

Physical properties

◆ Coefficient of thermal expansion

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]	[21,251]	[20,853]	[20,221]	[19,466]	[18,589]

Mechanical properties

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

Test piece : JIS14A (6φx 30mm)



DAIDO STEEL CO., LTD.

Tokyo Head Office
(Tool Steel Div., Tool Steel
Marketing & Sales Dept.
Overseas Sect.)

Daido Shinagawa Building, 6-35, 1-Chome, Konan, Minato-ku, Tokyo, Japan
Phone: +81-3-5495-1270 Fax: +81-3-5495-6739

Bangkok Office

Unit2-1, 22nd Fl., Silom Complex Bldg., 191, Silom Road,
Silom, Bangrak, Bangkok10500, Thailand
Phone: +66-2-231-3214 Fax: +66-2-231-3216

Europe Office

Insterburger Strasse 16, 60487 Frankfurt am Main, Germany
Phone:+49-69-29802867-0 Fax:+49-69-29802867-40

Daido Steel (America) Inc.

1111 Plaza Drive, Suit 740, Schaumburg, Illinois60173 U.S.A.
Phone: +1-847-517-7950 Fax: +1-847-517-7951

Daido Steel (Shanghai) Co., Ltd.

Room 1402, Ruijin Building, 205 Mao Ming Nan Road, Shanghai,200020, China
Phone: +86-21-5466-2020 Fax: +86-21-5466-0279

Daido Steel (Shanghai) Co., Ltd.
Guangzhou Subsidiary Company

Room 2601, No.8, Linhezhong Road, Tianhe District, Guangzhou,510610, China
Phone: +86-20-3877-1632 Fax: +86-20-8550-1126

www.daido.co.jp

■ Document Disclaimer

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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Daido Plastic Mold Steel Series

