

PELPRENE® Special Grades & Material Properties

About Special Grades

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About Special Grades

A series of special brands for PELPRENE® is provided as follows.

P-type with high flexibility and high melting point

It increases the upper limit of the service temperatures for the low hardness P-type, and its processability is enhanced.

High-viscous type

Its profile extrusion suits blow molding. (e. g. CVJ boots)

Flame-resistant type

It exhibits the flame resistance approved as UL94 V-0 class. (e. g. Spatter tubes)

High durability (high fatigue strength) type

It exhibits excellent oil resistance in high service temperatures and fatigue strength. (e. g. High-pressure hoses)

Non-smell and non-deposit type

It generates very little smell during its molding and keeps molds unspotted. (e. g. Gears)

Weather-resistant P-type

It enhances the weather-resistant durability several fold as long as that of the original P-type. (e. g. Exterior parts of automobiles)

Ultra heat-resistant S-type

It enhances the heat-aging resistance of the original S-type to the utmost limit. (e. g. Engine compartment parts of automobiles)

Other than the above, there are many customer-built brands typically such as anti-static tires.

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P-type with high flexibility and high melting point

Item	Method	Unit	P-type with high flexibility and high melting point	
			P80C	P95C
Hardness	JIS K6301	A	93	95
	ASTM D2240	D	38	41
Specific Gravity	ASTM D792	—	1.12	1.14
50% Tensile Modulus	ASTM D638	MPa	6.4	8.3

10% Compression Modulus	ASTM D695	MPa	4.2	7.6
Flexual Modulus	ASTM D790	MPa	49	74
Tensile strength	ASTM D638	MPa	26	27
Tensile elongation	ASTM D638	%	600	700
Tear strength	ASTM D624	kN/m	98	108
IZOD notched impact test	ASTM D256	J/m	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	20	17
Resilience	JIS K6301	%	78	75
Compression set JIS	JIS K6301	%	49	52
Melting point	DSC	°C	203	213
Vicat softening point	ASTM D1525	°C	154	162
Heat deflection temperature	ASTM D648	°C	< 25	< 25
Brittle point	JIS K6301	°C	< -65	< -65
Flammability	UL94	–	HB class	HB class
Coefficient of heat expansion	TMA	1/K	17×10 ⁻⁵	17×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	20	22
Volume strength	ASTM D257	Ω•cm	12×10 ¹²	9×10 ¹²
Moisture absorption	23°C, 65%RH	%	0.48	0.45
Melt flow index	ASTM D1238	g/10min	18 ^b	17 ^b
Mold shrinkage	Mold 2mm thickness	%	0.5	0.8

* 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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High-viscous type

Item	Method	Unit	High viscous and high durability type	
			P90BD	P46D-01
Hardness	JIS K6301	A	96	97
	ASTM D2240	D	57	46
Specific Gravity	ASTM D792	–	1.19	1.15
50% Tensile Modulus	ASTM D638	MPa	15.2	10.9
10% Compression Modulus	ASTM D695	MPa	13.3	9.6
Flexual Modulus	ASTM D790	MPa	162	110
Tensile strength	ASTM D638	MPa	31.4	31.9
Tensile elongation	ASTM D638	%	700	700
Tear strength	ASTM D624	kN/m	172	165
IZOD notched impact test	ASTM D256	J/m	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	13	10
Resilience	JIS K6301	%	65	70
Compression set JIS	JIS K6301	%	57	55
Melting point	DSC	°C	203	203
Vicat softening point	ASTM D1525	°C	180	153
Heat deflection temperature	ASTM D648	°C	101	74
Brittle point	JIS K6301	°C	< -65	< -65
Flammability	UL94	–	HB class	HB class
Coefficient of heat expansion	TMA	1/K	14×10 ⁻⁵	17×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	30	25

Volume strength	ASTM D257	Ω•cm	6×10 ¹³	4×10 ¹³
Moisture absorption	23°C, 65%RH	%	0.40	0.45
Melt flow index	ASTM D1238	g/10min	3 ^b	0.5 ^b
Mold shrinkage	Mold 2mm thickness	%	1.1	0.7

