

Features

Thermoplastic Polyester Elastomer PELPRENE™

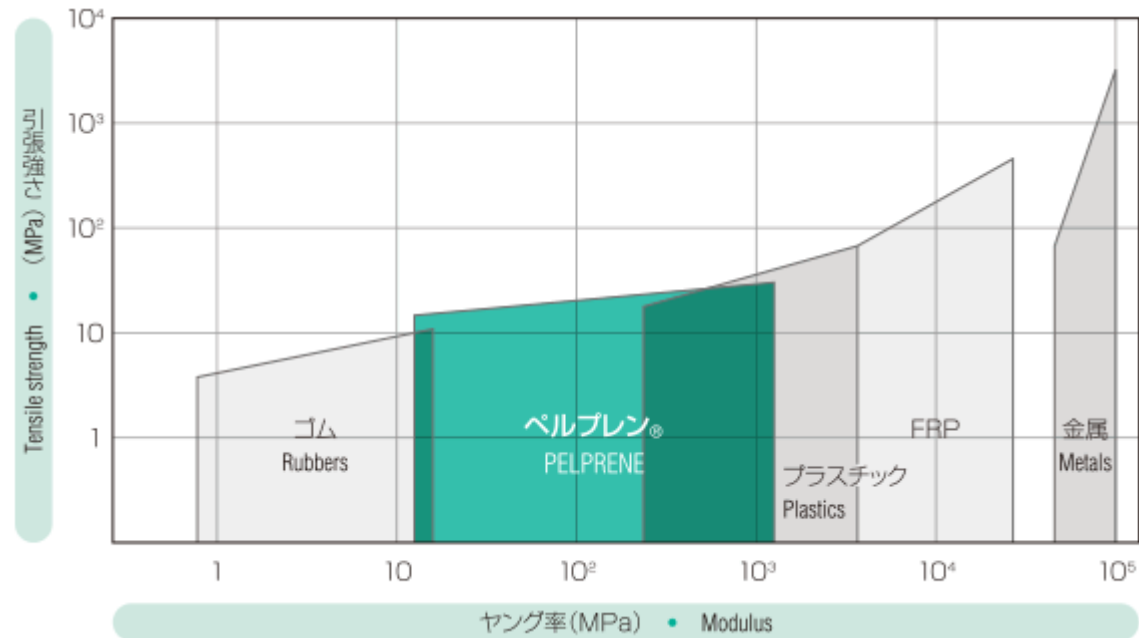
- A comprehensive range of performance across four composition types
- A wide range of hardness
- Excellent oil and chemical resistance
- Excellent bending fatigue resistance
- Excellent low temperature properties
- Compatible with injection, extrusion, and blow molding and more, offering a wide range of possibilities for applications



