

Physical properties

Thermal expansion rate

Temperature()	30 - 100	30 - 200	30 - 300	30 - 400
×10 ⁻⁶ /K	11.9	12.3	12.5	12.8

Thermal conductivity

Temperature()	24	100	200	300	400
W/m ·K	33.8	34.3	34.4	34.2	33.5
[cal/cm ·sec ·]	[0.0807]	[0.0819]	[0.0822]	[0.0817]	[0.0800]

Specific heat

Temperature()	24	100	200	300	400
J/kg ·K	455	472	504	546	591
[cal/g ·]	[0.109]	[0.113]	[0.120]	[0.130]	[0.141]

Young's modulus

Temperature()	25	100	200	300	400
GPa	208.4	204.5	198.3	190.9	182.3
[kgf/mm ²]	[21251]	[20853]	[20221]	[19466]	[18589]

Tensile properties (Room Temp.)

Hardness (HRC)	Tensile strength (MPa)	0.2% Yield (MPa)	Elongation (%)	Reduction in area (%)
40	1244	1127	15.9	61.7

Specimen: JIS14A (6 x 30mm)



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IMPORTANT NOTE

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PAC5000



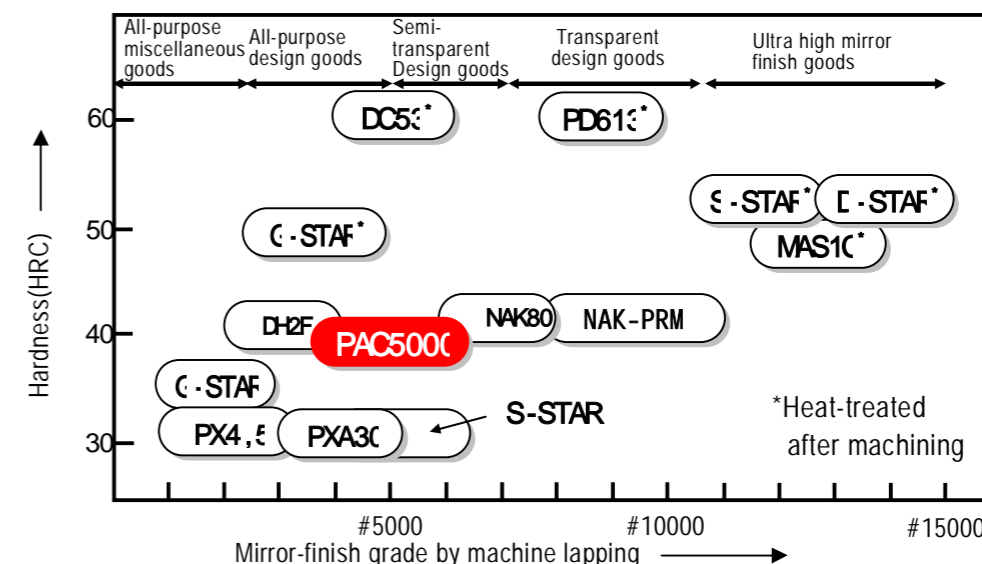
40HRC Pre-hardened type, General-purpose Plastic Mold Steel

Features

PAC5000 is general-purpose plastic mold steel that outperforms P20 improved grades in wear resistance and mirror polishing.

Polishability : In spite of single melt steel, it polishes up to #5000 or higher.

Texture processing: Suitable for various types of processing.



Applications

Automobile related (for lens cover etc.)
 Home electric appliances, Audio set, Information equipment, Office automation equipment
 Other plastic molds required higher hardness than 30HRC for wear resistance

Chemical composition

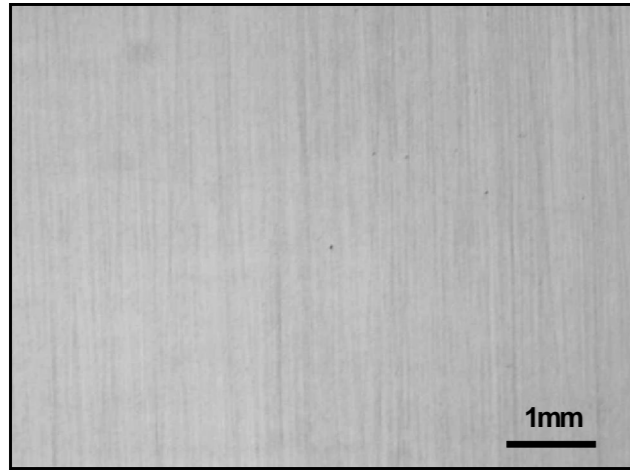
Grade	Hardness (HRC)	Chemical composition					
		C	Si	Mn	Cr	Mo	V
PAC5000	36 - 40	Patent pending					



