Zytel® 77G33L 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® 77G33L NC010 is a 33% glass fiber reinforced polyamide 612 resin for injection moulding.

Product information

Resin Identification	PA612-GF33	ISO 1043
Part Marking Code	>PA612-GF33<	ISO 11469
ISO designation	ISO 16396-PA612,GF33,M1GNR,S10-090	

Rheological properties

	dry/cond.		
Viscosity number	100 / *	cm^3/g	ISO 307, 1628
Moulding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.9 / -	%	ISO 294-4, 2577
Mold Shrinkage, Flow, 3.2mm (0.125in)	0.2 / *	%	
Mold Shrinkage, Transverse, 3.2mm (0.125in)	1 / *	%	

Typical mechanical properties

	dry/cond.		
Tensile modulus	9500 / 7900	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	170 / 140	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2 / 3.2	%	ISO 527-1/-2
Flexural modulus	8500 / 7000	MPa	ISO 178
Flexural strength	260 / -	MPa	ISO 178
Compressive strength	160 / -	MPa	ISO 604
Charpy impact strength, 23°C	80 / 90	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30°C	60 / 65	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	13 / 12	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -30°C	12 / 10	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -40°C	11 / 10	kJ/m^2	ISO 179/1eA
Izod notched impact strength, 23°C	13 / 12	kJ/m^2	ISO 180/1A
Izod notched impact strength, -30°C	11.0 / 10.0	kJ/m^2	ISO 180/1A
Izod notched impact strength, -40°C	11.0 / 10.0	kJ/m^2	ISO 180/1A
Izod impact strength, 23°C	70 / 60	kJ/m^2	ISO 180/1U
Izod impact strength, -30°C	60 / 45	kJ/m^2	ISO 180/1U
Poisson's ratio	0.34 / 0.34		

Tribological properties

	dry/cond.	
Coefficient of static friction, against steel	- / 0.28	ISO 8295
Coefficient of sliding friction, 1h against steel	- / 0.34	ASTM 1894

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Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	218 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	65 / 55	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	200 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	216 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23°C	26 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	20 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	14 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	83 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	110 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	160 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity, flow	0.42	W/(m K)	ISO 22007-2
Thermal conductivity of melt	0.26	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	7.5E-8	m²/s	ISO 22007-4
Specific heat capacity of melt	2130	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	105	°C	UL 746B
RTI, electrical, 1.5mm	120	°C	UL 746B
RTI, electrical, 3.0mm	120	°C	UL 746B
RTI, strength, 1.5mm	120 / *	°C	UL 746B
RTI, strength, 3.0mm	120	°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	0.7 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Oxygen index	23 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.75mm	675 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	675 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	700 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	700 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	700 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725 / -	°C	IEC 60695-2-13
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	23	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.1 / -		IEC 62631-2-1
Relative permittivity, 1MHz	3.7 / -		IEC 62631-2-1
Dissipation factor, 100Hz	135 / -	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	200 / -	E-4	IEC 62631-2-1
Volume resistivity	1E13 / 1E10	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E12	Ohm	IEC 62631-3-2
Electric strength	33 / 30	kV/mm	IEC 60243-1

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Comparative tracking index	600 / -		IEC 60112
Electric Strength, Short Time, 2mm	27 / -	kV/mm	IEC 60243-1

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	0.7 / *	%	Sim. to ISO 62
Water absorption, 2mm	1.8 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.3 / *	%	Sim. to ISO 62
Density	1320 / -	kg/m³	ISO 1183

VDA Properties

	dry/cond.		
Fogging, G-value (condensate)	0.1 / *	mg	ISO 6452

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	290	°C
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	90	°C
Min. mould temperature	65	°C
Max. mould temperature	120	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm
Ejection temperature	189	°C

Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Bosch	N28 BN05-OX020	
Stellantis - Chrysler	MS.50017 / CPN-4765	Natural

