Celanese
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Zytel® 7335F 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® 7335F NC010 is a nucleated, lubricated polyamide 6 resin for injection moulding.

Product information

Resin Identification	PA6	ISO 1043
Part Marking Code	>PA6<	ISO 11469
ISO designation	ISO 16396-PA6,,M1G1NR,S14-040	

Rheological properties

	dry/cond.		
Viscosity number	150[1]/*	cm³/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.6 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile Modulus	3600 / 1400	MPa	ISO 527-1/-2
Yield stress, 50mm/min	92 / 55	MPa	ISO 527-1/-2
Yield strain, 50mm/min	3.8 / 24	%	ISO 527-1/-2
Nominal strain at break	9 / >50	%	ISO 527-1/-2
Strain at break, 50mm/min	15 / -	%	ISO 527-1/-2
Flexural Modulus	3100 / 1100	MPa	ISO 178
Charpy impact strength, 23°C	70 / 120	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	110 / 60	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	3.2 / 18	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	2.5 / 3	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	3.5 / -[A]	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	2 / -[A]	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	2 / -[A]	kJ/m²	ISO 180/1A
Hardness, Rockwell, R-scale	- / 85		ISO 2039-2
Poisson's ratio	0.36 / 0.43		

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[A]: Assessed

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	221 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	60 / 15	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	65 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	175 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h, 50N	200 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	76 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	92 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K)	Internal
Spec. heat capacity of melt	2700	J/(kg K)	Internal
Temperature index, tensile strength, 20 000h	70 / *	°C	IEC 60216-1
Temperature index, tensile strength, 5000h	85 / *	°C	IEC 60216-1

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB / *	class	UL 94
Thickness tested	1.5 / *	mm	UL 94
UL recognition	yes / *		UL 94
Glow Wire Flammability Index, 1mm	850 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	800 / -	°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, 1mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3mm	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)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.2 / -		IEC 62631-2-1
Dissipation factor, 100Hz	300 / -	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 1E9	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E11	Ohm	IEC 62631-3-2
Electric strength	30 / -	kV/mm	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112

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Other properties

	dry/cond.		
Humidity absorption, 2mm	3 / *	%	Sim. to ISO 62
Water absorption, 2mm	9.5 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.8[2] / *	%	Sim. to ISO 62
Density	1130 / -	kg/m³	ISO 1183
Density of melt	970	kg/m³	Internal

[2]: 3.2mm wall thickness

Film Properties

	dry/cond.		
Strain at yield, parallel	4 / *	%	ISO 527-3

Injection

Drying Recommended	yes		
Drying Temperature	80	°C	
Drying Time, Dehumidified Dryer	2 - 4	h	
Processing Moisture Content	≤0.2	%	
Melt Temperature Optimum	270	°C	Internal
Min. melt temperature	260	°C	
Max. melt temperature	280	°C	
Screw tangential speed	≤0.2	m/s	
Mold Temperature Optimum	70	°C	
Min. mould temperature	50	°C	
Max. mould temperature	90	°C	
Hold pressure range	50 - 100	MPa	
Hold pressure time	4	s/mm	

Characteristics

Additives	Release agent

Additional information

Injection molding

POSTPROCESSING

Annealing : 30min at 170 °C

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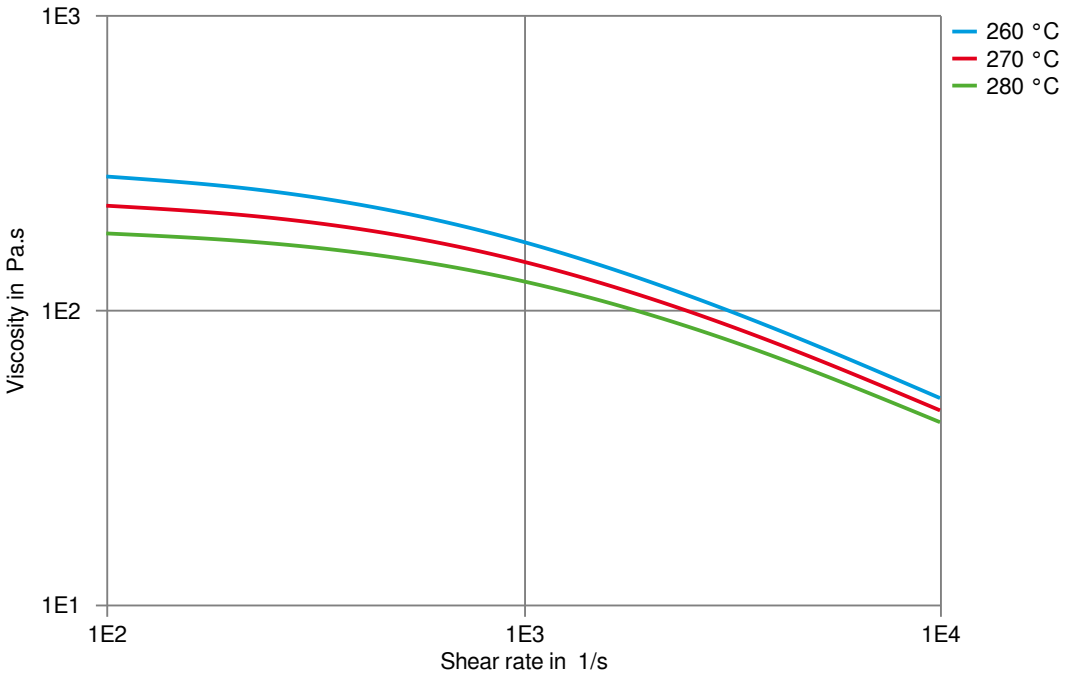
Viscosity-shear rate



