Zytel® 151L NC010

LONG CHAIN POLYAMIDE RESIN

Zytel® LCPA long chain polyamide resins provide an innovative and growing portfolio of flexible polymers with excellent thermal, chemical, and hydrolysis resistance. The diverse selection of Zytel® LCPA grades is targeted for a range of performance characteristics, balancing temperature resistance, flexibility and low permeation.

Zytel® 151L NC010 is a lubricated polyamide 612 resin.

Product information

Resin Identification	PA612	ISO 1043
Part Marking Code	>PA612<	ISO 11469
ISO designation	ISO 16396-PA612,,M1G1NR,S10-020	

Rheological properties

	dry/cond.		
Viscosity number	95[1]/*	cm³/g	ISO 307, 1628
Moulding shrinkage, parallel	1.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4/-	%	ISO 294-4, 2577
Mold Shrinkage, Flow, 3.2mm (0.125in)	1.1/*	%	
Mold Shrinkage, Transverse, 3.2mm (0.125in)	1.1/*	%	

[1]: sulphuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	2400/1700	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	62/54	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.5/18	%	ISO 527-1/-2
Nominal strain at break	17/>50	%	ISO 527-1/-2
Flexural modulus	2100/1440	MPa	ISO 178
Charpy impact strength, 23°C	N/N	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	N/40	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	3.5/4	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	3.5/3	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	4/4.5	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	4.5/3.0	kJ/m²	ISO 180/1A
Hardness, Rockwell, R-scale	114/-		ISO 2039-2
Poisson's ratio	0.38/0.42		

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	218/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	65/50	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	62/*	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	135/*	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	181/*	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	90/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	110/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	160/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	90/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	120/*	E-6/K	ISO 11359-1/-2

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Coeff. of linear therm. expansion, normal, 55-160°C	180 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.18	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2750	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	105	°C	UL 746B
RTI, electrical, 1.5mm	105	°C	UL 746B
RTI, electrical, 3.0mm	105	°C	UL 746B
RTI, impact, 0.75mm	65	°C	UL 746B
RTI, impact, 1.5mm	65	°C	UL 746B
RTI, impact, 3.0mm	65	°C	UL 746B
RTI, strength, 0.75mm	65	°C	UL 746B
RTI, strength, 1.5mm	65 / *	°C	UL 746B
RTI, strength, 3.0mm	65	°C	UL 746B

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	V-2 / *	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	V-2 / *	class	IEC 60695-11-10
Thickness tested	0.85 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Oxygen index	27 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.4mm	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	960 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	725 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 0.75mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1.5mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 2mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 3mm	700 / -	°C	IEC 60335-1
FMVSS Class	SE		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm		mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	3.6 / 5.1		IEC 62631-2-1
Relative permittivity, 1MHz	3.2 / 4		IEC 62631-2-1
Dissipation factor, 100Hz	135 / 700	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	160 / 400	E-4	IEC 62631-2-1
Volume resistivity	1E13 / 1E11	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E12	Ohm	IEC 62631-3-2
Electric strength	30 / 30	kV/mm	IEC 60243-1

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Comparative tracking index	600 / -		IEC 60112
Electric Strength, Short Time, 2mm	21.9 / 21.2	kV/mm	IEC 60243-1

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.3 / *	%	Sim. to ISO 62
Water absorption, 2mm	3 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.4 / *	%	Sim. to ISO 62
Density	1060 / -	kg/m³	ISO 1183
Density of melt	900	kg/m³	

Film Properties

	dry/cond.		
Strain at yield, parallel	4.5 / *	%	ISO 527-3

VDA Properties

Emission of organic compounds	3.1	µgC/g	VDA 277
Odour	4.5	class	VDA 270

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.15	%
Melt Temperature Optimum	260	°C
Min. melt temperature	230	°C
Max. melt temperature	290	°C
Mold Temperature Optimum	65	°C
Min. mould temperature	40	°C
Max. mould temperature	95	°C
Ejection temperature	180	°C

Extrusion

Drying Temperature	75 - 80	°C
Drying Time, Dehumidified Dryer	3 - 4	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	240	°C
Melt Temperature Range	235 - 250	°C

Characteristics

Processing	Injection Moulding, Other Extrusion
Delivery form	Pellets
Additives	Release agent

