Celanese
The chemistry inside innovation™

Zytel® HTN52G35EF BK420

HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTN high performance polyamide resins feature high retention of properties upon exposure to elevated temperature, to high moisture, and to harsh chemical environments. Polymer families and grades of Zytel® HTN are tailored to optimize performance as well as processability.

Typical applications with Zytel® HTN include demanding applications in the automotive, electrical and electronics, domestic appliances, and construction industries.

Zytel® HTN52G35EF BK420 is a 35% glass reinforced, heat stabilised, lubricated high performance polyamide resin that can be moulded in water heated molds, developed for electrical and electronics applications. It is also a PPA resin.

Product information

Resin Identification	PA6T/66-GF35	ISO 1043
Part Marking Code	>PA6T/66-GF35<	ISO 11469
Part Marking Code	>PPA-GF35<	SAE J1344
ISO designation	ISO 16396-PA6T/66,GF35,M1CGHR,S10-120	

Rheological properties

	dry/cond.		
Viscosity number	120 / *	cm^3/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.9 / -	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile Modulus	12000 / 1 2000[DS]	MPa	ISO 527-1/-2
Stress at break, 5mm/min	210 / 180	MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.6 / 2.6	%	ISO 527-1/-2
Flexural Modulus	10000 / -	MPa	ISO 178
Flexural Strength	290 / -	MPa	ISO 178
Charpy impact strength, 23°C	60 / -	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	10 / -	kJ/m^2	ISO 179/1eA
Poisson's ratio	0.33 / 0.33		

[DS]: Derived from similar grade

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	310 / *	°C	ISO 11357-1/-3
Melting temperature, first heat	310 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	90 / 45	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	280 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	20 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	65 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.24	W/(m K)	Internal
TGA curve	available		ISO 11359-1/-2

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Flammability

	dry/cond.		
Oxygen index	23 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	960 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 3mm	800 / -	°C	IEC 60695-2-13
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	44	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.3 / -		IEC 62631-2-1
Relative permittivity, 1MHz	4.2 / -		IEC 62631-2-1
Dissipation factor, 1MHz	147 / -	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / -	Ohm.m	IEC 62631-3-1
Surface resistivity	* / >1E15	Ohm	IEC 62631-3-2
Electric strength	31 / 30	kV/mm	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112
Dielectric Constant, 1 GHz	3.82 / -[OT]		ASTM D 2520 B
Dielectric Constant, 10 GHz	3.92 / -[OT]		ASTM D 2520 B / IPC-TM-650
Dissipation Factor, 1 GHz	124 / -[OT]	E-4	ASTM D 2520 B
Dissipation Factor, 10 GHz	113 / -[OT]	E-4	ASTM D 2520 B / IPC-TM-650

[OT]: One time tested

Other properties

	dry/cond.		
Humidity absorption, 2mm	2 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.4 / *[DS]	%	Sim. to ISO 62
Density	1450 / -	kg/m³	ISO 1183
Density of melt	1100	kg/m³	Internal

[DS]: Derived from similar grade

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	
Min. mould temperature	90	°C	
Max. mould temperature	110	°C	

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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.

