

PELPRENE® Basic Grades & Material Properties

About Basic Grades

P-type

S-type

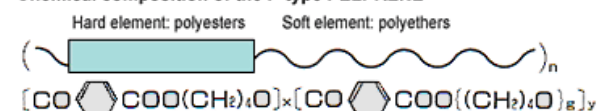
About Basic Grades

PELPRENE, a thermoplastic elastomer, is characterized by flexibility resulting from the pairing of soft and hard segments in the copolymer. Two types of PELPRENE are available.

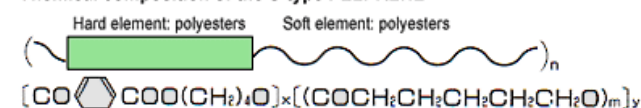
P-type PELPRENE, is a copolymer composed of polybutylene terephthalate as the hard element and an aliphatic polyether as the soft element. Ideally balanced proportions of heat resistance/low temperature resistance, chemical resistance, and processability are the key characteristics of P-type PELPRENE.

S-type PELPRENE is a copolymer composed of polybutylene terephthalate as the hard element and an aliphatic polyester as the soft element. It has physical properties comparable to those of P-type PELPRENE, and grades ranges from moderate to high hardness. S-type PELPRENE has excellent heat-aging resistance and weather resistance.

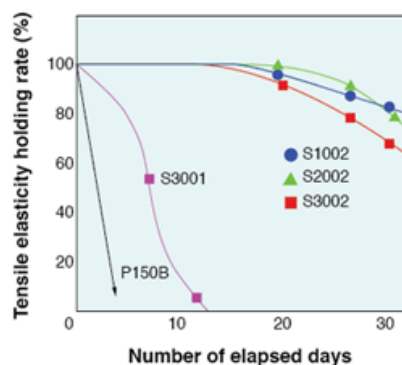
Chemical composition of the P-type PELPRENE



Chemical composition of the S-type PELPRENE



Heat-aging resistance of PELPRENE at a service temperature of 170°C


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P-type

Item	Method	Unit	PELPRENE P-Type				
			P30B	P40B	P40H	P55B	P70B
Hardness	JIS K6301	A	71	82	89	94	96
	ASTM D2240	D	29	31	38	44	46
Specific Gravity	ASTM D792	—	1.05	1.07	1.12	1.15	1.17
50% Tensile Modulus	ASTM D638	MPa	2.5	3.4	6.4	9.8	10.8
10% Compression Modulus	ASTM D695	MPa	2.0	2.4	4.5	7.6	9.2
Flexual Modulus	ASTM D790	MPa	15	23	51	76	108
Tensile strength	ASTM D638	MPa	12	14	21	29	30
Tensile elongation	ASTM D638	%	840	820	690	700	550
Tear strength	ASTM D624	kN/m	71	76	98	113	122

IZOD notched impact test	ASTM D256	J/m	NB**	NB	NB	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	20	20	20	15	15
Resilience	JIS K6301	%	78	81	78	74	71
Compression set JIS	K6301	%	50	49	50	53	55
Melting point	DSC	°C	160	180	172	182	200
Vicat softening point	ASTM D1525	°C	73	89	120	155	170
Heat deflection temperature	ASTM D648	°C	–	–	–	–	74
Brittle point	JIS K6301	°C	< -65	< -65	< -65	< -65	< -65
Flammability	UL94	–	HB	HB	HB	HB	HB
Coefficient of heat expansion	TMA	1/K	20×10^{-5}	20×10^{-5}	17×10^{-5}	17×10^{-5}	16×10^{-5}
Dielectric strength	JIS K2111	MV/m	20	20	20	22	25
Volume strength	ASTM D257	$\Omega \cdot \text{cm}$	1×10^{12}	1×10^{12}	2×10^{12}	9×10^{12}	6×10^{13}
Moisture absorption	23°C, 65%RH	%	0.58	0.56	0.48	0.45	0.43
Melt flow index	ASTM D1238	g/10min	14 ^a	10 ^a	10 ^a	22 ^b	20 ^b
Mold shrinkage	Mold 2mm thickness	%	0.4	0.4	0.5	0.7	1.0