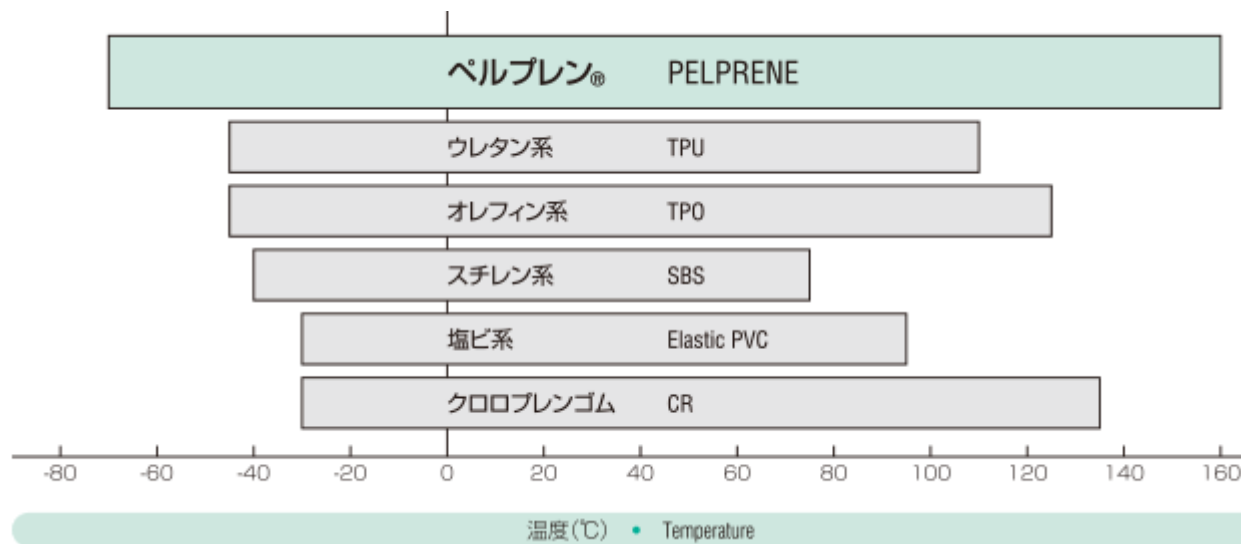
PELPRENE™ Main Grades

Type	Category	Grade	Feature
P-Type	Injection	P-30B	Low Hardness
		P-40B	Low Hardness
		P-40H	Low Hardness
		P-55B	Medium Hardness
		P-70B	Medium Hardness
		P-90B	Medium Hardness
		P-150B	High Hardness
		P-280B	High Hardness
		E-450B	High Hardness
	Adhesion	P-75M	Injection, Low Hardness
		P-150M	Injection, Medium Hardness
	Extrusion	P-90BD	Medium Hardness
	Blow Molding	P-47D-HW	Fatigue Resistant
S-Type	Heat Aging Resistant	S-2001	Injection, Medium Hardness
		S-3001	Injection, High Hardness
		S-6001	Injection, High Hardness
		S-6002FR2	High Hardness, Flame Retardant (V-0 equivalent/1.6mm thickness)
EN-Type	Chemical Resistant	EN-1000	Medium Hardness, Good Dimensional Stability
		EN-2000	High Hardness, Good Dimensional Stability
		EN-3000	High Hardness, Good Dimensional Stability
		EN-5000	High Hardness, Good Dimensional Stability
C-Type	Super Heat Aging Resistant	C-2003	Medium Hardness, Injection, Hydrolysis Resistant
		C-2005	Medium Hardness, Blow molding, Hydrolysis Resistant

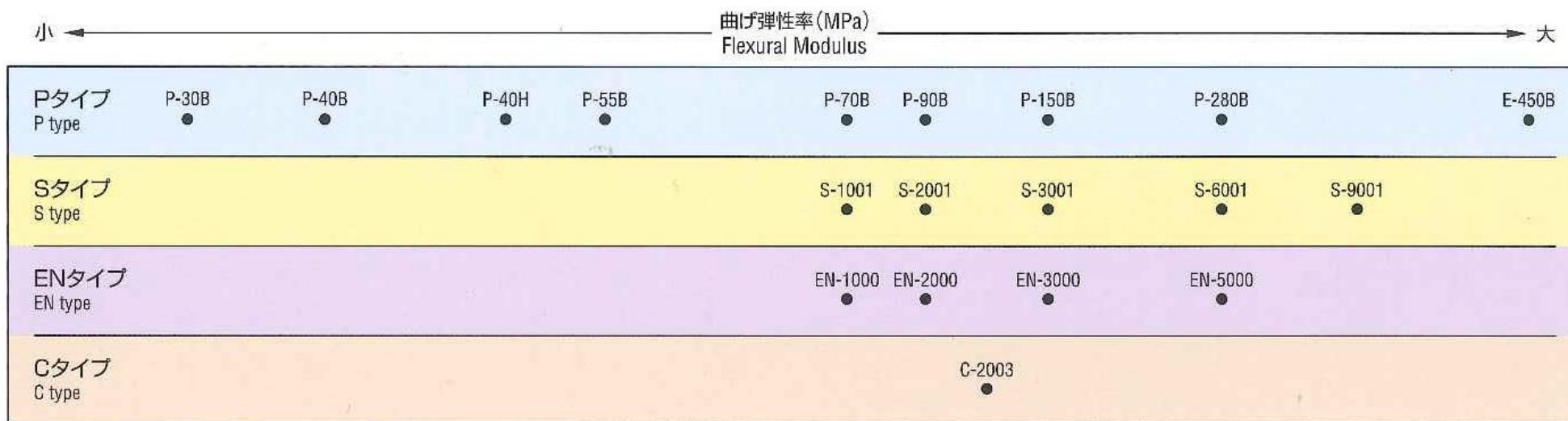
Comparison of PELPRENE™ with Rubber, Plastic, and Metal



