Celanese
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Zytel® 80G33HS1L NC010

NYLON RESIN

Common features of Zytel® nylon resin include mechanical and physical properties such as high mechanical strength, excellent balance of stiffness and toughness, good high temperature performance, good electrical and flammability properties, good abrasion and chemical resistance. In addition, Zytel® nylon resins are available in different modified and reinforced grades to create a wide range of products with tailored properties for specific processes and end-uses. Zytel® nylon resin, including most flame retardant grades, offer the ability to be coloured.

The good melt stability of Zytel® nylon resin normally enables the recycling of properly handled production waste. If recycling is not possible, we recommend, as the preferred option, incineration with energy recovery (-31kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Zytel® nylon resin typically is used in demanding applications in the automotive, furniture, domestic appliances, sporting goods and construction industry.

Zytel® 80G33HS1L NC010 is a 33% glass fiber reinforced heat stabilized polyamide 66 resin with outstanding impact resistance developed using our Super Tough technology.

Product information

Resin Identification	PA66-IGF33	ISO 1043
Part Marking Code	>PA66-IGF33<	ISO 11469
ISO designation	ISO 16396-PA66-I,GF33,M1GHNR,S14-090	

Rheological properties

	dry/cond.		
Viscosity number	144[1]/*	cm³/g	ISO 307, 1628
Moulding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.7 / -	%	ISO 294-4, 2577

[1]: sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	8900 / 6200	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	146 / 108	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.7 / 7	%	ISO 527-1/-2
Flexural modulus	7500 / 6200	MPa	ISO 178
Flexural strength	200 / -	MPa	ISO 178
Tensile creep modulus, 1h	* / 5300	MPa	ISO 899-1
Tensile creep modulus, 1000h	* / 4300	MPa	ISO 899-1
Charpy impact strength, 23°C	97 / 98	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	106 / 100	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	20 / 28	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	18 / 17	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	14 / 18	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	21 / 26	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	17.0 / 16.0	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	15.0 / 15.0	kJ/m²	ISO 180/1A
Izod impact strength, 23°C	80 / 80	kJ/m²	ISO 180/1U
Izod impact strength, -30°C	80 / 75	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	70 / -		ISO 2039-2
Hardness, Rockwell, R-scale	110 / -		ISO 2039-2
Ball indentation hardness, H 961/30	220 / -	MPa	ISO 2039-1
Poisson's ratio	0.34 / 0.35		

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Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	75 / 20	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	246 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	261 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h 50N	245 / *	°C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	15 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	120 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.22	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	9E-8	m^2/s	ISO 22007-4
Specific heat capacity of melt	2200	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	130	°C	UL 746B
RTI, electrical, 1.5mm	130	°C	UL 746B
RTI, electrical, 3.0mm	130	°C	UL 746B
RTI, impact, 0.75mm	65	°C	UL 746B
RTI, impact, 1.5mm	105	°C	UL 746B
RTI, impact, 3.0mm	105	°C	UL 746B
RTI, strength, 0.75mm	85	°C	UL 746B
RTI, strength, 1.5mm	95 / *	°C	UL 746B
RTI, strength, 3.0mm	105	°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[2] / *		UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.75 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Glow Wire Flammability Index, 1.0mm	650 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	700 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	900 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	700 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	700 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	750 / -	°C	IEC 60695-2-13
FMVSS Class	SE		ISO 3795 (FMVSS 302)

[2]: UL yellow card with (f1)

Electrical properties

	dry/cond.		
Relative permittivity, 1MHz	3.6 / 4.3		IEC 62631-2-1
Dissipation factor, 1MHz	130 / 600	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 1E9	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E12	Ohm	IEC 62631-3-2
Comparative tracking index	- / 425		IEC 60112

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Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.5 / *	%	Sim. to ISO 62
Water absorption, 2mm	4.5 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.85 / *	%	Sim. to ISO 62
Density	1330 / -	kg/m³	ISO 1183
Density of melt	1120	kg/m³	

VDA Properties

	dry/cond.		
Emission of organic compounds	25	µgC/g	VDA 277
Odour	3	class	VDA 270
Fogging, G-value (condensate)	0.8 / *	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	295	°C
Min. melt temperature	280	°C
Max. melt temperature	310	°C
Screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	70	°C
Min. mould temperature	40	°C
Max. mould temperature	90	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm
Ejection temperature	190	°C

Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	High impact or impact modified, Heat stabilised or stable to heat

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Ford	WSS-M4D703-B1	
General Motors	GMW17263P-PA66-GF35	Natural
VW Group	VW 50127 PA66-011	

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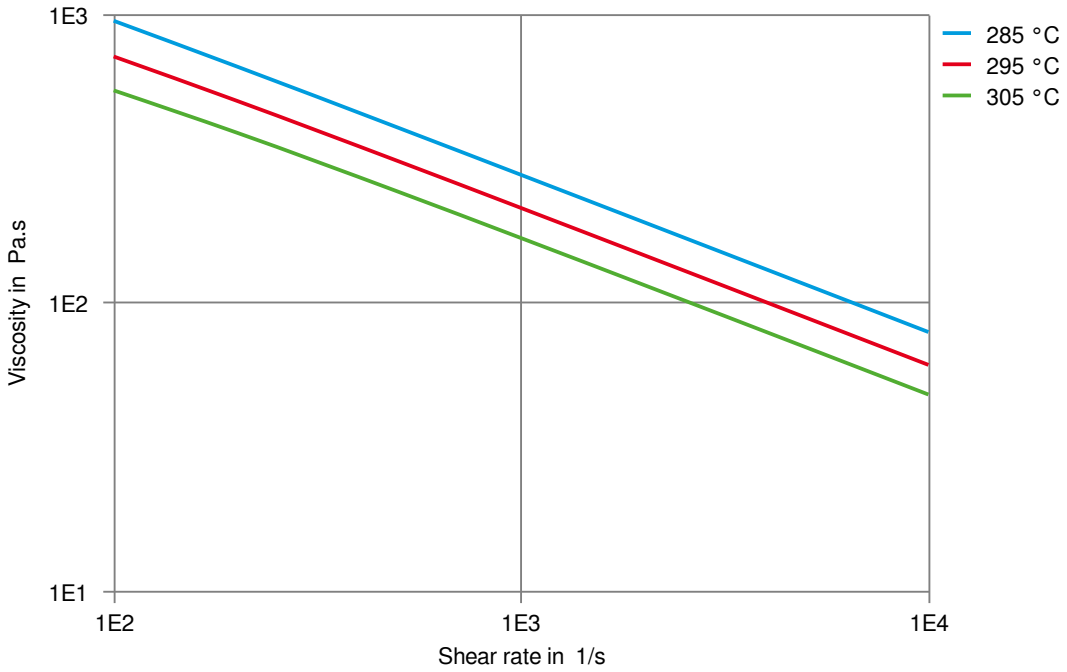
Viscosity-shear rate



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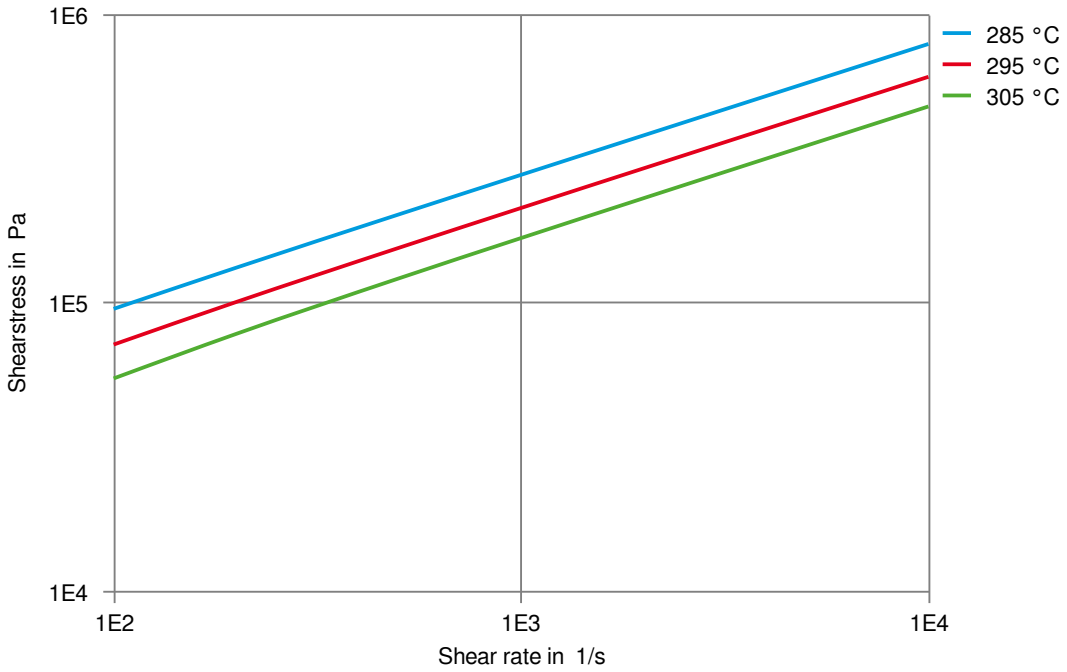
Shearstress-shear rate



