TO PM A11 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  
800-900°F, HOLD TWO HOURS  
THEN AIR COOL TO ROOM TEMPERATURE

#### HARDENING

SALT BATH, PROTECTIVE ATMOSPHERE, OR VACUUM FURNACE EQUIPMENT PREFERRED.

#### HIGH HEAT (AUSTENITIZING)

1850/2050°F FOR 30 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 400°F TEMPERING TEMPERATURE REQUIRED.  
DOUBLE TEMPERING IS REQUIRED, TRIPLE TEMPERING RECOMMENDED.  
AIR COOL TO ROOM TEMPERATURE BETWEEN TEMPER.

### TYPICAL HEAT TREAT RESPONSE

| HARDENING<br>TEMP |      | TEMPERING TEMP |     | HARDNESS<br>HRC |
|-------------------|------|----------------|-----|-----------------|
| °F                | °C   | °F             | °C  |                 |
| 2000              | 1093 | 400            | 205 | 61              |
|                   |      | 500            | 260 | 60              |
|                   |      | 600            | 315 | 59              |

\* Note: Tempering between 800 F and 1000 F is not recommended for stainless steels

#### THERMAL CONDUCTIVITY

#### Room T

W/M\*K

16.25

#### THERMAL EXPANSION

#### Room T-100C

#### Room T-200C

#### Room T-300C

10<sup>-6</sup> M/M\*K

10.8

11.0

11.5