

# Zytel® 77G33EFT BK276

## 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® 77G33EFT BK276 is a 33% glass fiber reinforced, heat stabilized and toughened polyamide 612 resin developed for electrical bobbins and encapsulation applications.

### Product information

Resin Identification	PA612-I-GF33	ISO 1043
Part Marking Code	>PA612-I-GF33<	ISO 11469

### Rheological properties

	dry/cond.		
Viscosity number	96 <sup>[1]</sup> *	cm <sup>3</sup> /g	ISO 307, 1628
Moulding shrinkage, parallel	0.2 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577
[1]: sulphuric acid 96%			

### Typical mechanical properties

	dry/cond.		
Tensile modulus	9600 / 8500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	165 / 143	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3 / 3.5	%	ISO 527-1/-2
Flexural modulus	8900 / 7200	MPa	ISO 178
Charpy impact strength, 23°C	88 / 81	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	18 / 17	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -40°C	14 / 14	kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.34 / 0.34		

### Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	218 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	70 / 55	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	203 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	215 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23°C	23 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	23 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	18 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	93 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	130 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	150 / *	E-6/K	ISO 11359-1/-2

### Flammability

FMVSS Class	SE / B	ISO 3795 (FMVSS 302)
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### Electrical properties

	dry/cond.		
Volume resistivity	1E13 / 1E13	Ohm.m	IEC 62631-3-1
Electric strength	41 / 41	kV/mm	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112

### Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	0.8 / *	%	Sim. to ISO 62
Water absorption, 2mm	1.7 / *	%	Sim. to ISO 62
Density	1300 / -	kg/m <sup>3</sup>	ISO 1183

### 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	100 °C
Min. mould temperature	70 °C
Max. mould temperature	120 °C
Hold pressure range	50 - 100 MPa
Hold pressure time	3 s/mm
Ejection temperature	179 °C

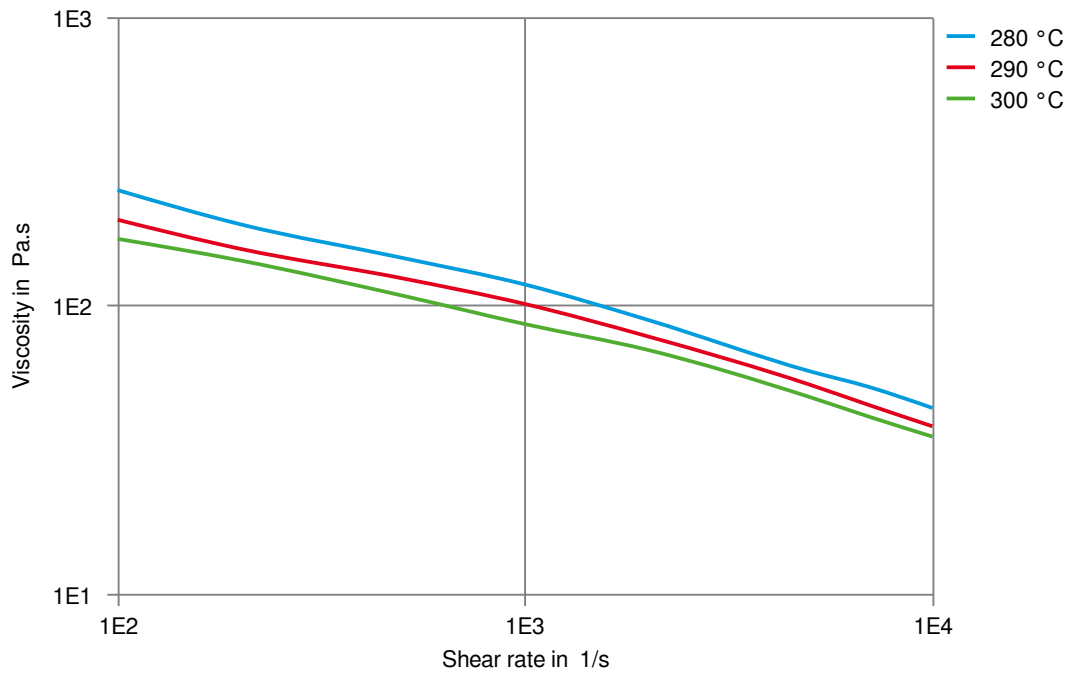
### Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Low halide content