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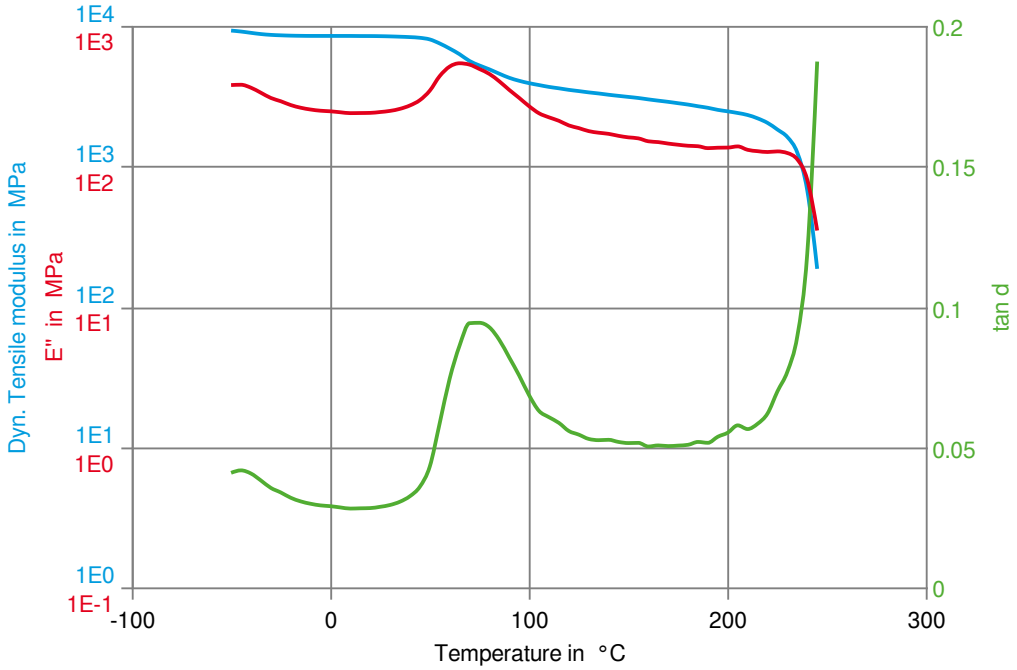
Dynamic Tensile modulus-temperature (dry)



