Celanese
The chemistry inside innovation™

Zytel® BM70G20HSLX BK537

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® BM70G20HSLX BK537 is a 20% glass fibre reinforced polyamide 66 for blow moulding.

Product information

Resin Identification	PA66-IGF20	ISO 1043
Part Marking Code	>PA66-IGF20<	ISO 11469
ISO designation	ISO 16396-PA66-I,GF20,M1CGH,S14-060	

Rheological properties

	dry/cond.		
Viscosity number	155[1]/*	cm³/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.5 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.7 / -	%	ISO 294-4, 2577
Melt viscosity , @ 1000 sec-1, 280 °C	330 / *	Pa.s	ISO 11443

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile Modulus	6500 / 4000	MPa	ISO 527-1/-2
Stress at break, 5mm/min	120 / 75	MPa	ISO 527-1/-2
Strain at break, 5mm/min	4 / 13	%	ISO 527-1/-2
Flexural Modulus	6000 / 3600[A]	MPa	ISO 178
Flexural Strength	160 / -[DS]	MPa	ISO 178
Shear Modulus	1400 / -	MPa	ISO 6721
Tensile creep modulus, 1h	* / 3900	MPa	ISO 899-1
Tensile creep modulus, 1000h	* / 3200	MPa	ISO 899-1
Charpy impact strength, 23 °C	80 / 80	kJ/m²	ISO 179/1eU
Charpy impact strength, -30 °C	40 / -	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23 °C	15 / 16	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	8 / 6	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	7.5 / -	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23 °C	14 / 16	kJ/m²	ISO 180/1A
Izod notched impact strength, -30 °C	8 / 6	kJ/m²	ISO 180/1A
Izod impact strength, 23 °C	73 / -	kJ/m²	ISO 180/1U

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Ball indentation hardness, H 961/30	225 / -	MPa	ISO 2039-1
Poisson's ratio	0.35 / 0.36		

[A]: Assessed

[DS]: Derived from similar grade

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	260 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	65 / 40	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	240 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	260 / *	°C	ISO 75-1/-2
Thermal conductivity of melt	0.2	W/(m K)	Internal
Spec. heat capacity of melt	2000	J/(kg K)	Internal

Flammability

FMVSS Class	SE		ISO 3795 (FMVSS 302)

Other properties

	dry/cond.		
Humidity absorption, 2mm	1.6 / *	%	Sim. to ISO 62
Water absorption, 2mm	5.2 / *	%	Sim. to ISO 62
Density	1250 / -	kg/m³	ISO 1183
Density of melt	1070	kg/m³	Internal

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	Internal
Min. melt temperature	285	°C	
Max. melt temperature	305	°C	
Screw tangential speed	≤0.2	m/s	
Mold Temperature Optimum	90	°C	
Min. mould temperature	50	°C	
Max. mould temperature	100	°C	
Hold pressure range	50 - 100	MPa	
Hold pressure time	3	s/mm	
Ejection temperature	210	°C	Internal

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Extrusion

Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.06	%
Melt Temperature Range	275 - 290	°C

Blow Molding

Drying Recommended	yes	
Drying Temperature	100 - 115	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.03	%
Melt Temperature Optimum	285	°C
Melt Temperature Range	285 - 305	°C
Swell ratio	1.3	
Mold Temperature Optimum	110	°C
Mold Temperature Range	80 - 120	°C

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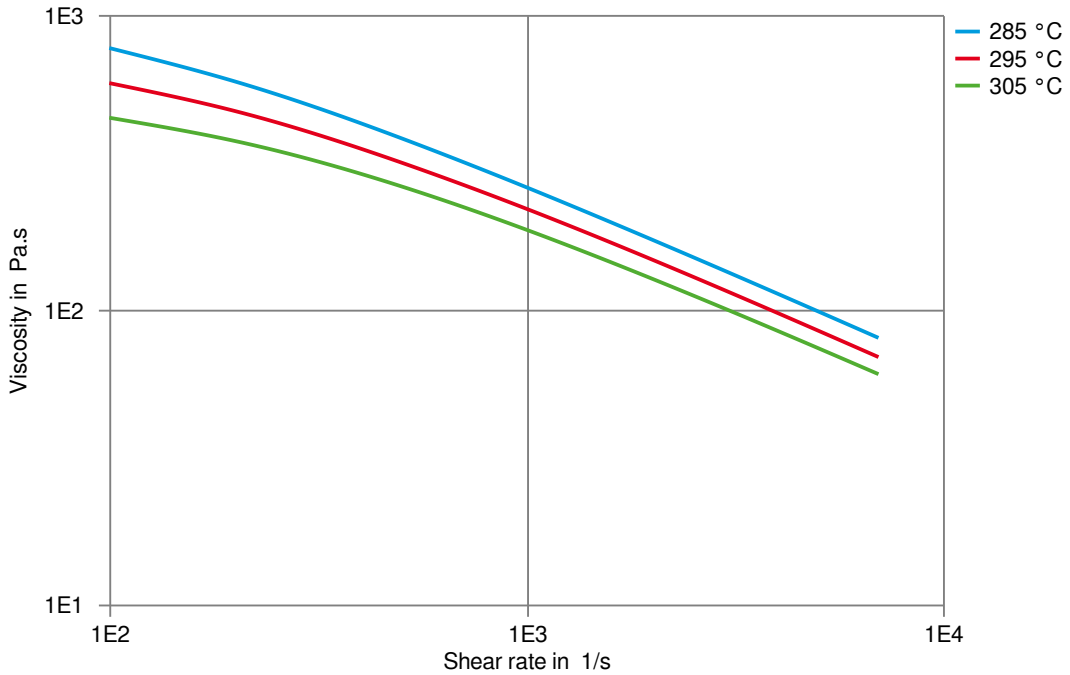
Viscosity-shear rate



