

PAC5000

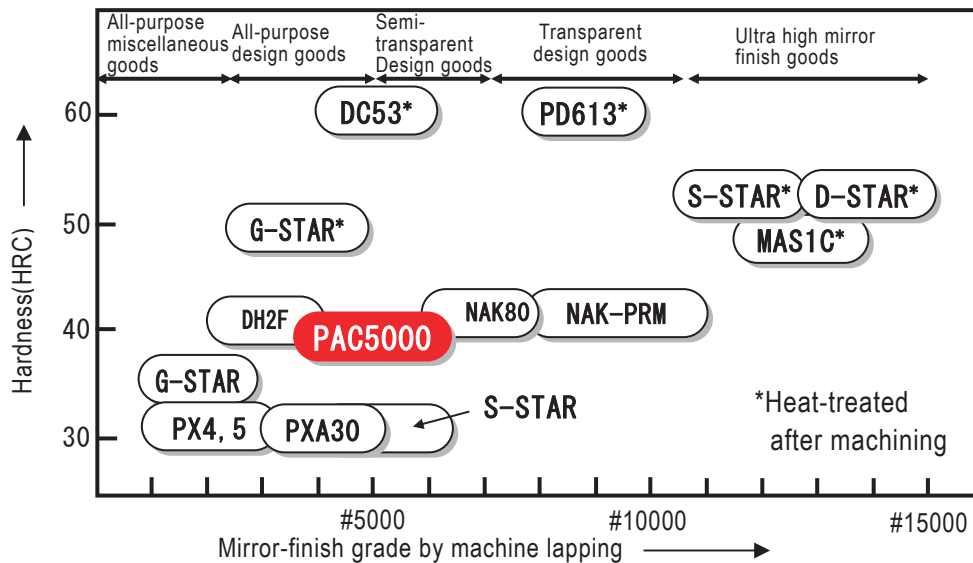


40HRC Pre-hardened type, General-purpose Plastic Mold Steel

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

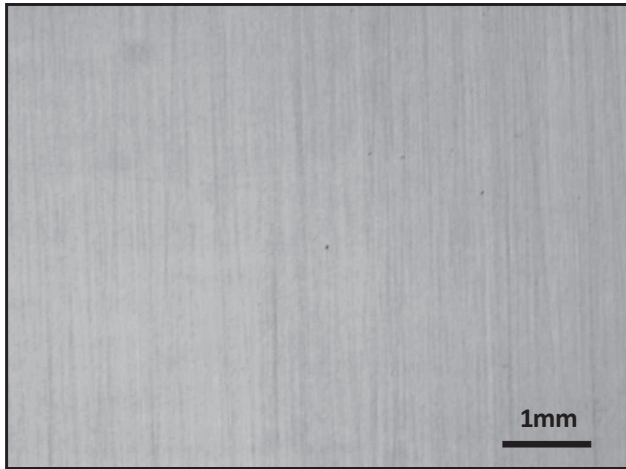
Chemical composition

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

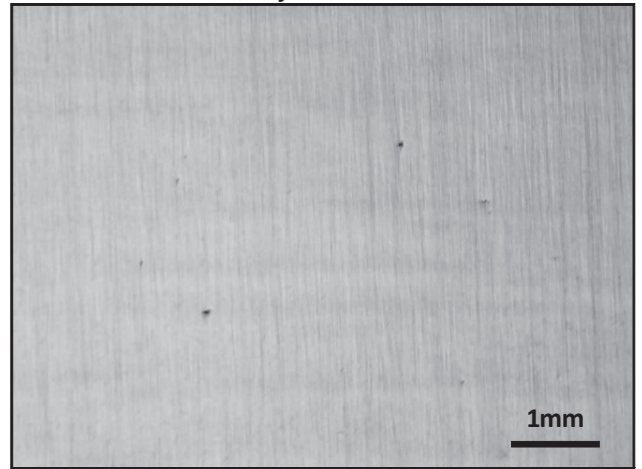
Properties

Polishability (When polished to #5000)

By differential interference contrast



PAC5000



P20 improved (40HRC)

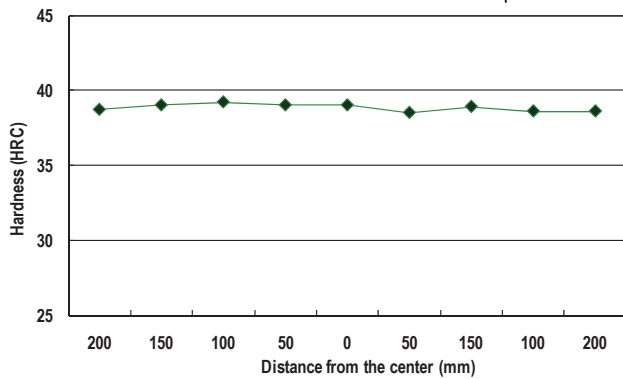
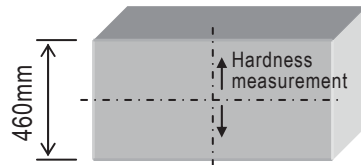
< Polishing procedures >

