Celanese
The chemistry inside innovation™

Zytel® HTN51G45HSL BK083

HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTN51G45HSL BK083 is a 45% glass reinforced, heat stabilized, lubricated, hydrolysis resistant high performance polyamide resin. It is also a PPA resin.

Product information

Property	Value	Standard
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,M1CGHR,S10-140	

Rheological properties

Property	dry/cond.	Unit	Standard
Moulding shrinkage, parallel	0.1 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6 / -	%	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	0.2 / *	%	ISO 294-4
Moulding shrinkage, normal, annealed	0.7 / *	%	ISO 294-4

Typical mechanical properties

Property	dry/cond.	Unit	Standard
Tensile Modulus	15000 / 15500	MPa	ISO 527-1/-2
Stress at break, 5mm/min	240 / 230	MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.3 / 2	%	ISO 527-1/-2
Flexural Modulus	13200 / -	MPa	ISO 178
Charpy impact strength, 23 °C	85 / -	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30 °C	80 / -	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23 °C	12 / -	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -30 °C	12 / -	kJ/m^2	ISO 179/1eA
Izod notched impact strength, 23 °C	12 / -	kJ/m^2	ISO 180/1A
Izod notched impact strength, -40 °C	13 / -	kJ/m^2	ISO 180/1A
Poisson's ratio	0.33 / 0.33		

Thermal properties

Property	dry/cond.	Unit	Standard
Melting temperature, first heat	300 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	135 / 95	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	265 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	285 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23 °C	14 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	14 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160 °C	15 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23 °C	45 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	50 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160 °C	69 / *	E-6/K	ISO 11359-1/-2
RTI, electrical, 0.75mm	150	°C	UL 746B
RTI, electrical, 1.5mm	150	°C	UL 746B

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Property	Value	Unit	Test Standard
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
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	29	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Volume resistivity	>1E13 / -	Ohm.m	IEC 62631-3-1

Other properties

	dry/cond.		
Humidity absorption, 2mm	1 / *	%	Sim. to ISO 62
Water absorption, 2mm	3.6 / *	%	Sim. to ISO 62
Density	1570 / -	kg/m^3	ISO 1183

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[1]	°C	
Max. mould temperature	180	°C	

[1]: Higher temperature needed for thinner sections.

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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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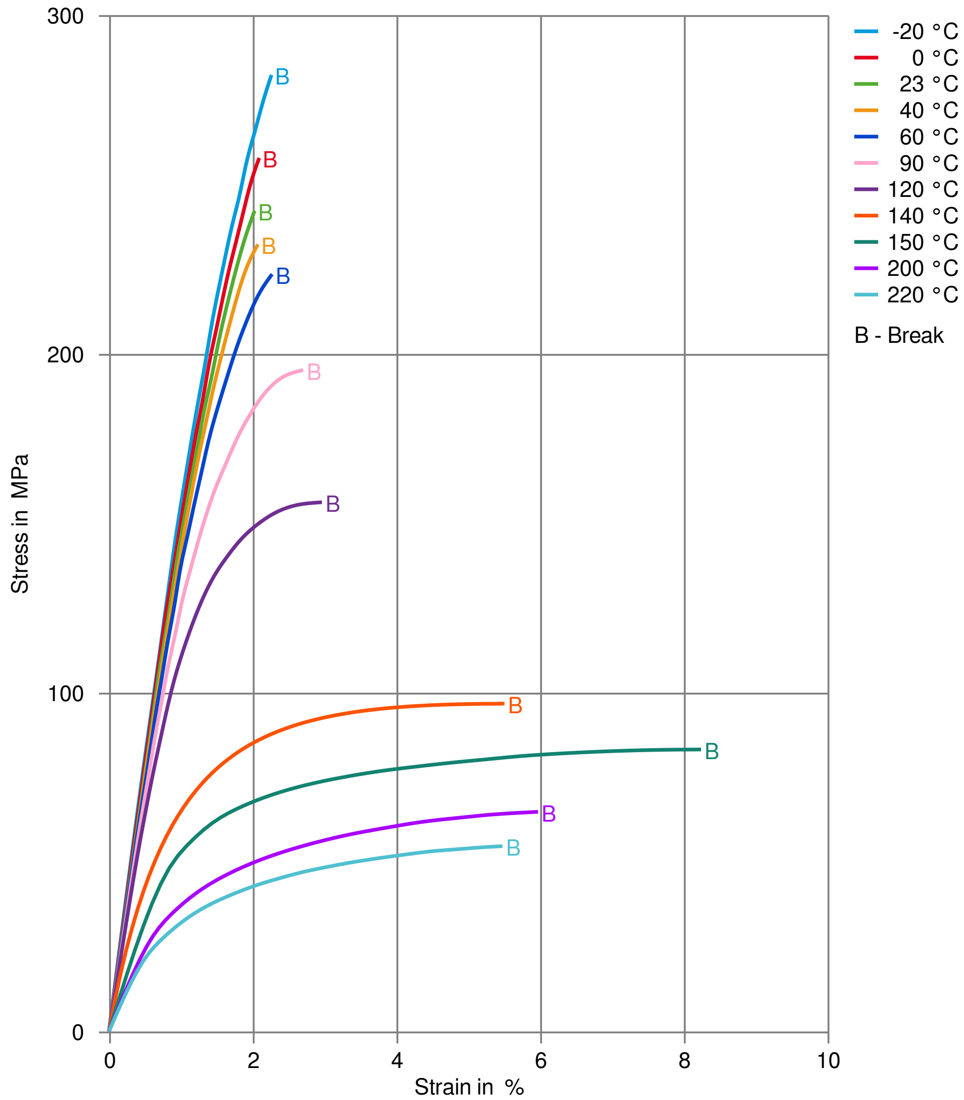
Stress-strain (dry)