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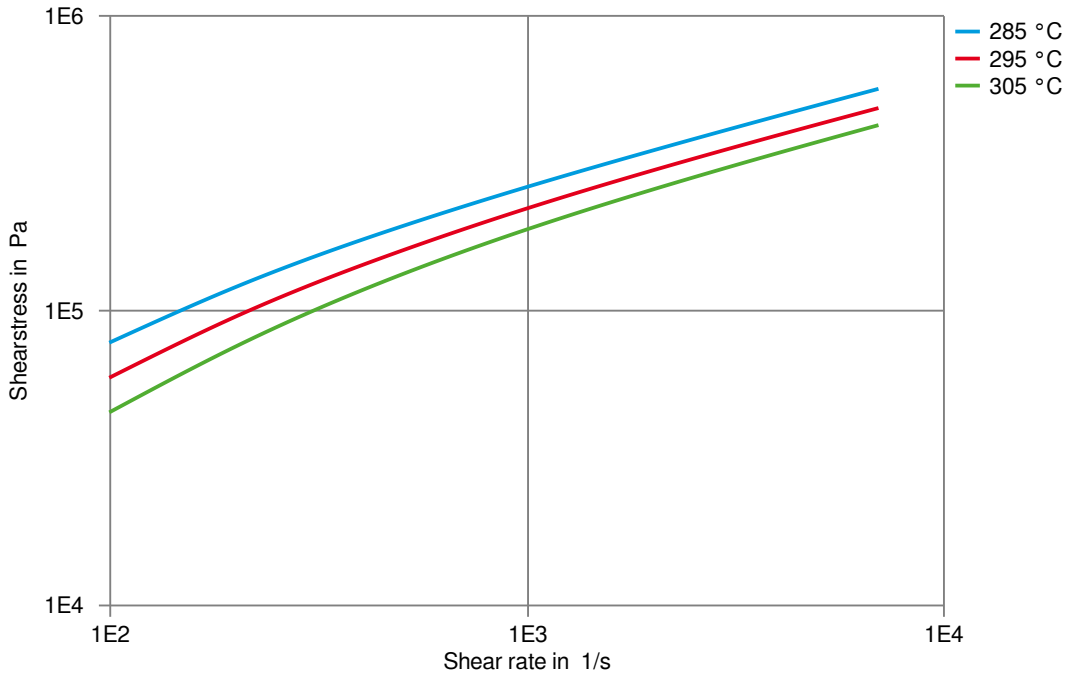
Shearstress-shear rate