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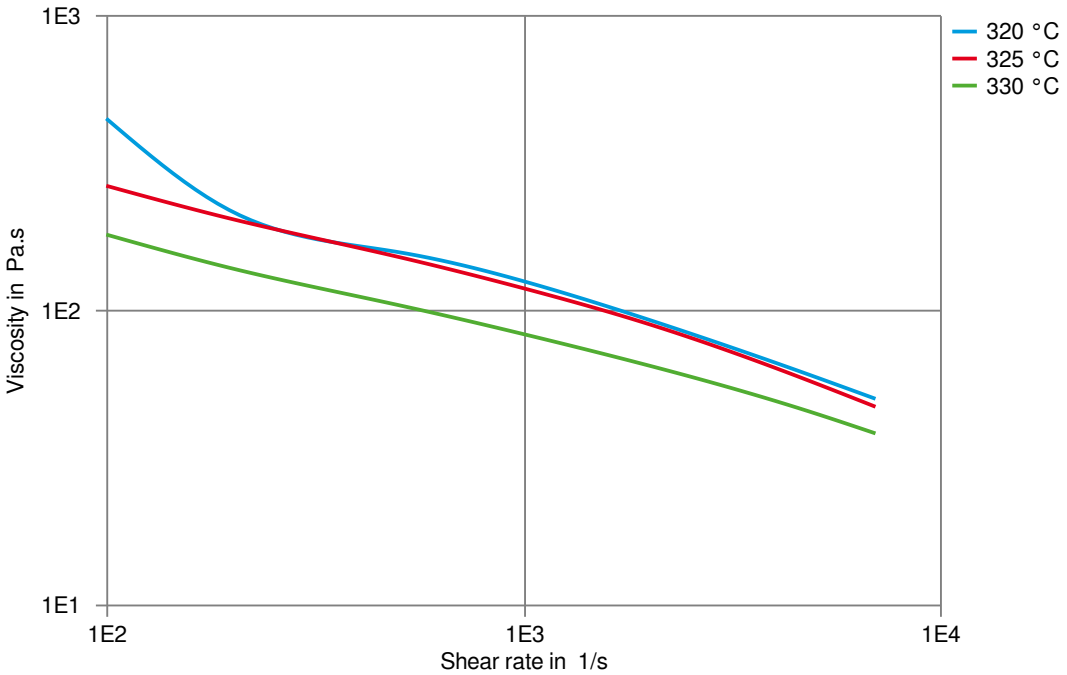
Viscosity-shear rate



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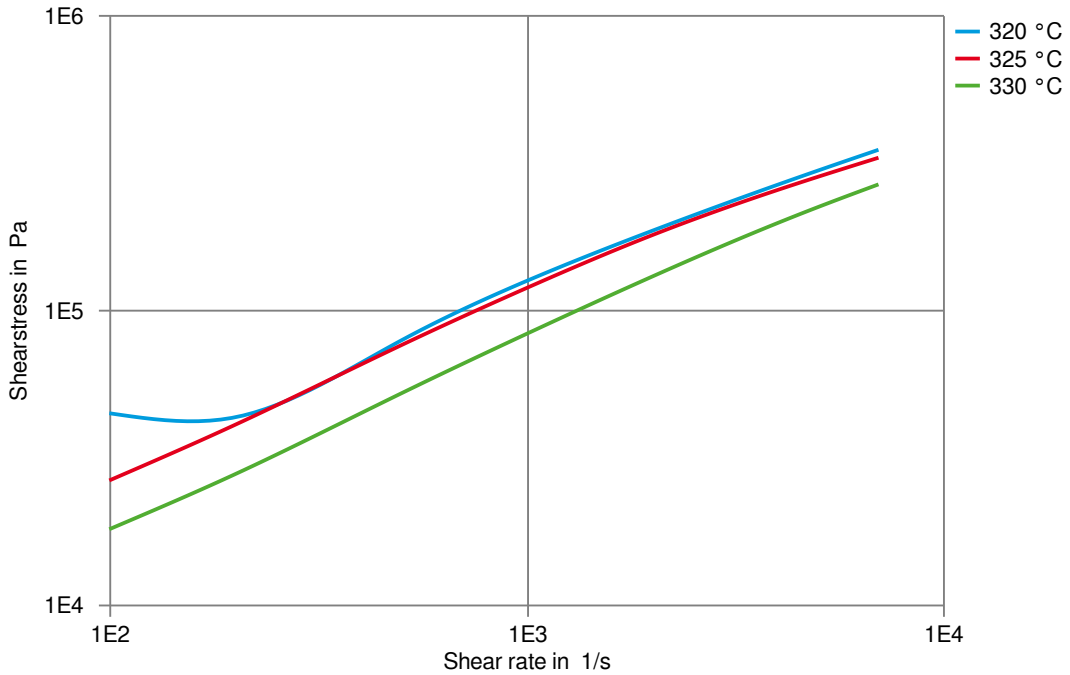
Shearstress-shear rate



