Celanese
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Zytel® HTN51G45HSL NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTN51G45HSL NC010 is a 45% glass reinforced, heat stabilized, lubricated, hydrolysis resistant high performance polyamide resin. It is also a PPA resin.

Product information

Resin Identification	PA6T/XT-GF45	ISO 1043
Part Marking Code	>PA6T/XT-GF45<	ISO 11469
Part Marking Code	>PPA-GF45<	SAE J1344
ISO designation	ISO 16396-PA6T/XT,GF45,M1GHNR,S10-140	

Rheological properties

	dry/cond.		
Moulding shrinkage, parallel	0.1 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6 / -	%	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	0.2[1] / *	%	ISO 294-4
Moulding shrinkage, normal, annealed	0.75 / *	%	ISO 294-4

[1]: annealing 2h at 170 °C

Typical mechanical properties

	dry/cond.		
Tensile Modulus	16000 / 15000	MPa	ISO 527-1/-2
Stress at break, 5mm/min	260 / 230	MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.4 / 2.1	%	ISO 527-1/-2
Flexural Modulus	15000 / 15000	MPa	ISO 178
Flexural Strength	370 / -	MPa	ISO 178
Tensile creep modulus, 1h	* / 14000	MPa	ISO 899-1
Tensile creep modulus, 1000h	* / 12000	MPa	ISO 899-1
Charpy impact strength, 23 °C	90 / 75	kJ/m²	ISO 179/1eU
Charpy impact strength, -30 °C	85 / -	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23 °C	12 / 11	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	12 / -	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	13 / -	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23 °C	12 / 12	kJ/m²	ISO 180/1A
Izod notched impact strength, -40 °C	13 / -	kJ/m²	ISO 180/1A
Izod impact strength, 23 °C	87 / -	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	109 / -		ISO 2039-2
Hardness, Rockwell, R-scale	125 / -		ISO 2039-2
Poisson's ratio	0.33 / 0.33		

Thermal properties

	dry/cond.		
Melting temperature, first heat	300 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	140 / 95	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	260 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	290 / *	°C	ISO 75-1/-2

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Coeff. of linear therm. expansion, parallel, -40-23°C	15 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	15 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	13 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	50 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	54 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.28	W/(m K)	Internal
Spec. heat capacity of melt	1610	J/(kg K)	Internal
RTI, electrical, 0.75mm	150	°C	UL 746B
RTI, electrical, 1.5mm	150	°C	UL 746B
RTI, electrical, 3mm	150	°C	UL 746B
RTI, impact, 0.75mm	120	°C	UL 746B
RTI, impact, 1.5mm	125	°C	UL 746B
RTI, impact, 3mm	150	°C	UL 746B
RTI, strength, 0.75mm	130	°C	UL 746B
RTI, strength, 1.5mm	140 / *	°C	UL 746B
RTI, strength, 3mm	150	°C	UL 746B

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB / *	class	UL 94
Thickness tested	1.5 / *	mm	UL 94
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	HB / *	class	UL 94
Thickness tested	0.85 / *	mm	UL 94
UL recognition	yes / *		UL 94
Oxygen index	24 / *	%	ISO 4589-1/-2
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	29	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.2 / -		IEC 62631-2-1
Relative permittivity, 1MHz	3.9 / -		IEC 62631-2-1
Dissipation factor, 100Hz	90 / -	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150 / -	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E14	Ohm	IEC 62631-3-2
Electric strength	35 / 34	kV/mm	IEC 60243-1
Comparative tracking index	600 / 600		IEC 60112

Other properties

	dry/cond.		
Humidity absorption, 2mm	1.2 / *	%	Sim. to ISO 62
Water absorption, 2mm	3.6 / *	%	Sim. to ISO 62
Density	1570 / -	kg/m³	ISO 1183

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Injection

Drying Recommended	yes		
Drying Temperature	100	°C	
Drying Time, Dehumidified Dryer	6 - 8	h	
Processing Moisture Content	≤0.1	%	
Melt Temperature Optimum	325	°C	Internal
Min. melt temperature	320	°C	
Max. melt temperature	330	°C	
Mold Temperature Optimum	150	°C	
Min. mould temperature	140[2]	°C	
Max. mould temperature	180	°C	

[2]: Higher temperature needed for thinner sections.

Characteristics

Additives	Release agent

Additional information

Injection molding	During molding, use proper protective equipment and adequate ventilation. Avoid exposure to fumes and limit the hold up time and temperature of the resin in the machine. Purge degraded resin carefully with HDPE. When lower mold temperatures are used, the initial warpage and shrinkage may be lower, but the surface appearance and chemical resistance may be reduced, and the dimensional change may be greater when parts are subsequently heated.