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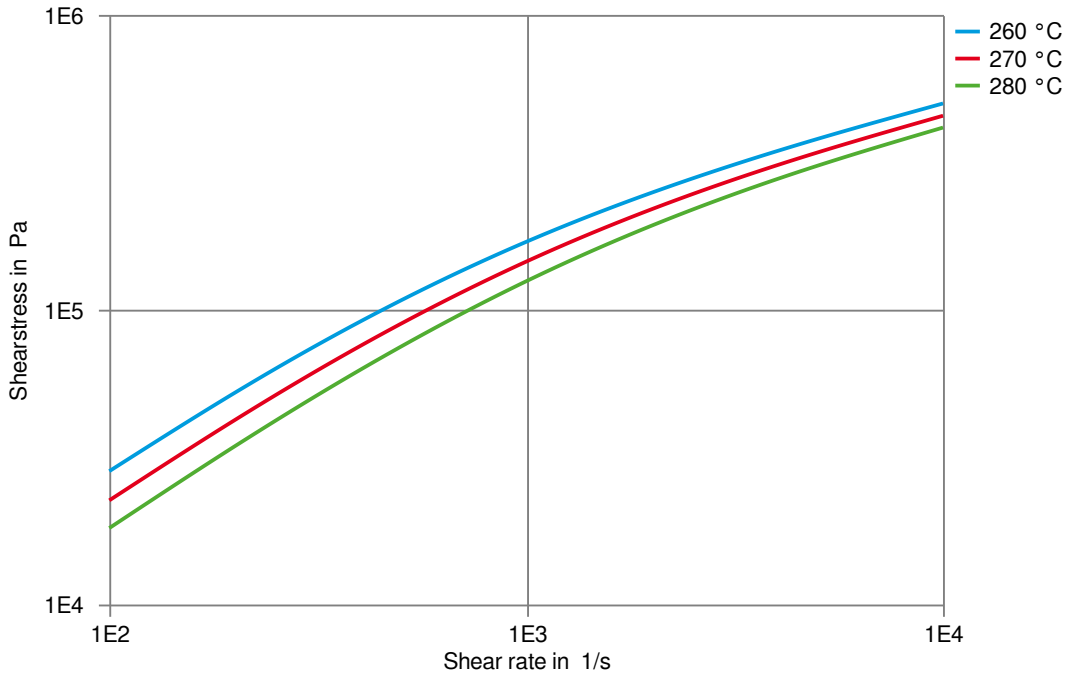
Shearstress-shear rate



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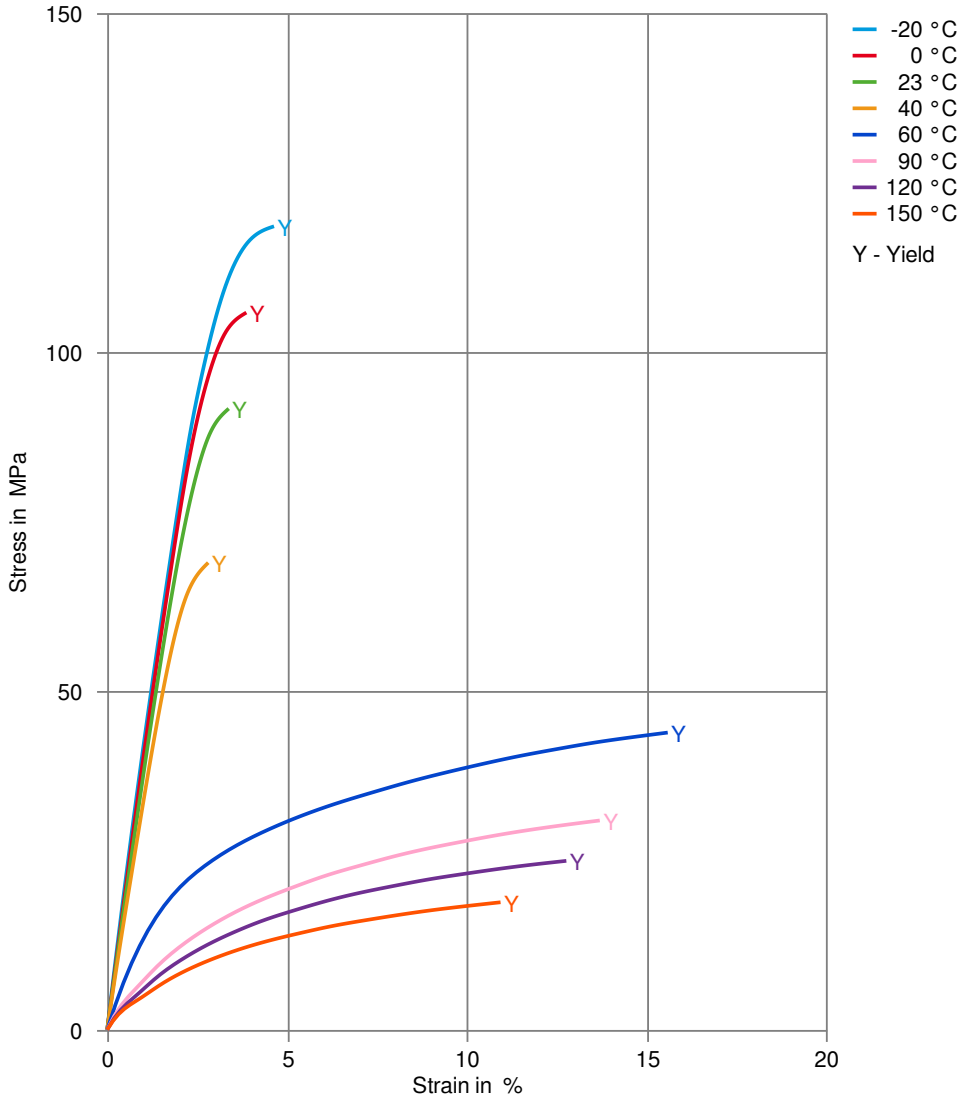
Stress-strain (dry)