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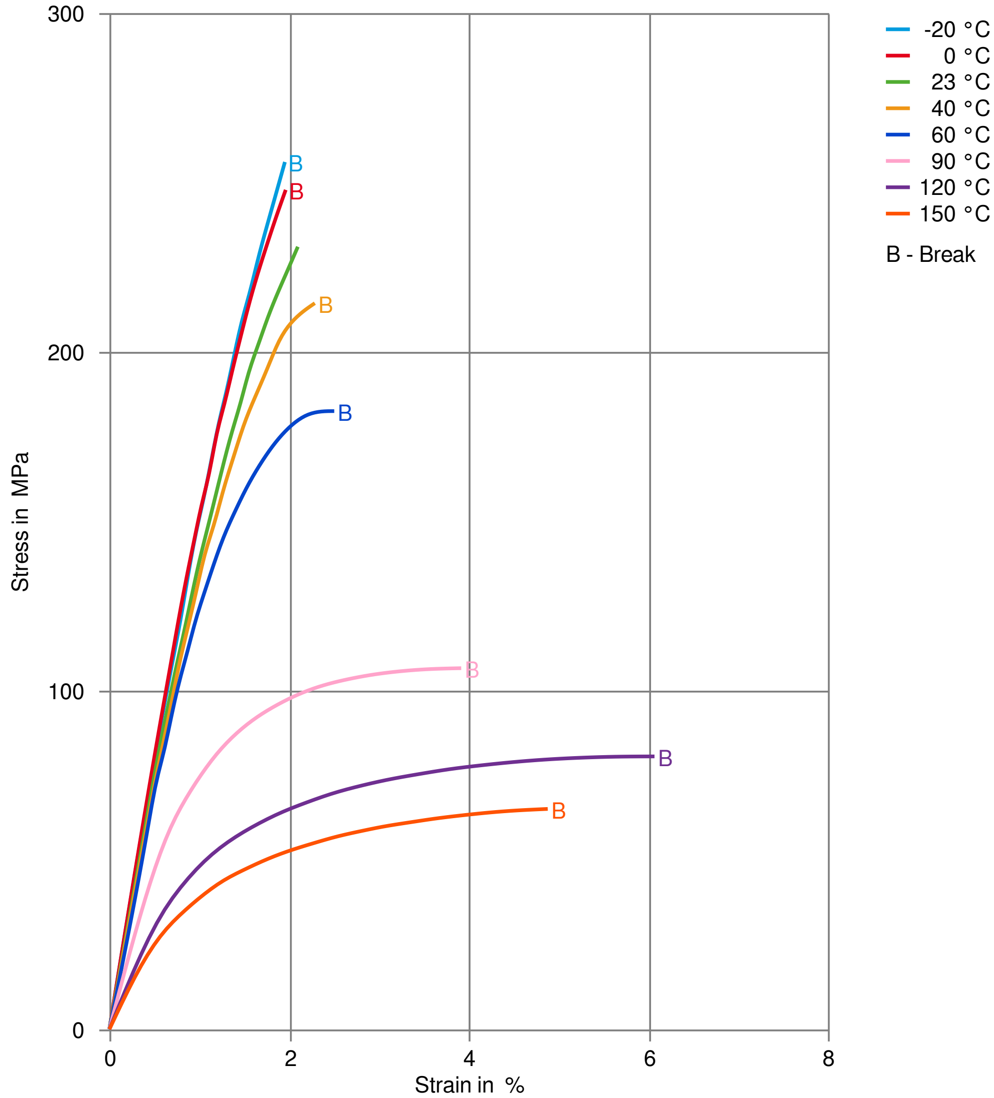
Stress-strain (cond.)