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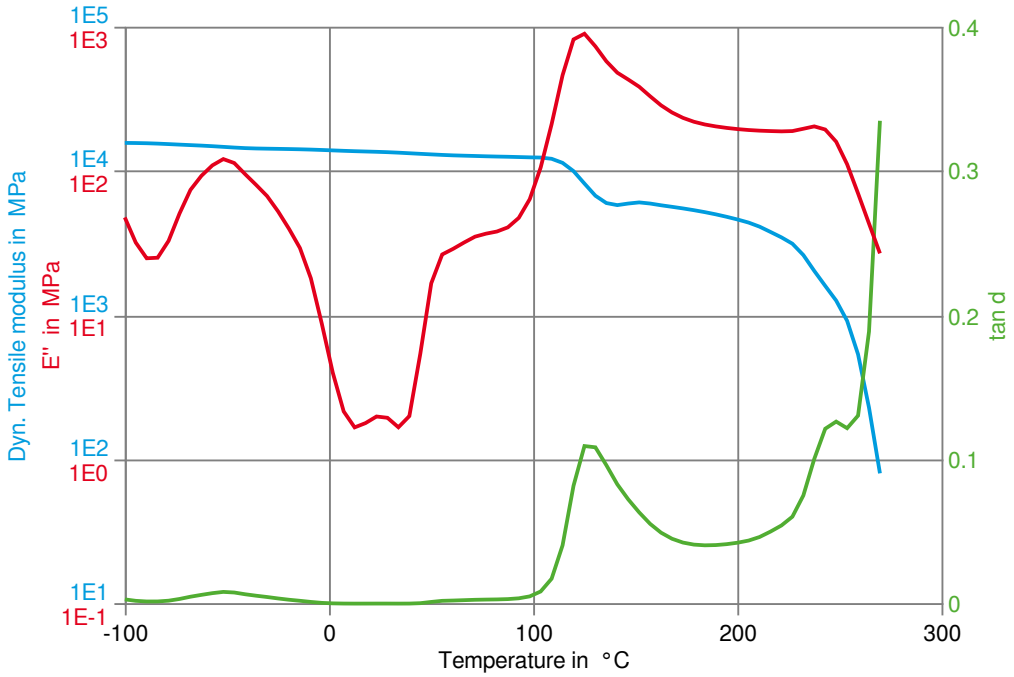
Dynamic Tensile modulus-temperature (dry)



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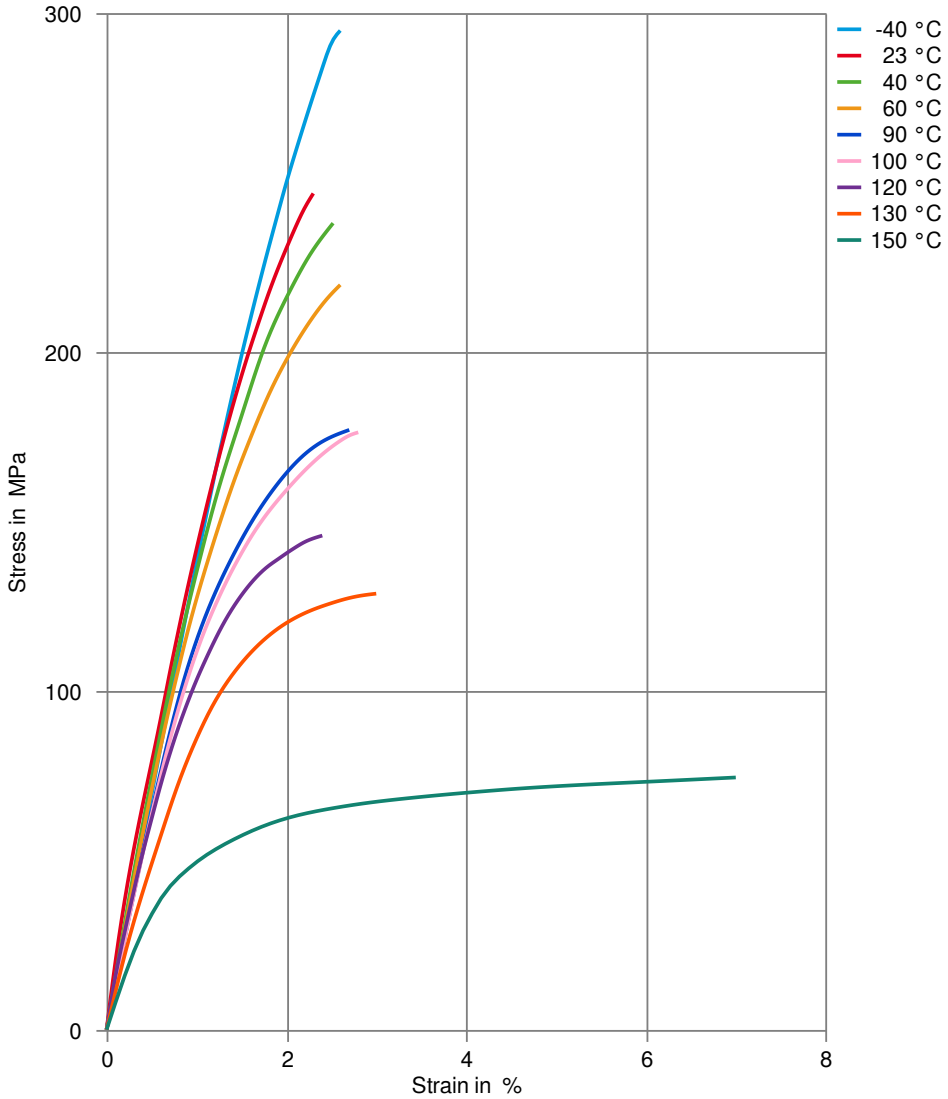
Stress-strain (dry)