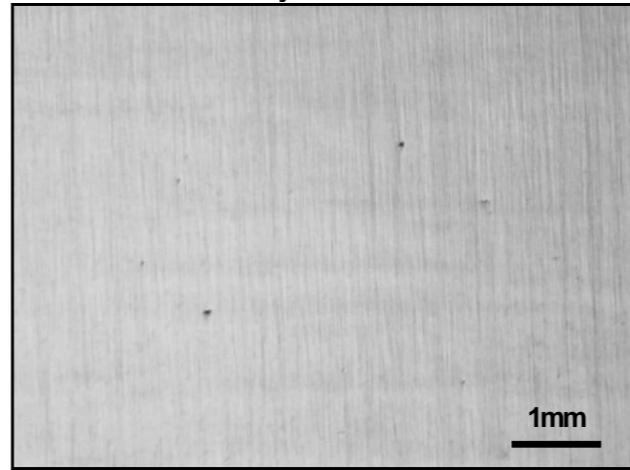
Properties

Polishability (When polished to #5000)

By differential interference contrast



PAC5000



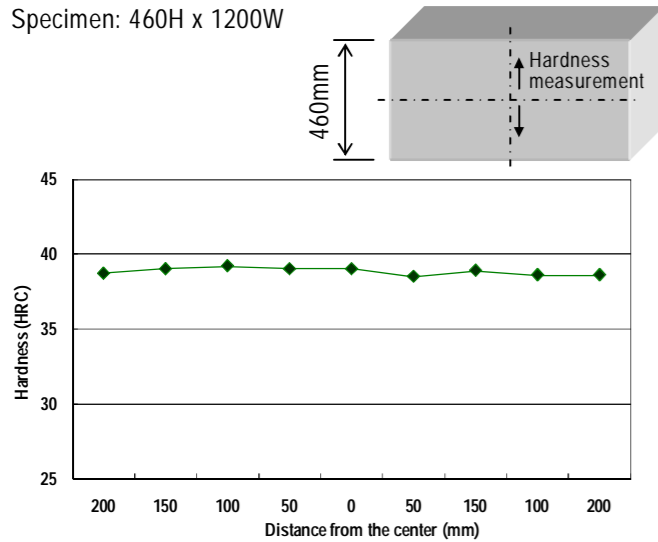
P20 improved (40HRC)

< Polishing procedures >

Turning, Milling Grinding (- #220-#320-#400) Emery paper polishing (#320-#400-#600-#800-#1000-#1200-#1500)
 Diamond paste finishing (#1200-#1800-#3000-#5000)

