Zytel® HTN51G35HSL BK083

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® HTN51G35HSL BK083 is a 35% glass reinforced, heat stabilized, lubricated, hydrolysis resistant high performance polyamide resin. It is also a PPA resin.

Product information

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

Rheological properties

	dry/cond.		
Viscosity number	100 / *	cm³/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.2 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6 / -	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile Modulus	12000 / 11500	MPa	ISO 527-1/-2
Stress at break	230 / 210	MPa	ISO 527-1/-2
Strain at break	2.4 / 2.3	%	ISO 527-1/-2
Flexural Modulus	12600 / -	MPa	ISO 178
Flexural Strength	323 / -	MPa	ISO 178
Charpy impact strength, 23°C	70 / -	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	70 / 40	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	10 / -	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	10 / 9	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	9 / -	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	10 / -	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	8 / -	kJ/m²	ISO 180/1A
Izod impact strength, 23°C	65 / -	kJ/m²	ISO 180/1U
Izod impact strength, -30°C	67 / -	kJ/m²	ISO 180/1U
Poisson's ratio	0.33 / 0.33	-	

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Thermal properties

	dry/cond.		
Melting temperature, first heat	300/*	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	264/*	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	284/*	°C	ISO 75-1/-2
CLTE, Parallel, -40-23°C	18/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	19/*	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 55-160°C	18/*	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	51/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	60/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal, 55-160°C	75/*	E-6/K	ISO 11359-1/-2
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	125	°C	UL 746B
RTI, impact, 1.5mm	125	°C	UL 746B
RTI, impact, 3mm	130	°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	IEC 60695-11-10
Thickness tested	1.5/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Burning Behav. at thickness h	HB/*	class	IEC 60695-11-10
Thickness tested	0.85/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Oxygen index	26/*	%	ISO 4589-1/-2
Glow Wire Flammability Index, 1.5mm	750/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	960/-	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.5mm	775/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3mm	800/-	°C	IEC 60695-2-13
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	21	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4/-	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.8/-	-	IEC 62631-2-1
Dissipation factor, 100Hz	90/-	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	170/-	E-4	IEC 62631-2-1
Volume resistivity	>1E13/-	Ohm.m	IEC 62631-3-1
Comparative tracking index	600/-	-	IEC 60112

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Other properties

	dry/cond.		
Humidity absorption, 2mm	1.6/*	%	Sim. to ISO 62
Water absorption, 2mm	4/*	%	Sim. to ISO 62
Density	1470/-	kg/m³	ISO 1183

VDA Properties

Odour	4	class	VDA 270

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
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.

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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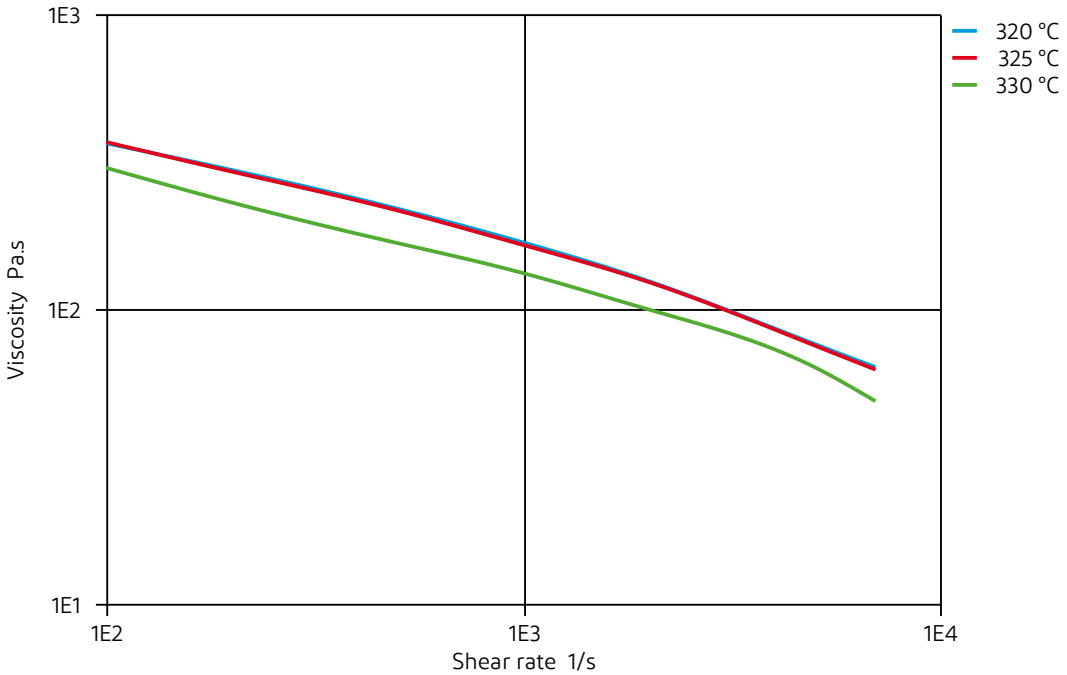
Viscosity-shear rate