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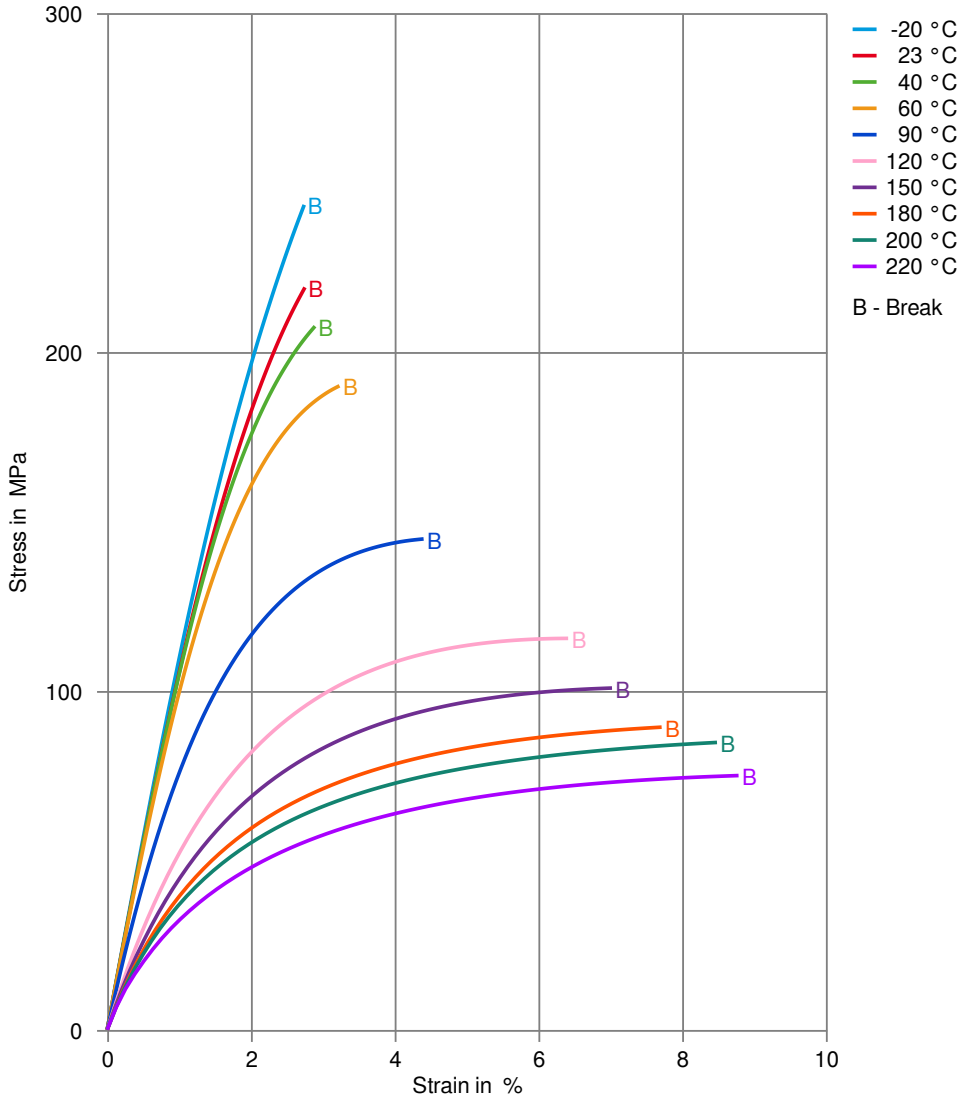
HIGH PERFORMANCE POLYAMIDE RESIN

Stress-strain (dry)