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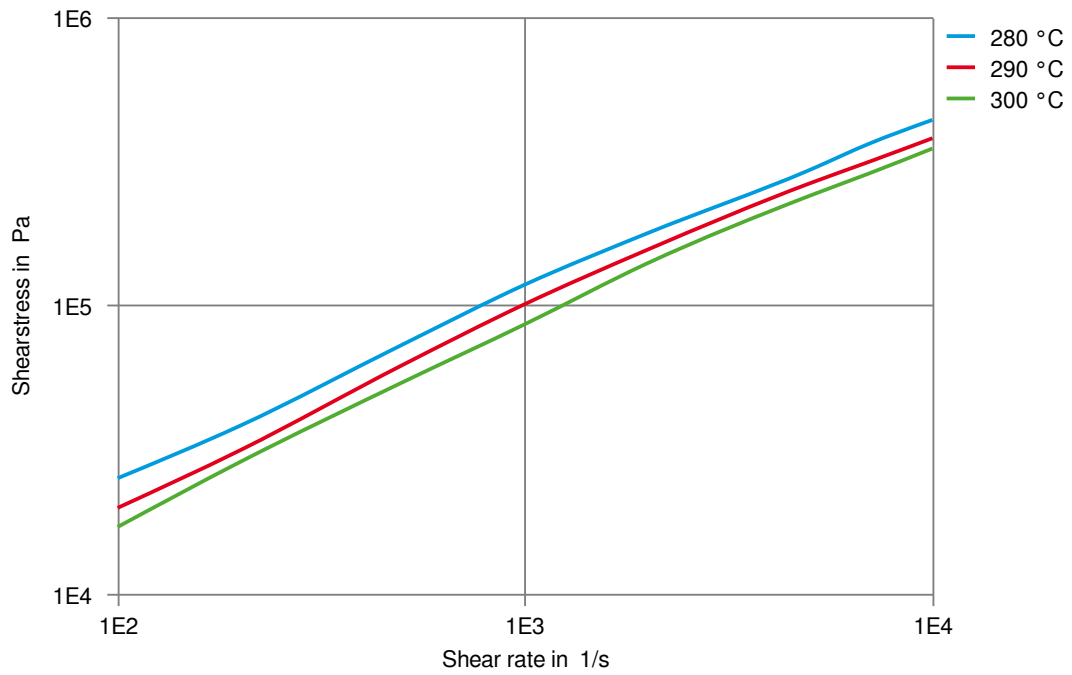
Viscosity-shear rate



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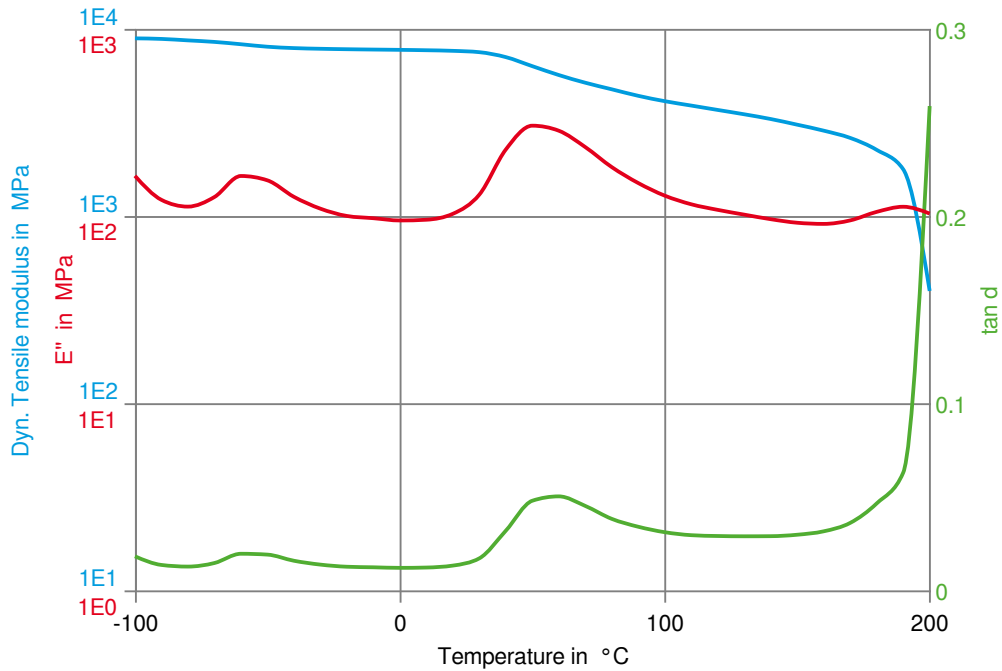
Shearstress-shear rate