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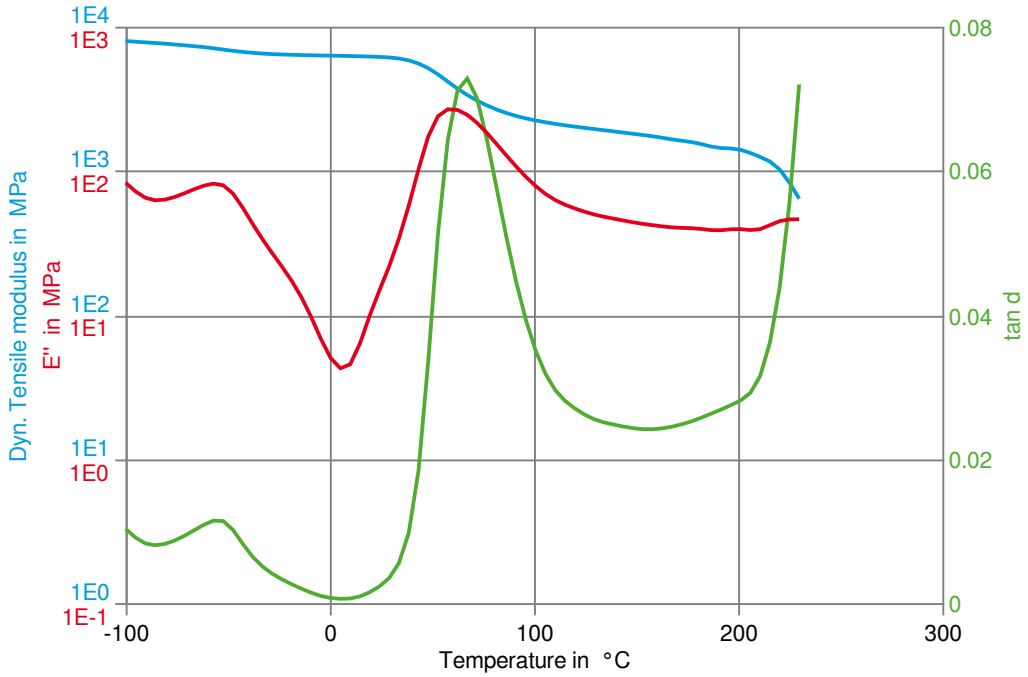
Dynamic Tensile modulus-temperature (dry)



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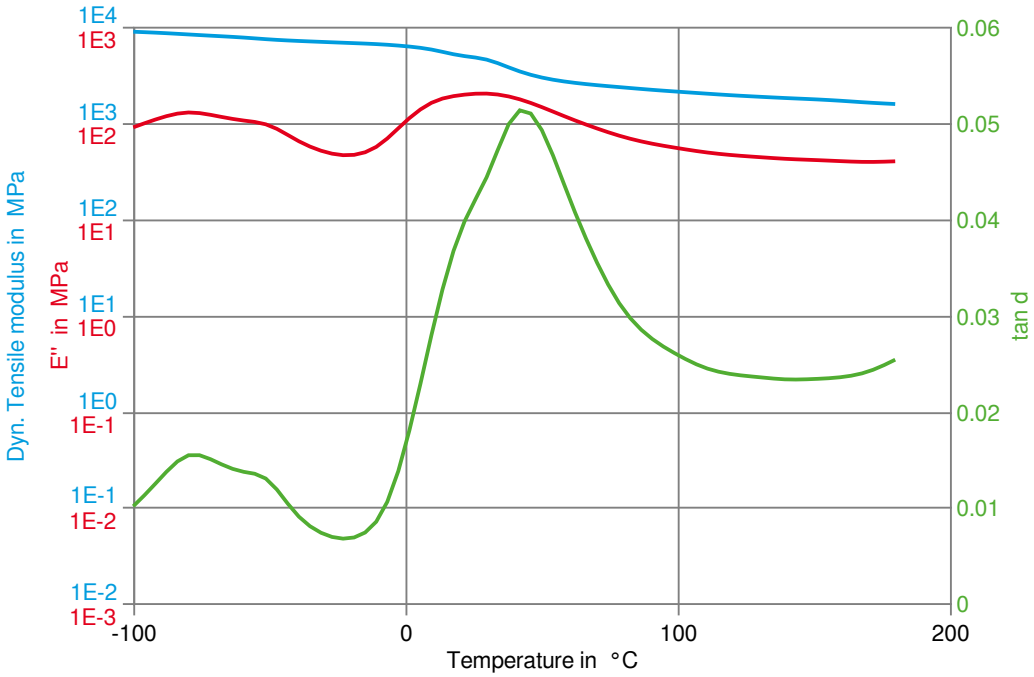
Dynamic Tensile modulus-temperature (cond.)