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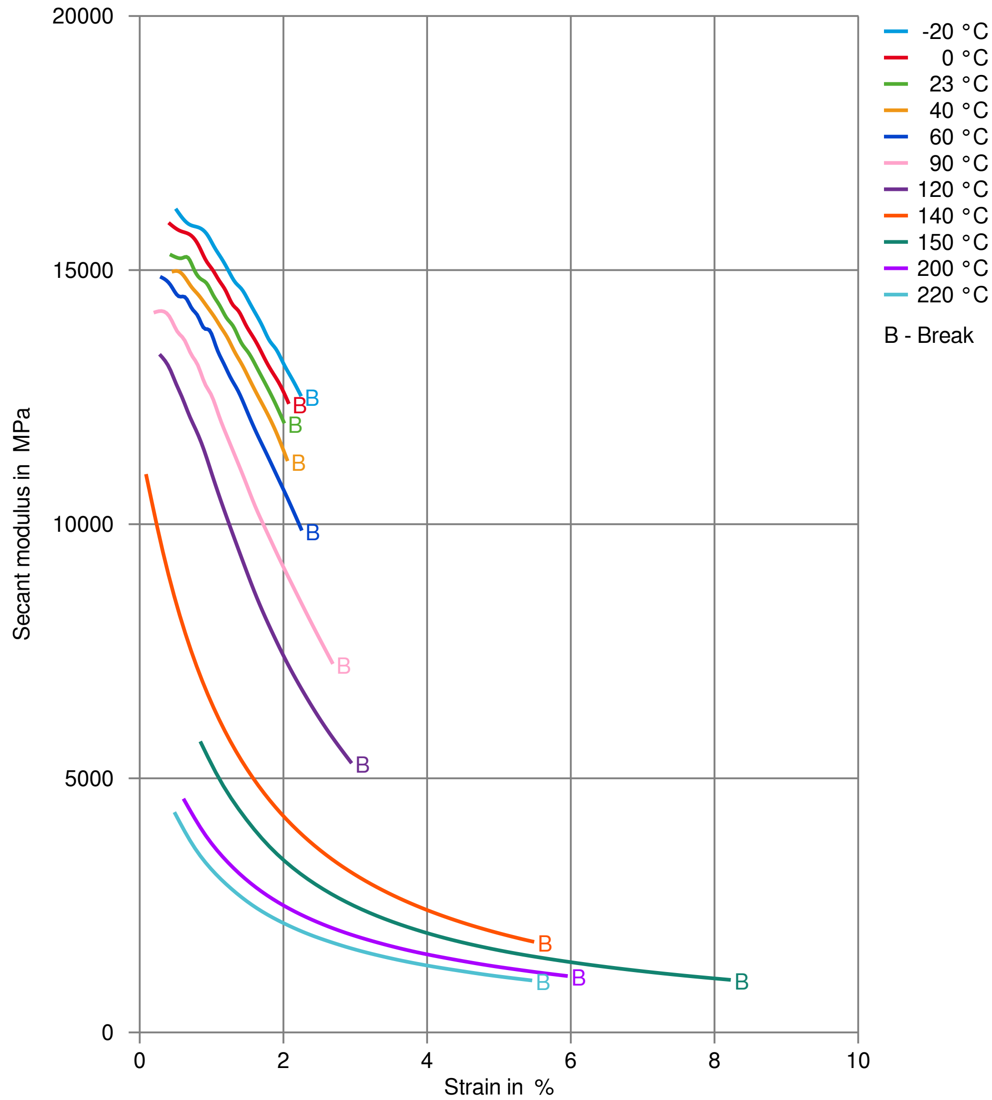
Secant modulus-strain (dry)