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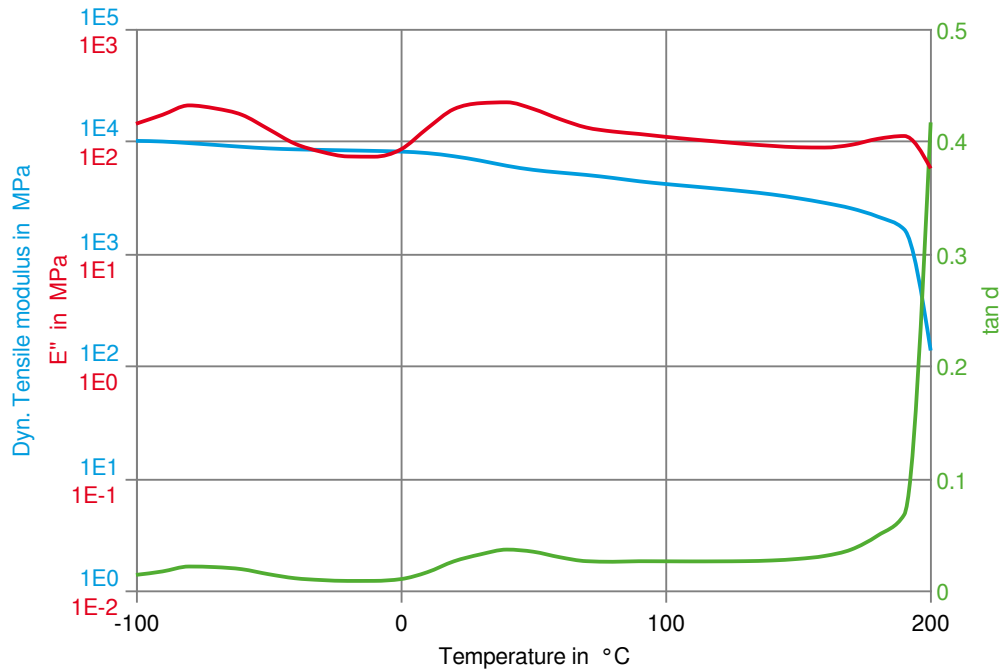
Dynamic Tensile modulus-temperature (dry)