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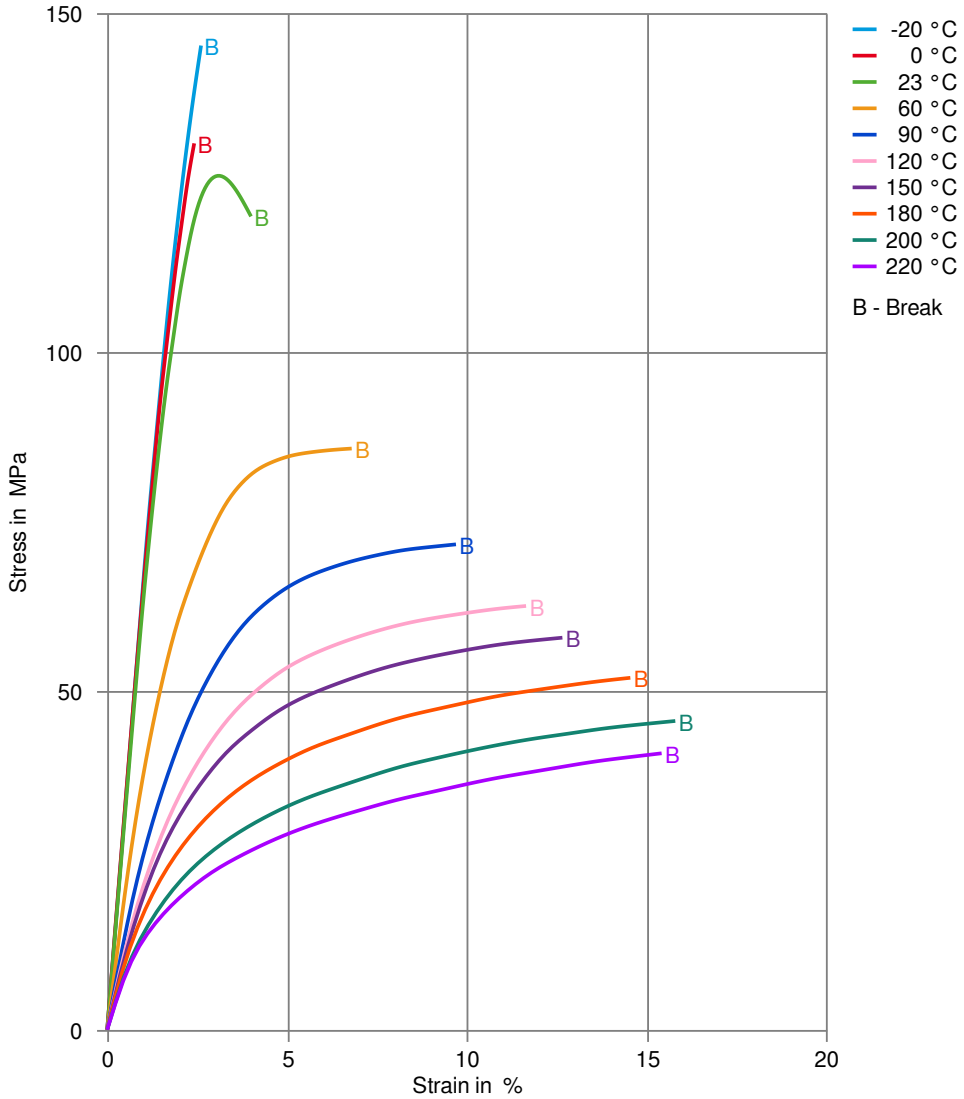
NYLON RESIN

Stress-strain (dry)



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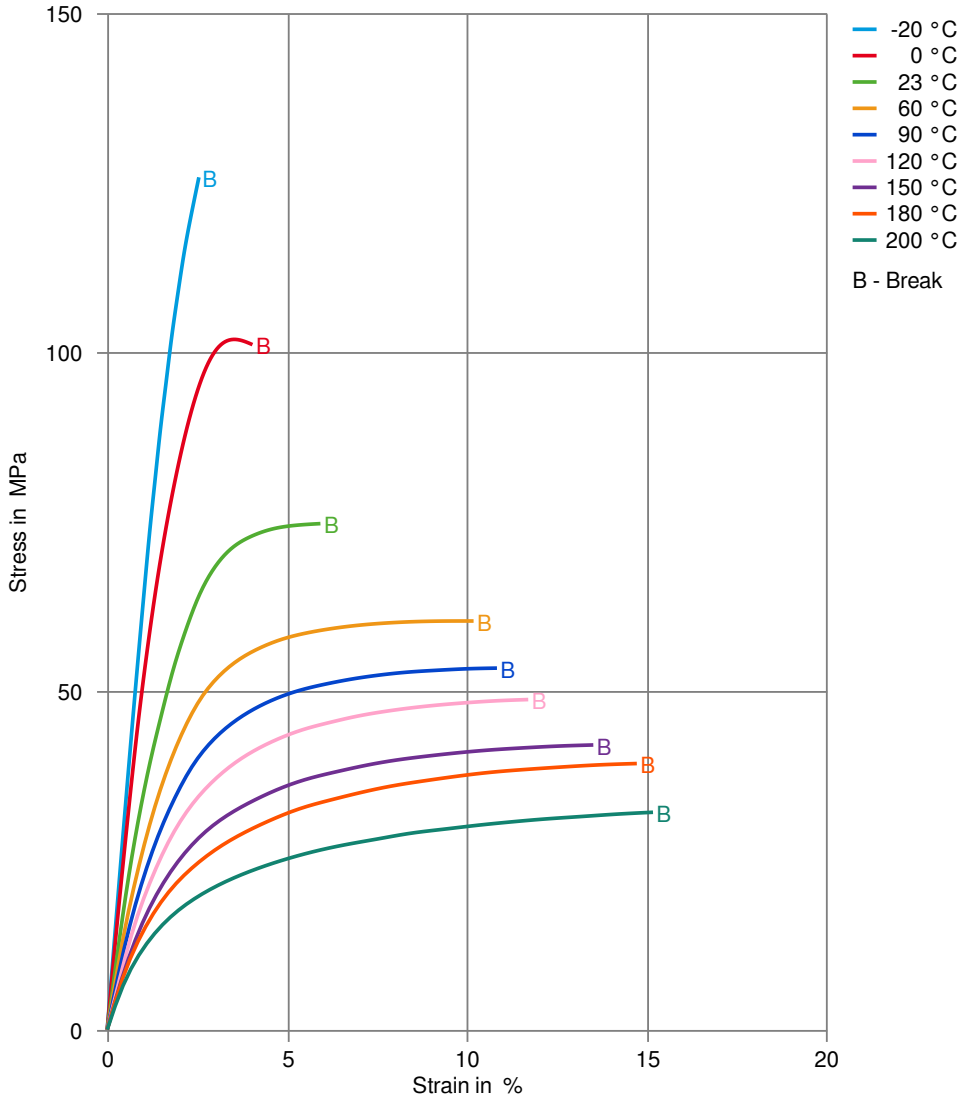
NYLON RESIN