* Melt flow index a:190°C b:230°C
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Flame-resistant type

Item	Method	Unit	Flame-resistance type		
			P50DFR	S2002FB	S2004FS
Hardness	JIS K6301	A	96	98	98
	ASTM D2240	D	54	57	58
Specific Gravity	ASTM D792	—	1.36	1.33	1.28
50% Tensile Modulus	ASTM D638	MPa	10.8	16.6	20.1
10% Compression Modulus	ASTM D695	MPa	9.4	15.8	19.2
Flexual Modulus	ASTM D790	MPa	167	230	290
Tensile strength	ASTM D638	MPa	17.6	26.9	27.2
Tensile elongation	ASTM D638	%	600	560	550
Tear strength	ASTM D624	kN/m	108	160	155
IZOD notched impact test	ASTM D256	J/m	NB	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	17	12	12
Resilience	JIS K6301	%	65	60	60
Compression set JIS	JIS K6301	%	55	65	65
Melting point	DSC	°C	215	210	210
Vicat softening point	ASTM D1525	°C	170	185	185
Heat deflection temperature	ASTM D648	°C	70	110	110
Brittle point	JIS K6301	°C	< -65	< -65	< -65
Flammability	UL94	—	V0	V2 class	V2 class
Coefficient of heat expansion	TMA	1/K	16×10 ⁻⁵	13×10 ⁻⁵	14×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	15	25	30
Volume strength	ASTM D257	Ω•cm	6×10 ¹³	4×10 ¹³	2×10 ¹³
Moisture absorption	23°C, 65%RH	%	0.40	0.38	0.38
Melt flow index	ASTM D1238	g/10min	22 ^b	12 ^b	12 ^b
Mold shrinkage	Mold 2mm thickness	%	0.8	1.3	1.3

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High durability (high fatigue strength) type

Item	Method	Unit	High viscous and high durability type	
			P90BD	P46D-01
Hardness	JIS K6301	A	96	97
	ASTM D2240	D	57	46
Specific Gravity	ASTM D792	—	1.19	1.15

50% Tensile Modulus	ASTM D638	MPa	15.2	10.9
10% Compression Modulus	ASTM D695	MPa	13.3	9.6
Flexual Modulus	ASTM D790	MPa	162	110
Tensile strength	ASTM D638	MPa	31.4	31.9
Tensile elongation	ASTM D638	%	700	700
Tear strength	ASTM D624	kN/m	172	165
IZOD notched impact test	ASTM D256	J/m	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	13	10
Resilience	JIS K6301	%	65	70
Compression set JIS	JIS K6301	%	57	55
Melting point	DSC	℃	203	203
Vicat softening point	ASTM D1525	℃	180	153
Heat deflection temperature	ASTM D648	℃	101	74
Brittle point	JIS K6301	℃	< -65	< -65
Flammability	UL94	–	HB class	HB class
Coefficient of heat expansion	TMA	1/K	14×10 ⁻⁵	17×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	30	25
Volume strength	ASTM D257	Ω•cm	6×10 ¹³	4×10 ¹³
Moisture absorption	23℃, 65%RH	%	0.40	0.45
Melt flow index	ASTM D1238	g/10min	3 ^b	0.5 ^b
Mold shrinkage	Mold 2mm thickness	%	1.1	0.7

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Non-smell and non-deposit type

Item	Method	Unit	Non-smell and non-deposit type	
			P40H-05	P150B-05
Hardness	JIS K6301	A	89	98
	ASTM D2240	D	38	57
Specific Gravity	ASTM D792	–	1.12	1.23
50% Tensile Modulus	ASTM D638	MPa	6.4	19.6
10% Compression Modulus	ASTM D695	MPa	4.5	19.1
Flexual Modulus	ASTM D790	MPa	51	289
Tensile strength	ASTM D638	MPa	23	38
Tensile elongation	ASTM D638	%	690	500
Tear strength	ASTM D624	kN/m	98	176
IZOD notched impact test	ASTM D256	J/m	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	20	10
Resilience	JIS K6301	%	78	59
Compression set JIS	JIS K6301	%	50	60
Melting point	DSC	℃	172	212
Vicat softening point	ASTM D1525	℃	120	190
Heat deflection temperature	ASTM D648	℃	< 25	117
Brittle point	JIS K6301	℃	< -65	< -65
Flammability	UL94	–	HB	HB
Coefficient of heat expansion	TMA	1/K	17×10 ⁻⁵	14×10 ⁻⁵