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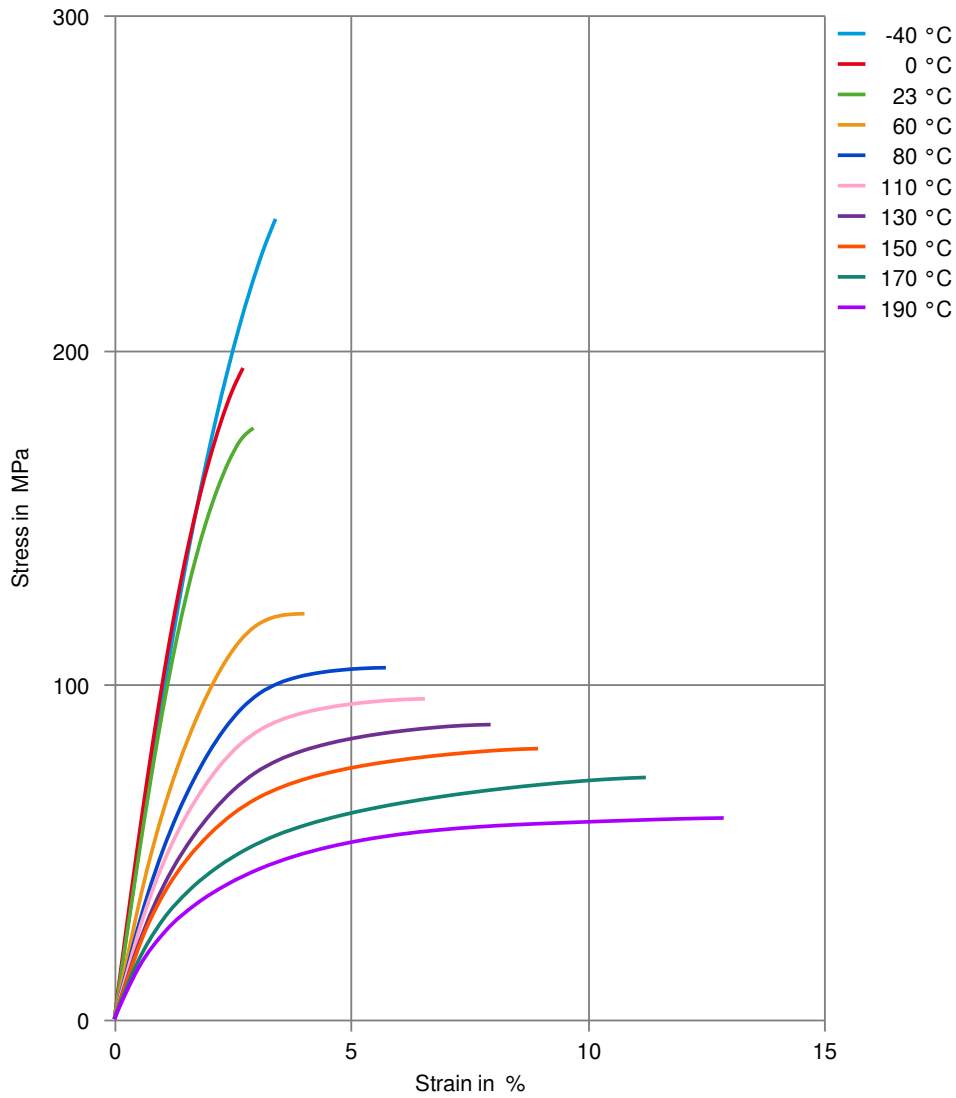
Dynamic Tensile modulus-temperature (cond.)