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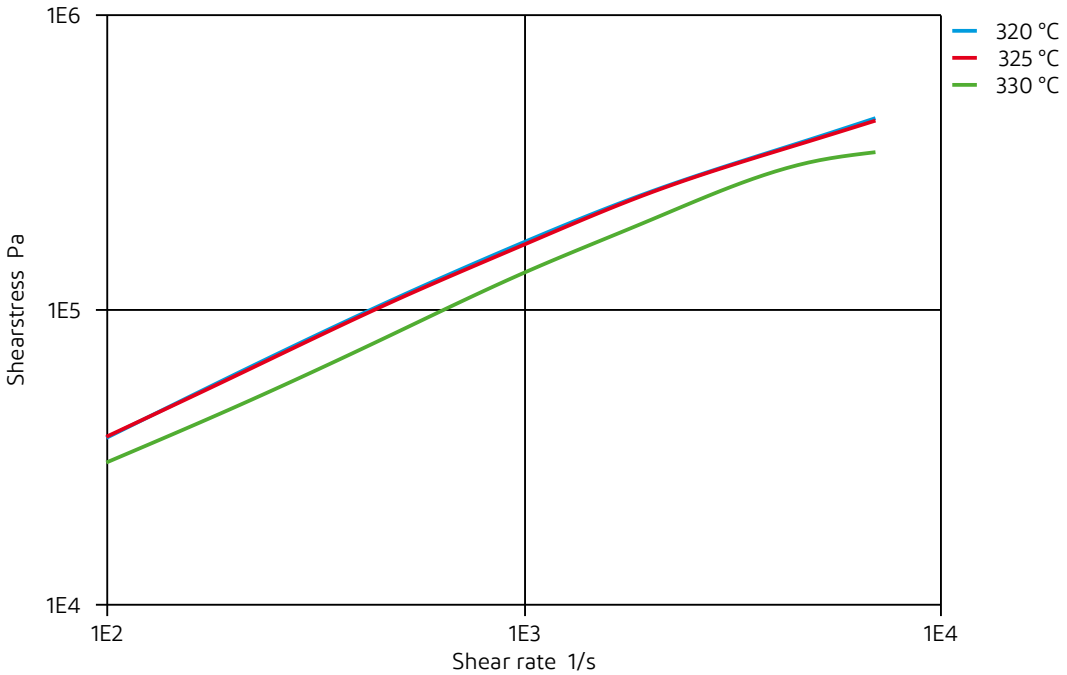
Shearstress-shear rate