Temperature ranges of various elastomers

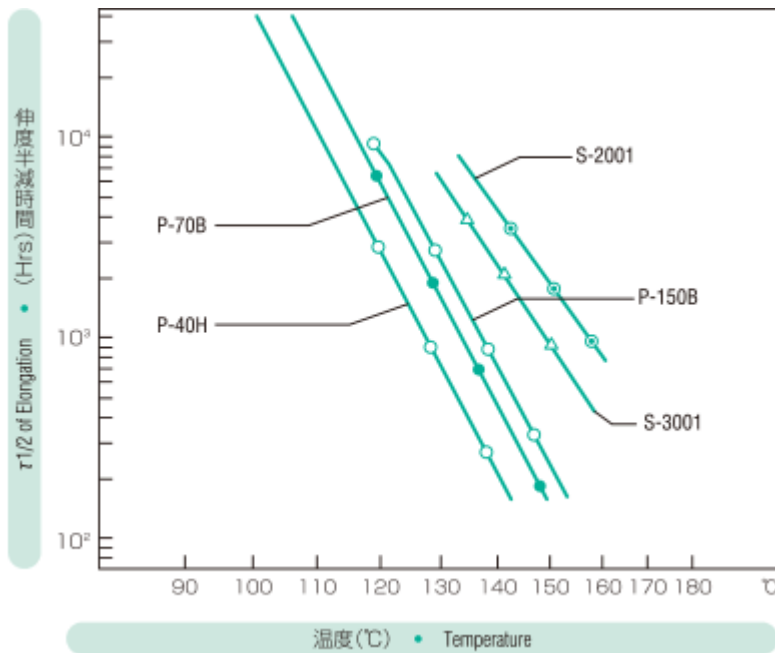


Elastic modulus of PELPRENE™ types P, S, EN, and C



Thermal Durability of PELPRENE™

The figure shows thermal durability of general purpose PELPRENE™ grades. Thermal durability for each grade is defined as the time for which the elongation drops to one half of its initial value in a high temperature aging test.



Test piece

JIS #3 dumbbell

Thickness 2mmt 2mm

Processing

PELPRENE™ can be used for injection, extrusion, and blow molding using conventional equipment. It's also compatible with compression molding, melt casting, and rotational molding. Additionally, PELPRENE™ can be post-processed by painting, printing, vacuum metallizing, and cathode sputtering, along with hot-melt adhesion of molded articles. Its pellets being applied packed in a moisture-proof bag after drying, PELPRENE™ can be processed as received. However, unused or dampened pellets should be dried again for 4 or more hours at 100-120°C before use.

Processing

Standard Injection Molding Temperature

Example of applicable grades	P-30B~P-40H	P-55B~P-90B	P-150B~P-280B S-2001~S-3001 EN-1000 C-2003	P-450B S-6001~S-9001 EN-2000~EN-3000	EN-5000
C1	160~180°C	190~210°C	200~230°C	220~240°C	230~250°C
C2	180~200°C	200~230°C	220~240°C	230~250°C	250~270°C
C3	180~200°C	200~230°C	220~240°C	230~250°C	250~270°C
NZ	180~200°C	200~230°C	220~240°C	230~250°C	250~270°C
Mold Temperature	20~40°C	20~60°C	20~60°C	20~60°C	20~60°C