Stress-strain (cond.)



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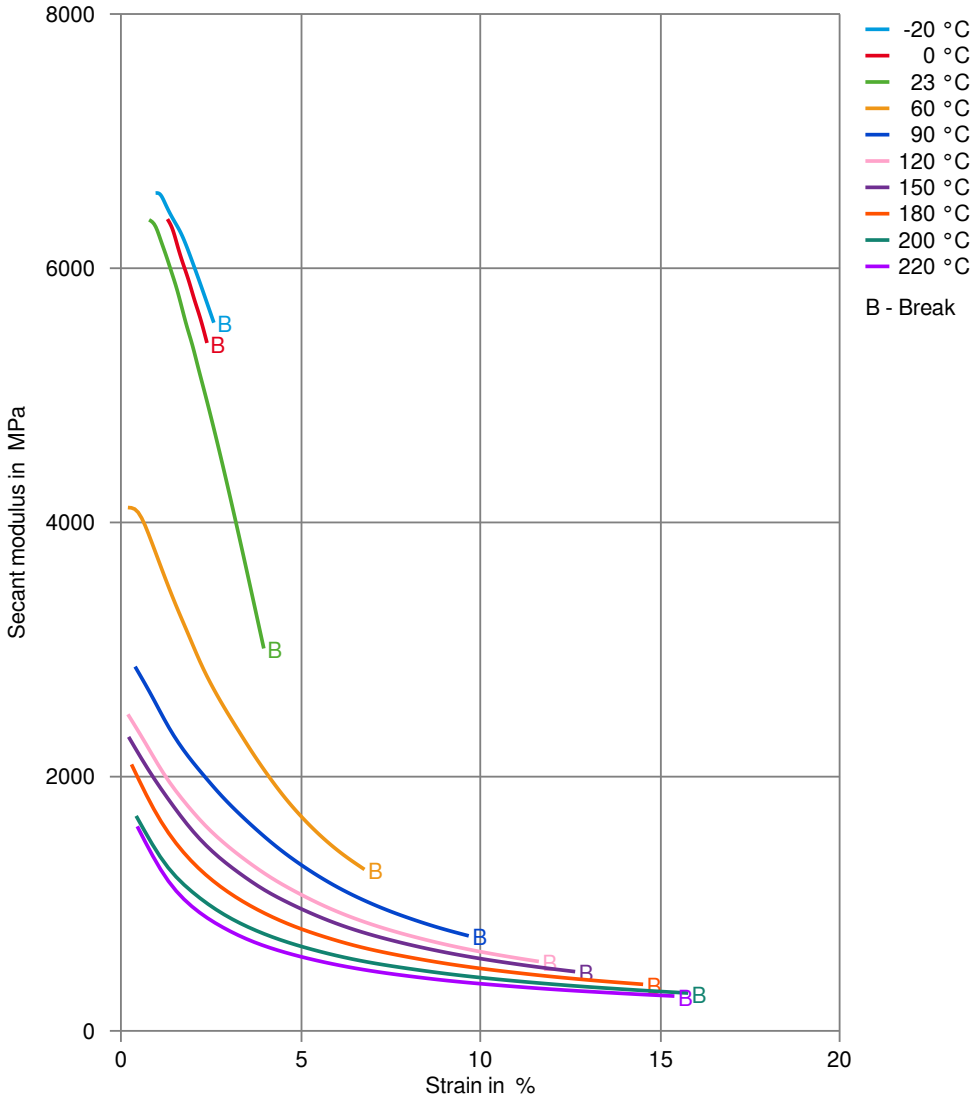
NYLON RESIN

