

## Mechanical properties

Hardness	40HRC
Tensile strength	1,244MPa
0.2% Proof stress	1,127MPa
Elongation	15.9%
Reduction of area	61.7%

Specimen: JIS 14A (φ6 x 30 mm)

## Physical properties

### ◆ Thermal expansion rate

Temp.	20~100℃	20~200℃	20~300℃	20~400℃	20~500℃	20~600℃
×10 <sup>-6</sup> /K	11.2	12.0	12.6	13.1	13.6	14.0

### ◆ Thermal conductivity

Temp.	25℃	100℃	200℃	300℃	400℃	500℃	600℃
W/m·K	32.5	33.6	33.7	35.1	34.5	33.9	33.6

\* Accuracy of repeated measurements is about ±10%.

### ◆ Specific heat

Temp.	25℃	100℃	200℃	300℃	400℃	500℃	600℃
J/kg·K	455	510	503	566	620	690	814

### ◆ Young's modulus / Rigidity modulus / Poisson's ratio (25℃)

Young's modulus	Rigidity modulus	Poisson's ratio
211GPa	81GPa	0.30

## Daido's Plastic Mold Steel Series

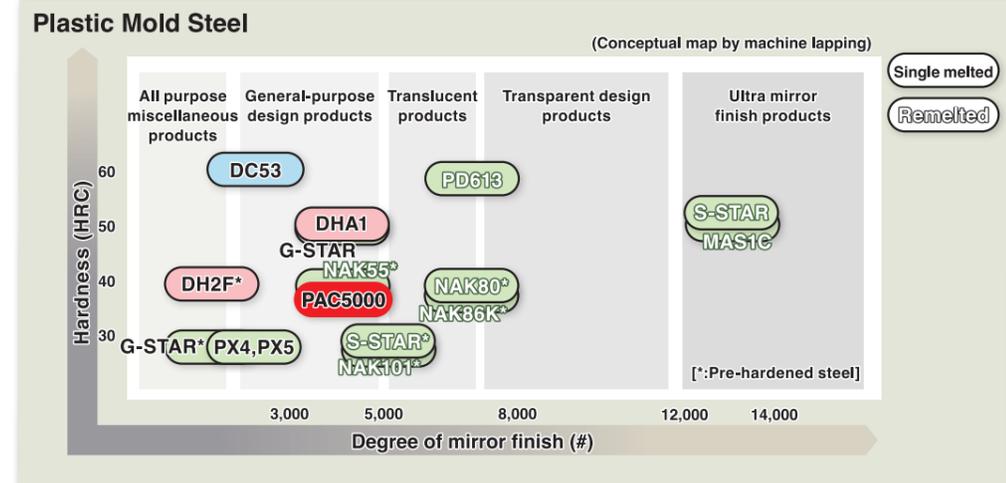
# PAC5000<sup>TM</sup>

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

### Features

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

- ◆ **Polishability** : Despite being a single melt steel, it can be polished up to #5000 or higher.
- ◆ **Texture processing** : Suitable for various types of processing.



### Main 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

Daido brand	Supplied condition (Hardness)	Chemical composition					
		C	Si	Mn	Cr	Mo	V
PAC5000	Pre-hardened (36~40HRC)	P20 mod.					



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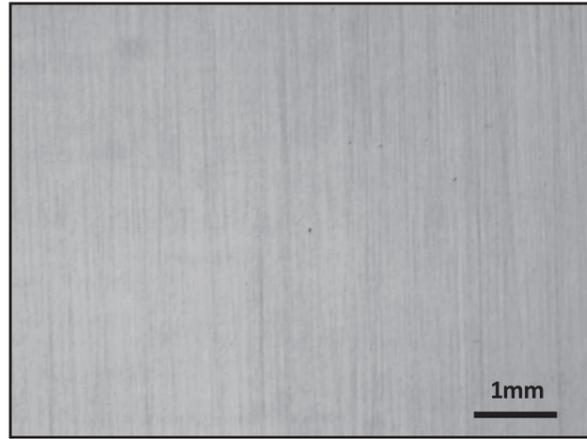
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The product characteristics included in this brochure are the representative values based on the result of our measurements, and do not guarantee the performance in use of the products. Please inquire the latest information to our department in charge as the information of this brochure is updated without previous notice as needed.  
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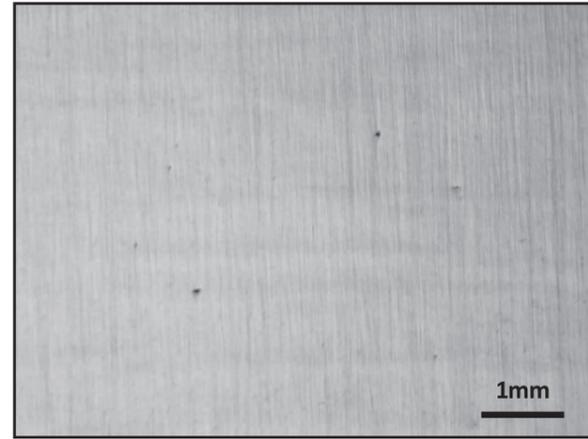
# Properties