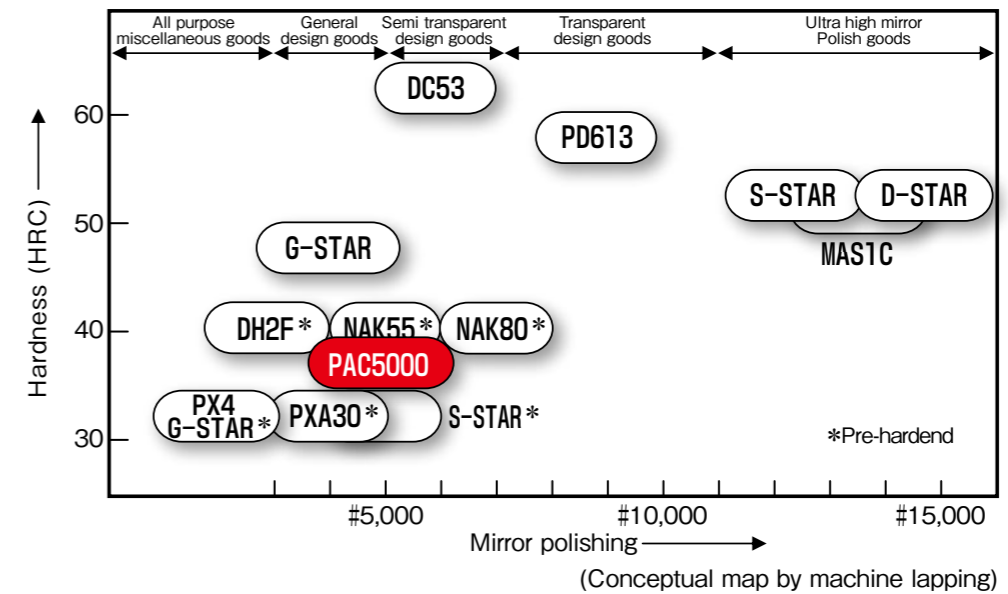
PAC5000

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

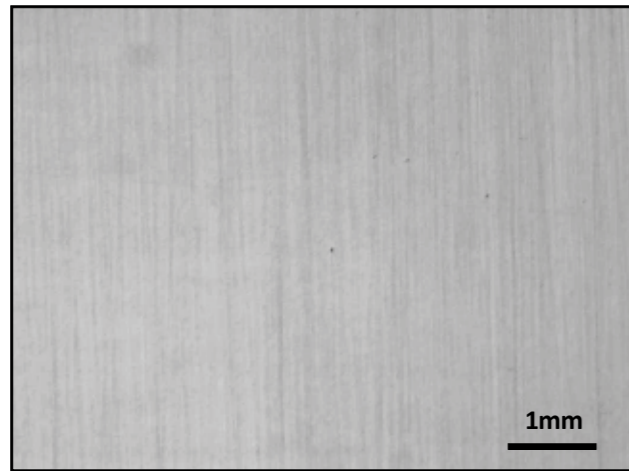
Chemical composition

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



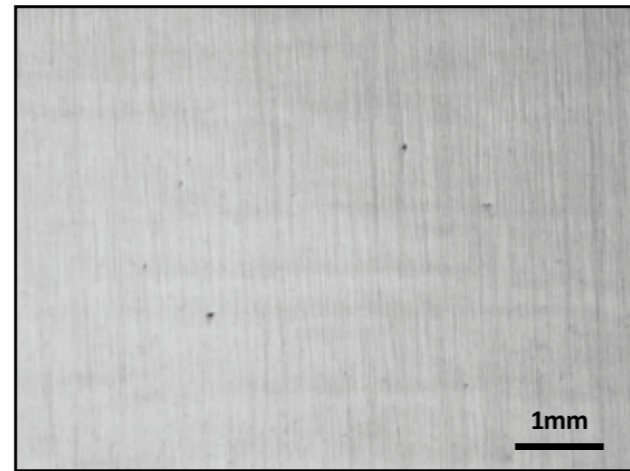
Properties

Mirror polishability



PAC5000

By differential interference contrast



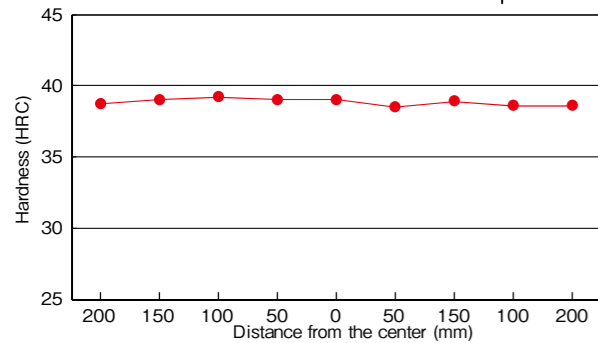
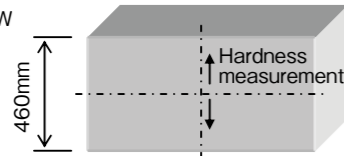
P20 improved (40HRC)

<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)

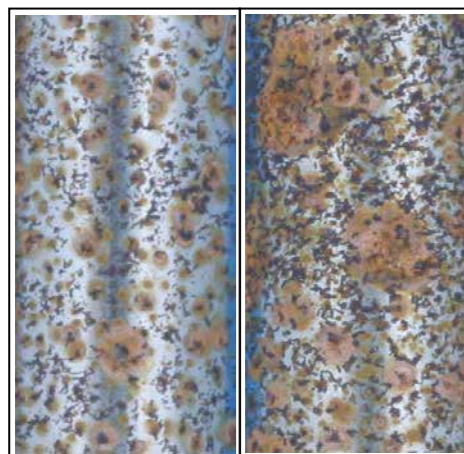
Hardness distribution

Product size : 460H x 1200W



Humidity cabinet test

<Test conditions>
Temperature:50°C, Humidity:98%, Holding time:24h

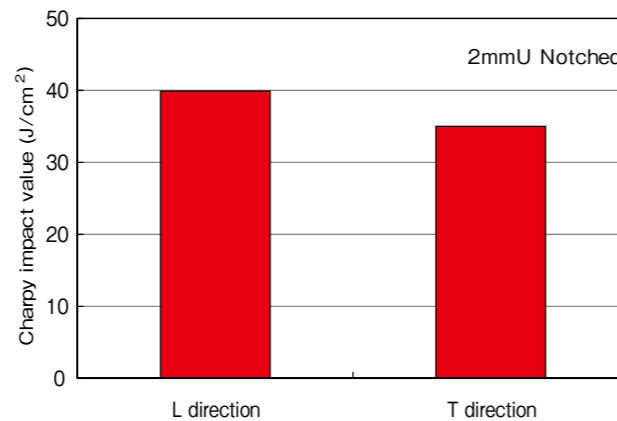


PAC5000

P20 improved (40HRC)