Dielectric strength	JIS K2111	MV/m	20	30
Volume strength	ASTM D257	Ω•cm	2×10 ¹²	2×10 ¹⁴
Moisture absorption	23°C, 65%RH	%	0.48	0.36
Melt flow index	ASTM D1238	g/10min	10 ^a	20 ^b
Mold shrinkage	Mold 2mm thickness	%	0.5	1.3

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Weather-resistant P-type

Item	Method	Unit	Weather-resistant P-type			
			P40BU	P40U	P48U	P55U
Hardness	JIS K6301	A	82	89	92	94
	ASTM D2240	D	31	38	41	44
Specific Gravity	ASTM D792	—	1.07	1.12	1.14	1.15
50% Tensile Modulus	ASTM D638	MPa	3.4	6.4	8.3	9.8
10% Compression Modulus	ASTM D695	MPa	2.4	4.6	6.1	7.6
Flexual Modulus	ASTM D790	MPa	23	51	63	76
Tensile strength	ASTM D638	MPa	16	23	26	30
Tensile elongation	ASTM D638	%	820	690	700	700
Tear strength	ASTM D624	kN/m	76	98	103	113
IZOD notched impact test	ASTM D256	J/m	NB	NB	NB	NB
Taber abrasion	ASTM D1044	mg/1000c.	20	20	17	15
Resilience	JIS K6301	%	81	78	76	74
Compression set JIS	JIS K6301	%	49	50	51	53
Melting point	DSC	°C	80	172	176	182
Vicat softening point	ASTM D1525	°C	89	120	130	155
Heat deflection temperature	ASTM D648	°C	< 25	< 25	< 25	< 25
Brittle point	JIS K6301	°C	< -65	< -65	< -65	< -65
Flammability	UL94	—	HB class	HB class	HB	HR class
Coefficient of heat expansion	TMA	1/K	20×10 ^{- 5}	17×10 ⁻⁵	17×10 ⁻⁵	17×10 ⁻⁵
Dielectric strength	JIS K2111	MV/m	20	20	22	22
Volume strength	ASTM D257	Ω•cm	1×10 ¹²	2×10 ¹²	4×10 ¹²	9×10 ¹²
Moisture absorption	23°C, 65%RH	%	0.56	0.48	0.47	0.45
Melt flow index	ASTM D1238	g/10min	10 ^a	10 ^a	25 ^b	22 ^b
Mold shrinkage	Mold 2mm thickness	%	0.4	0.5	0.6	0.7

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Ultra heat-resistant S-type

Item	Method	Unit	Ultra heat-resistant S-type				
			S1002	S2002	S3002	S6002	S9002
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	108	206	284	568	911
Tensile strength	ASTM D638	MPa	30	38	41	46	52
Tensile elongation	ASTM D638	%	720	550	520	450	380
Tear strength	ASTM D624	kN/m	118	155	167	196	250
IZOD notched impact test	ASTM D256	J/m	NB	NB	NB	196	98
Taber abrasion	ASTM D1044	mg/1000c.	15	12	10	8	6
Resilience	JIS K6301	%	63	60	58	56	–
Compression set JIS	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 class	HB class	HB class	HB class
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	30	30	30	30	30
Volume strength	ASTM D257	Ω•cm	2×10 ¹²	2×10 ¹³	2×10 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	17 ^b	12 ^b	10 ^b	8 ^b	8 ^b
Mold shrinkage	Mold 2mm thickness	%	1.2	1.3	1.5	1.7	1.8

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