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[Japanese](#)
[Chinese](#)

 [Printing Tips](#)

[Nylon Resin](#)
[U-polymer](#)
[TERRAMAC](#)
[UNILATE](#)
[elitel](#)
[Powder Paint Resins](#)

[U-polymer > P Series](#)
[Top Page](#)

Schematic Grade Diagram

Position among Engineering Plastics

Available Grades

U-100 (neat polymer)

P Series

[P Series Resins](#)
[Technical Data](#)
[Composite Grades](#)

U-polymer

P series resins (transparent heat-resisting grade)

P series resins are resins succeeding the characteristics of the neat polymer, U-100, and improved in flowability and optical properties. Among many super engineering plastics, the resins are few transparent polymer alloys that have heat resistance. The heat-stable P-series resins have variations different in heat resistance in the range from 150 to 175°C. There are few transparent heat-resistant resins among super engineering plastics, and thus P series resins are valuable. The resins have favorable weather resistance, and in particular, the P-1001 resin is approved by SAE Standard (J576 and J578) and FMVSS Standard (108). Making the most of these characteristics, the resins may be used, for example, as the lenses for automobile lamps. High flow-type resins, P-1001A, and P-3001S, are also available for thin molding products.

Characteristics

- Transparent, heat resistant, deflection temperature under load: 150 to 175°C (under a great load of 1.8 MPa)
- High weather resistance
- High creep resistant
- High dimensional stability
- High impact strength

Properties

	Item	ASTM	Unit: SI (conventional)	P-1001	P-3001	P-5001
	Density	D-792	-	1.21	1.21	1.21
	Water absorption (1/8", 24hrs)	D-570	%	0.26	0.25	0.25
	Light transmittance (Thickness: 3mm)	D-1003	%	87	88	88
Mechanical Properties	Tensile strength	D-638	MPa {kg/cm ² }	69 {700}	69 {700}	65 {660}
	Elongation at break	D-638	%	65	80	80
	Bending strength	D-790	MPa {kg/cm ² }	82 {840}	83 {850}	86 {880}
	Bending modulus	D-790	GPa {kg/cm ² }	2.1 {21,000}	2.1 {21,000}	2.2 {22,500}
	Compressive strength (Yield)	D-695	MPa {kg/cm ² }	81 {830}	79 {810}	76 {780}
	Izod impact strength (1/8", with notch)	D-256	J/m {kg-Ecm/cm}	255 {26}	353 {36}	451 {46}
	Rockwell hardness	D-785	R	123	122	120
Thermal properties	Deflection temperature under load 1.8MPa {18.6kg/cm ² }	D-648	°C	175	160	150
	Linear expansion coefficient	D-696	10 ⁻⁵ /K {10 ⁻⁵ cm/cm/°C}	6.2	6.2	6.3
	Dielectric breakdown strength	D-149	MV/m {kv/mm}	31	30	30
	Specific volume resistivity	D-257	Ωm {Ωcm}	2x10 ¹⁴ {2x10 ¹⁶ }	2x10 ¹⁴ {2x10 ¹⁶ }	2x10 ¹⁴ {2x10 ¹⁶ }
Electrical Properties	Dielectric constant (10 ⁶ Hz)	D-150	PF/m	27 {3.0}	27 {3.0}	27 {3.0}
	Dielectric dissipation factor (10 ⁶ Hz)	D-150	-	0.01	0.01	0.01
	Ark resistance	D-495	s	127	125	125
	Tracking resistance	IEC	V	-	-	-
Other properties	Molding shrinkage (Thickness: 3mm)	-	%	0.8	0.8	0.8
	Flow direction, orthogonal	-	%	0.8	0.8	0.8

U Series

AX Series

Precautions in molding

Applications

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[Print Table on A4 Paper](#)

direction

Properties of <High-flow grade resins>[Print Table on A4 Paper](#)

	Item	ASTM	Unit: SI (conventional)	P-1001A	P-3001S
	Density	D-792	-	1.21	1.21
	Water absorption (1/8", 24hrs)	D-570	%	0.26	0.24
	Light transmittance (Thickness: 3mm)	D-1003	%	88	89
Mechanical Properties	Tensile strength	D-638	MPa {kg/cm ² }	69 {700}	66
	Elongation at break	D-638	%	50	45
	Bending strength	D-790	MPa {kg/cm ² }	81 {830}	84
	Bending modulus	D-790	GPa {kg/cm ² }	2.1 {21,000}	2.2
	Compressive strength (Yield)	D-695	MPa {kg/cm ² }	81 {830}	-
	Izod impact strength (1/8", with notch)	D-256	J/m {kg-Ecm/cm}	196 {20}	300
	Rockwell hardness	D-785	R	123	-
Thermal properties	Deflection temperature under load 1.8MPa {18.6kg/cm ² }	D-648	°C	175	169
	Linear expansion coefficient	D-696	10 ⁻⁵ /K {10 ⁻⁵ cm/cm/°C}	6.2	6.0
	Dielectric breakdown strength	D-149	MV/m {kv/mm}	31	
Electrical Properties	Specific volume resistivity	D-257	Ωm {Ωcm}	2x10 ¹⁴ {2x10 ¹⁶ }	
	Dielectric constant (10 ⁶ Hz)	D-150	PF/m	27 {3.0}	
	Dielectric dissipation factor(10 ⁶ Hz)	D-150	-	0.01	
	Ark resistance	D-495	s	127	
	Tracking resistance	IEC	V	-	
Other properties	Molding shrinkage (Thickness: 3mm)	-	%	0.8	0.8
	Flow direction, orthogonal direction				

[To Page Top](#)

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