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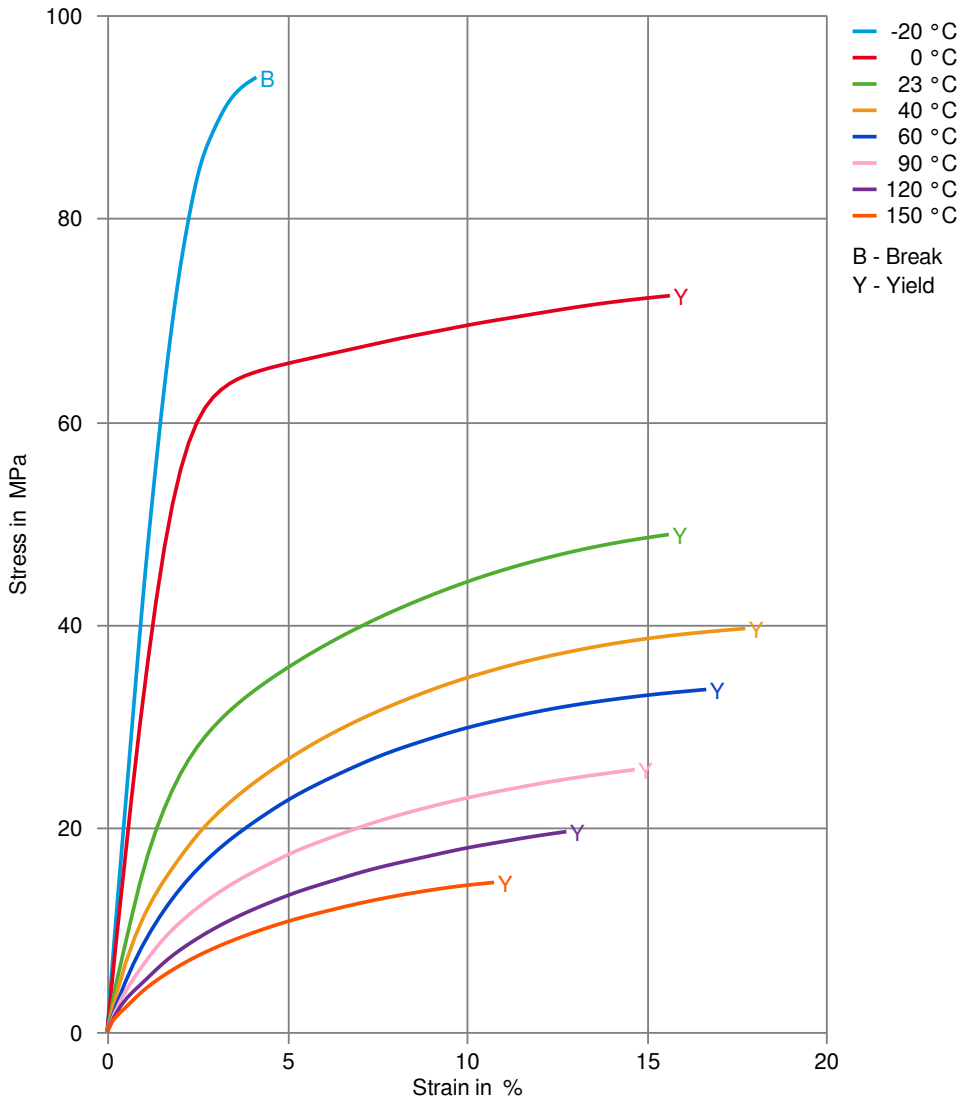
NYLON RESIN

Stress-strain (cond.)



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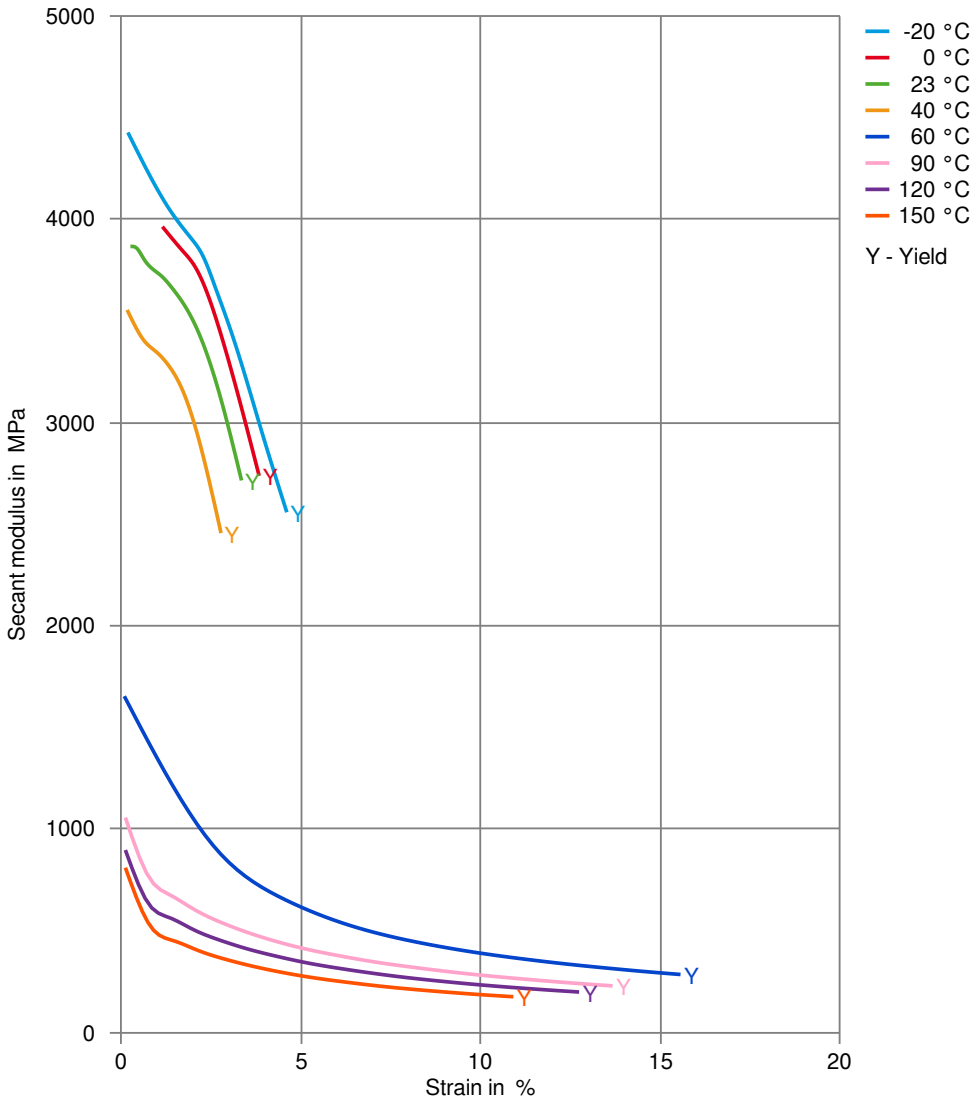
Secant modulus-strain (dry)