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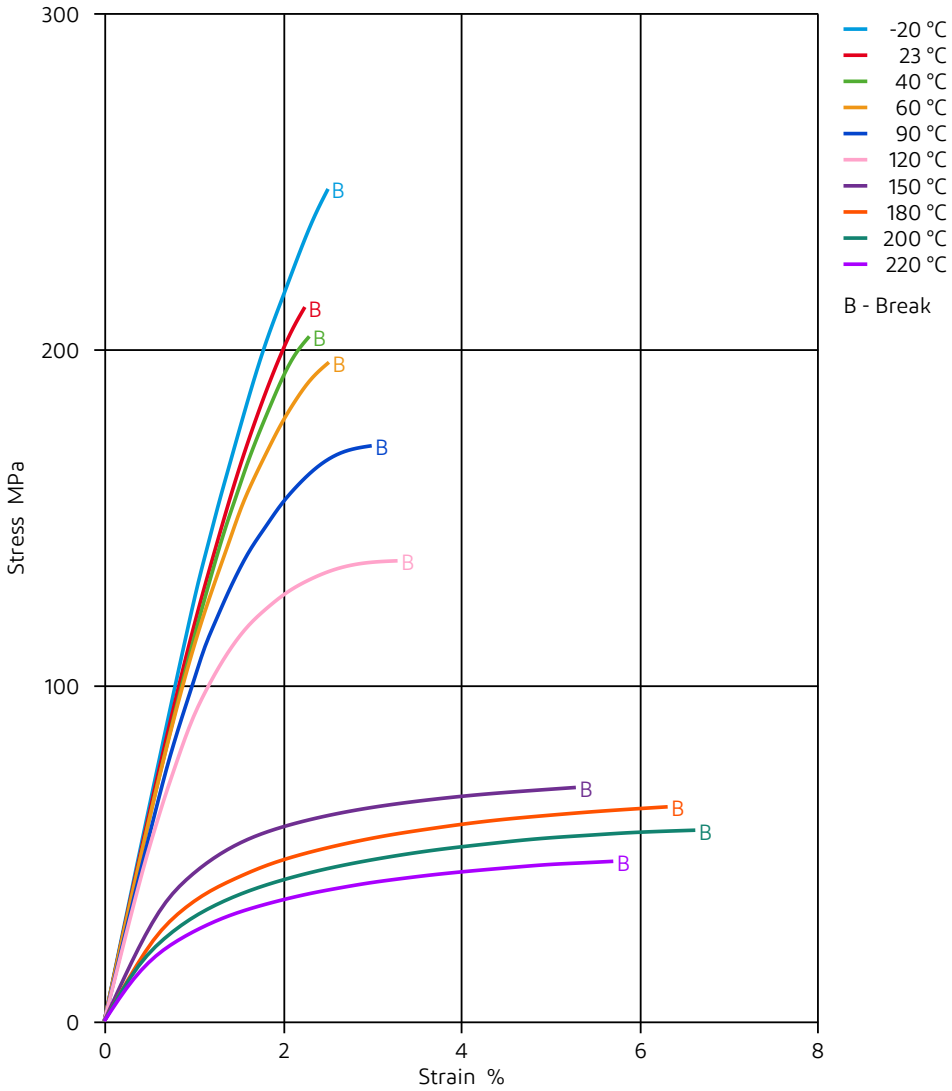
Stress-strain (dry)



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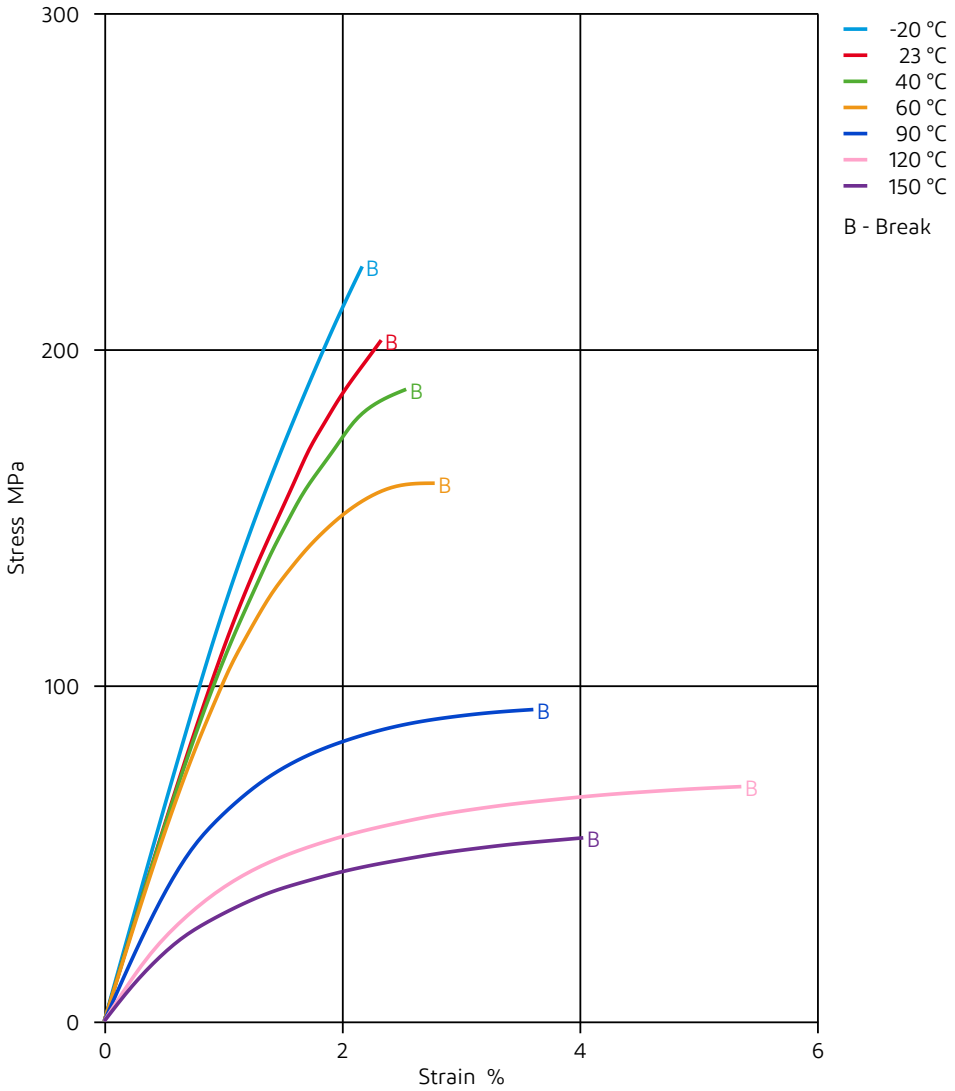
Stress-strain (cond.)