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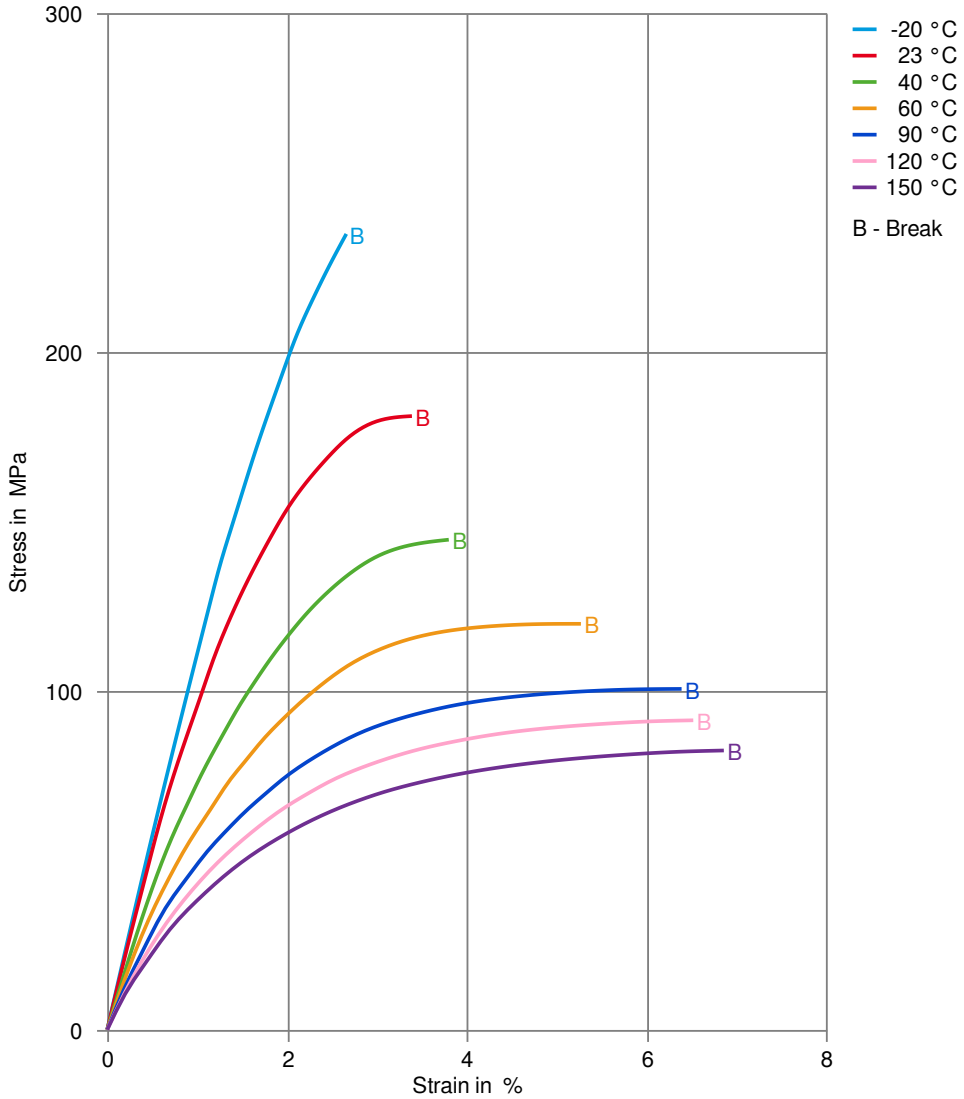
Stress-strain (cond.)