## Mirror finish properties



PAC5000

By differential interference contrast



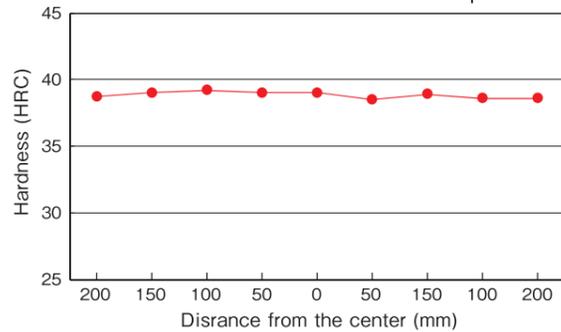
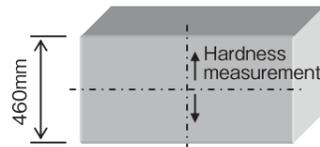
P20 mod. (40HRC)

<Polishing procedure>

Turning, Milling → Grinding (#220 - #320 - #400) → Emery paper polishing (#320 - #400 - #600 - #800 - #1000 - #1200 - #1500)  
→ Diamond paste finishing (#1200 [15μm] - #1800 [9μm] - #3000 [6μm] - #5000 [4.5μm])

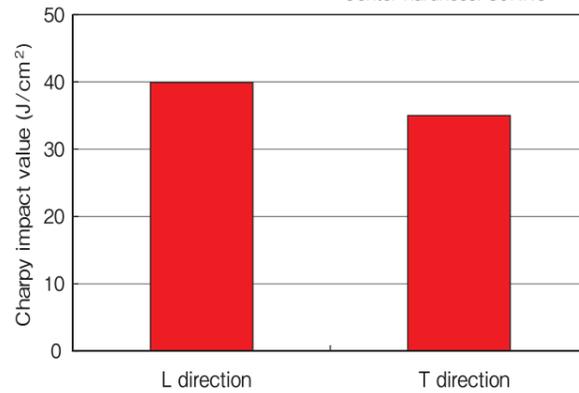
## Hardness distribution

Material size: 460H x 1200W



## Toughness

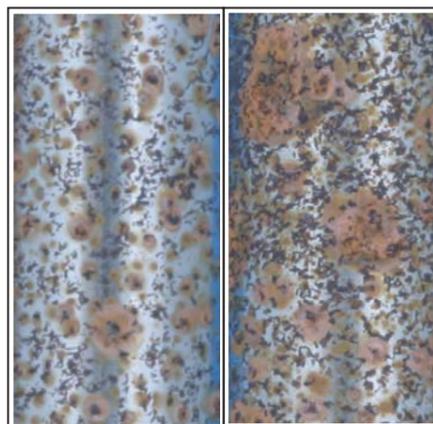
Material size: 460H x 1200W  
Specimen: 2mmU Notched  
Center hardness: 39HRC



## Humidity cabinet test

<Test conditions>

Temperature:50°C, Humidity:98%, Holding time:24h

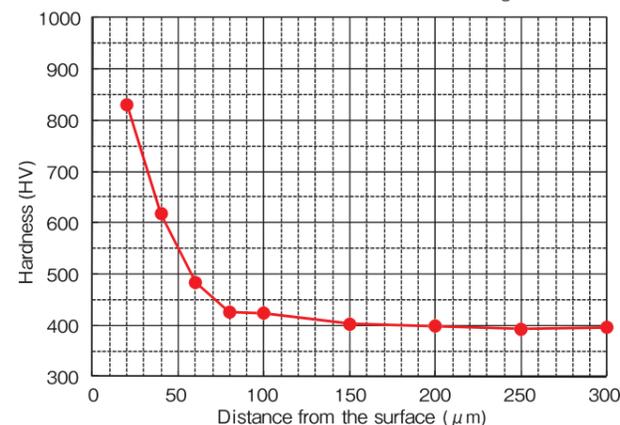


PAC5000

P20 mod. (40HRC)