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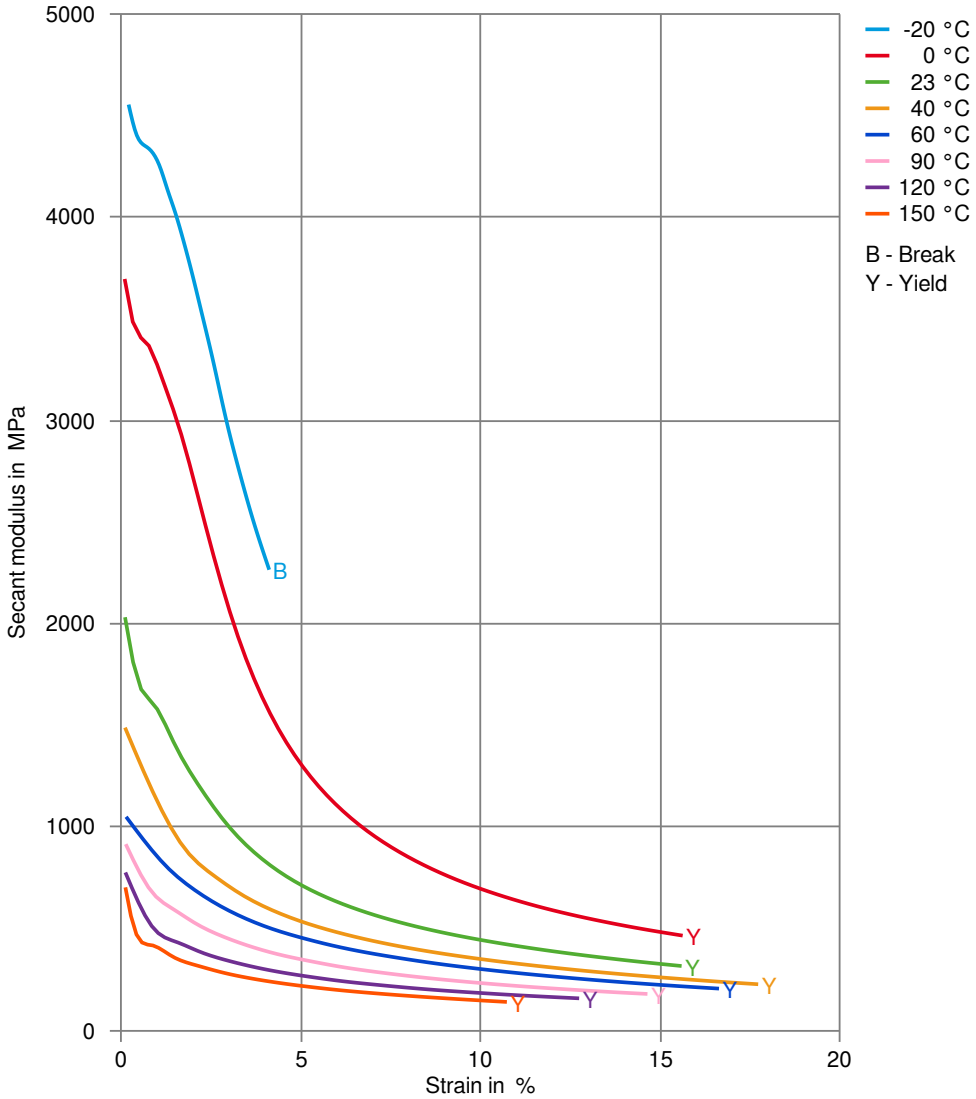
Secant modulus-strain (cond.)