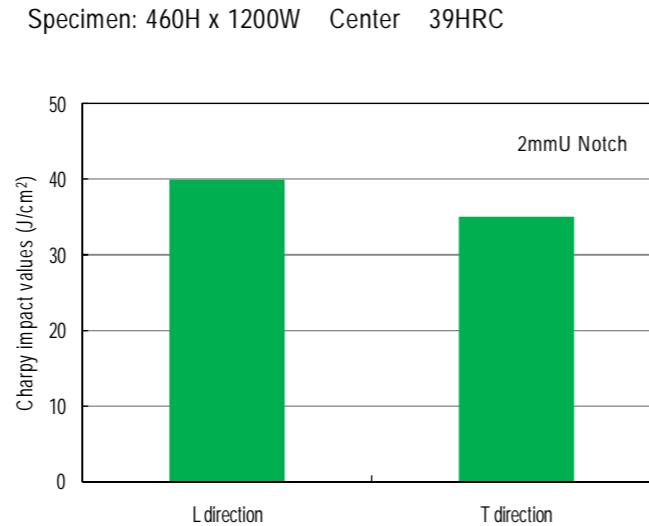
Hardness distribution

Specimen: 460H x 1200W



Toughness

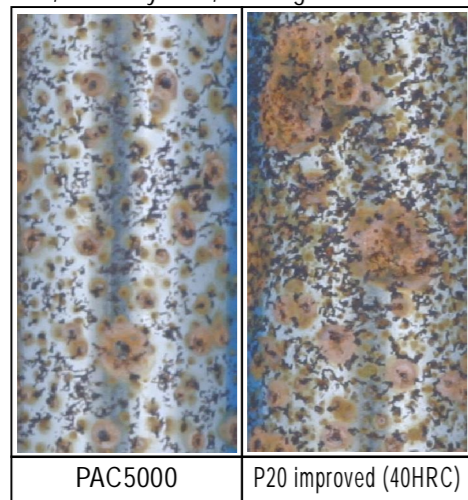
Specimen: 460H x 1200W Center 39HRC



Humidity cabinet test

< Test conditions >

Temp.:50 , Humidity:98%, Holding time:24hours

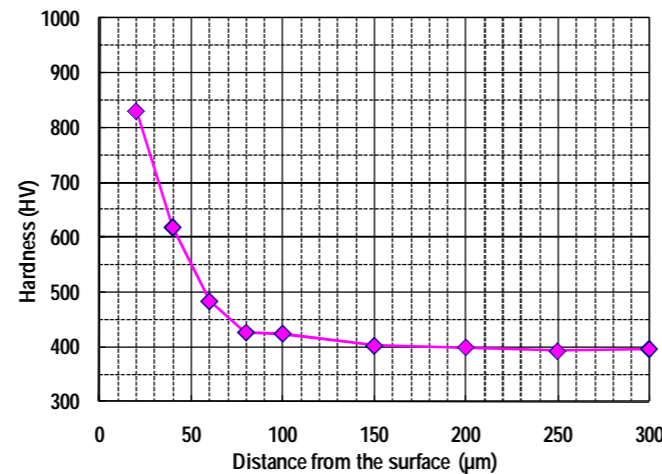


PAC5000

P20 improved (40HRC)

Nitriding characteristics

Gas soft-nitriding: 510 x3hours

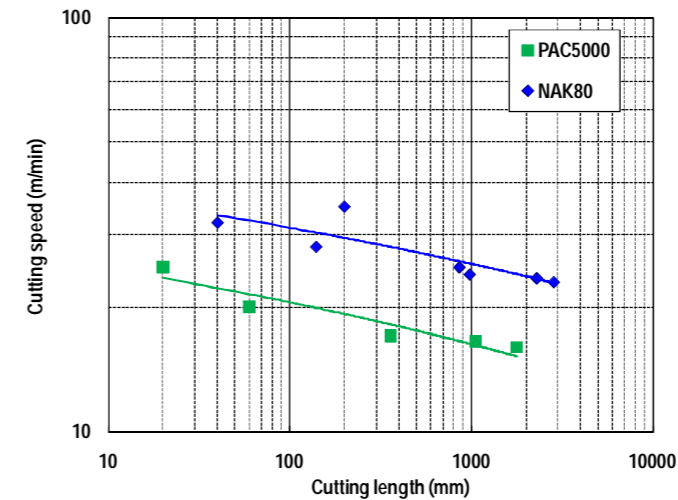


Dimensional change and hardness decrease may occur when processed at the higher than 520 .

Machinability

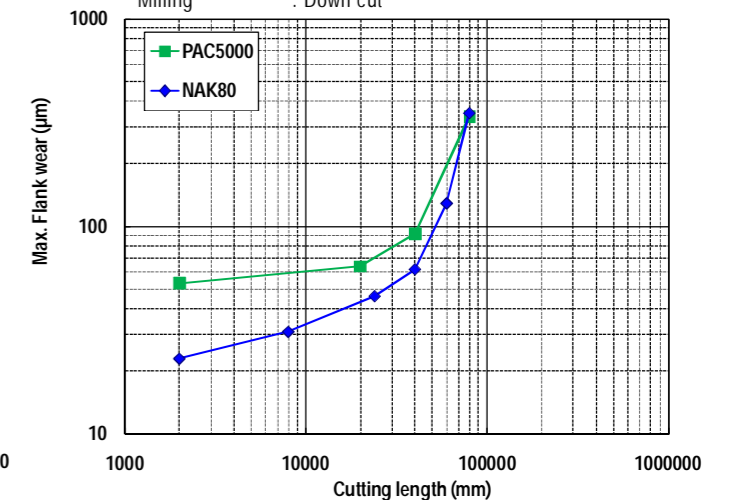
< Drilling condition > Hardness:40HRC

Tool : SKH51
 Shape : 5 Straight shank
 Feed : 0.15mm/rev
 Lubricant : Yushiro FGE360 (5% solution)
 Criteria : Breakage or corrosion



