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DELPET™

Acrylic Resin

Piano Black series

PB01,PB21,PB22,PB23

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URL: https://www.asahi-kasei.co.jp/delpet/en/

1. Properties of PB series

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PB series looks jet-black even when viewed outside

*Appearance when illuminated with LED light

Color/Weather Resistance	**High Jet-black tone/Good weather stability**
Injection moldability/ Mechanical Strength	**Same or better than general PMMA**
Options of Grades	**Can be selected upon your requirements**

2. Properties

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Item	ISO Method	Unit	General	BIMODAL		
			(General) PB01	(High flow) PB21	(Solvent Resistance) PB22	(Good flow & Solvent Resistance) PB23
1. Rheological Properties						
Melt mass-flow rate (230℃、37.3N)	1133	g/10min	2.0	1.8	0.6	1.0
Spiral flow length Thickness : 2 mm Cylinder Temp : 250 ° C Mold Temp : 60 ° C Pressure : 75 MPa	ASAHIKASEI PMMA method	cm	27	33	27	30
2. Mechanical Properties						
Tensile modulus	527-2/1A/1	MPa	3300	3300	3300	3300
Tensile strength at break	527-2/1A/5	MPa	77	77	77	77
Tensile strain at break	527-2/1A/5	%	6	5	7	6
Charpy impact strength (Unnotched)	179/1eU	kJ/m^2	22	22	24	24
Charpy impact strength (Notched)	179/1eA	kJ/m^2	1.4	1.3	1.4	1.4
Flexural modulus	178	MPa	3300	3300	3300	3300
Flexural strength	178	MPa	130	130	130	130
3. Thermal Properties						
Temperature of deflection under load (1.8 MPa)	75-1 75-2	℃	100	100	98	98
VICAT softening temperature	306 B 50	℃	108	108	106	106
4. Other Properties						
Brightness L^*	SCE measurement mode (Illuminant : D65/10° FOV)	-	<1.0	<1.0	<1.0	<1.0
Chromaticity a^*/b^*			-0.3/-1.3	-0.3/-1.3	-0.3/-1.3	-0.3/-1.3
Water absorption (23°C, 24 hr)	62 method 1	%	0.3	0.3	0.3	0.3
Density	1183	g/cm^3	1.19	1.19	1.19	1.19
Rockwell hardness M scale	2039-2	-	100	100	95	98
Mold shrinkage	ASAHIKASEI PMMA method	%	0.2～0.6	0.2～0.6	0.2～0.6	0.2～0.6

NOTE: The above values are representative values of natural colors and are not standard values or guaranteed. The test piece preparation conditions, annealing conditions, and test conditions are-in accordance with the conditions specified or recommended by the PMMA resin standard of ISO8257-2. Please use these values as a reference when selecting the most suitable grade for each respective use. In addition, these values may change due to the improvement of properties.