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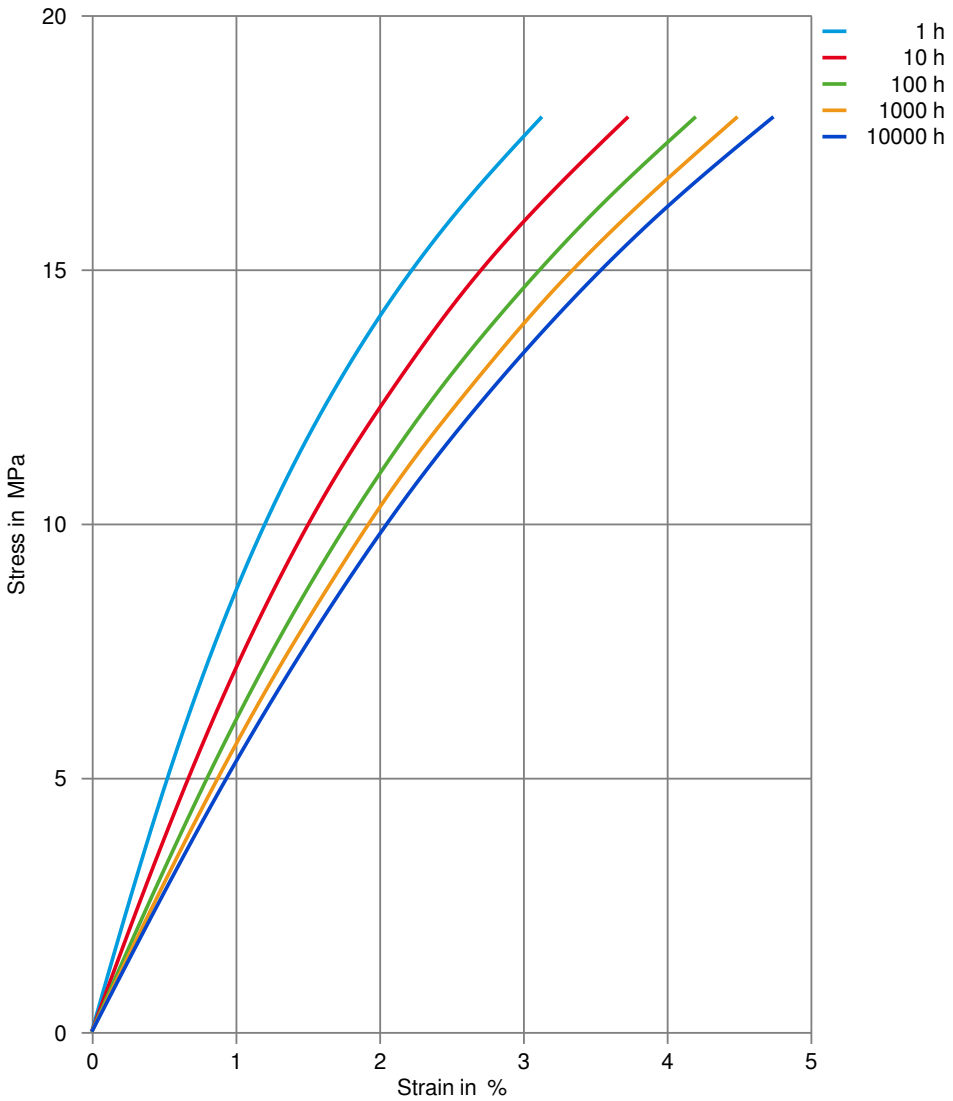
Stress-strain (isochronous) 23 °C (cond.)



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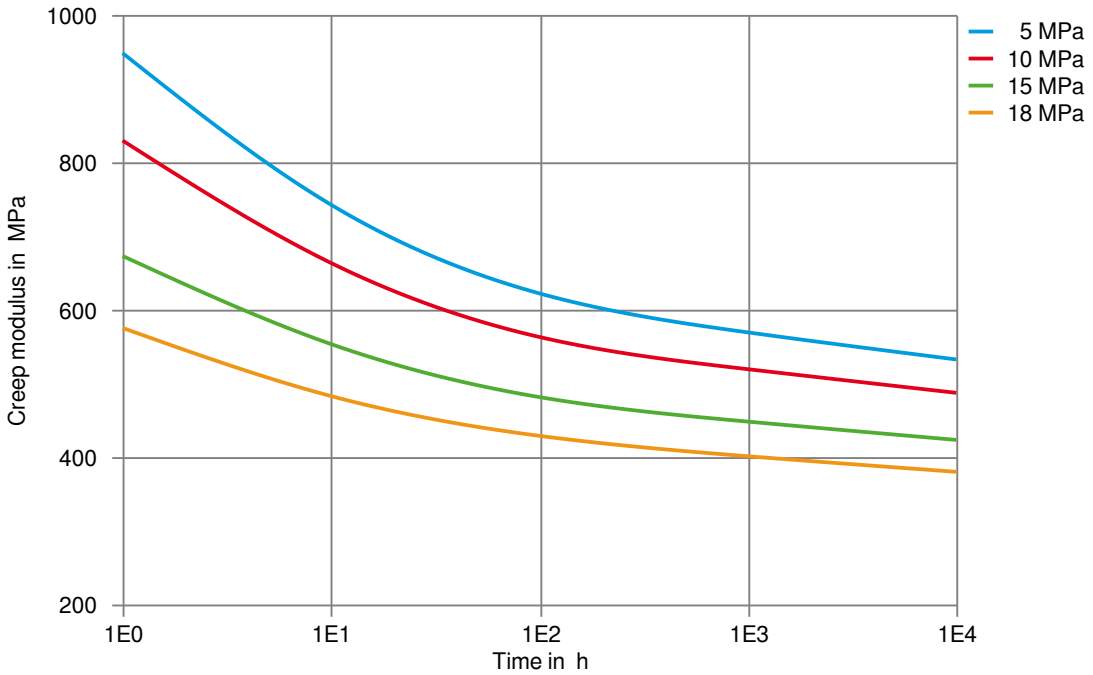
Creep modulus-time 23 °C (cond.)