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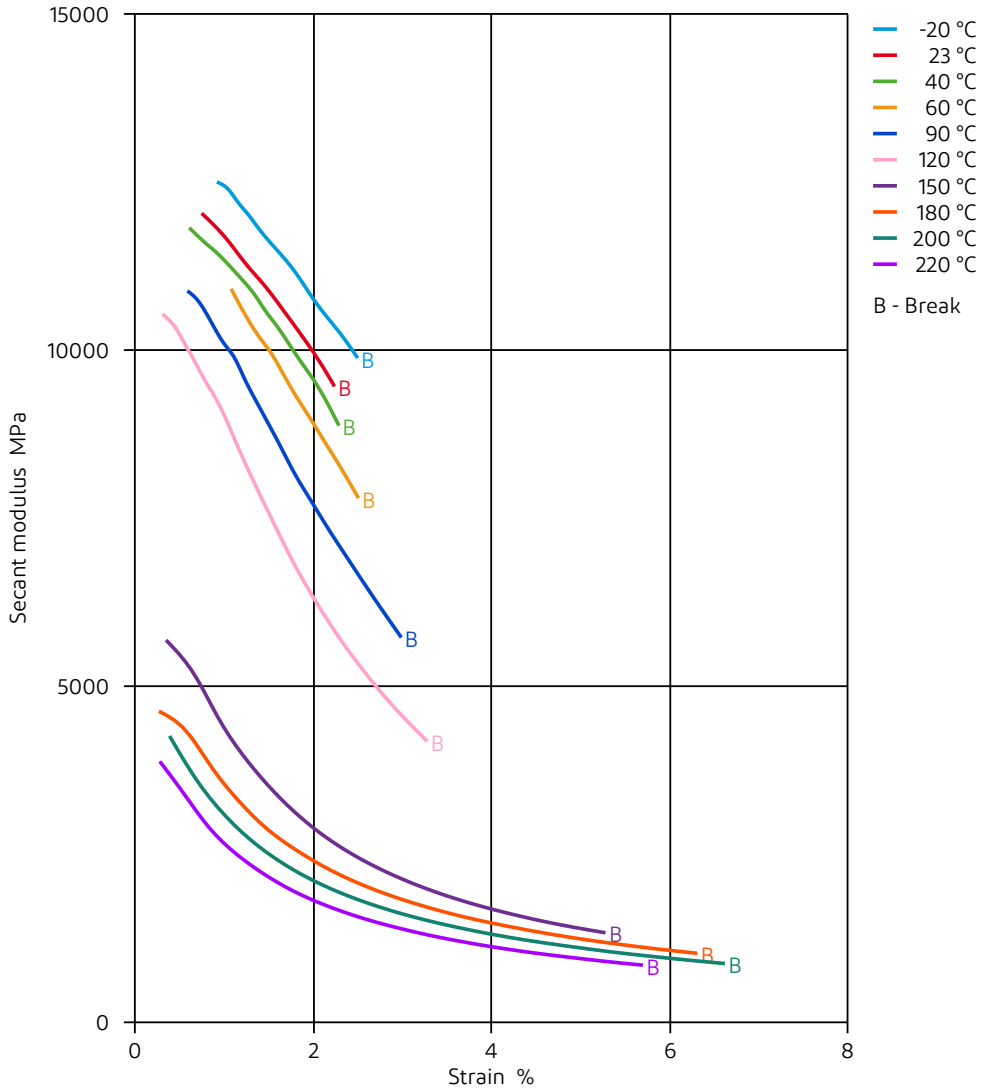
Secant modulus-strain (dry)