3. Color/Weather stability of PB series

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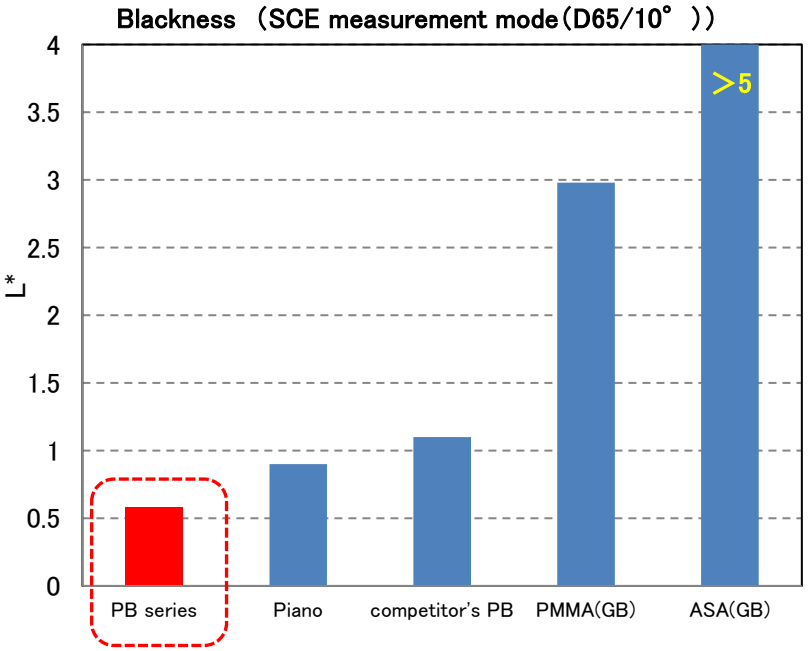
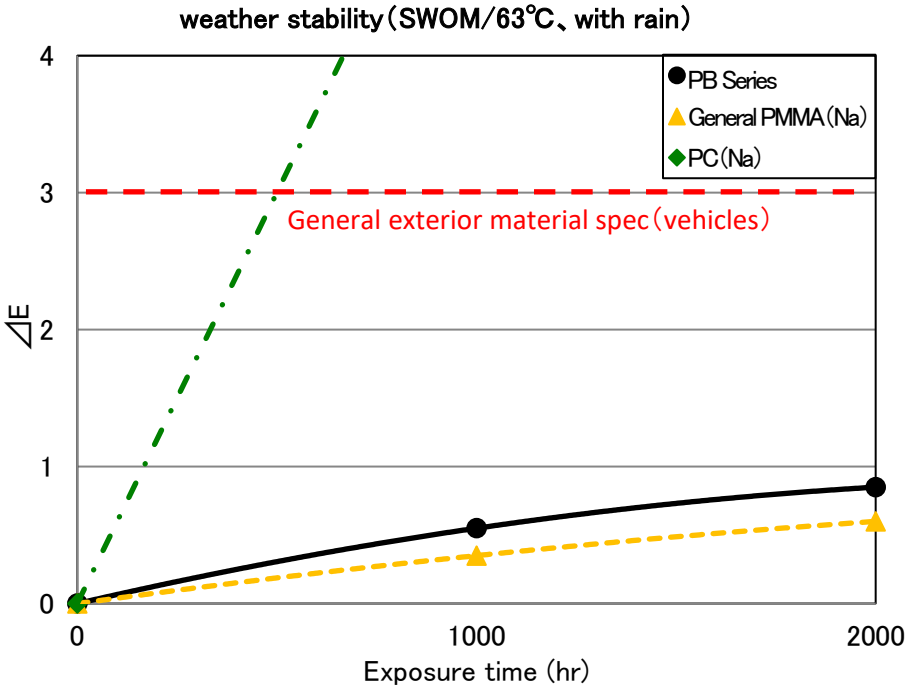
Combines excellent blackness and weather stability





PB series are particularly suitable for outdoor use

*) SCE measurement mode：SCE mode excludes specular reflected light, is used to evaluate color of an object which correlates to visual perception. Using SCE mode, a glossy surface will typically measure darker than a matt surface of the same color; similar to how our eyes see it.