Secant modulus-strain (dry)



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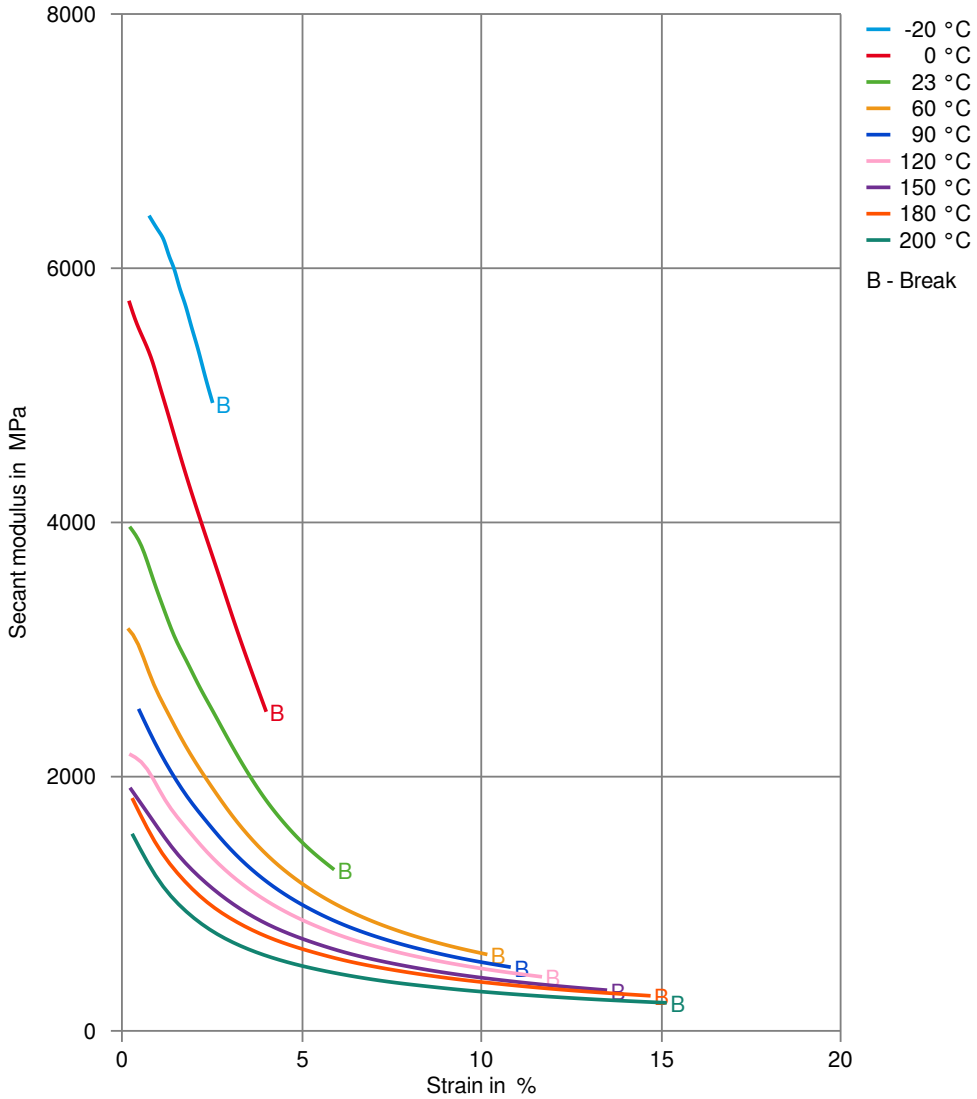
NYLON RESIN

Secant modulus-strain (cond.)