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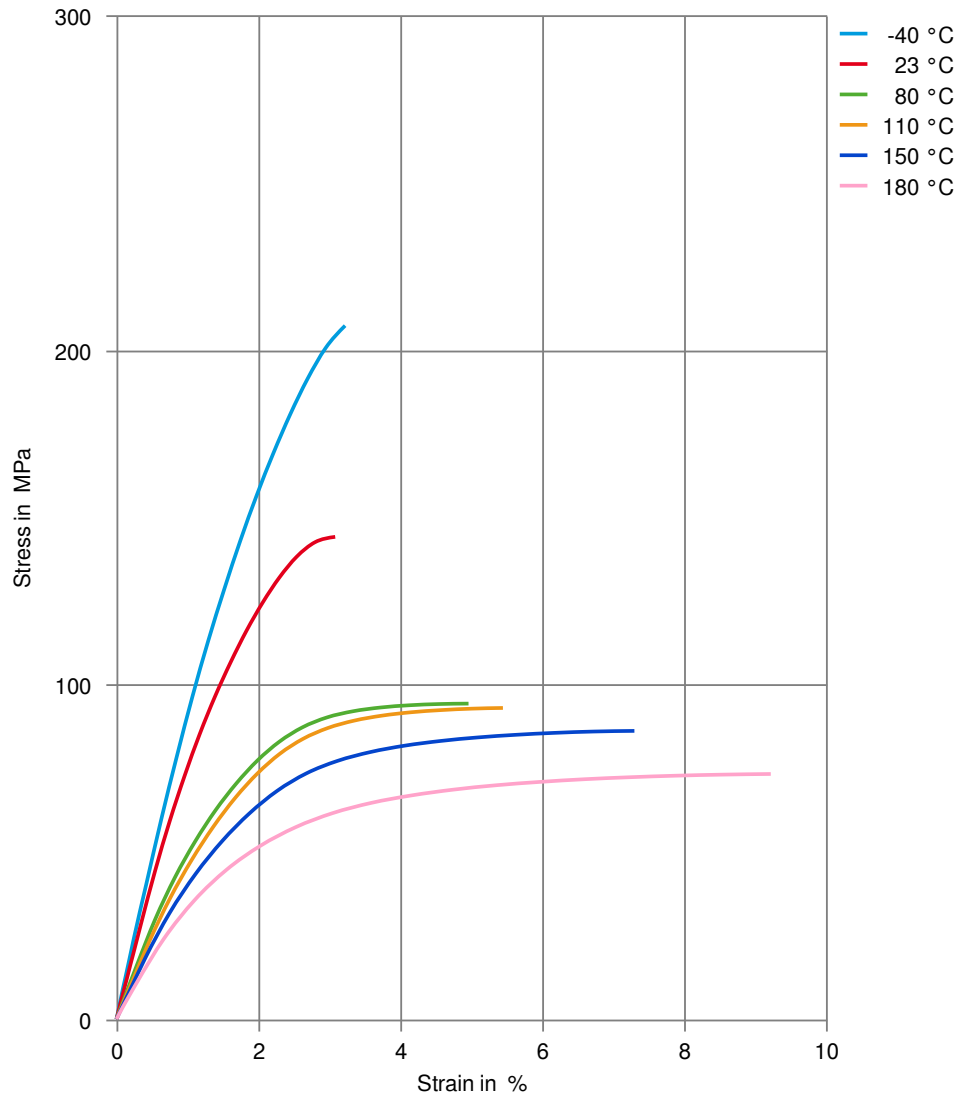
## Stress-strain (dry)



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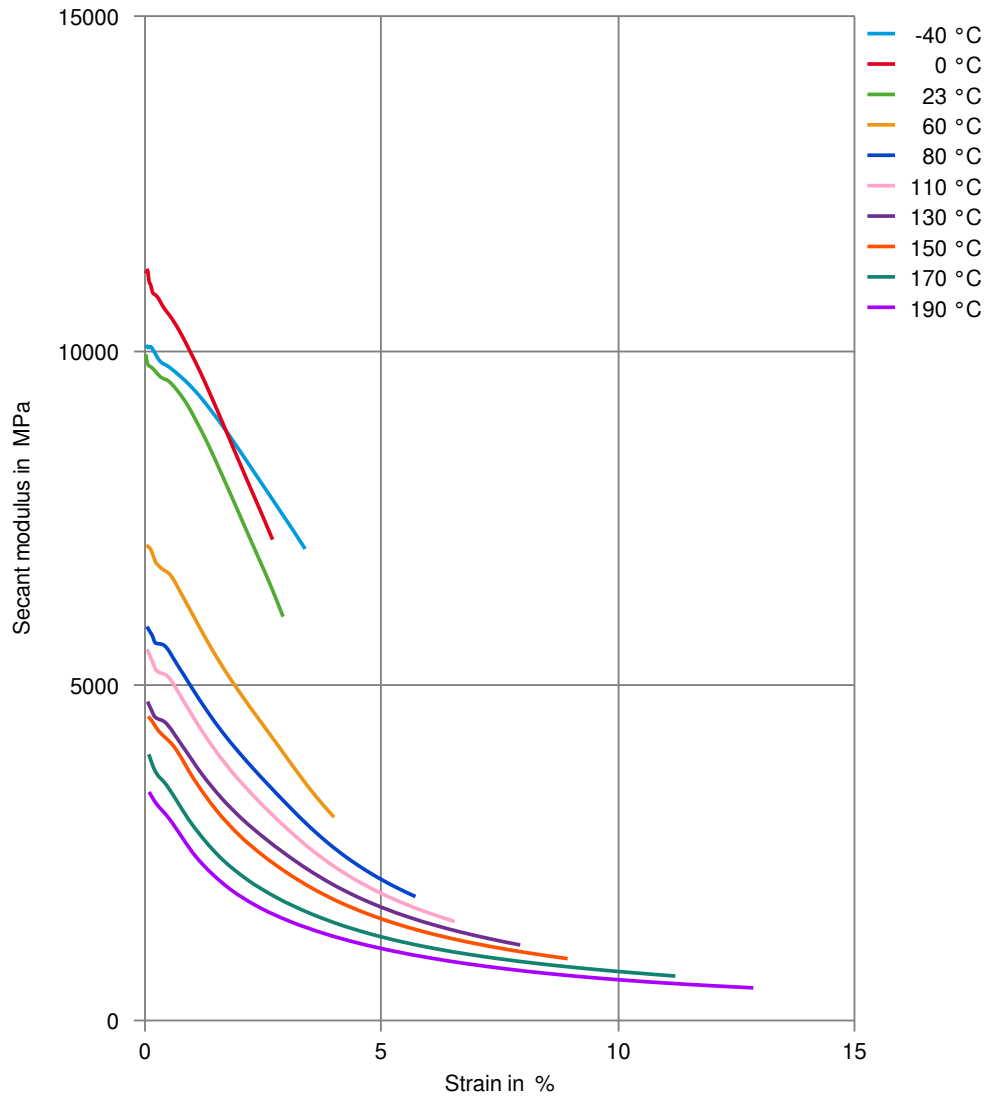
## Stress-strain (cond.)