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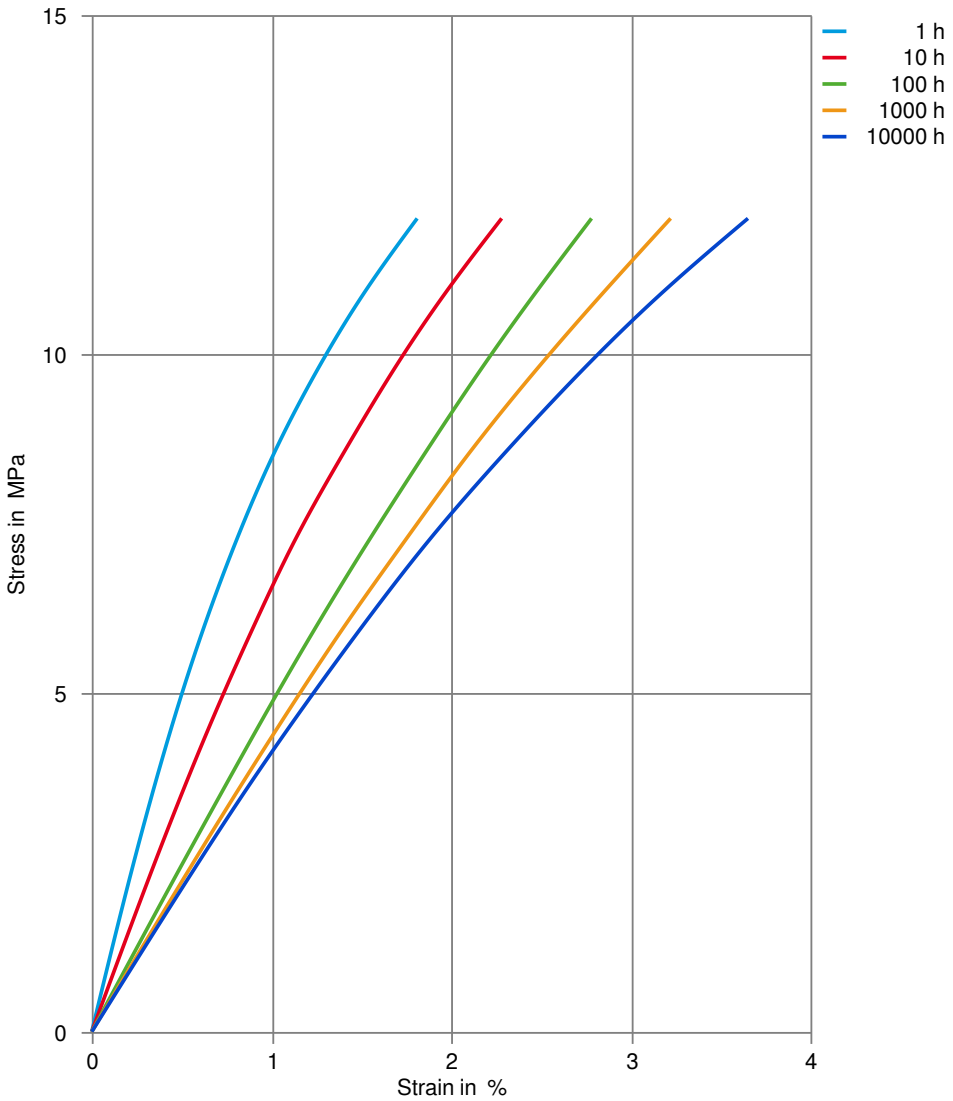
Stress-strain (isochronous) 60 °C (cond.)



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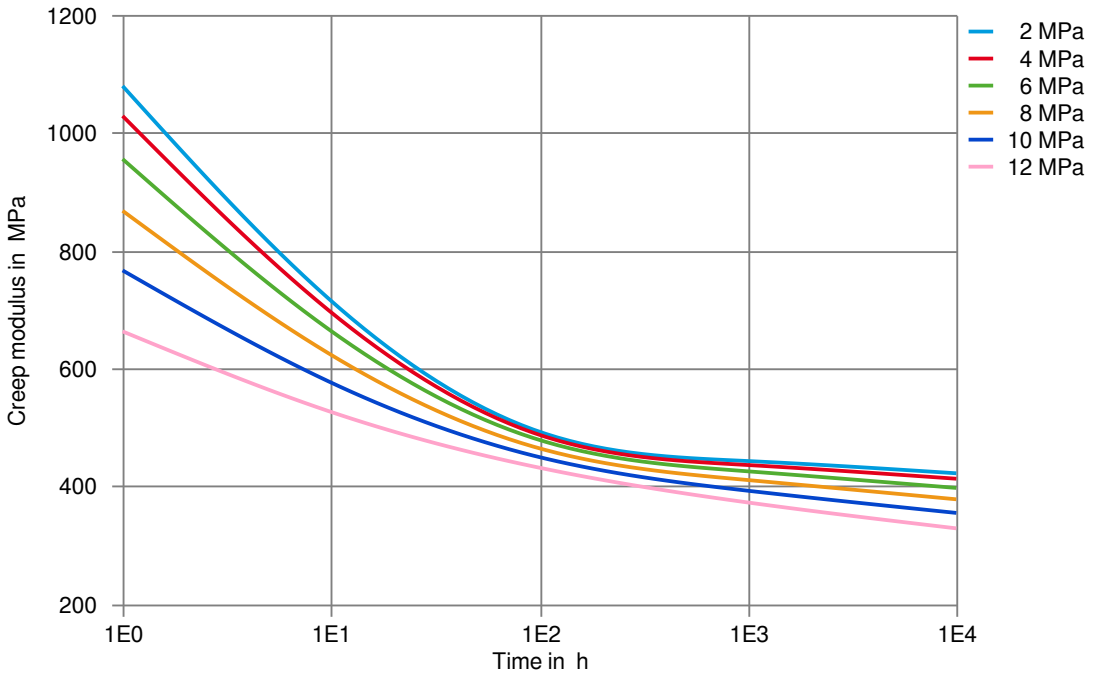
NYLON RESIN

Creep modulus-time 60 °C (cond.)