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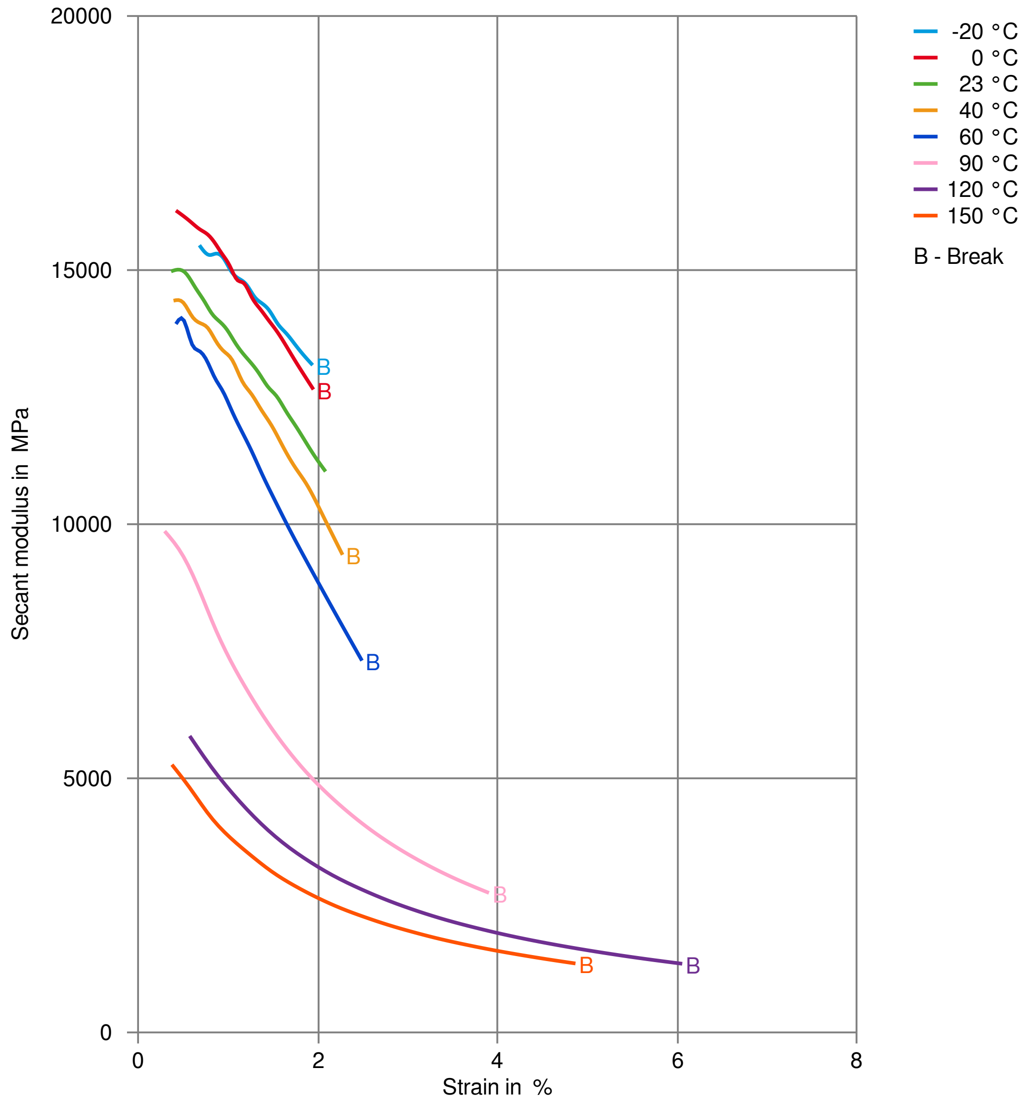
Secant modulus-strain (cond.)



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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).

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.
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