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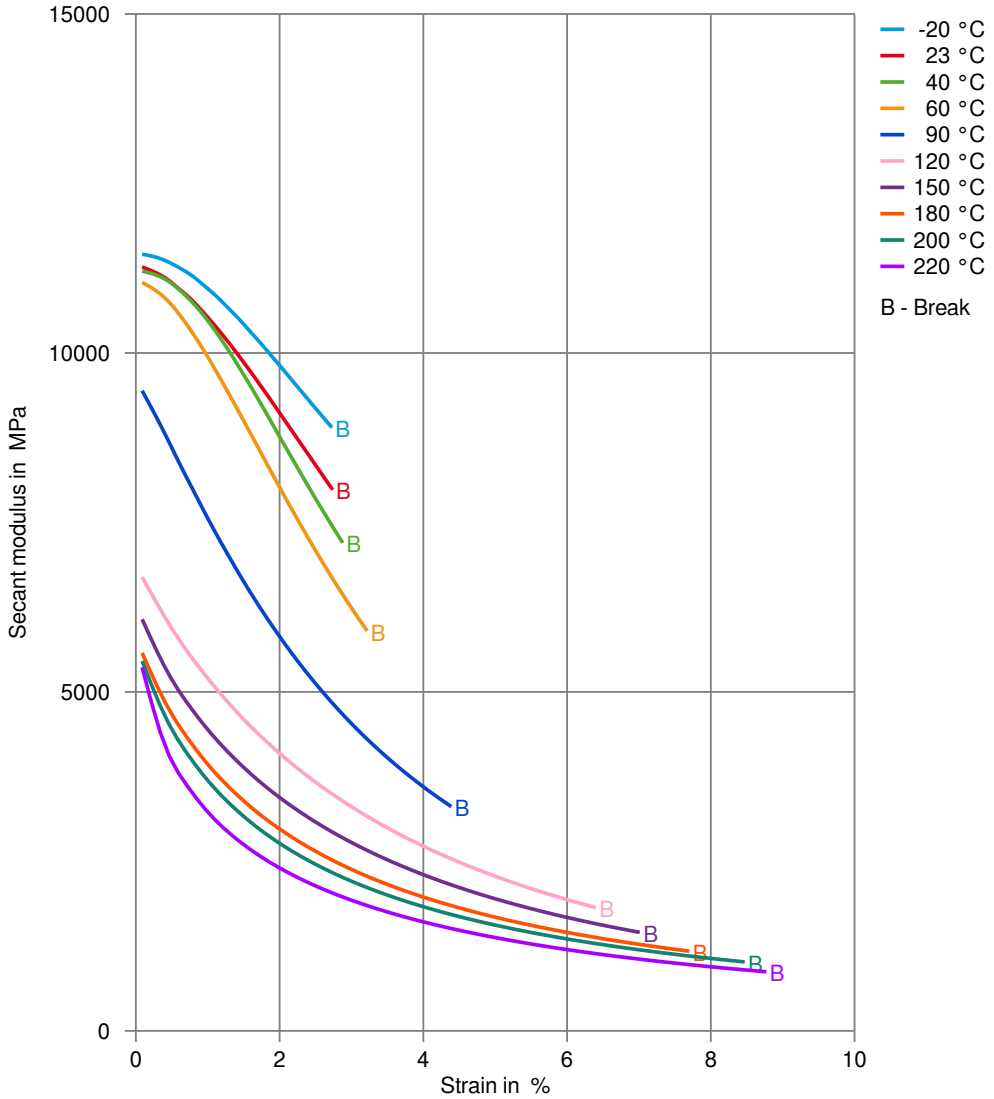
HIGH PERFORMANCE POLYAMIDE RESIN

Secant modulus-strain (dry)