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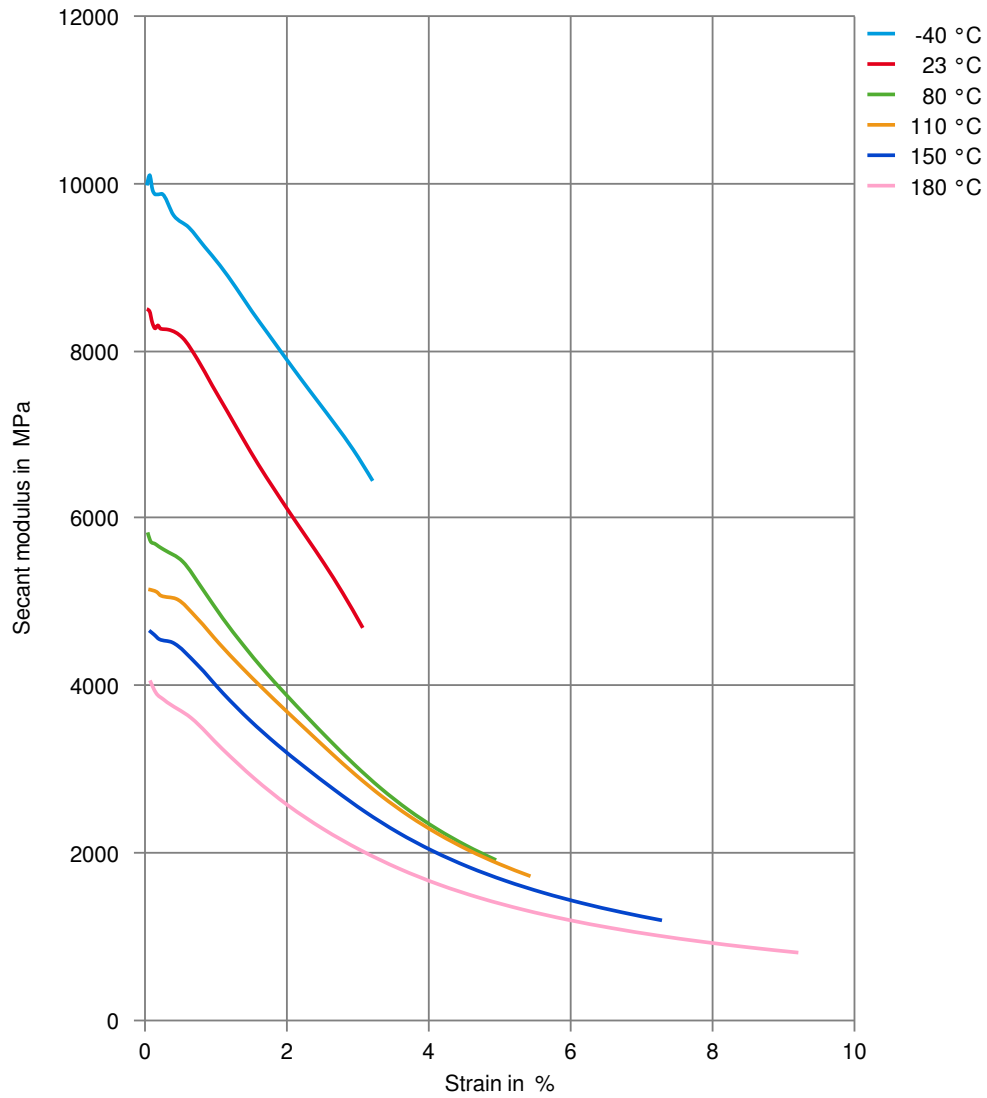
Secant modulus-strain (dry)