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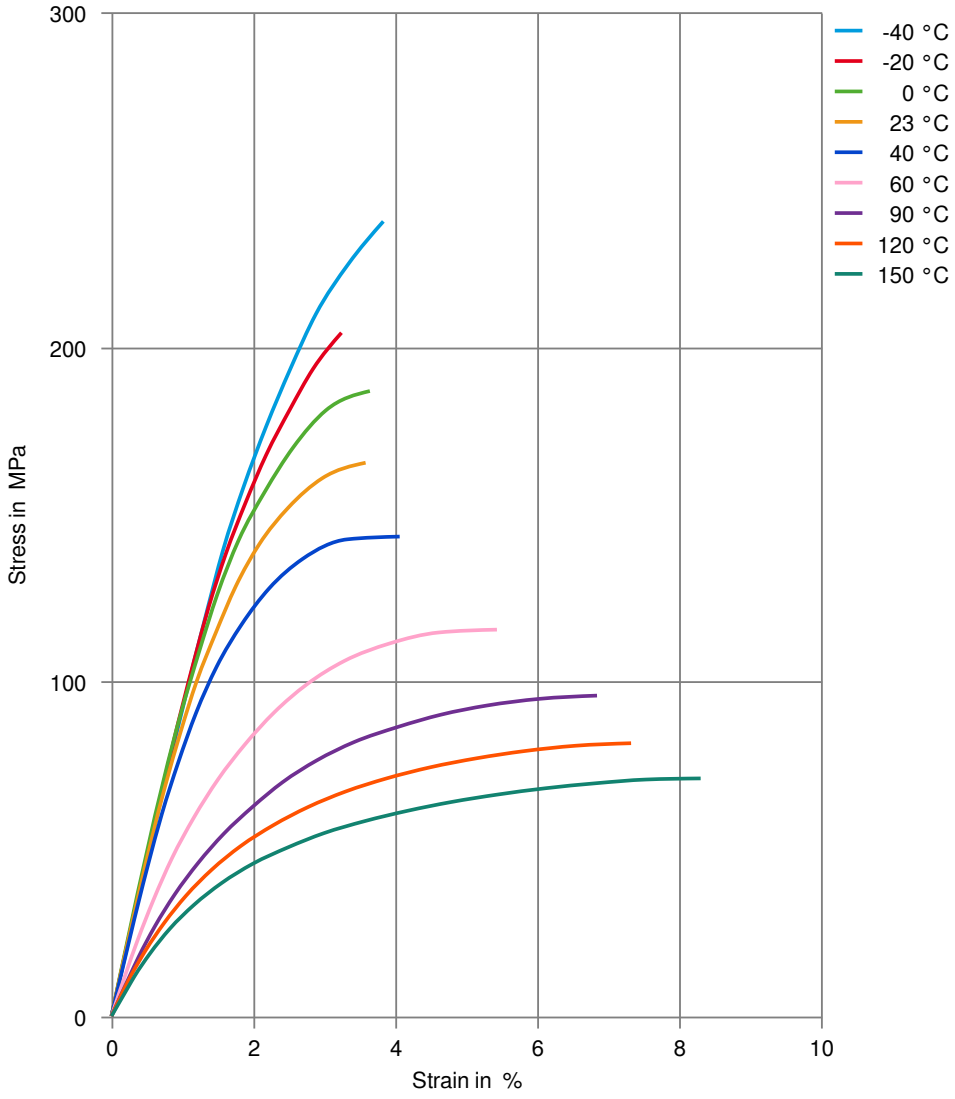
NYLON RESIN

Stress-strain (dry)