Standard Extrusion Molding Temperatures

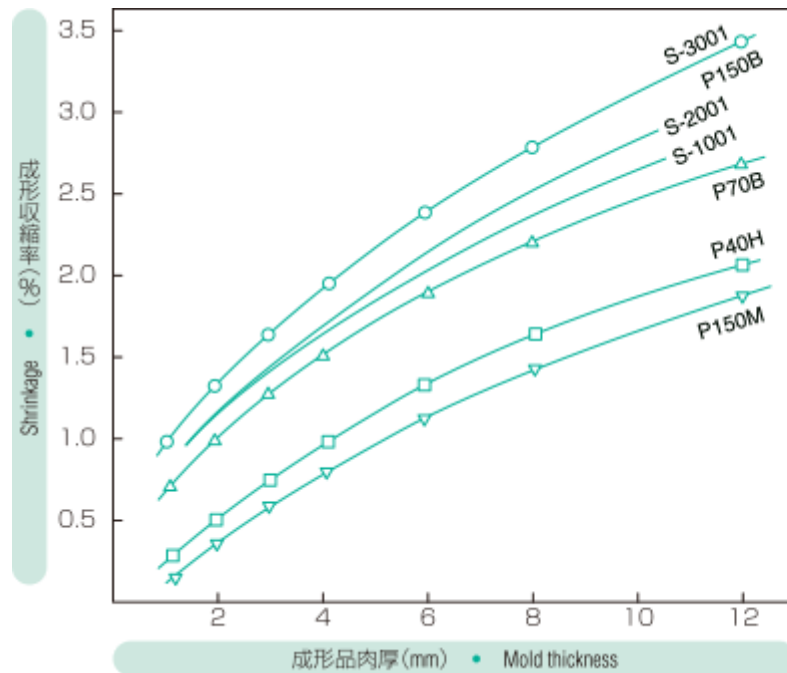
Example Grades	P-90BD
Rear	180~200°C
Middle	200~220°C
Front	200~220°C
Die temperature	200~220°C

Standard Blow Molding Temperatures

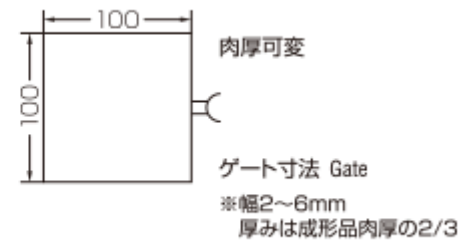
Relevant Grade Examples	P-47D-HW
Rear end	200~220°C
Middle part	220~230°C
Front part	220~240°C
Mold Temperature	20~40°C