* Melt flow index a:190°C b:230°C

** NB : Not Break

Item	Method	Unit	PELPRENE P-Type				
			P90B	P150B	P280B	E450B	P150M
Hardness	JIS K6301	A	96	98	99	99	96
	ASTM D2240	D	52	57	68	78	50
Specific Gravity	ASTM D792	–	1.19	1.23	1.26	1.28	1.19
50% Tensile Modulus	ASTM D638	MPa	14.7	19.6	28.4	40.3	9.8
10% Compression Modulus	ASTM D695	MPa	13.3	19.1	35.0	39.2	9.0
Flexual Modulus	ASTM D790	MPa	162	289	494	1,267	118
Tensile strength	ASTM D638	MPa	31	38	37	35	37
Tensile elongation	ASTM D638	%	700	500	500	440	420
Tear strength	ASTM D624	kN/m	172	177	206	237	142
IZOD notched impact test	ASTM D256	J/m	NB	NB	78	39	NB
Taber abrasion	ASTM D1044	mg/1000c.	13	10	8	5	15
Resilience	JIS K6301	%	65	59	55	–	44
Compression set JIS	K6301	%	57	60	–	–	60
Melting point	DSC	°C	203	212	218	222	170
Vicat softening point	ASTM D1525	°C	180	190	199	202	140
Heat deflection temperature	ASTM D648	°C	101	117	155	161	50
Brittle point	JIS K6301	°C	< -65	< -65	< -60	< -60	< -65
Flammability	UL94	–	HB	HB	HB	HB class	HB class
Coefficient of heat expansion	TMA	1/K	14×10^{-5}	14×10^{-5}	14×10^{-5}	14×10^{-5}	17×10^{-5}
Dielectric strength	JIS K2111	MV/m	30	30	30	30	30
Volume strength	ASTM D257	$\Omega \cdot \text{cm}$	6×10^{13}	2×10^{14}	5×10^{14}	7×10^{15}	1×10^{14}
Moisture absorption	23°C, 65%RH	%	0.40	0.36	0.30	0.25	0.36
Melt flow index	ASTM D1238	g/10min	20 ^b	20 ^b	13 ^b	10 ^b	20 ^b
Mold shrinkage	Mold 2mm thickness	%	1.1	1.3	1.6	1.7	0.3

* Melt flow index a:190°C b:230°C

The data the description is the popular value, not the guaranteed value.

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S-type

Item	Method	Unit	PELPRENE S-Type				
			S1001	S2001	S3001	S6001	S9001
Hardness	JIS K6301	A	96	97	98	99	99
	ASTM D2240	D	48	55	60	72	78
Specific Gravity	ASTM D792	–	1.21	1.24	1.26	1.28	1.29
50% Tensile Modulus	ASTM D638	MPa	10.8	16.7	19.6	27.5	44.1
10% Compression Modulus	ASTM D695	MPa	10.2	16.3	21.1	30.8	39.2
Flexual Modulus	ASTM D790	MPa	125	186	274	568	882
Tensile strength	ASTM D638	MPa	30	36	40	44	49
Tensile elongation	ASTM D638	%	730	610	540	490	400
Tear strength	ASTM D624	kN/m	118	155	167	196	250
IZOD notched impact test	ASTM D256	J/m	NB	NB	NB	147	59
Taber abrasion	ASTM D1044	mg/1000c.	15	12	10	8	6
Resilience	JIS K6301	%	63	60	58	56	–
Compression set JIS	K6301	%	60	61	62	–	–
Melting point	DSC	°C	200	206	216	218	223
Vicat softening point	ASTM D1525	°C	172	185	193	202	207
Heat deflection temperature	ASTM D648	°C	68	107	117	130	146
Brittle point	JIS K6301	°C	< -65	< -65	< -65	< -60	< -50
Flammability	UL94	–	HB	HB	HB	HB	HB
Coefficient of heat expansion	TMA	1/K	19×10 ⁻⁵	14×10 ⁻⁵	14×10 ⁻⁵	14×10 ⁻⁵	14×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	25	30	30	30	30
Volume strength	ASTM D257	Ω•cm	2×10 ¹²	2×10 ¹³	1×10 ¹⁴	5×10 ¹⁴	7×10 ¹⁵
Moisture absorption	23°C, 65%RH	%	0.40	0.38	0.34	0.30	0.28
Melt flow index	ASTM D1238	g/10min	18 ^b	16 ^b	16 ^b	12 ^b	10 ^b
Mold shrinkage	Mold 2mm thickness	%	1.2	1.3	1.5	1.7	1.8

* Melt flow index a:190°C b:230°C
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