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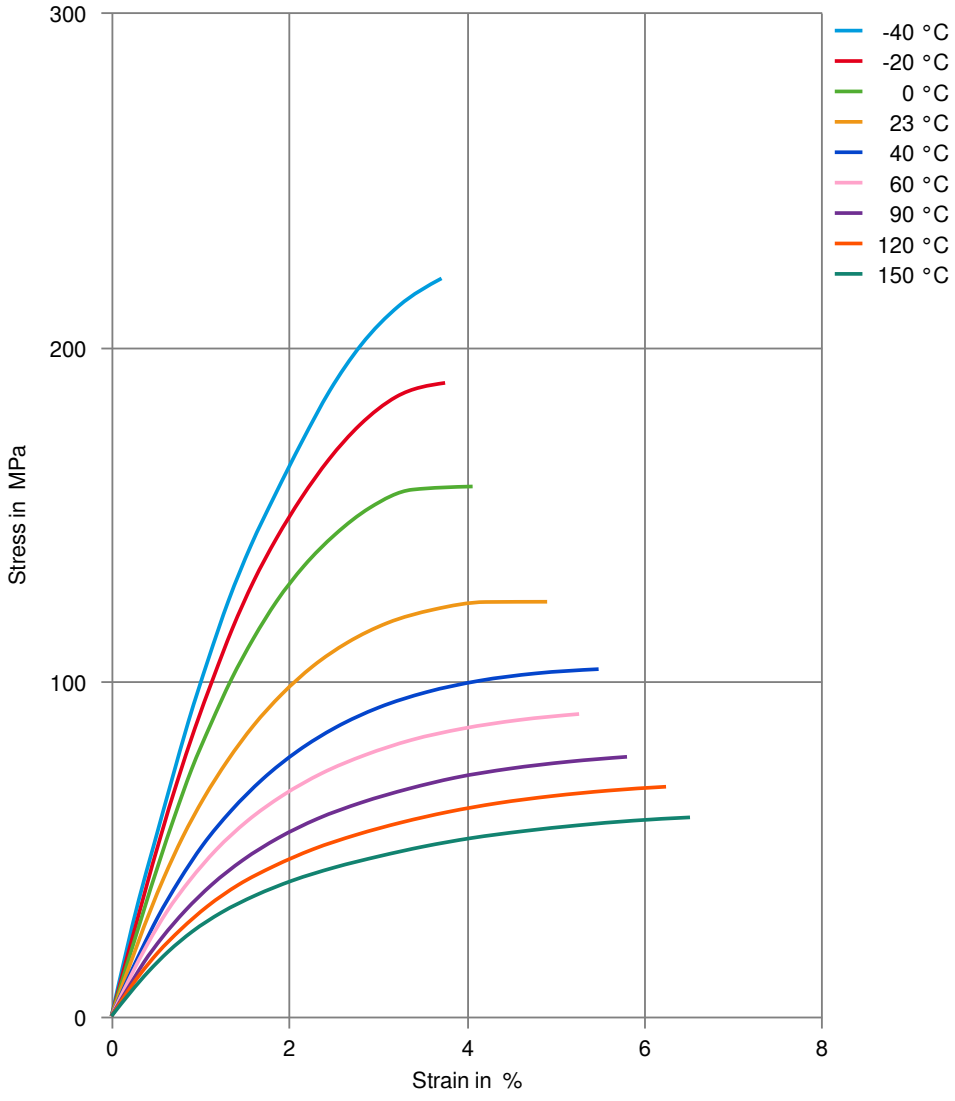
NYLON RESIN

Stress-strain (cond.)



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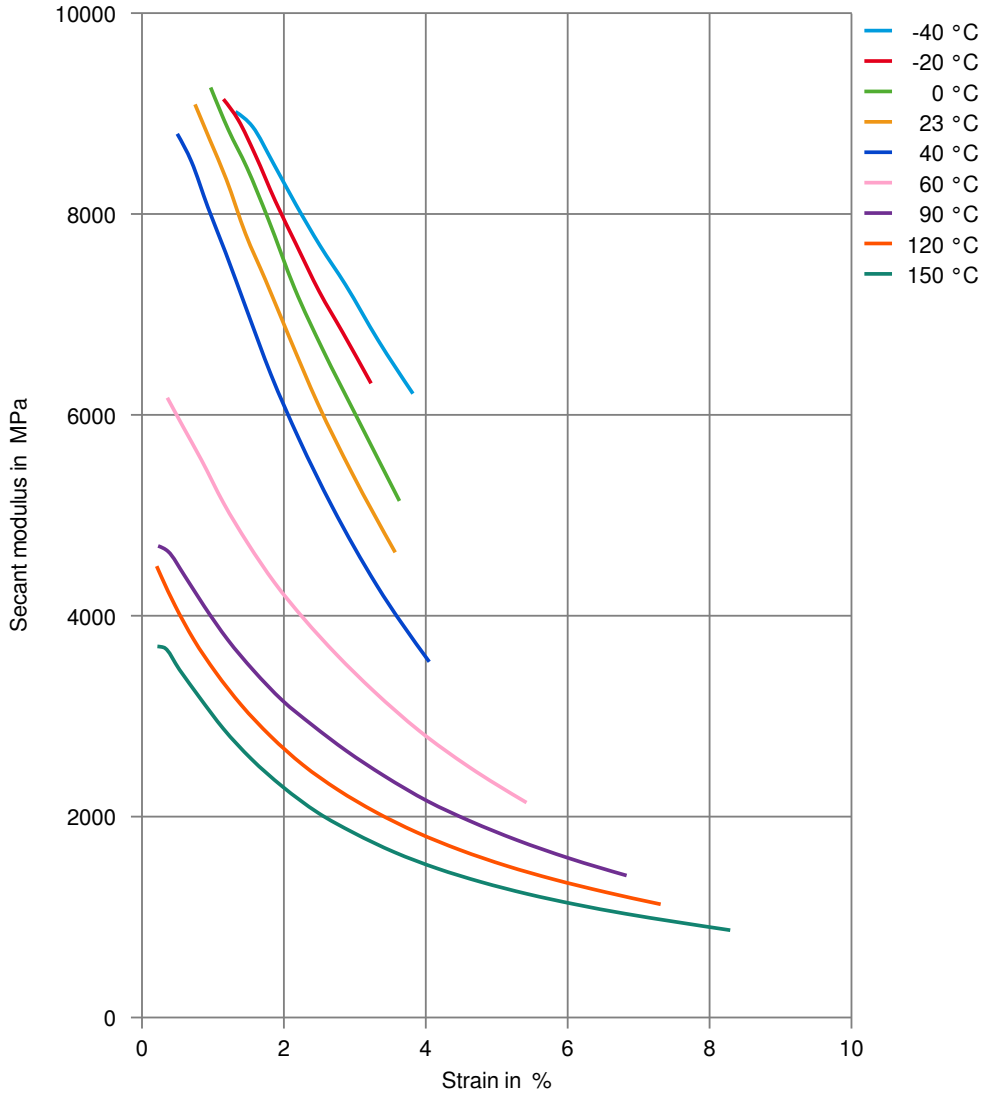
Secant modulus-strain (dry)