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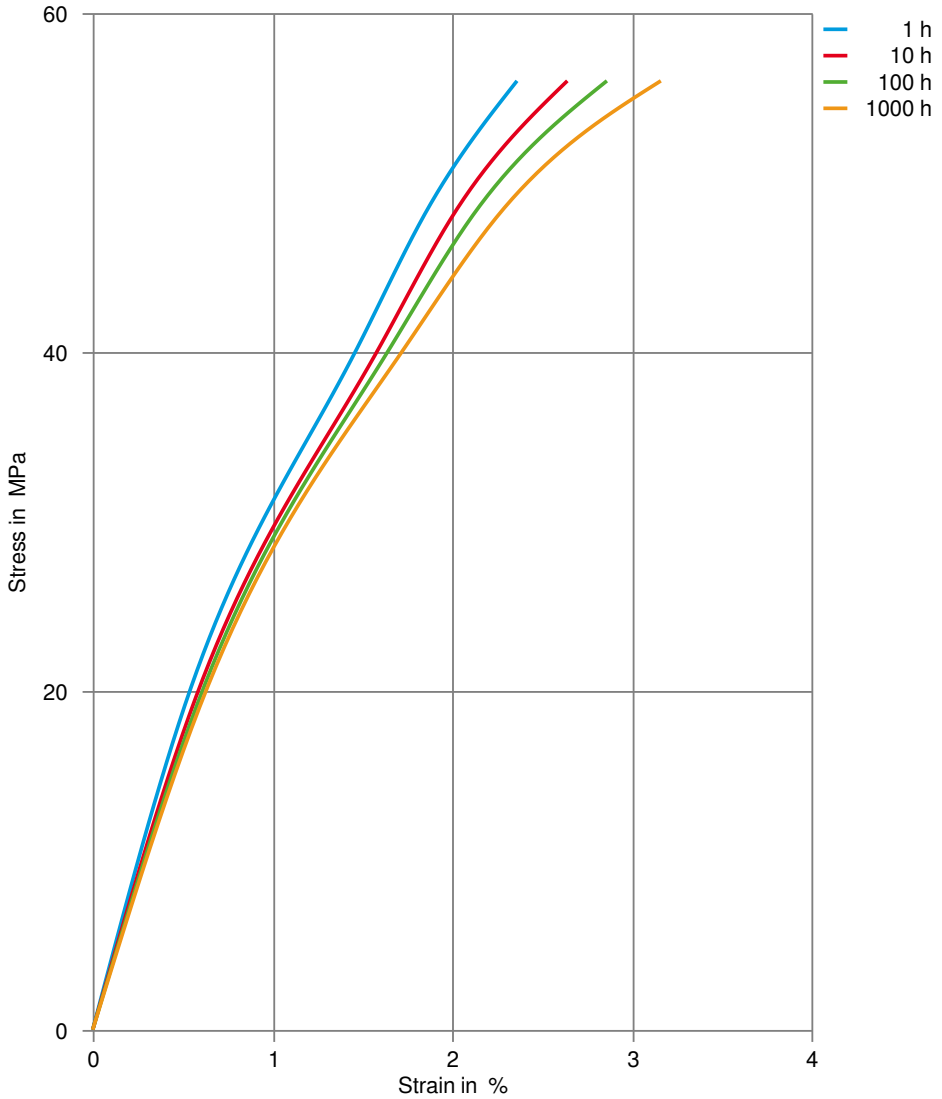
NYLON RESIN

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



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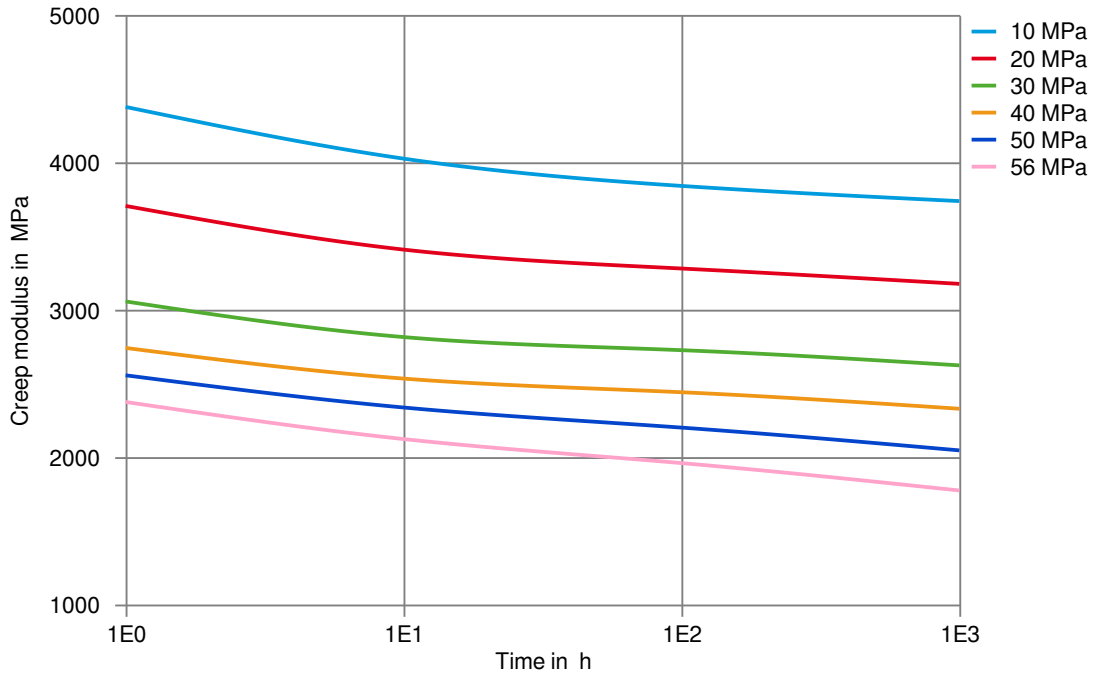
NYLON RESIN