4. Injection moldability of PB series

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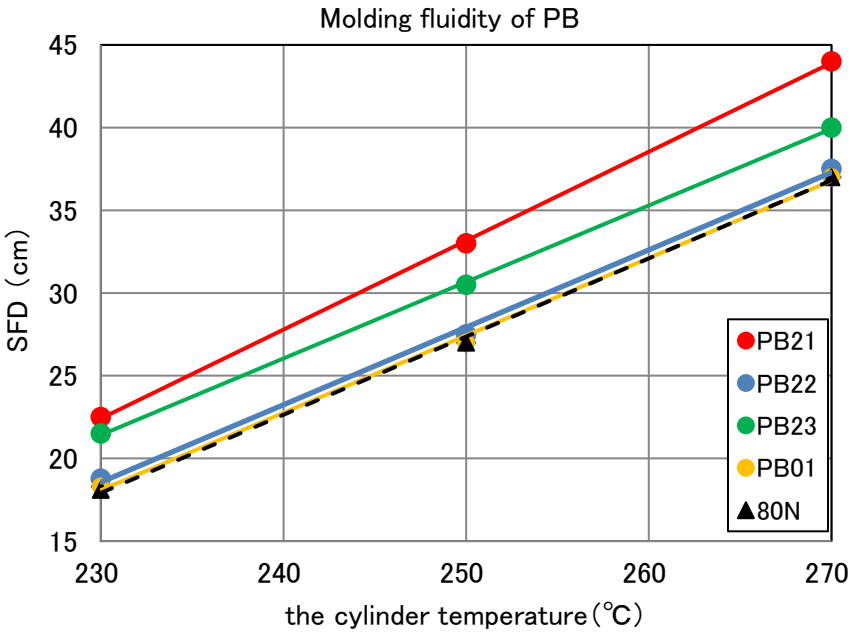
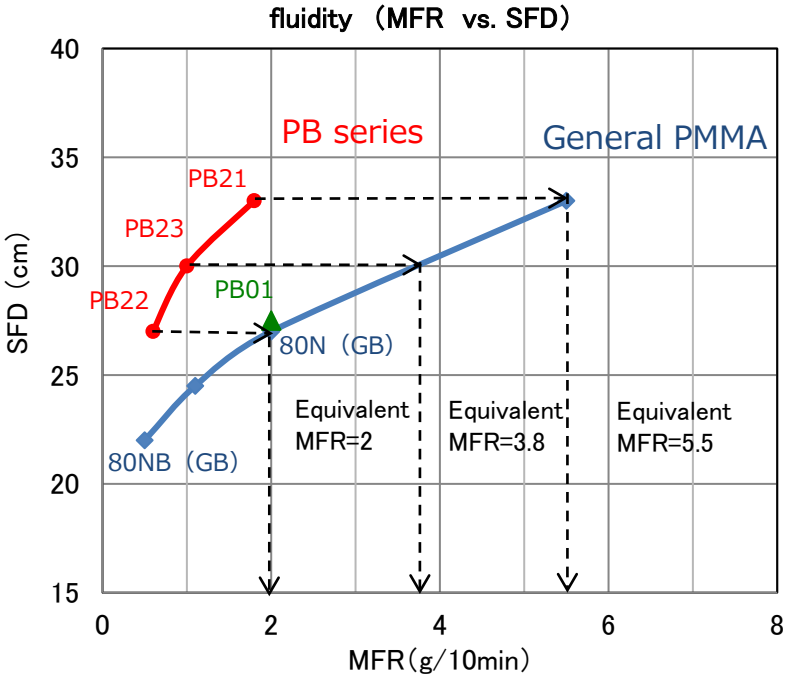
① PB21,22,23 exhibit High fluidity

② You can mold at lower temperature, shorter molding cycle





(Molding conditions)

Mold : Spiral mold(t = 2 mm)

Filling pressure : 75 MPa

Mold temperature: 60 ℃

PB21,22,23 exhibit higher fluidity even with MFR equivalent to general PMMA

*) SFD : Spiral Flow Distance

5-1. Solvent resistance

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Equivalent solvent resistance to General PMMA

		PB Series				General Grades	
		PB01 (General)	PB21 (High flow)	PB22 (Solvent resistance)	PB23 (Good flow & Solvent resistance)	80N (General)	80NB (Solvent resistance)
Reagent	0.1N Sulfuric acid	Good	Good	Good	Good	Good	Good
	0.1N NaOH	Good	Good	Good	Good	Good	Good
	Ethanol	Good	Good	Good	Good	Good	Good
	Methanol	Good	Good	Good	Good	Good	Good
Car accessories	Shampoo and Wax	Good	Good	Good	Good	Good	Good
	Window washer fluid	Good	Good	Good	Good	Good	Good
	Brake fluid	Good	Good	Good	Good	Good	Good
	Glass cleaner	Good	Good	Good	Good	Good	Good
	Wax remover(CPC)	Good	Good	Good	Good	Good	Good

Good：unchanged in surface appearance Poor：crack/whitening

Note) using sunscreen, hand cream or hair wax might cause a crack and whitening.