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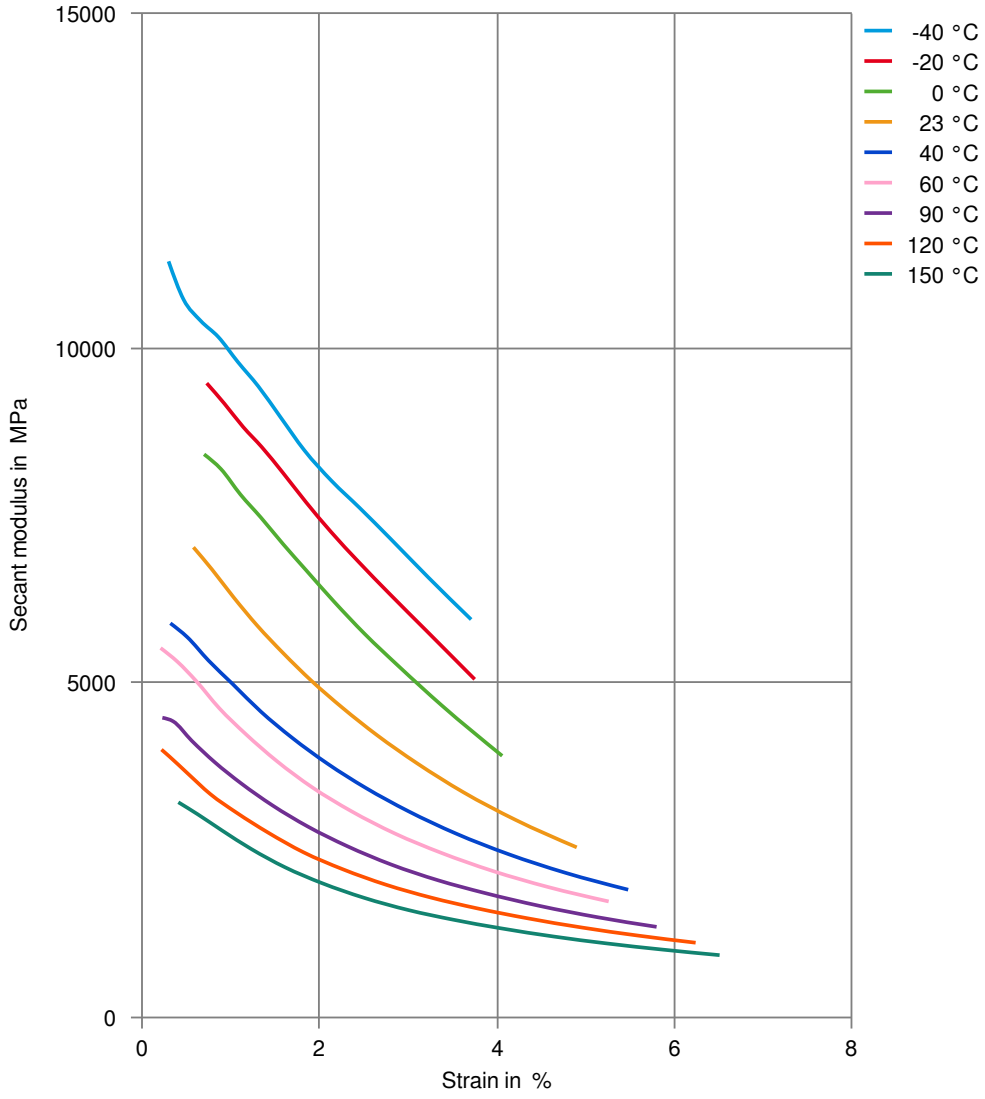
Secant modulus-strain (cond.)