< Endmilling condition > Hardness:40HRC

Tool : UTI20 (No-coated)
 Speed : 150m/min
 Feed : 0.15mm/rev
 Depth of cut : 1x4mm
 Cooling : Air blow
 Milling : Down cut



Build-up Welding

- Preparation
 - Fully clean all oils, foreign material, and scales
 - Remove all cracks and surface treatment layers
 - Edge preparation: corner sections 3R or above
- Build-up Welding Rod
NAK-W
- Pre-heating
 - 200 to 300
 - Gradually heat by furnace, or propane or natural gas burner

- Welding
TIG welding is recommended

< Conditions >

Electrode diameter (mm)	1.6	2.4
Rod diameter (mm)	1.6	2.4
Current (A)	70 ~ 150	150 ~ 250
Argon (/min)	6 ~ 9	7 ~ 10

- Post-heating
500

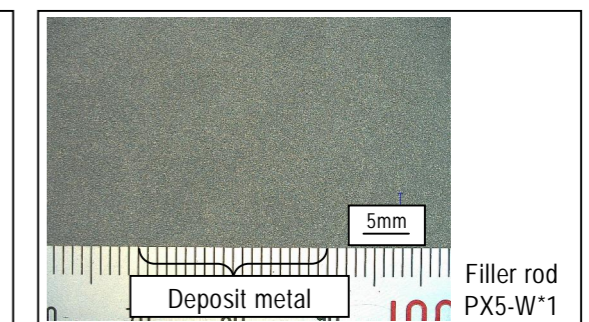
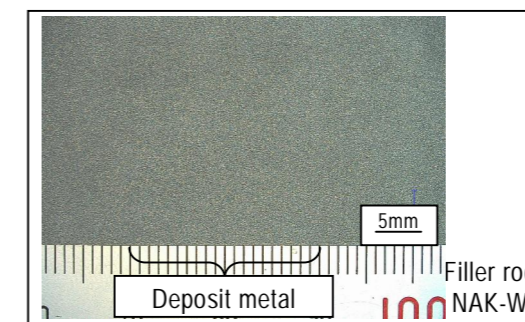
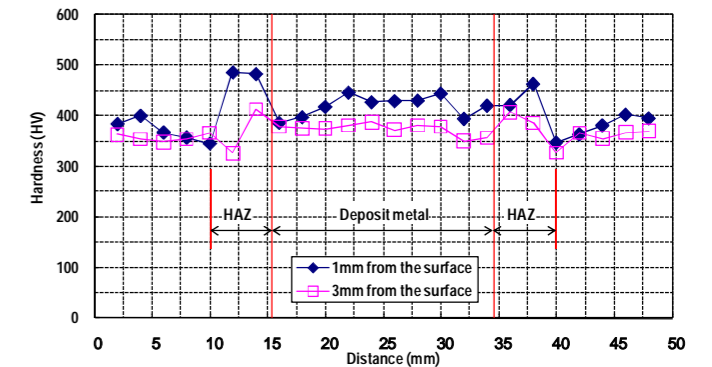
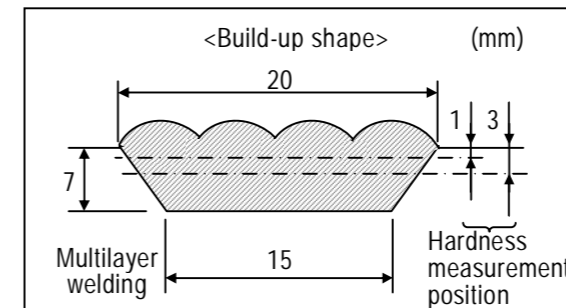


Photo etching after build-up welding (Photo etching: Pearskin finish)

*1) When build-up welded with PX5-W filler, PAC5000 shows superb photo-etched surface without unevenness. It is appreciated to note that lower hardness deposit around 30HRC and the hardness difference from base metal may result in some influence in service.
 【Welding conditions】
 Filler rod: PX5-W (2.4mm), Current: 130A, Argon: 10 /min, Pre-heating: 200 , Post-heating: 500