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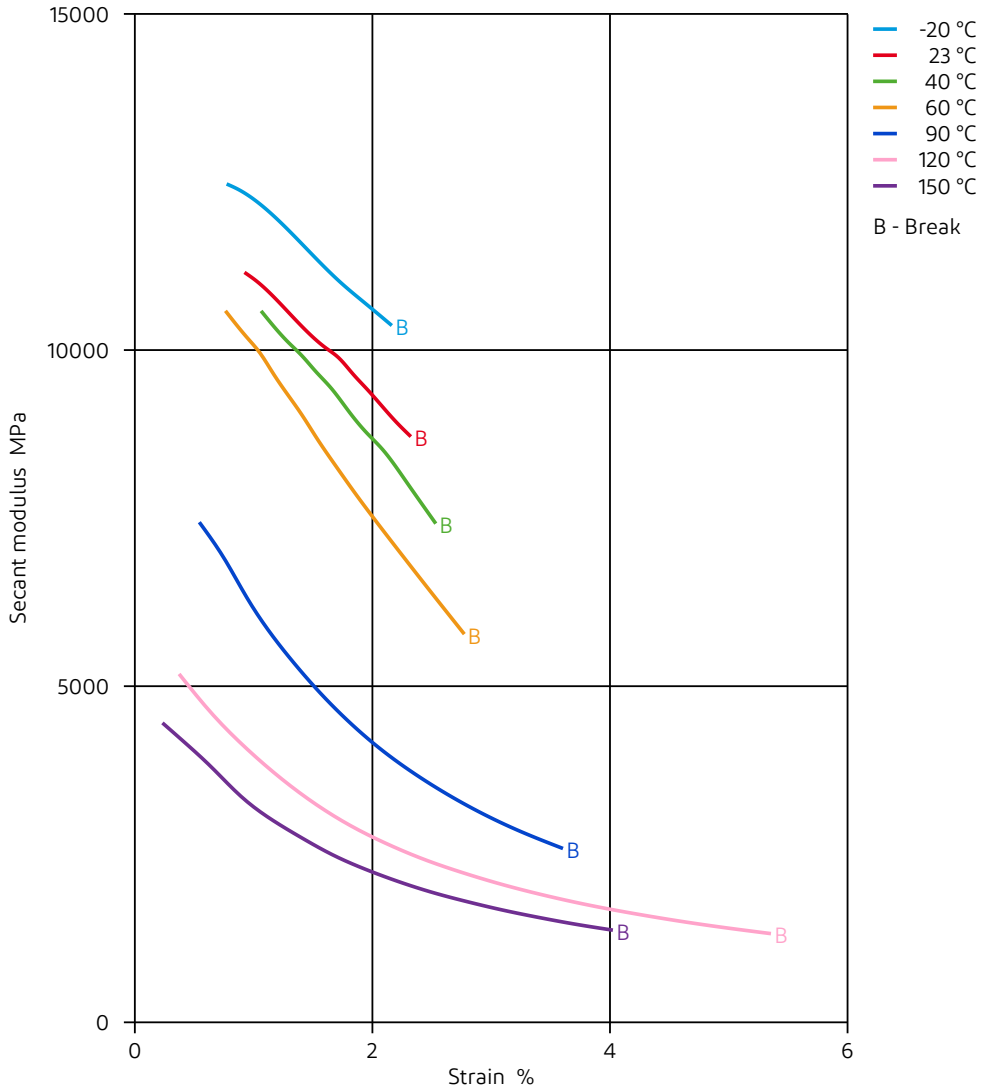
Secant modulus-strain (cond.)



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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

Mineral oils

- ✔ SAE 10W40 multigrade motor oil, 23°C
- ✔ Insulating Oil, 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).