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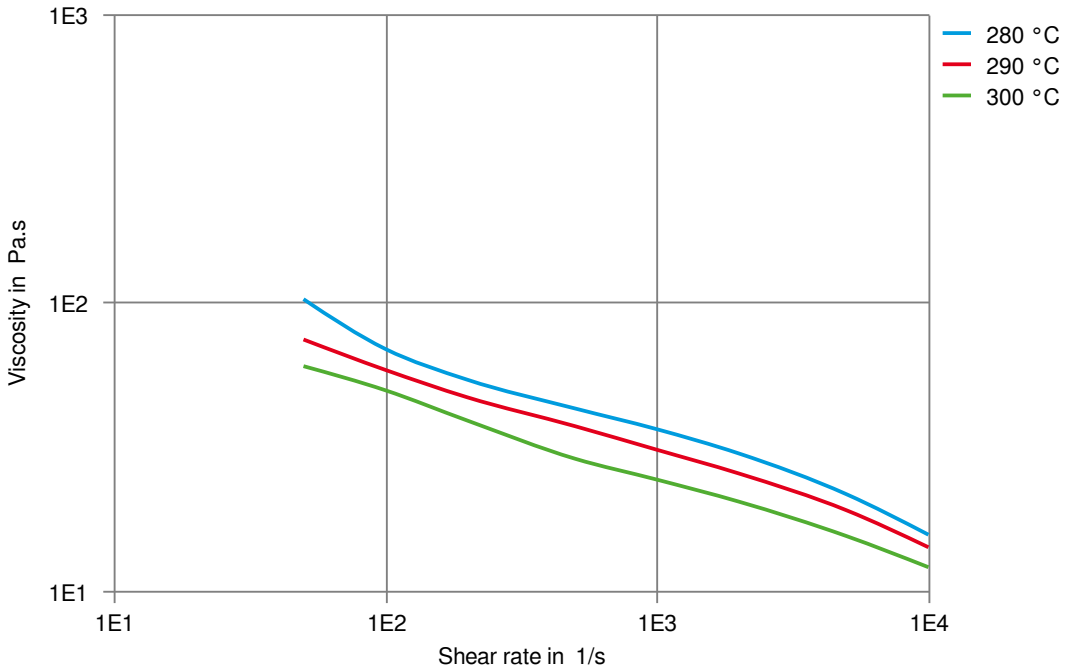
Viscosity-shear rate



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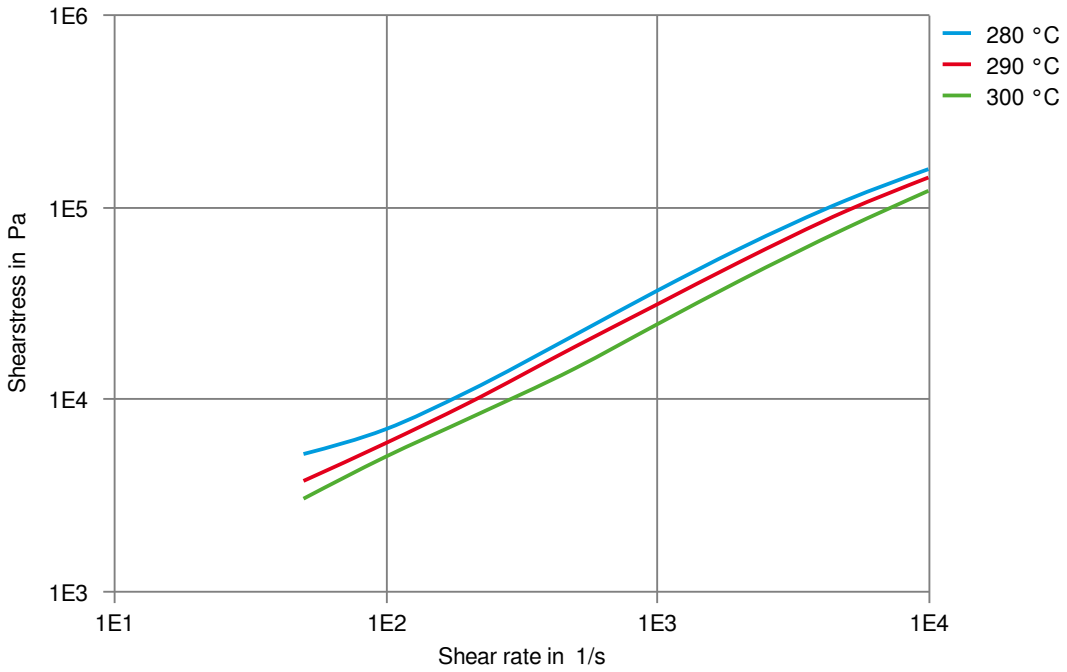
Shearstress-shear rate