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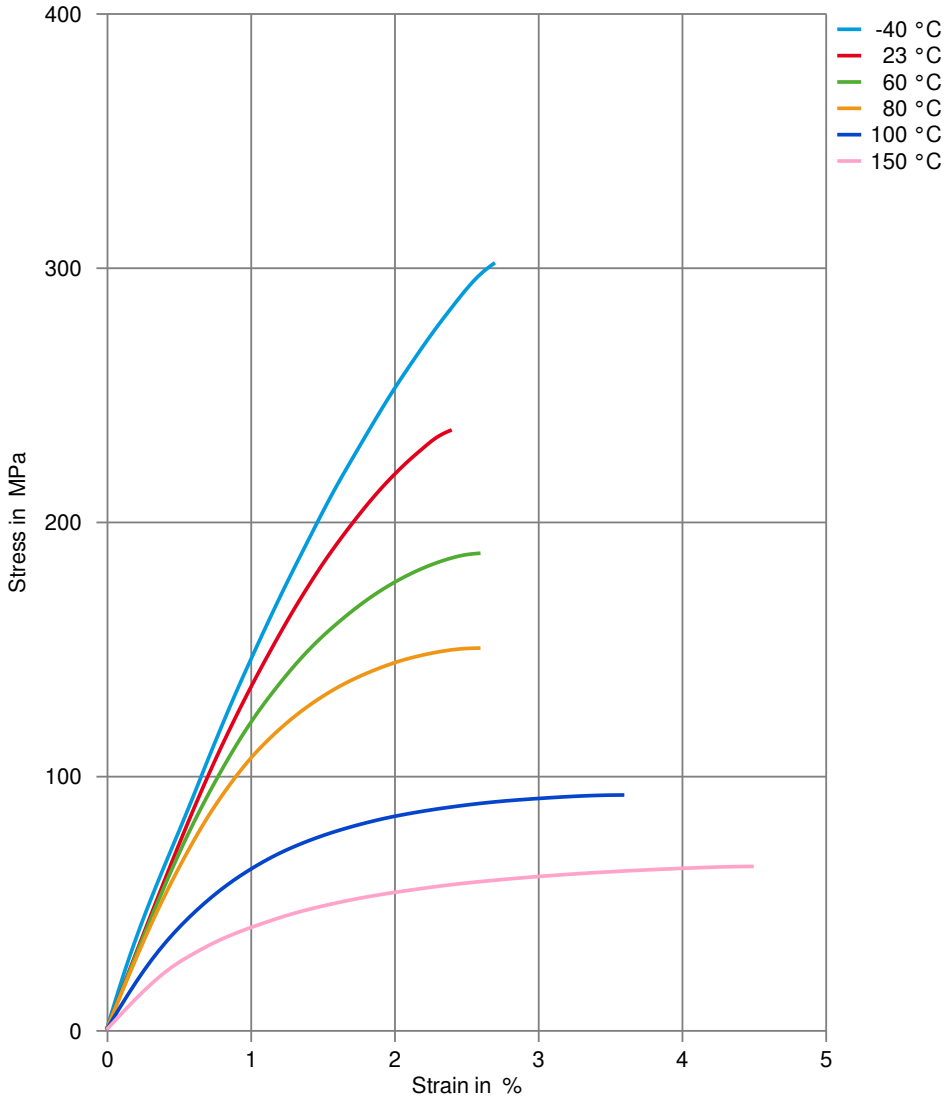
Stress-strain (cond.)



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Chemical Media Resistance

Acids

- ✔ Acetic Acid (5% by mass), 23°C
- ✔ Citric Acid solution (10% by mass), 23°C
- ✔ Lactic Acid (10% by mass), 23°C

Other

- ✔ Ethylene Glycol (50% by mass) in water, 108°C
- ✔ Water, 23°C
- ✔ Water, 90°C
- ✔ Coolant Glysantin G48, 1:1 in water, 125°C

Symbols used:

✔ possibly resistant
Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

✘ not recommended - see explanation
Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).