CPM Magnacut – Technical Data

General Descriptions:

CPM Magnacut is a unique powder metallurgy stainless tool steel with a design which eliminates chromium carbide in the heat treated microstructure. An excellent combination of toughness and wear resistance is achieved by having only small, high hardness, vanadium and niobium carbides.
Being free from chromium carbide also provides improved corrosion resistance.

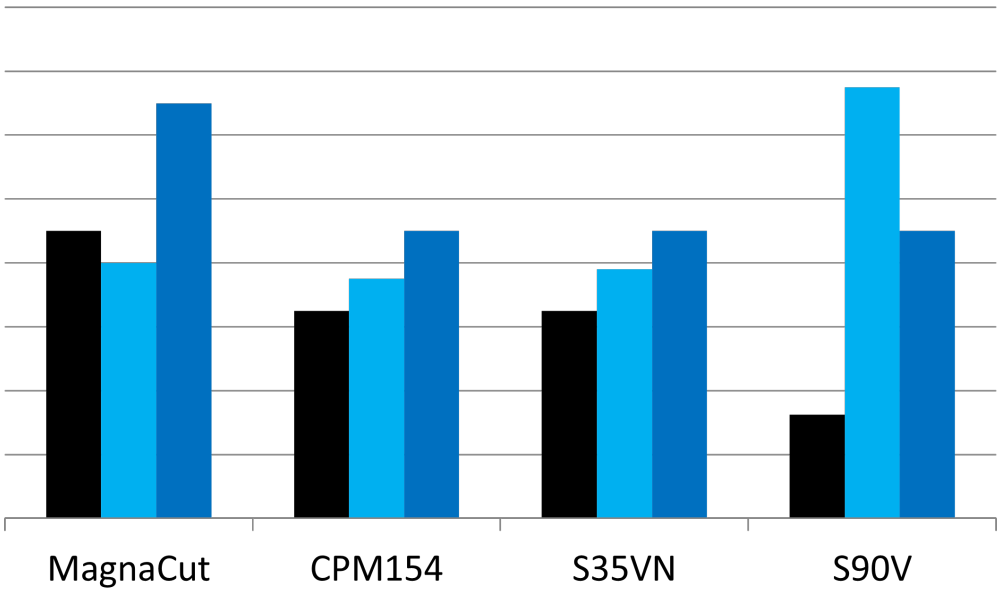
Examples of applications:

Long-wearing specialty cutlery, plastic injection and extrusion feed screws and dies, pelletizing equipment, wear components for food and chemical processing.

Chemical Composition

Carbon	Chromium	Vanadium	Molybdenum	Niobium	Nitrogen
1.15%	10.70%	4.00%	2.00%	2.00%	0.20%

Comparison Chart ■ Toughness ■ Edge Retention ■ Corrosion Resistance



Typical Heat Treat Response

Tempering Temp Degrees °F	Hardness HRC 1950 °F	2000 °F	2050 °F	2100 °F	2150 °F	2200 °F
Min Aust. time	30 min	25 min	20 min	15 min	10 min	5 min
300	60.5	62	62.5	63	62	63
350	59.5	60.5	61.5	61.5	62	61.5
400	58.5	59.5	60	60.5	60.5	60.5
500	57.5	58.5	58.5	59	60	59.5
1000	57	58.5	59.5	60.5	61.5	62

Size Changes During Hardening

Hardening Temp °F	Tempering Temp °F	HRC	Longitudinal Size Change %
2050	350	61	+0.05-0.10%

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Heat Treatment

Forging

2100 °F
Do not forge below 1750 °F.

Annealing

Heat to 1650 °F, hold two hours, slow cool(25 °F/hour max) to 1100 °F, then furnace cool or cool in still air to room temperature.
Typical annealed hardness is 235 BHN.

Stress Relieving

Annealed Material: Heat to 1100-1300 °F, hold two hours, then furnace cool or cool in still air.
Hardened Material: Heat to 25-50 °F below original tempering temperature, hold two hours, then furnace cool or cool in still air.

Hardening

Preheat: 1550-1600 °F, equalize.

High Heat (Austenitizing)

1950-2200 °F, hold time at temperature as shown in chart above. Thick cross-sections and larger pieces may need longer austenitizing time.

Quench

Plate quench, air or positive pressure quench (2 bar minimum) to below 125 °F.

Tempering

Double temper at 300-450 °F. Hold for two hours minimum per temper and cool to room temperature between tempers.

Note: Tempering above 750 °F results in a decrease in corrosion resistance.

Physical Properties

Modulus of Elasticity	31 psi x 10^6 (215 GPa)	**Density**	0.280 lb/in^3
Annealed Hardness	235 BHN	**Machinability**	70% of O1