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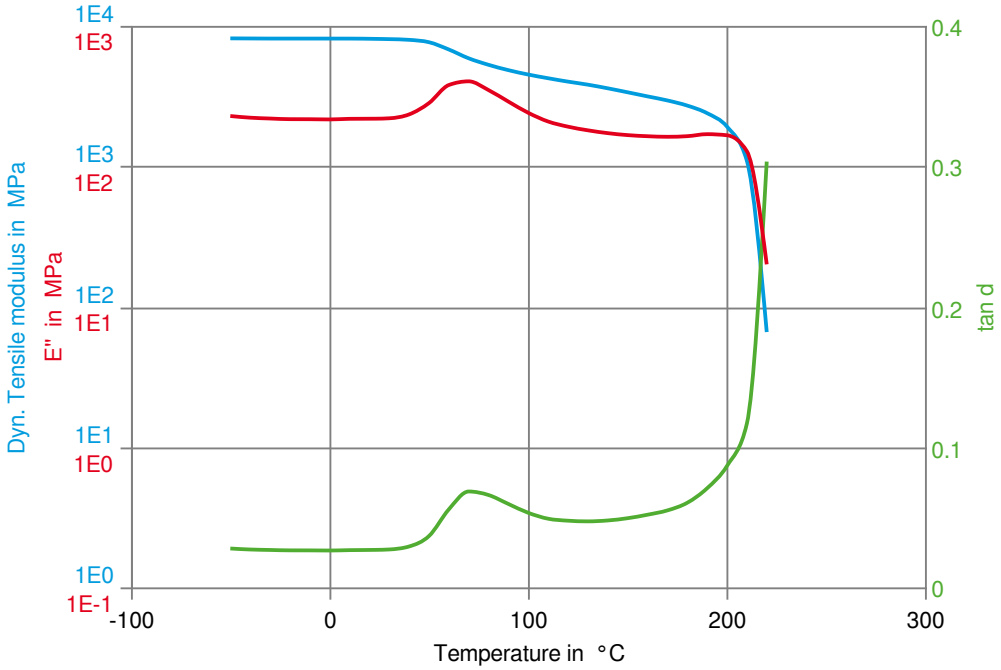
Dynamic Tensile modulus-temperature (dry)



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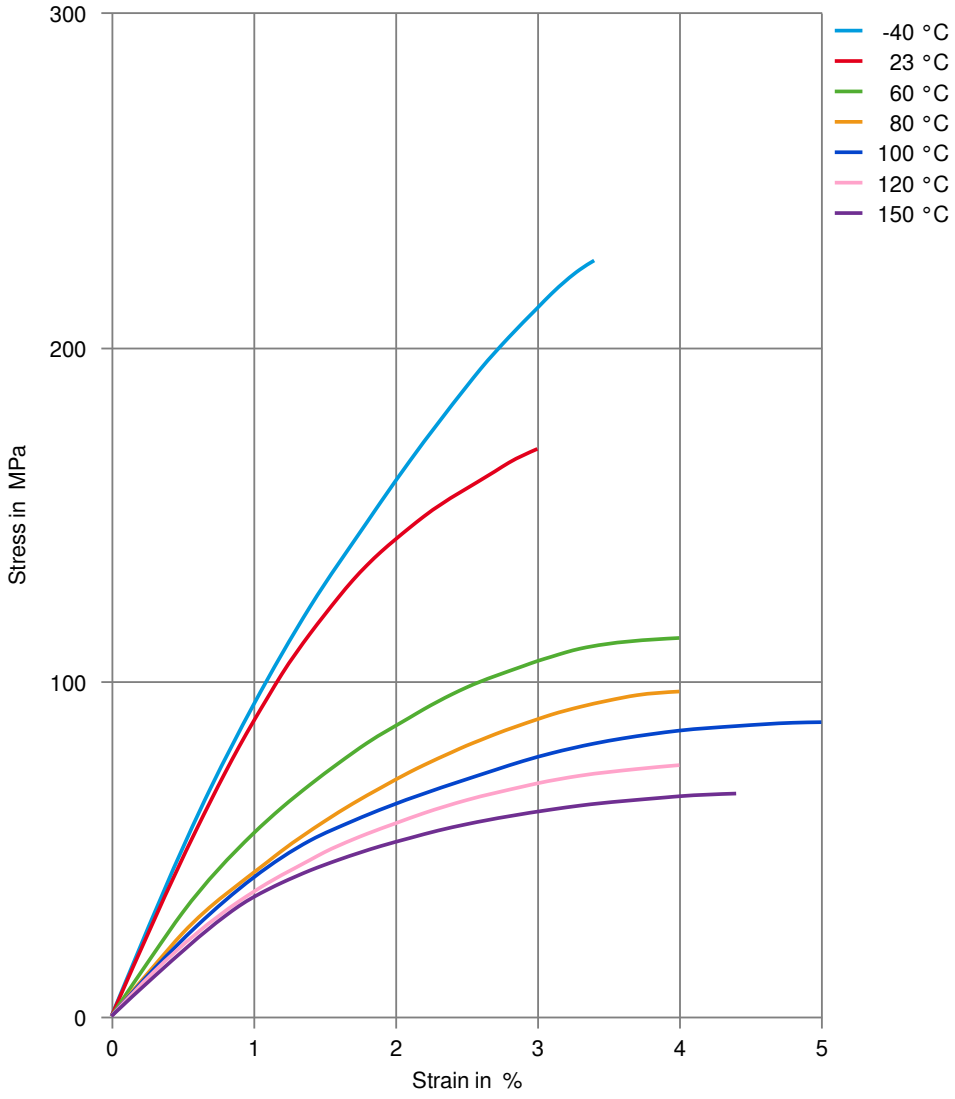
Stress-strain (dry)