Processing

Mold Shrinkage



成形品形状 Mold



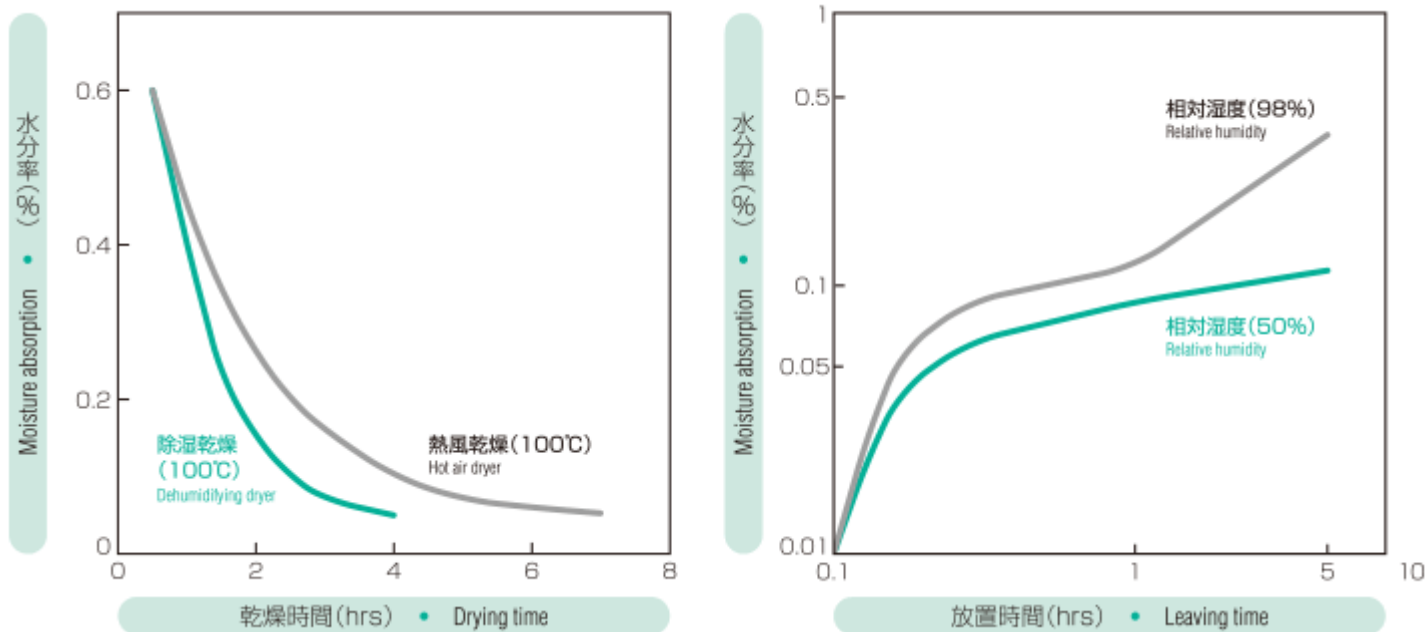
Processing

Reuse of PELPRENE™

Sprues and runners of PELPRENE™ can be recycled via remolding. To ensure molded parts of consistent quality, thoroughly dry and pulverize material to be recycled, then blend with virgin pellets up to around 30% recycled content. Note that the ratio of recycled material that can be used varies with molding conditions. Contact us for details.

PELPRENE™ Dry and Conditioned Data

ペルプレネ® P-90Bの乾燥・吸水曲線 Dry and Moisture absorption data of PELPRENE P-90B



Processing

Injection Molding Troubleshooting

Trouble		Cause	Countermeasure
Sink marks	Condition	<ol style="list-style-type: none"> 1. High resin temperature 2. High/low mold temperature 3. Low holding pressure 4. Insufficient holding pressure time 5. Insufficient cooling time 6. No cushion 	<ol style="list-style-type: none"> 1. Reduce the cylinder temperature 2. Set the mold temperature accordingly 3. Increase the holding pressure 4. Increase the holding pressure time 5. Increase the cooling time 6. Make cushion 5-10mm
	Design	<ol style="list-style-type: none"> 1. Small runner/ gate 2. Unsuitable gate location 	<ol style="list-style-type: none"> 1. Enlarge the runner/gate size 2. Relocate the gate to a thicker area
	Machine	<ol style="list-style-type: none"> 1. Back-flow during injection 	<ol style="list-style-type: none"> 1. Inspect or exchange the backflow valve
Warping, Deformation	Condition	<ol style="list-style-type: none"> 1. Unsuitable injection conditions 2. Insufficient holding pressure time 3. Insufficient Cooling time 4. Temperature difference between cavity and core 	<ol style="list-style-type: none"> 1. Increase the injection pressure/speed 2. Increase the holding pressure 3. Increase the cooling time 4. Control the temperature of cavity and core separately
	Mold	<ol style="list-style-type: none"> 1. Unsuitable ejector pin placement 2. Insufficient ejector pin size 	<ol style="list-style-type: none"> 1. Balance ejector pin placement 2. Enlarge ejector pin size 3. Increase the draft angle
	Design	<ol style="list-style-type: none"> 1. Unsuitable gate location 2. Extreme change in part thickness 3. Not enough gates for the part size 	<ol style="list-style-type: none"> 1. Change gate location 2. Even out the part thickness 3. Increase the number of gates
Flash	Condition	<ol style="list-style-type: none"> 1. High resin temperature 2. High injection speed 3. High holding pressure 4. Low mold clamping force 5. Filling resin Volume is too high 	<ol style="list-style-type: none"> 1. Reduce the resin temperature 2. Reduce the injection speed 3. Reduce the holding pressure 4. Increase the mold clamping force 5. Set the cushion about 5mm
	Mold	<ol style="list-style-type: none"> 1. Mold surface doesn't mate properly 	<ol style="list-style-type: none"> 1. Modify the mold
Burn marks	Condition	<ol style="list-style-type: none"> 1. High resin temperature 2. Air entrapment 3. High injection speed 4. Filling resin volume is too high 	<ol style="list-style-type: none"> 1. Reduce the resin temperature 2. Reduce the screw rotation 3. Reduce the injection speed 4. Decrease the residence time
	Mold	<ol style="list-style-type: none"> 1. Inadequate venting 	<ol style="list-style-type: none"> 1. Increase gas ventilation
	Design	<ol style="list-style-type: none"> 1. Unsuitable gate location 2. Small gate size 	<ol style="list-style-type: none"> 1. Change the gate location to make the welding line on the PL 2. Enlarge the gate size
Welding line	Condition	<ol style="list-style-type: none"> 1. Low resin temperature 2. Low mold temperature 3. Low injection speed 	<ol style="list-style-type: none"> 1. Increase the cylinder temperature 2. Increase the mold temperature 3. Increase the injection speed
	Mold	<ol style="list-style-type: none"> 1. Inadequate holding pressure 	<ol style="list-style-type: none"> 1. Increase gas venting and/or change gate location to move the weld line onto the parting line.
Poor surface appearance	Condition	<ol style="list-style-type: none"> 1. Low resin temperature 2. Low mold temperature 3. Low injection speed 4. Inadequate holding pressure 5. Insufficient amount of resin for fill 	<ol style="list-style-type: none"> 1. Increase the cylinder temperature 2. Increase the mold temperature 3. Increase the injection speed 4. Increase the holding pressure/time 5. Make cushion 5-10mm
	Mold	<ol style="list-style-type: none"> 1. Inadequate holding pressure 2. Unclean mold 	<ol style="list-style-type: none"> 1. Increase the holding pressure/time 2. Clean the mold