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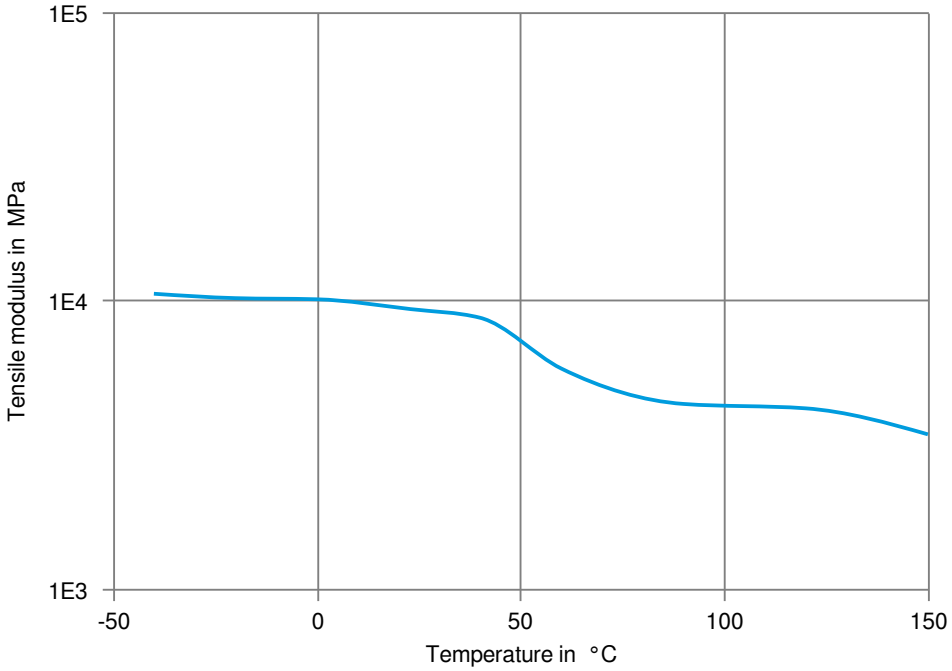
Tensile modulus-temperature (dry)