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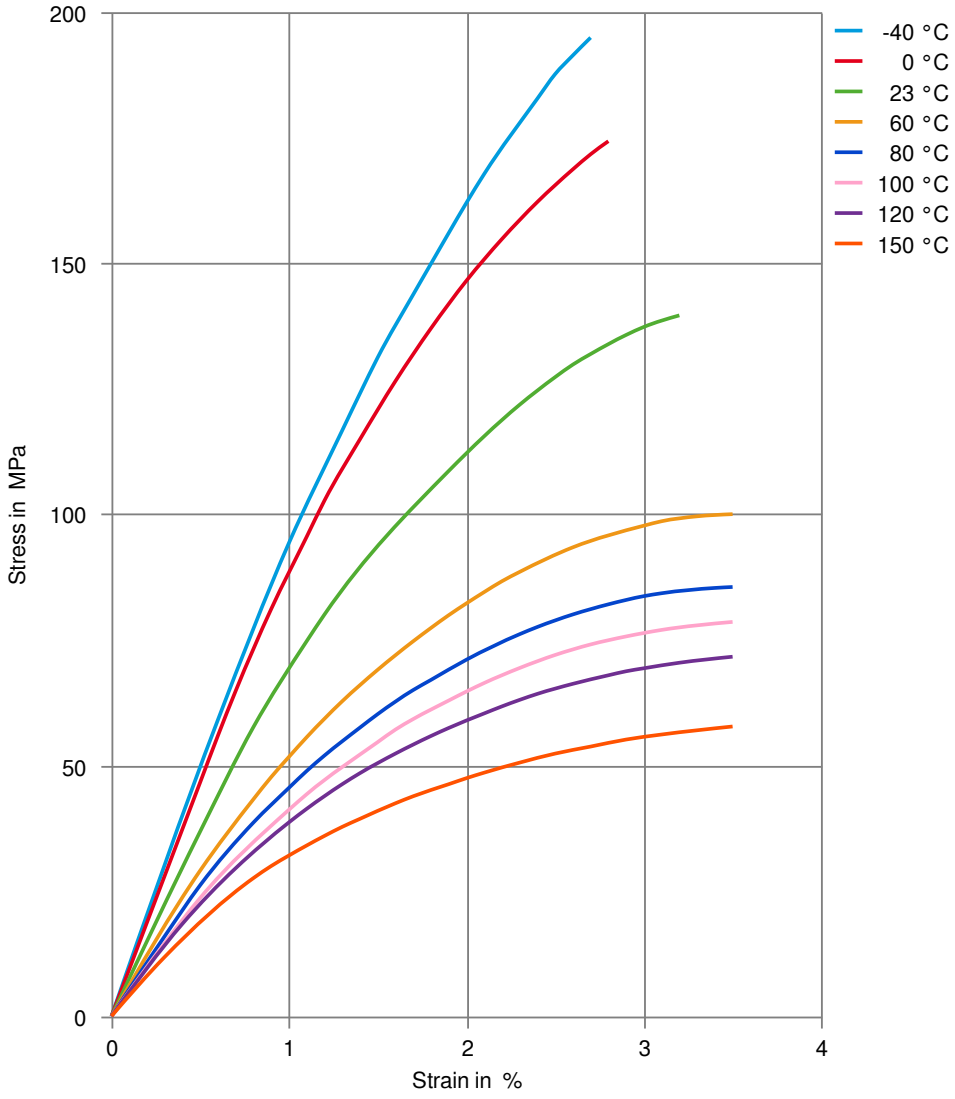
Stress-strain (cond.)