Turning, Milling → Grinding (- #220-#320-#400)→Emery paper polishing (#320-#400-#600-#800-#1000-#1200-#1500)

→Diamond paste finishing (#1200-#1800-#3000-#5000)

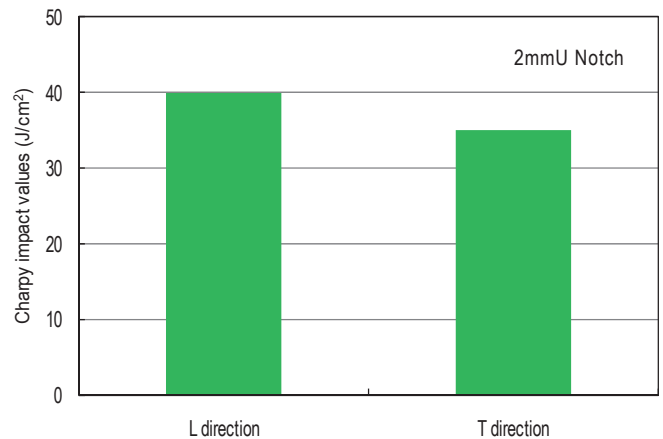
Hardness distribution

Specimen: 460H x 1200W



Toughness

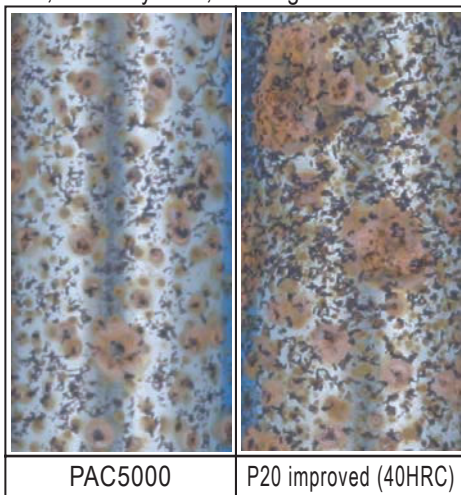
Specimen: 460H x 1200W Center 39HRC



Humidity cabinet test

< Test conditions >

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

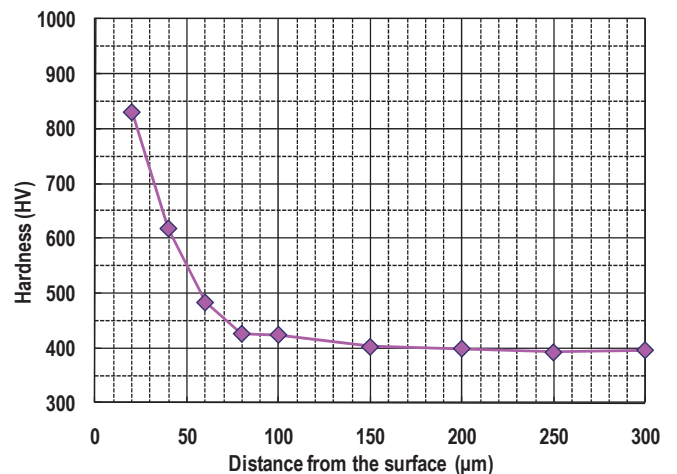


PAC5000

P20 improved (40HRC)