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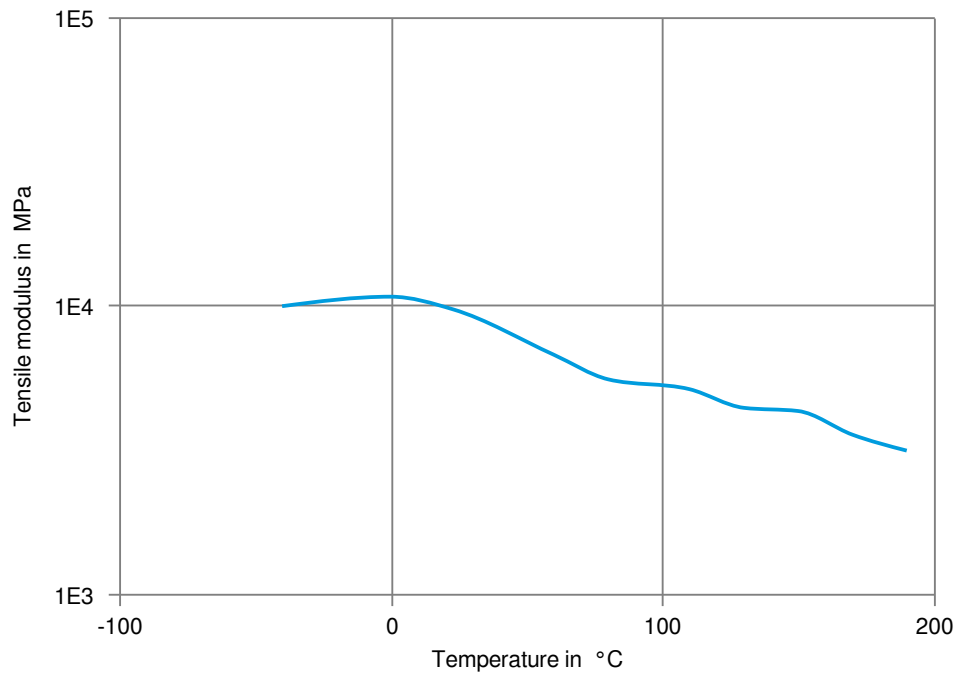
Secant modulus-strain (cond.)