【Test scheme】(Asahi kasei PMMA method) Test piece ：□100 mm × t=3 mm

1. Apply the entire surface of test piece by immersing test solution in the nonwoven fabric.
2. Wash the test piece after leaving it at 23 ℃ and 50%RH for 24 hrs.
3. Review the surface appearance.

5-2. Solvent resistance

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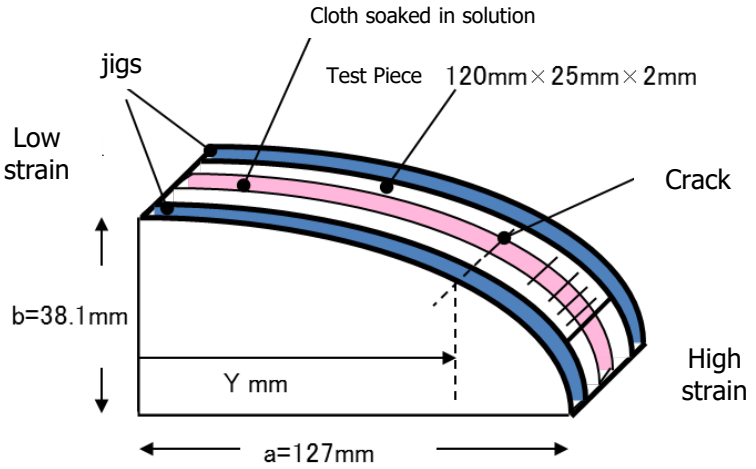
PB22 and PB23 have excellent solvent resistance

	PB series				General grade	
	PB01 (General)	PB21 (High flow)	PB22 (Solvent resistance)	PB23 (Good flow & Solvent Resistance)	80N (General)	80NB (Solvent resistance)
Ethanol	0.25%	0.27%	0.42%	0.38%	0.25%	0.40%
Wax remover(CPC)	0.90%	0.91%	No crack	No crack	0.90%	No crack

＊)Good solvent resistance at 0.3% or higher



Variable strain solvent test(1/4 ellipse method)

【1/4 ellipse method】
Test piece：120 mm×25 mm×t=2 mm flat plate
1.Fix a test piece to the 1/4 ellipse jig.
2.Place the gauze soaked in solvent on the test piece.
3.Measure the crack strains ε(%) from the crack position (Y mm) after leaving it at 23 ℃ and 50%RH for 24 hrs.

$$\varepsilon(\%) = \frac{b \times t}{2 \times a^2}\left(1 - \frac{Y^2 \times (a^2 - b^2)}{a^4}\right)^{-\frac{3}{2}} \times 100$$

t：thickness(mm)

6. Recommended Molding conditions

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Grades		Drying conditions		Molding conditions		Annealing conditions	
		Temp. ℃	Time Hrs.	Cylinder ℃	Mold ℃	Temp. ℃	Time Hrs.
P B	PB01 PB21 PB22 PB23	80～85	3～6	220～260	50～90	80～85	2～5

1. Pre-drying:	DELPET™ is hygroscopic. In addition, even if the bag is unopened, it gradually absorbs moisture, so it is necessary to pre-dry the pellets before molding. If the drying is insufficient, poor appearance is likely to occur. The drying condition also changes depending on the drying equipment.
2. Dustproof:	If foreign matter gets mixed in, it will spoil the appearance of the molded product, so please be careful about dust protection in the room and dust protection when opening the pellets package. Also, pay attention to cleaning the hopper and dryer of the molding machine.
3. Resin switching:	Mixing with a small amount of other resin tends to cause appearance defects such as white turbidness and haze. Thoroughly clean the hopper, cylinder, nozzle, etc. of the molding machine so that other resins do not adhere to them. Also, please note that mixing with other companies' methacrylic resins or mixing with different grades may cause molding defects.