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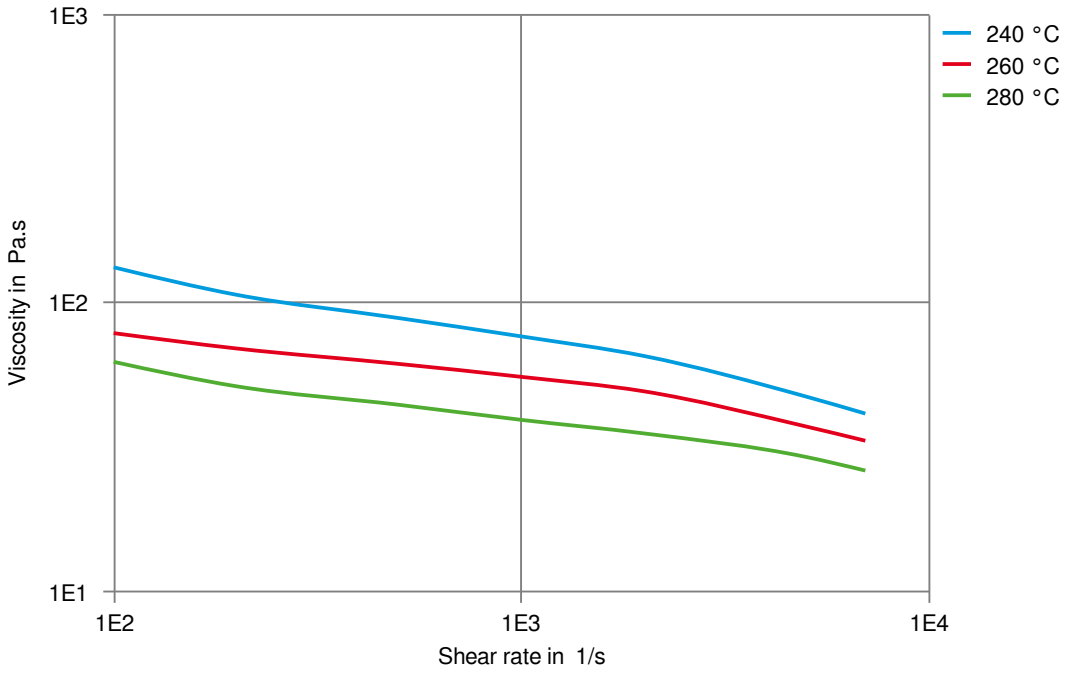
Additional information

Other extrusion

Melt Viscosity

@235°C, 1000s-1 = 70 Pa.s

Viscosity-shear rate



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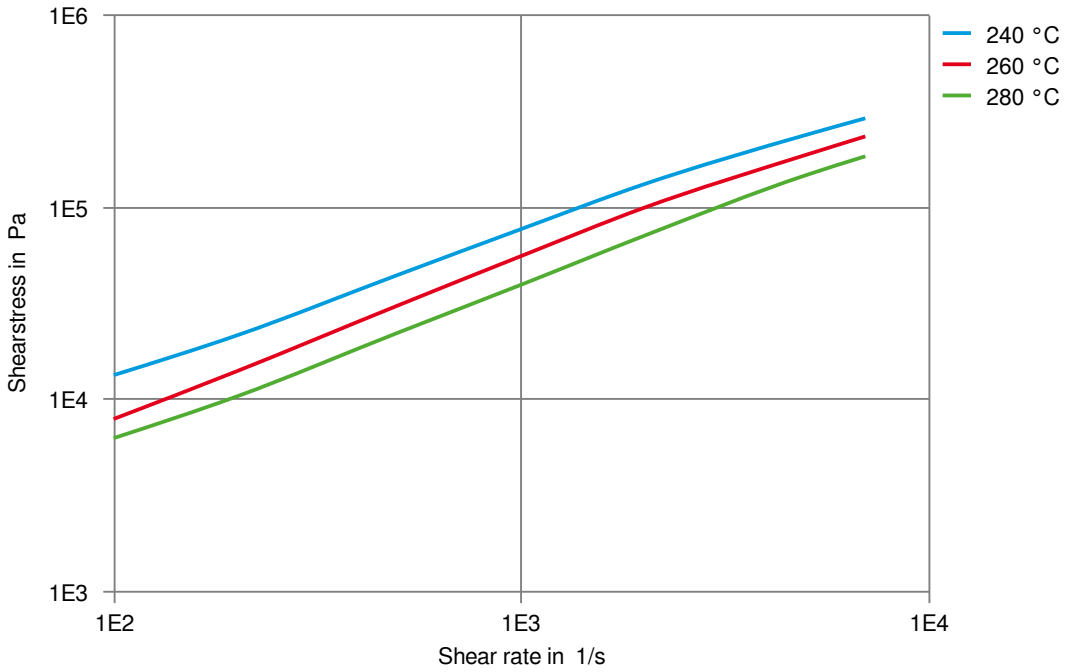
Shearstress-shear rate