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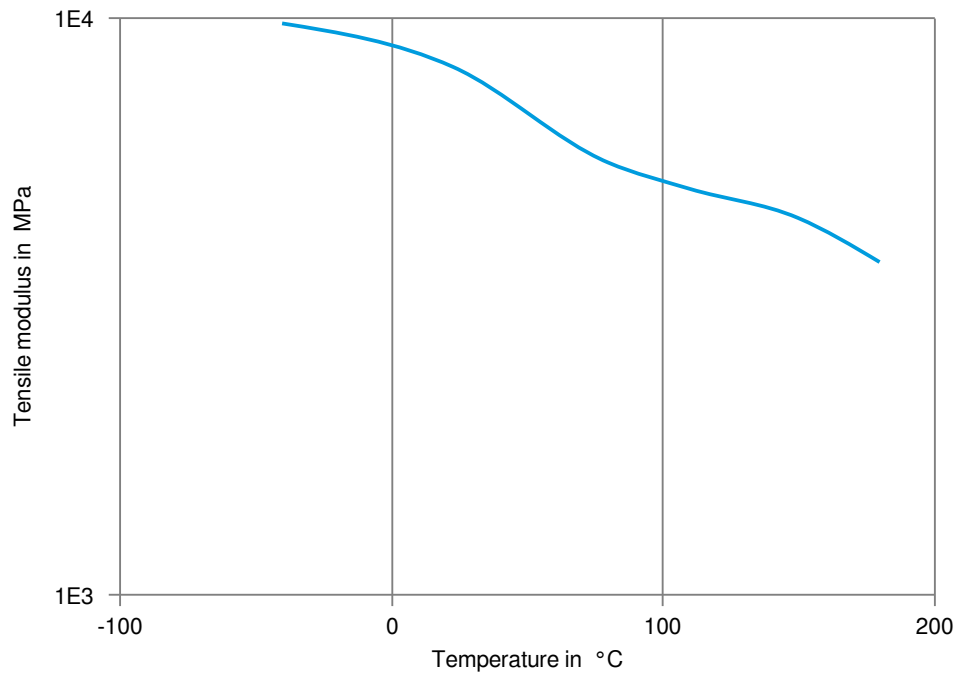
Tensile modulus-temperature (dry)



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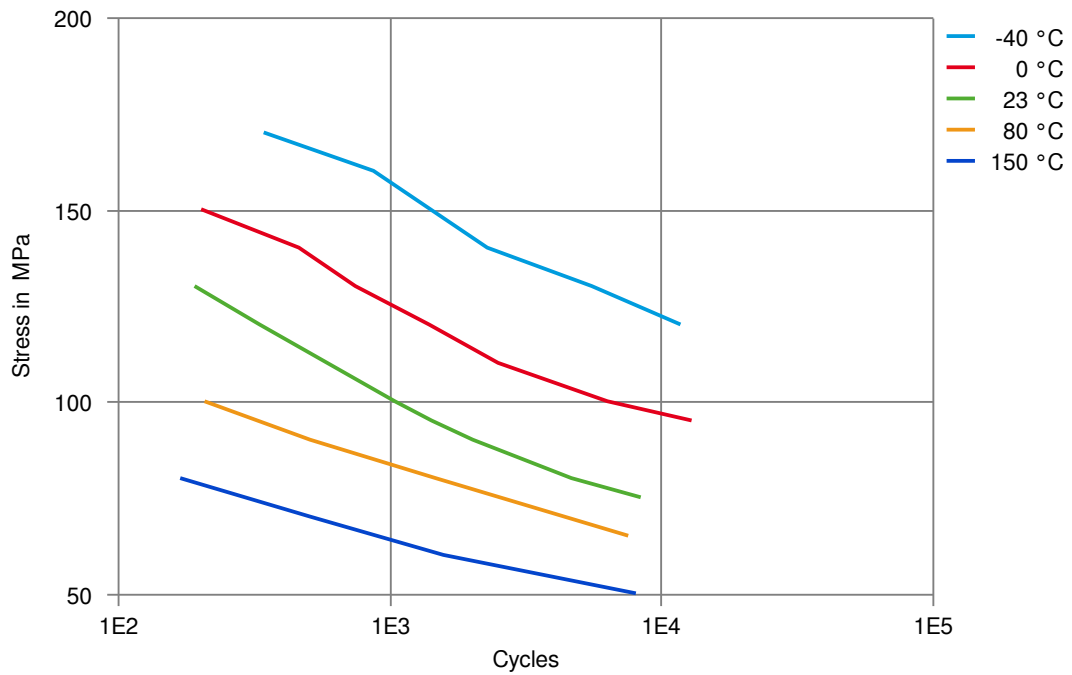
Tensile modulus-temperature (cond.)



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Tensile Fatigue, 10Hz, R=0.1 @ 0mm (cond.)



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### Mineral oils

#### Mineral oils

- ✓ SAE 10W40 multigrade motor oil, 130 °C

#### Other

- ✓ Ethylene Glycol (50% by mass) in water, 108 °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).