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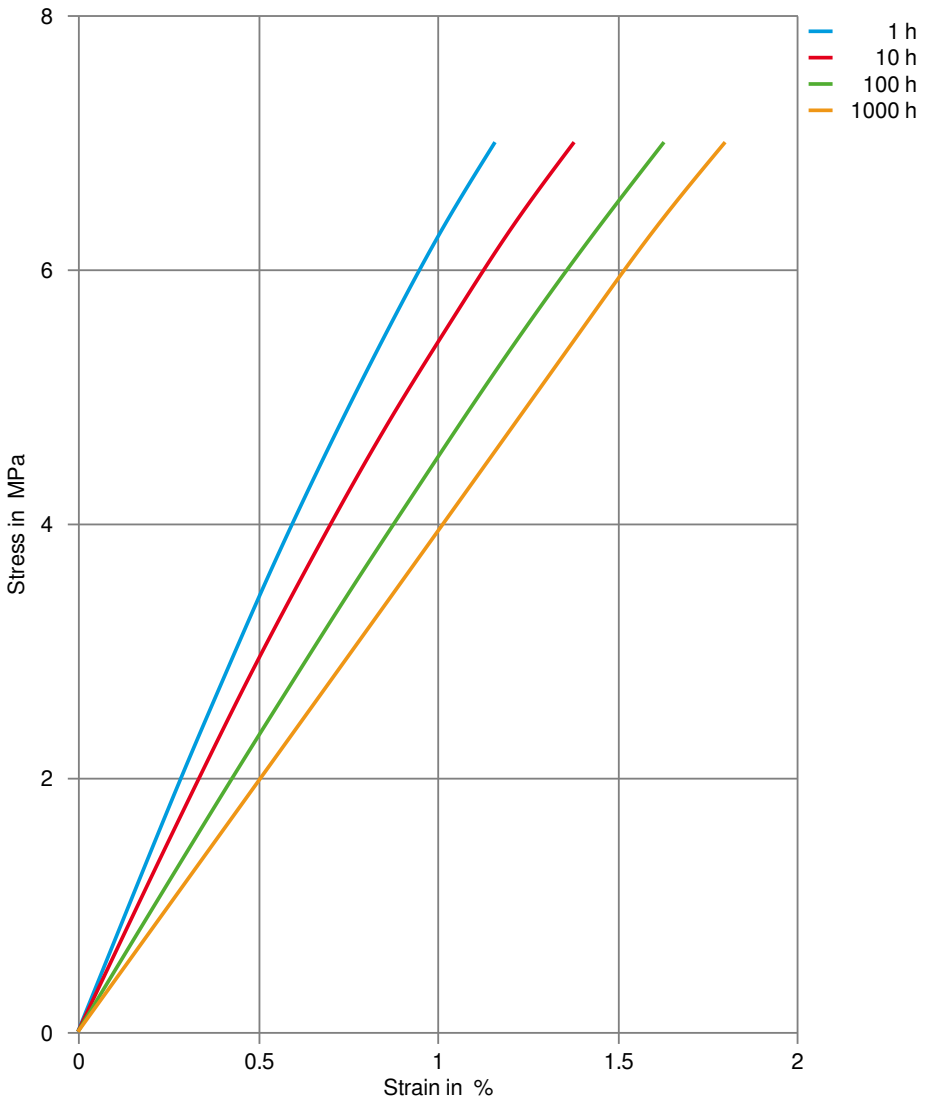
Stress-strain (isochronous) 90 °C (cond.)



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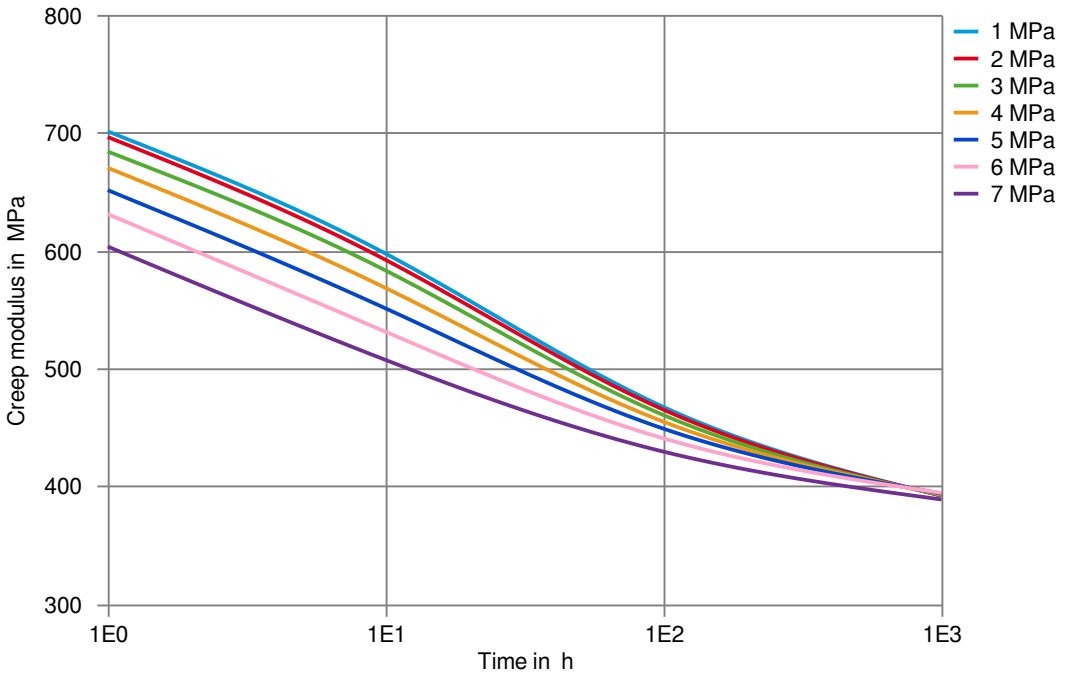
NYLON RESIN

Creep modulus-time 90 °C (cond.)