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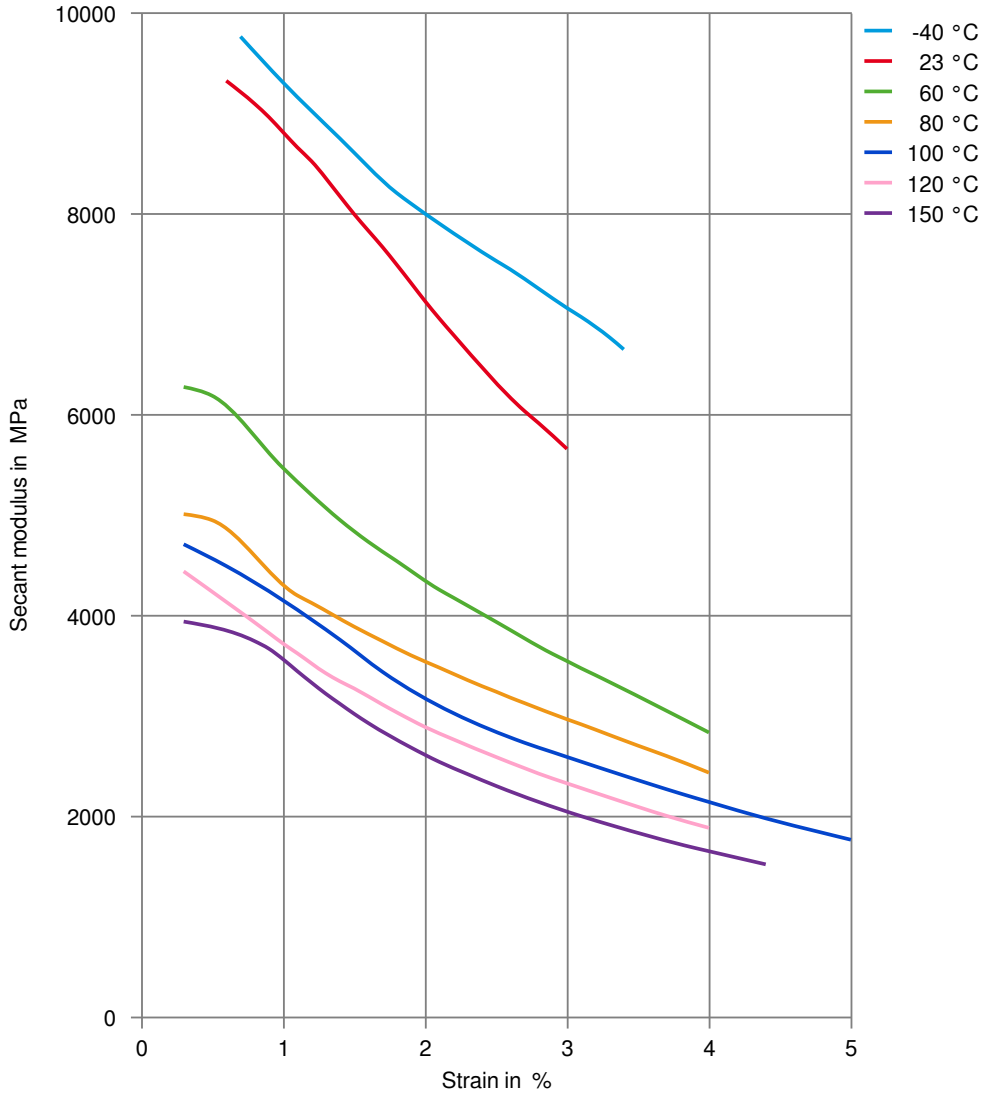
Secant modulus-strain (dry)