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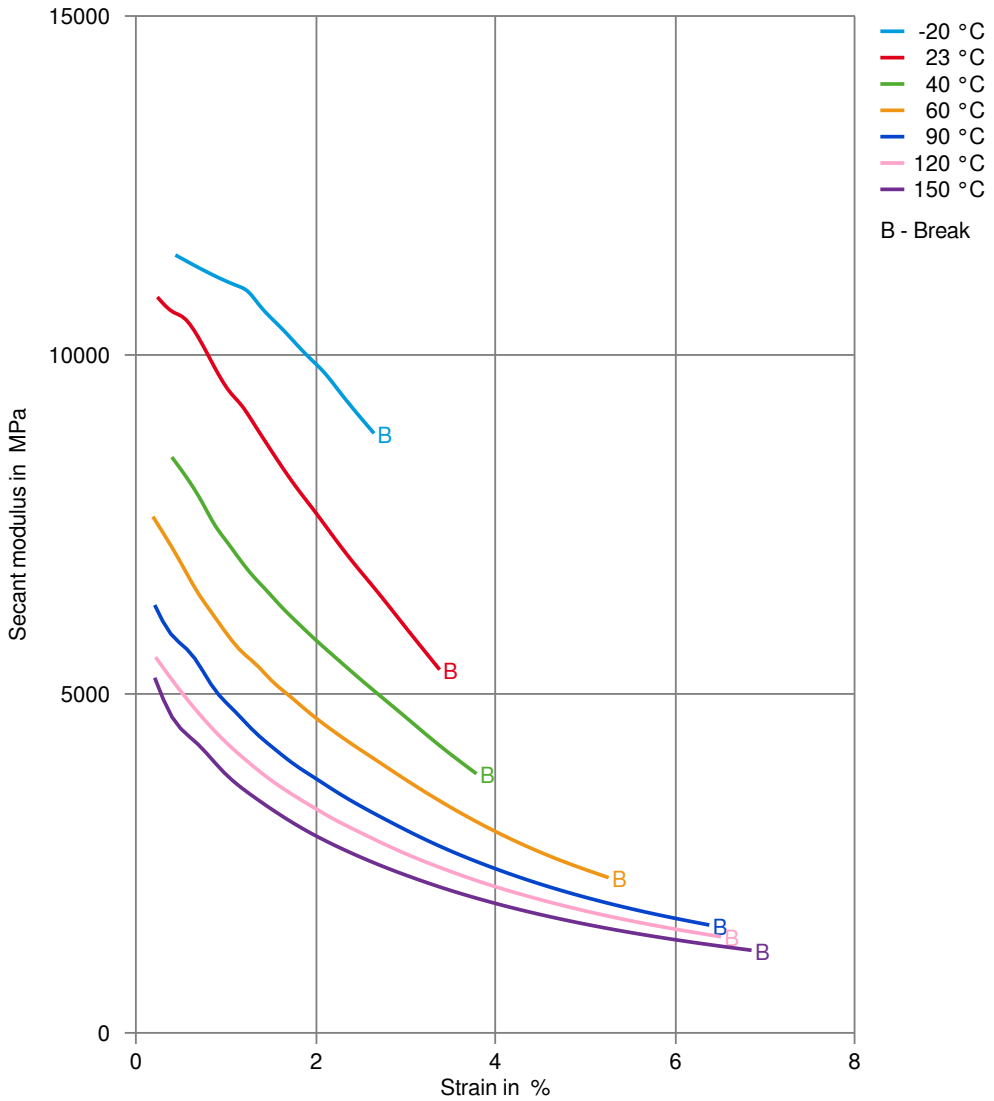
Secant modulus-strain (cond.)