## Nitriding characteristics

Gas soft-nitriding: 510°Cx3h

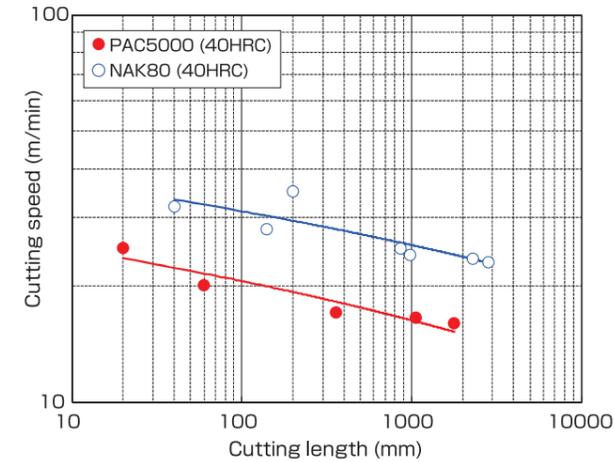


Dimensional change and hardness decrease may occur when processed at the higher than 520°C

## Machinability

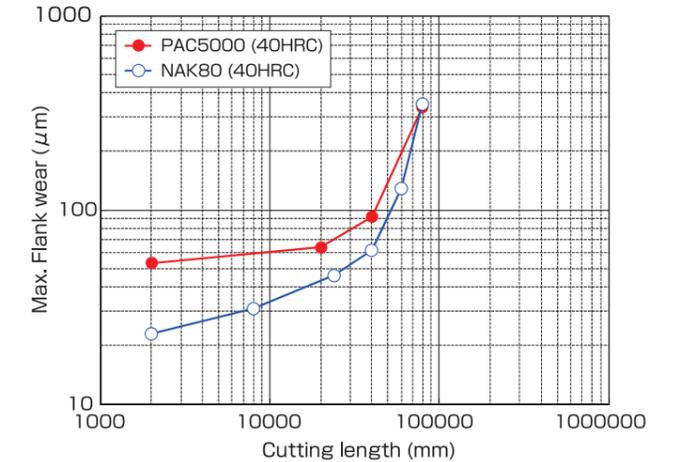
### Drilling

Tool : SKH51  
Shape : φ5 Straight shank  
Feed : 0.15mm/rev  
Lubricant : Yushiro FGE360 (5% solution)  
Criteria : Breakage of erosion



### Endmilling

Tool : UTi20 (non-coated)  
Speed : 150m/min  
Feed : 0.15mm/rev  
Depth of cut : 1x4mm  
Cooling : Air blow  
Milling : Down cut



## Weldability

### 1. Preparation

- (1) Fully clean all oils, foreign material, and scales
- (2) Remove all cracks and surface treatment layers
- (3) Edge preparation: corner sections 3R or above

### 2. Build-up Welding Rod

PXA50-W is recommended.

### 3. Pre-heating

- (1) 200 to 300°C
- (2) Gradually heat by furnace, or propane or natural gas burner

### 4. Welding

TIG welding is recommended.

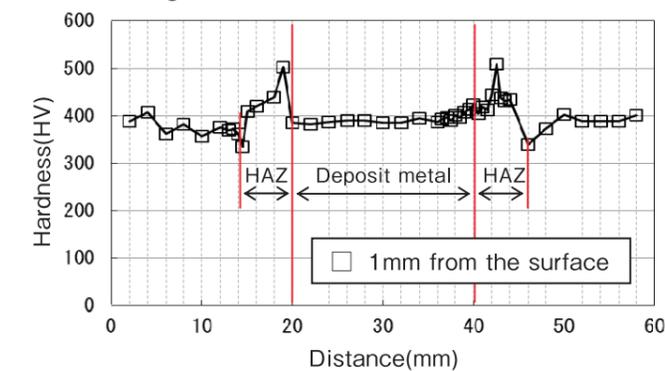
<Conditions>

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

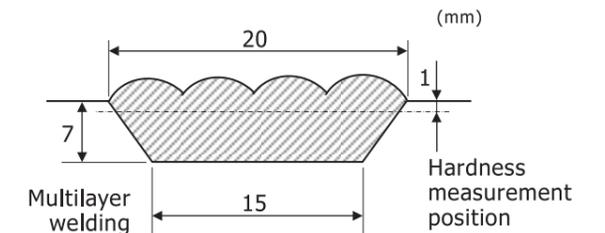
### 5. Post-heating

500°C

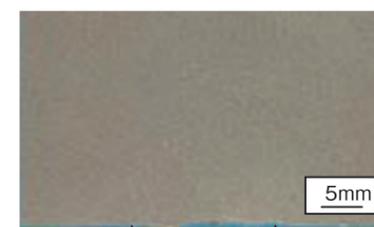
### TIG welding



<Build-up shape>

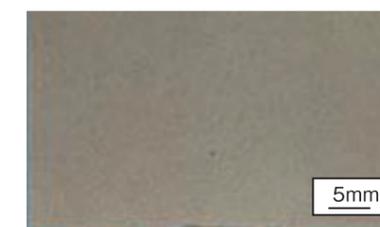


### Photo etching after build-up welding (Pearskin finish)



Deposit metal

Welding rod: NAK-W



Deposit metal

Welding rod: PXA50-W (\*1)

\*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.