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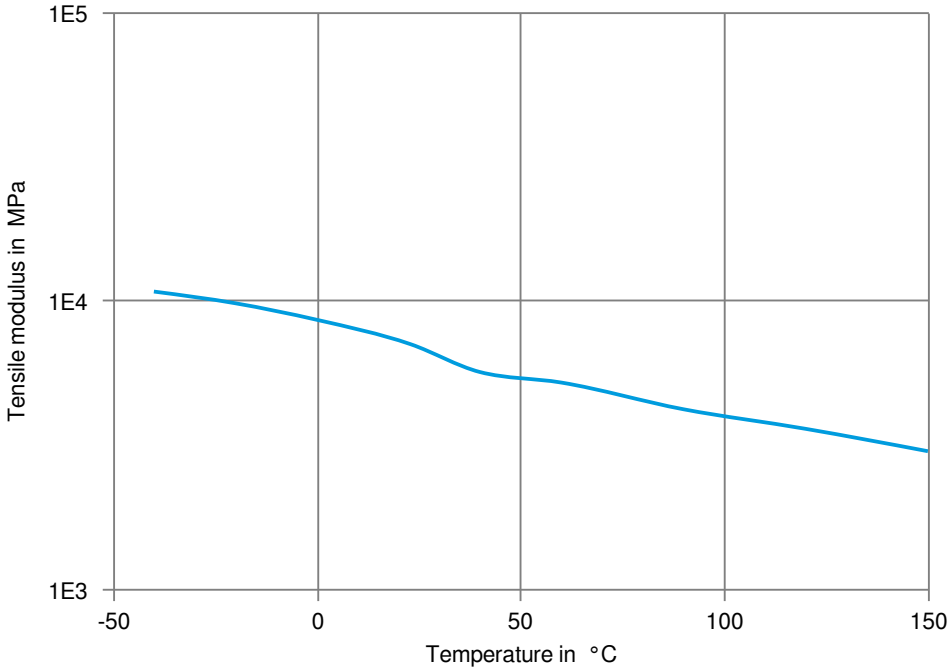
Tensile modulus-temperature (cond.)



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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
- ✘ Hydrochloric Acid (36% by mass), 23°C
- ✘ Nitric Acid (40% by mass), 23°C
- ✘ Sulfuric Acid (38% by mass), 23°C
- ✘ Sulfuric Acid (5% by mass), 23°C
- ✘ Chromic Acid solution (40% by mass), 23°C

Bases

- ✘ Sodium Hydroxide solution (35% by mass), 23°C
- ✔ Sodium Hydroxide solution (1% by mass), 23°C
- ✔ Ammonium Hydroxide solution (10% by mass), 23°C

Alcohols

- ✔ Isopropyl alcohol, 23°C
- ✔ Methanol, 23°C
- ✔ Ethanol, 23°C

Hydrocarbons

- ✔ n-Hexane, 23°C
- ✔ Toluene, 23°C
- ✔ iso-Octane, 23°C

Ketones

- ✔ Acetone, 23°C

Ethers

- ✔ Diethyl ether, 23°C

Mineral oils

- ✔ SAE 10W40 multigrade motor oil, 23°C
- ✔ SAE 10W40 multigrade motor oil, 130°C
- ✔ SAE 80/90 hypoid-gear oil, 130°C
- ✔ Insulating Oil, 23°C

Standard Fuels

- ✔ ISO 1817 Liquid 1 - E5, 60°C
- ✔ ISO 1817 Liquid 2 - M15E4, 60°C
- ✔ ISO 1817 Liquid 3 - M3E7, 60°C
- ✔ ISO 1817 Liquid 4 - M15, 60°C
- ✔ Standard fuel without alcohol (pref. ISO 1817 Liquid C), 23°C
- ✔ Standard fuel with alcohol (pref. ISO 1817 Liquid 4), 23°C
- ✔ Diesel fuel (pref. ISO 1817 Liquid F), 23°C
- ✔ Diesel fuel (pref. ISO 1817 Liquid F), 90°C
- ✔ Diesel fuel (pref. ISO 1817 Liquid F), >90°C

Salt solutions

- ✔ Sodium Chloride solution (10% by mass), 23°C
- ✘ Sodium Hypochlorite solution (10% by mass), 23°C

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- ✔ Sodium Carbonate solution (20% by mass), 23°C
- ✔ Sodium Carbonate solution (2% by mass), 23°C
- ✘ Zinc Chloride solution (50% by mass), 23°C

Other

- ✔ Ethyl Acetate, 23°C
- ✘ Hydrogen peroxide, 23°C
- ✔ DOT No. 4 Brake fluid, 130°C
- ✔ Ethylene Glycol (50% by mass) in water, 108°C
- ✔ 1% nonylphenoxy-polyethyleneoxy ethanol in water, 23°C
- ✔ 50% Oleic acid + 50% Olive Oil, 23°C
- ✔ Water, 23°C
- ✘ Water, 90°C
- ✘ Phenol solution (5% by mass), 23°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).