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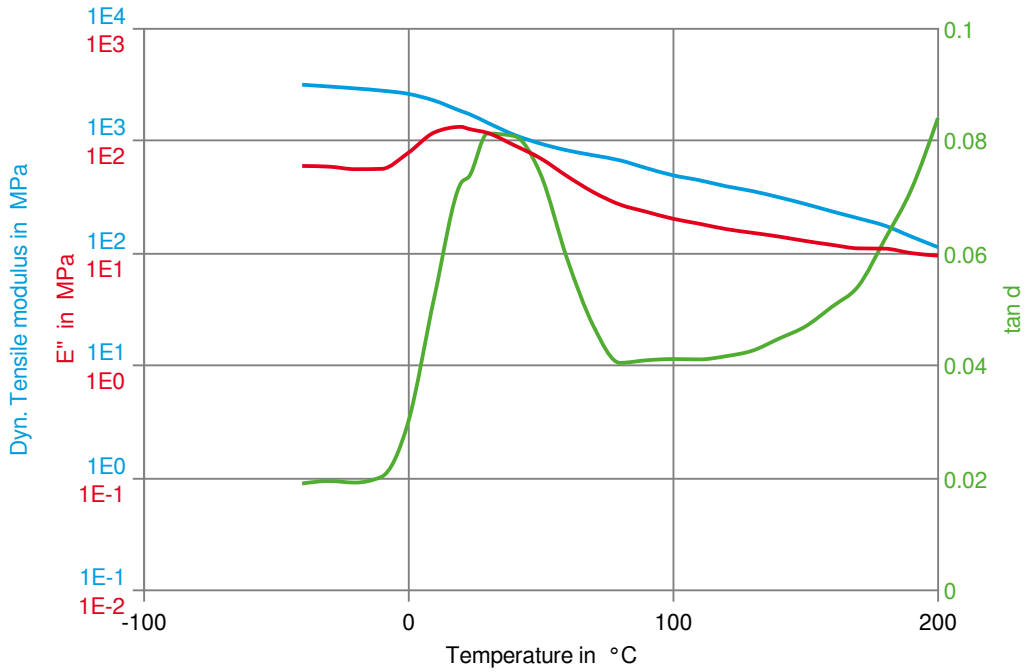
Dynamic Tensile modulus-temperature (dry)