Processing

Safety

Molding Operation

- When purged resin contains a large quantity of gas or steam, the resin may have been insufficiently dried. We recommend re-drying the resin.
- Resin held in the cylinder for an extended period of time may lose viscosity or experience other impacts on quality. Please resume molding only after
thoroughly replacing the resin that has been held too long in the cylinder with new resin.
- When switching from PELPRENE™ to another polymer, replace the PELPRENE™ with polyethylene or polypropylene to purge. Local and general ventilation
are recommended.
- Keep hands and face away from the nozzle during molding to prevent burn injury.
- Please ensure proper ventilation, as a small amount of gas and fine dust may be produced during molding.

Protective equipment

- Wear appropriate protective equipment such as protective clothing, safety glasses, and gloves to protect eyes and skin from the molten resin.

Emergency Response

- Should molten resin adhere to the skin, cool the area immediately with cold water or an ice pack and then seek medical attention. Do not attempt to peel
the resin off of the skin.

Other

- Do not let molten resin touch electric wires or hoses.
- Molten resin reaches high temperatures and can catch fire if it forms large clumps when purging. Break up large clumps and allow to cool before disposal.
- Spilled pellets can be a slipping hazard, so be sure to clean them off the floor immediately.

Notes

Disclaimer

- All of the property data is based on natural color or general black. Data may vary depending on color.
- All information in this technical data sheet is based on the experiences of TOYOBO MC Corporation.
- These information may vary depending on mold condition and application.
- There may also be laws and regulations depending on intended use. Please be careful of this things when using this product.
- If this material is to be used for medical, military, or food contact applications, or if it is to be used in a product where a defect in the product is likely to result in death, bodily harm, or substantial property damage, please contact us separately beforehand.
- Export of our materials and products using our materials must comply with the Foreign Exchange and Foreign Trade Law and other relevant laws and regulations.
- Chemical substances used in this material may be regulated by laws and regulations related to chemical substances in each country, and separate applications may be required or import/export may not be allowed. If you are an importer or exporter of this material, please inquire about compliance with regulations in the relevant country.
- The information of this document is based on materials, methods and data available at the time of document preparation. Please note that the information is subject to revision without prior notice based on subsequent findings.