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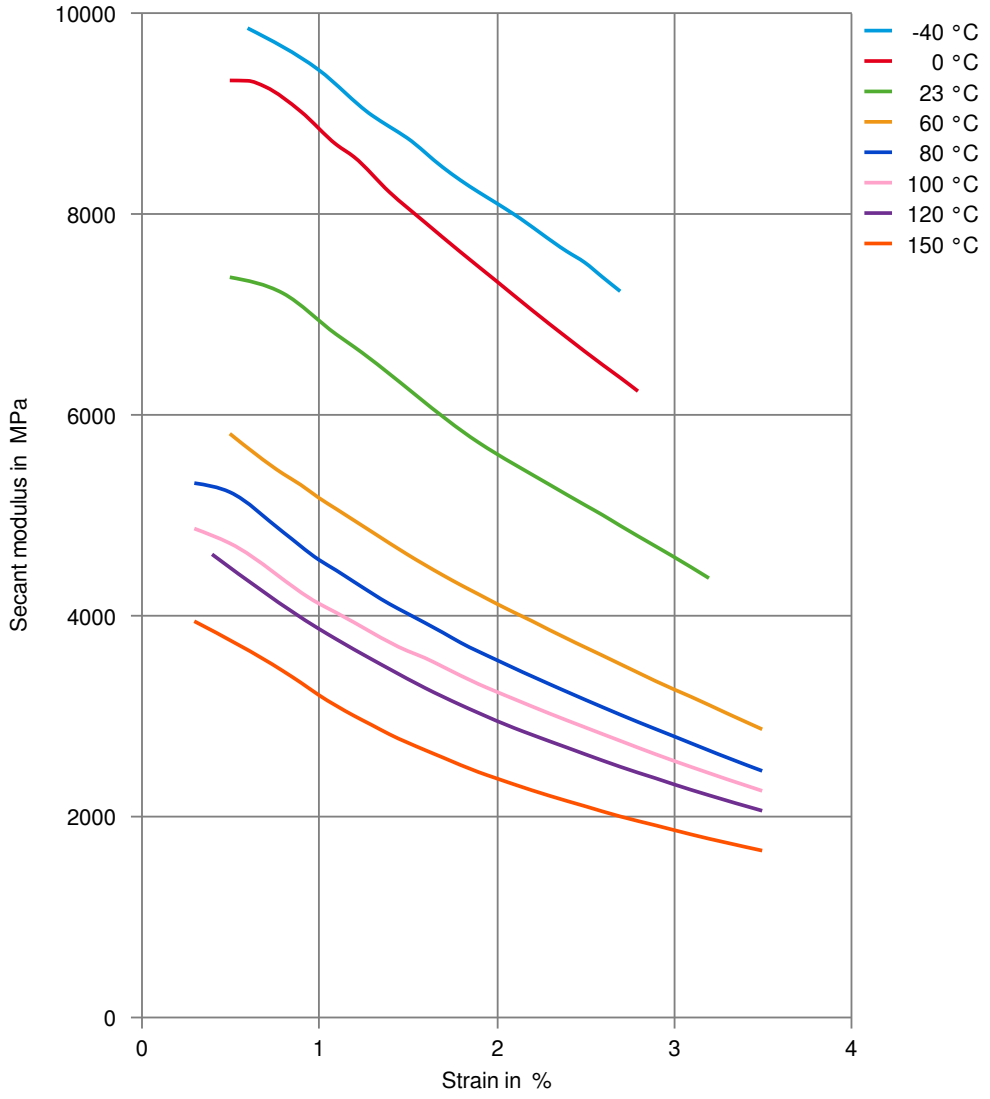
Secant modulus-strain (cond.)



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