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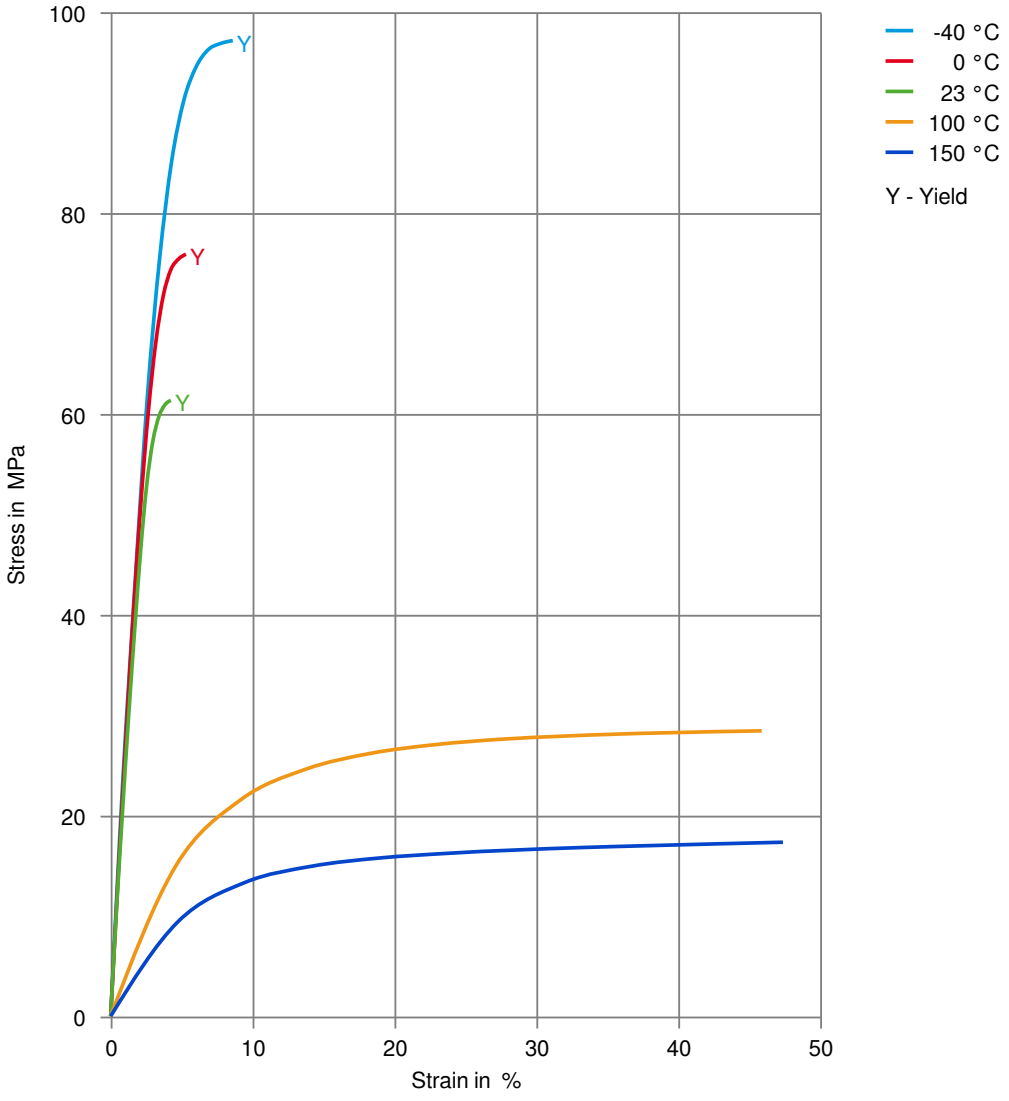
Stress-strain (dry)