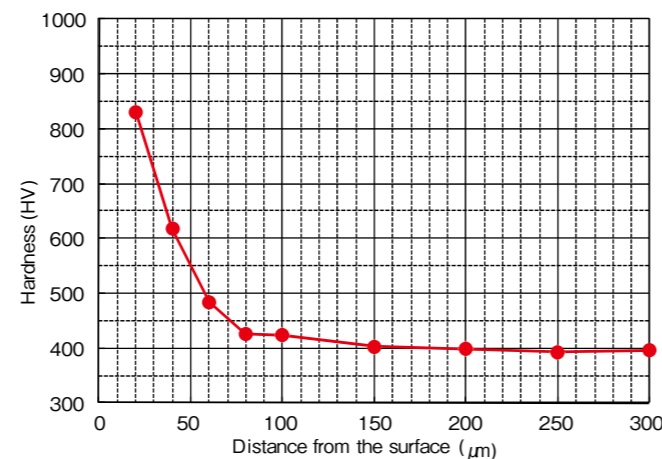
Toughness

Product size : 460H x 1200W Center 39HRC



Nitriding property

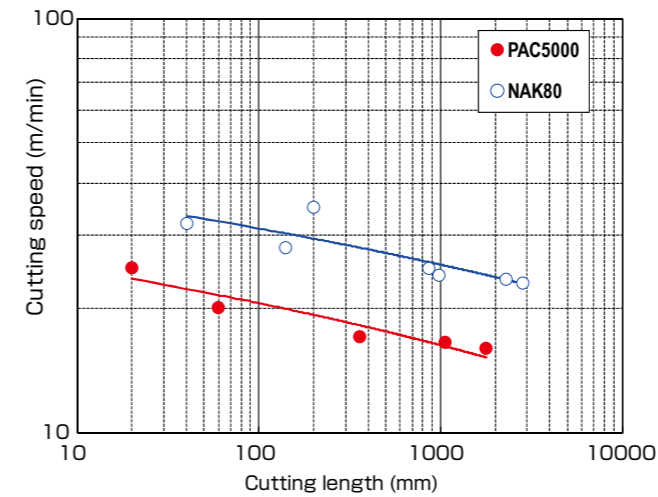
Gas soft-nitriding: 510°Cx3h



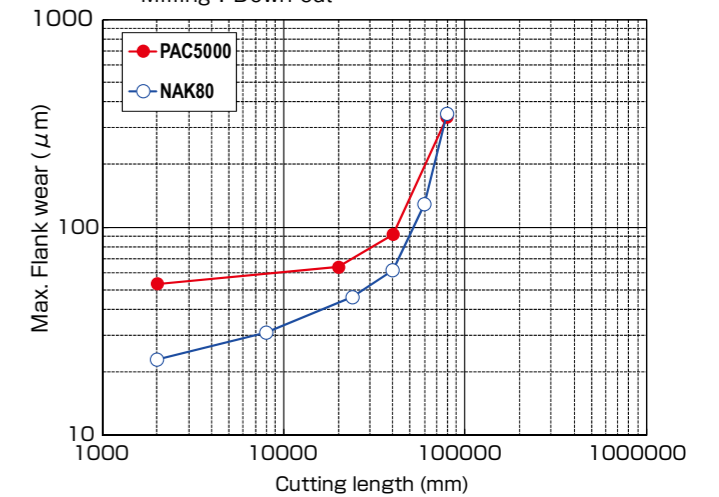
Dimensional change and hardness decrease may occur when processed at the higher than 520 °C

Machinability

<Drilling condition> Hardness:40HRC
Tool : SKH51
Shape : φ5 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



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

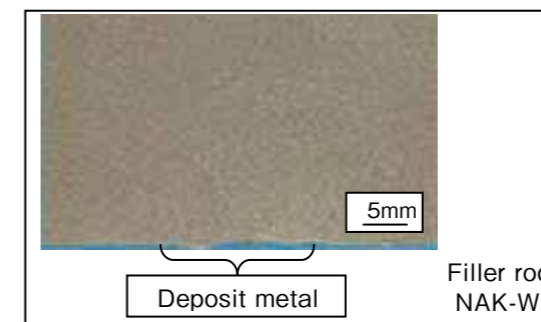
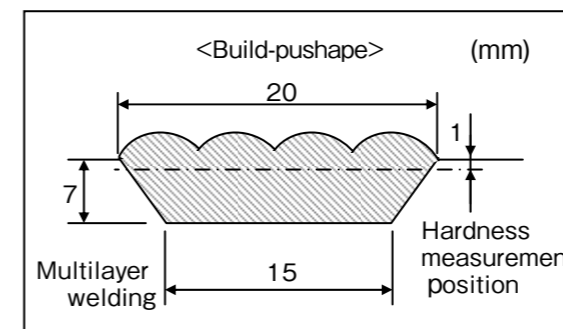
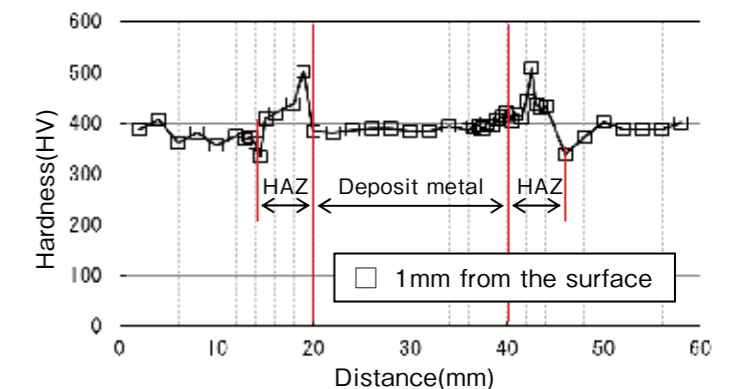
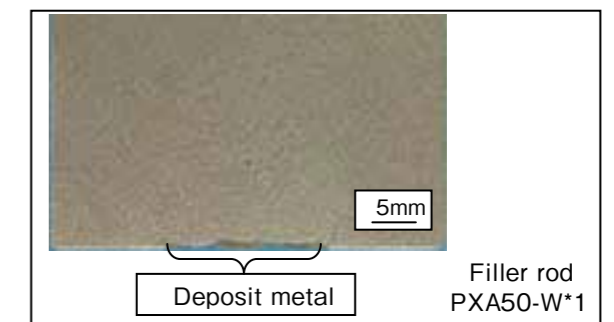


Photo etching after build-up welding



(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.