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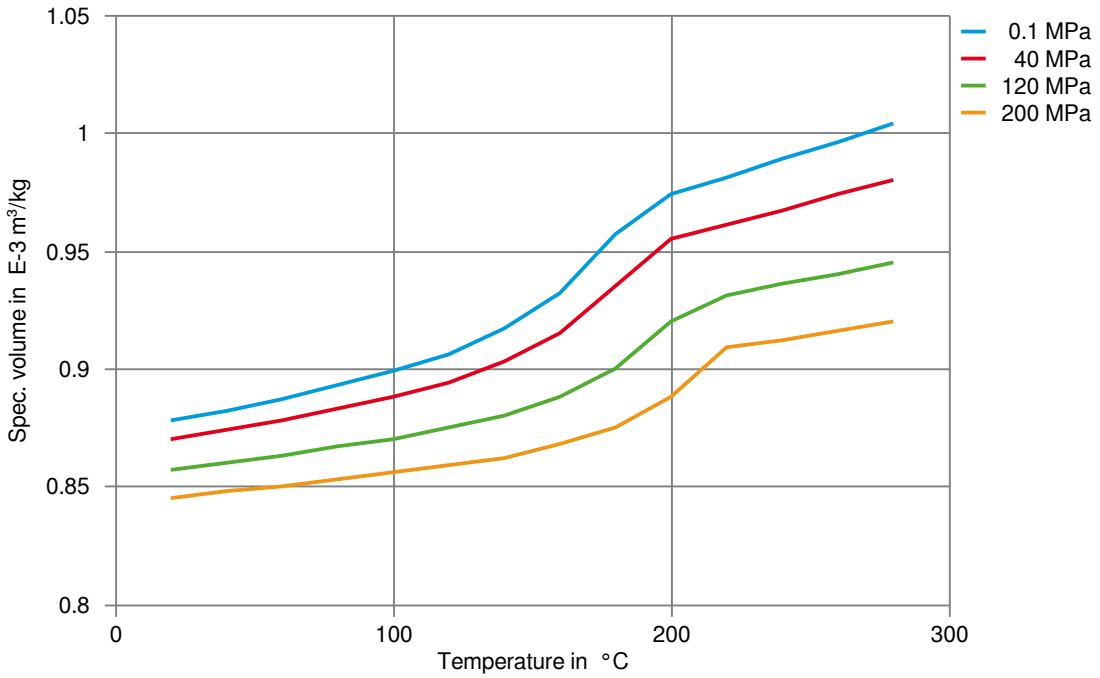
Specific volume-temperature (pvT)



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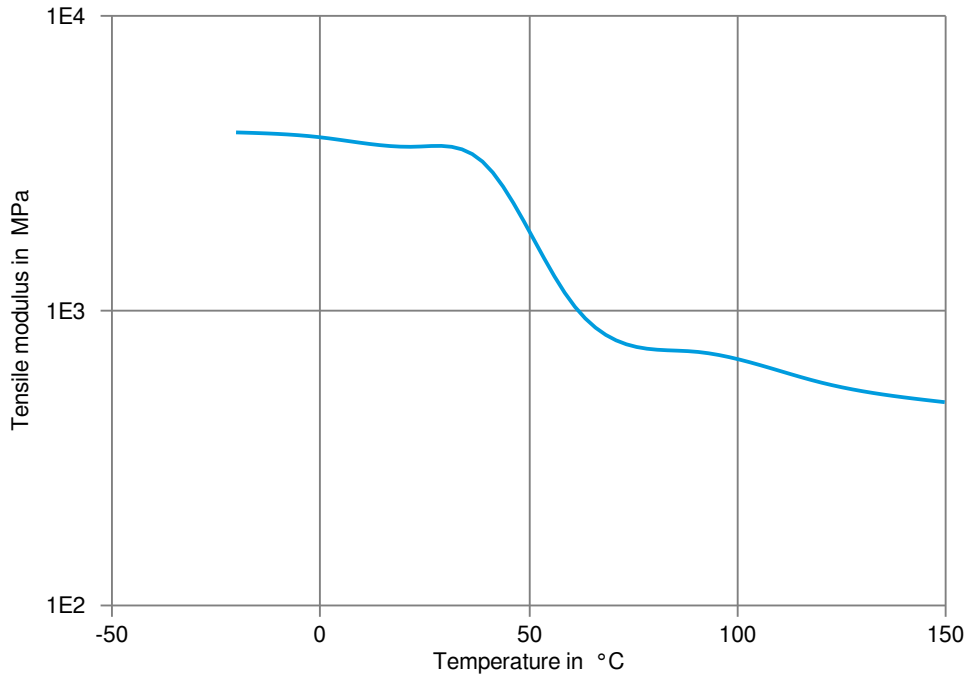
Tensile modulus-temperature (dry)



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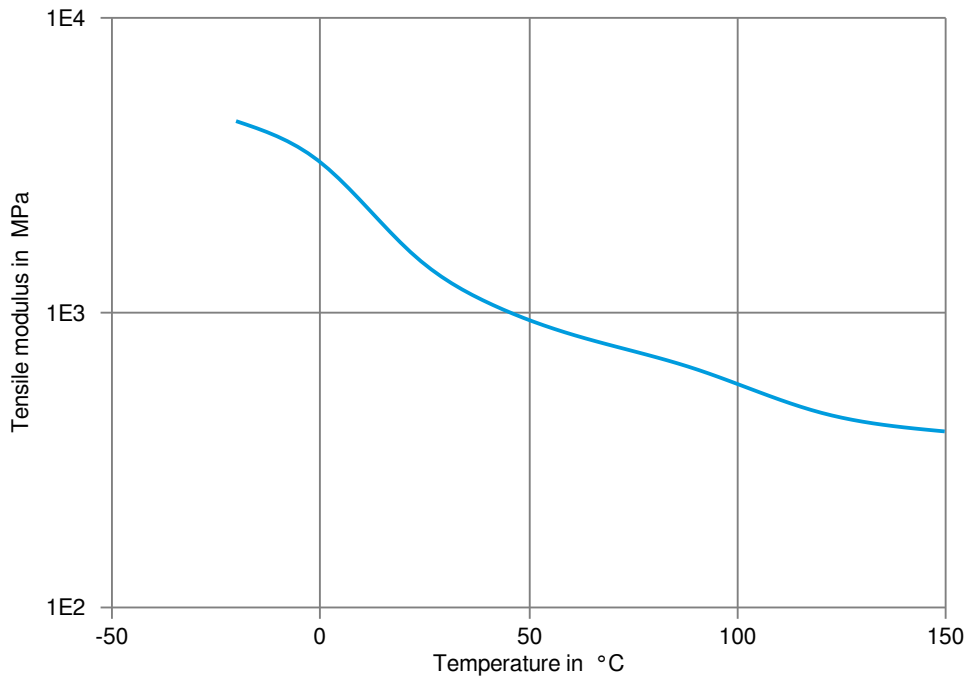
Tensile modulus-temperature (cond.)



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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

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Salt solutions

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

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).