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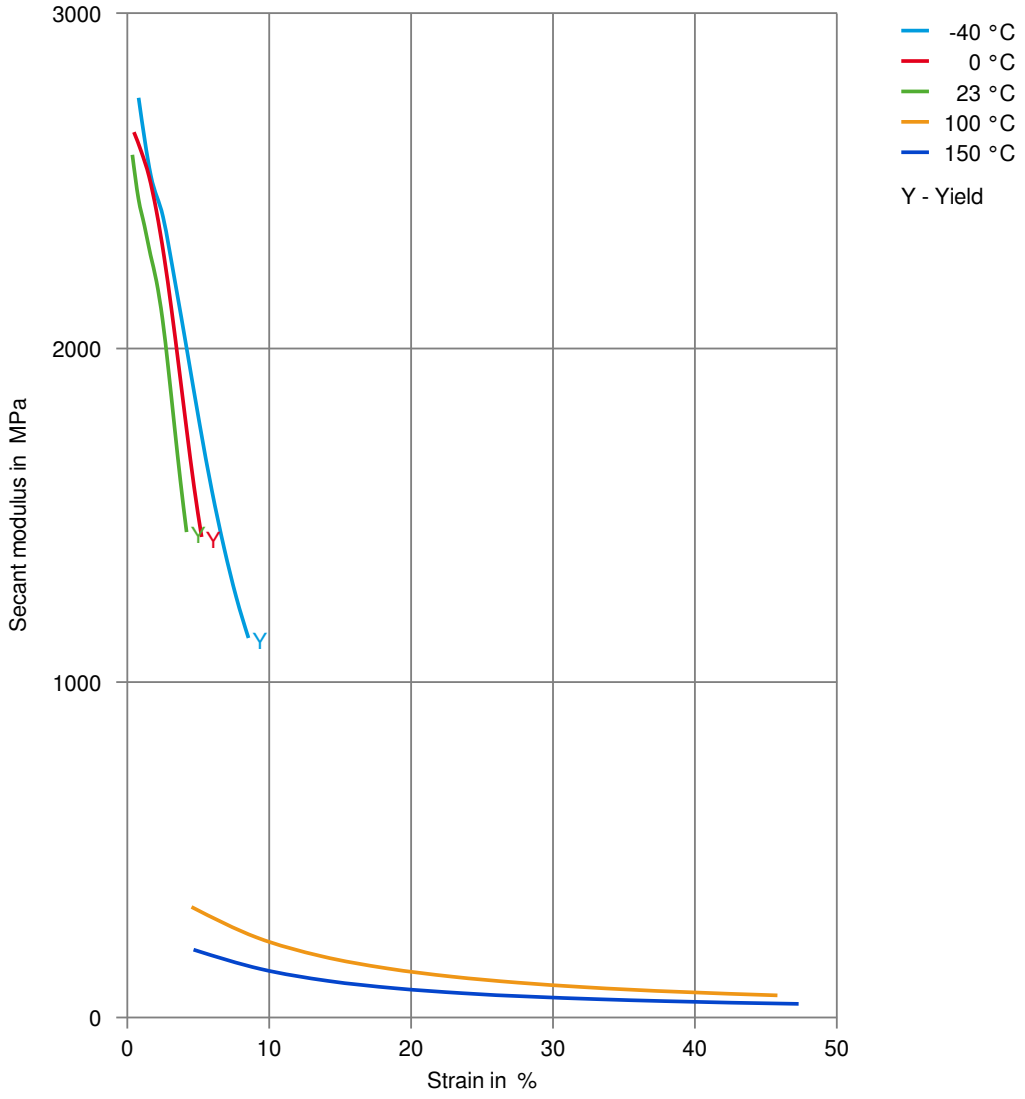
Secant modulus-strain (dry)



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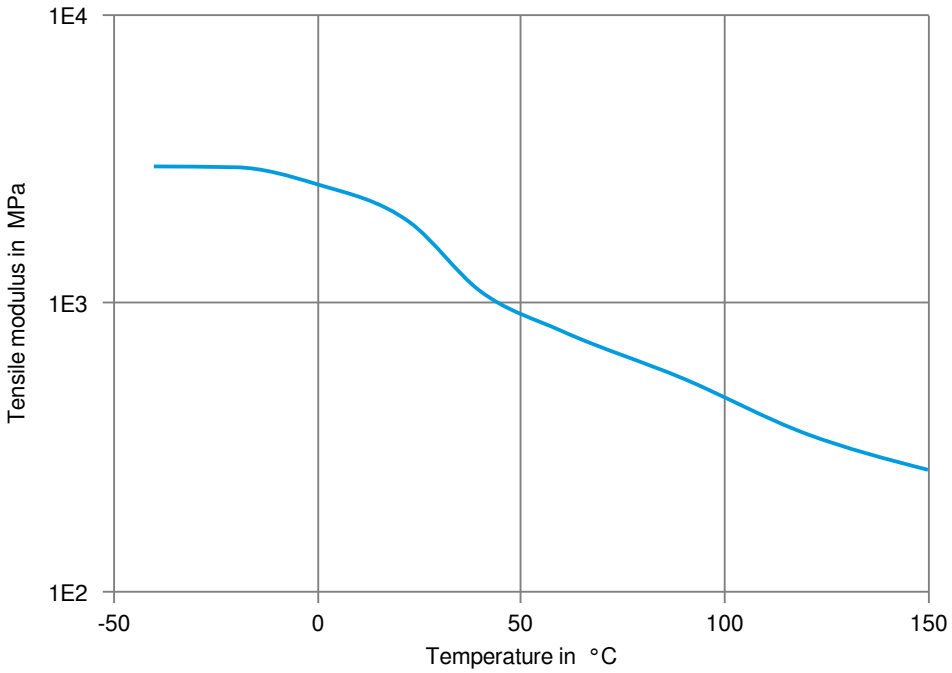
Tensile modulus-temperature (cond.)



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Chemical Media Resistance

Other

- ✔ Water, 23 °C
- ✘ Water, 90 °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).

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