Nitriding characteristics

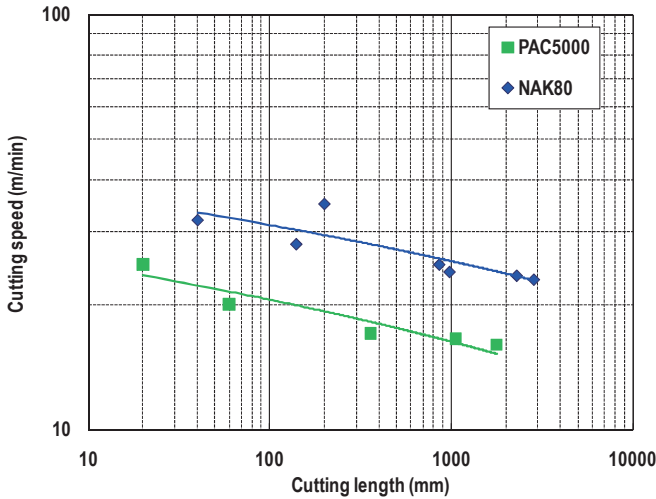
Gas soft-nitriding: 510°Cx3hours



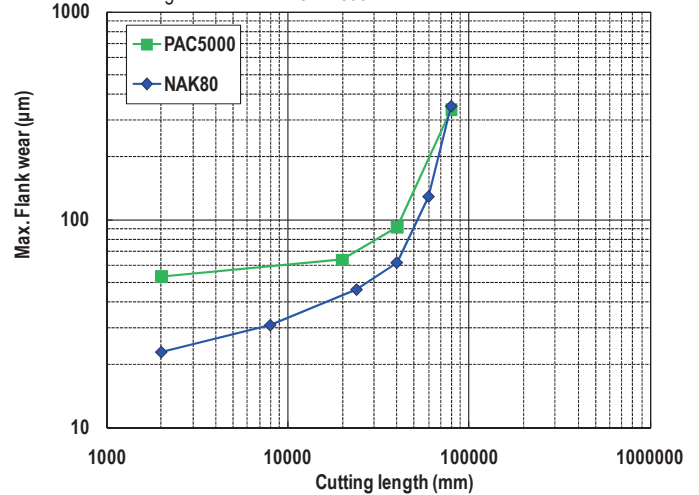
Dimensional change and hardness decrease may occur when processed at the higher than 520°C.

Machinability

< Drilling condition > Hardness: 40HRC
 Tool : SKH51
 Shape : ϕ 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
PXA50-W is recommended.
- Pre-heating
 - 200 to 300°C
 - 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 (ℓ/min)	6~9	7~10

- Post-heating
500°C

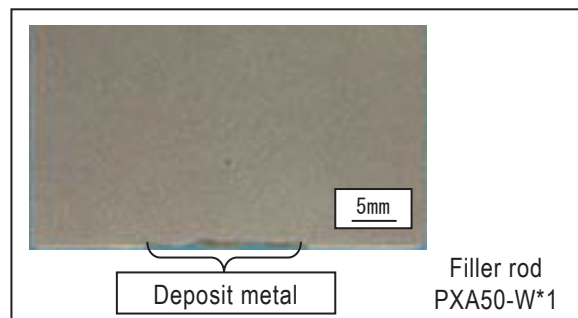
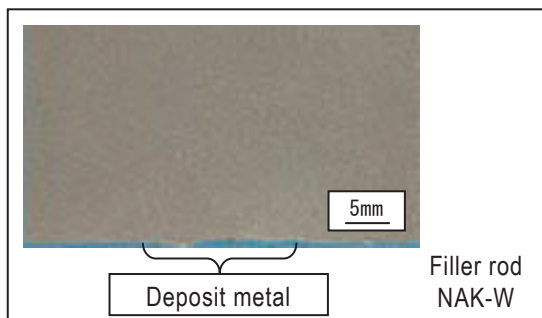
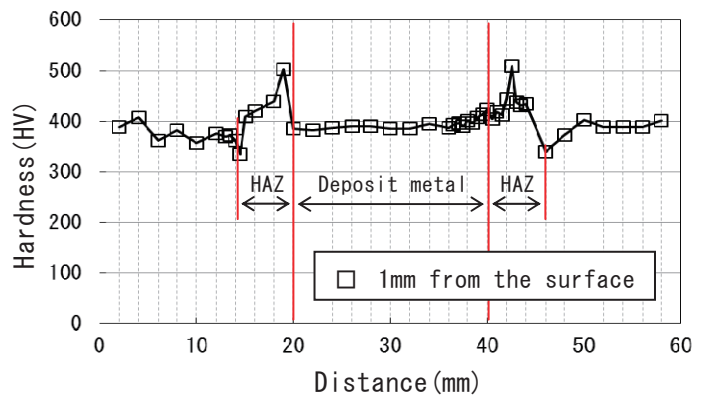
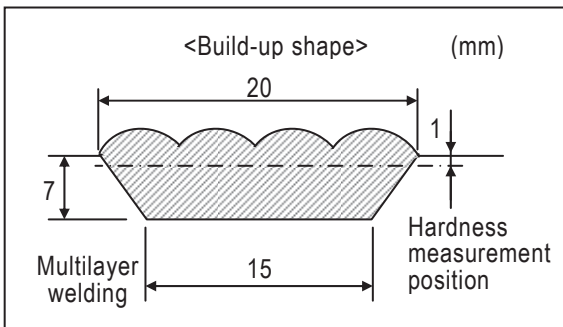


Photo etching after build-up welding (Photo etching: Pearskin finish)

*1) When build-up welded with PXA50-W filler, PAC5000 shows superb photo-etched surface without unevenness. The small difference in hardness between the deposit metal and the base metal (around 40HRC) would reduce the risk of defects such as short-term mold life in the repaired part or polishing unevenness.

Physical properties

◆ Thermal expansion rate

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

◆ Thermal conductivity

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

◆ Specific heat

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

◆ Young's modulus

Temperature(°C)	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 (φ 6 x 30mm)



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