7. Applications of PB

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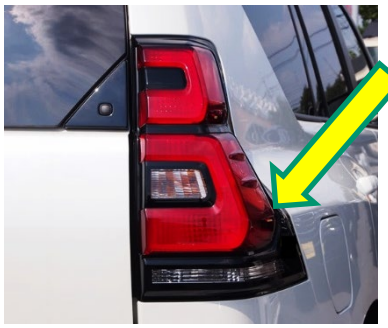
Application examples of PB series

Periphery of tail lump



Rear corner garnish

Exterior of a vehicle

Potential applications

Musical instruments

Home appliance

Precautions for handling DELPET™

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These data are based on the documents, information and data now available and may be changed when new knowledge or information is acquired.

(1) Safe Handling

Safety Data Sheets (SDS) on DELPET™ are available from Asahi Kasei Corporation. Please be sure to read the DELPET™ Handling Precautions listed in the separate Product Safety Data Sheet before using DELPET™. The main points when handling DELPET™ are as follows. Please use them for the safe handling of DELPET™. Please investigate the safety of additives, etc., used by your company aside from DELPET™.

① Precautions for safety and health

The main component of the gas generated when DELPET™ is melted and when the resin is decomposed is methyl methacrylate, which is a raw material monomer. Be careful to avoid contact with eyes and skin and inhalation. Also, do not touch the high temperature resin directly. For each work such as melting, it is necessary to install a local exhaust ventilation and wear protective equipment (protective glasses, protective gloves, etc.).

② Precautions regarding combustion

DELPET™ is flammable, so handle and store it away from heat and ignition sources. During a fire , irritating and highly toxic gases such as carbon-monoxide may be generated by thermal
decomposition or incomplete combustion. Use water, foam and dry chemical extinguishants as extinguishing media.

③ Precautions for disposal

In principle, dispose of by incineration or landfill. When incinerating, use incineration facilities to treat and incinerate in accordance with relevant regulations. When landfilling, treat in accordance with relevant regulations. Or consign to a specialized disposal contractor approved by the prefectural governor. Dispose of empty bags properly without reuse or diversion.

④ Precautions for storage

It is a combustible material (synthetic resin) and should be handled in accordance with the relevant regulations.

⑤ Precautions for molding

Please note the following points to avoid decomposition of the resin.

- Do not allow the resin to stay in the processing machine at high temperature for a long time.
- If pellets are scattered on floors, they should be collected immediately because they are slippery.

(2) Conforming standards

DELPET™ is available in grades that comply with various standards including UL (Underwriters Laboratories Inc.), SAE (Society of Automotive Engineers), and Electrical Appliance and Material Safety Law, etc. There are grades that have received a confirmation certificate (Japan Hygienic Olefin And Styrene Plastics Association type) (or an equivalent confirmation certificate). Conformance to these standards is determined by specific test methods. Safety as a product should be verified after conducting appropriate tests for the application of use.

(3) Others

Please give heed to industrial property rights when using.

[Inhibited Applications]

Do not use DELPET™ on medical devices and products that come into contact with human tissues or fluids for a long period of time (more than 30 days), or on anything that touches or may be swallowed by infants. In addition, please be sure to contact our acrylic resin sales department in advance when using for medical purposes that do not fall under the above, applications that come into contact with food and drinking water, applications such as cosmetics, toys, sports equipment, etc. We will consult with you individually.

If you need information on the product safety of DELPET™, please contact Asahi Kasei Corporation MMA Division / Acrylic Resin Sales Department.

ASAHIKASEI CORPORATION Acrylic Resin Sales & Marketing Department
〒100-0006 1-1-2 Yurakucho, Chiyoda-ku, Tokyo (Hibiya Mitsui Tower) TEL:+81-3-6699-3286 FAX:+81-3-6699-3460

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Creating for Tomorrow

THE COMMITMENT OF THE ASAHI KASEI GROUP:

To do all that we can in every era to help the people of the world
make the most of life and attain fulfillment in living.
Since our founding, we have always been deeply committed
to contributing to the development of society,
boldly anticipating the emergence of new needs.
This is what we mean by “Creating for Tomorrow.”