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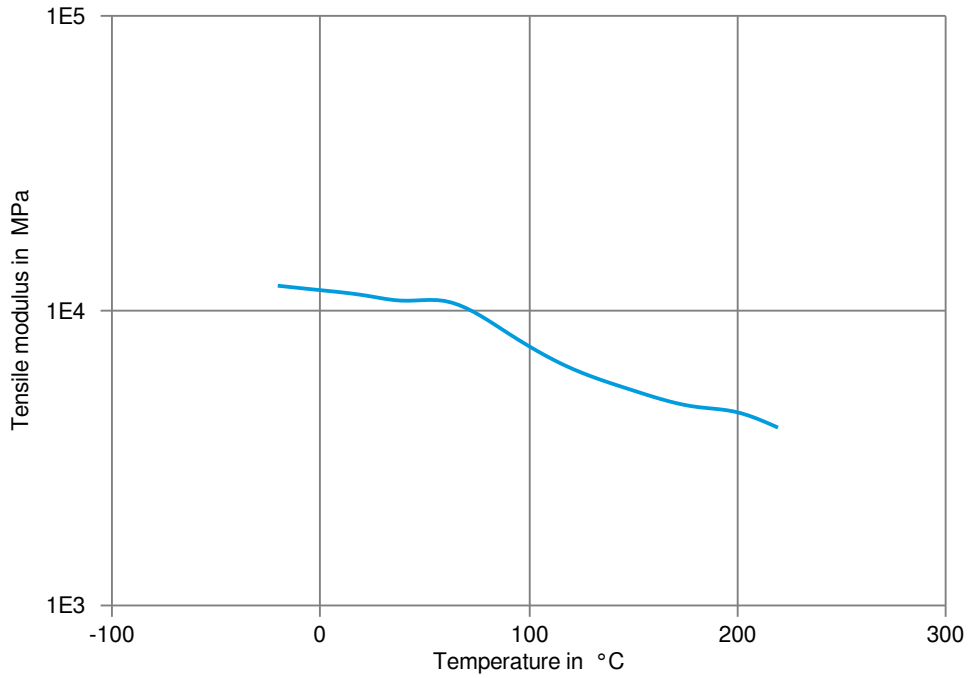
HIGH PERFORMANCE POLYAMIDE RESIN

Tensile modulus-temperature (dry)



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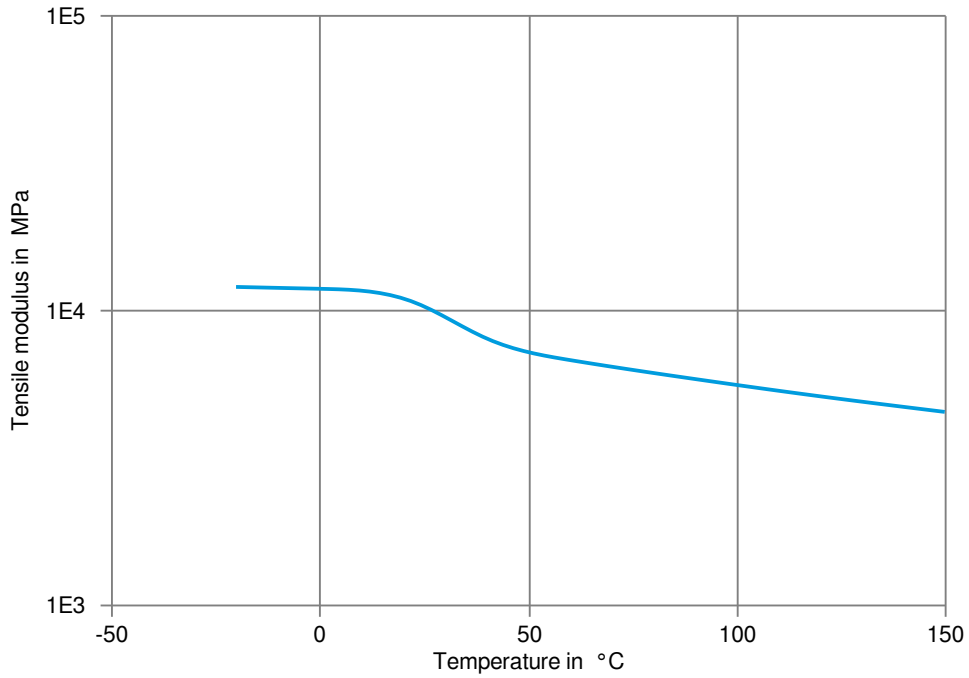
HIGH PERFORMANCE POLYAMIDE RESIN

Tensile modulus-temperature (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
- ✔ Urea solution (32.5% by mass), 23°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).