Creep modulus-time 23 °C (cond.)



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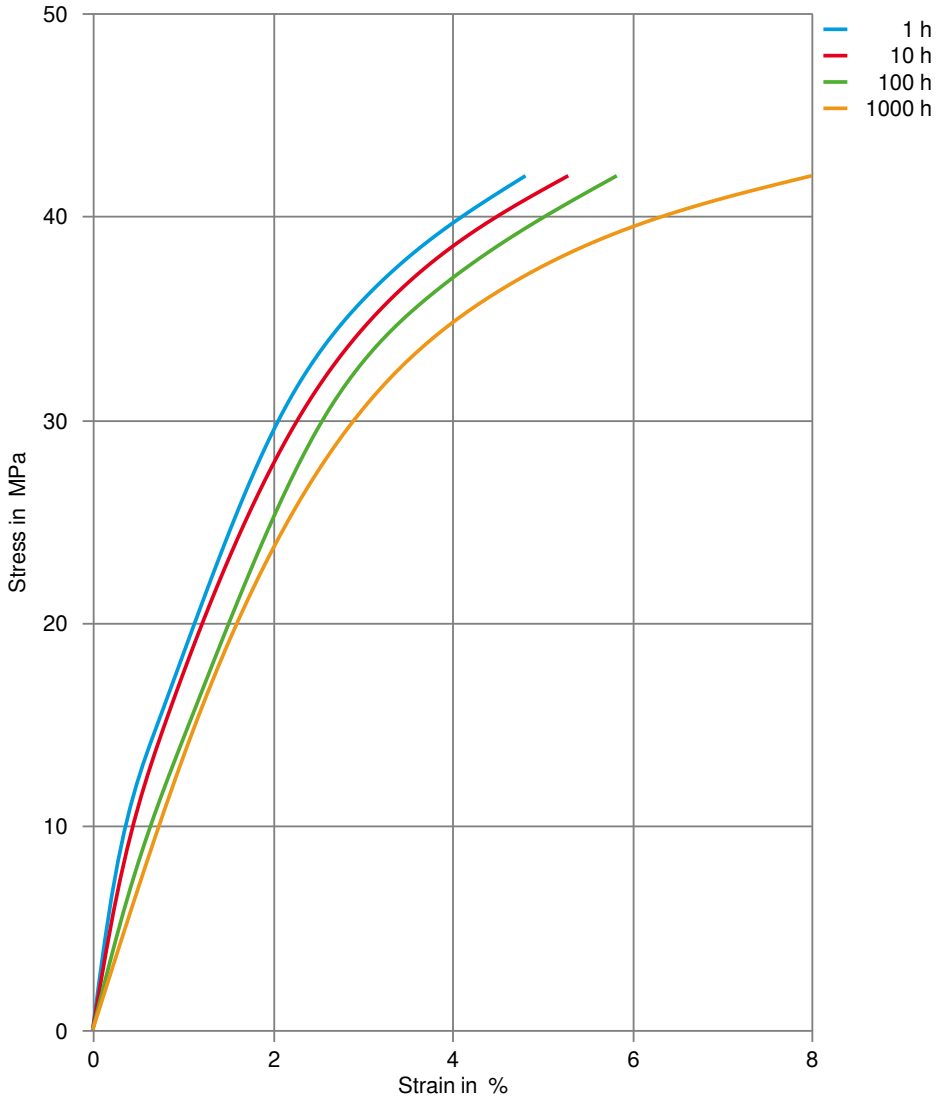
NYLON RESIN

Stress-strain (isochronous) 150 °C (dry)



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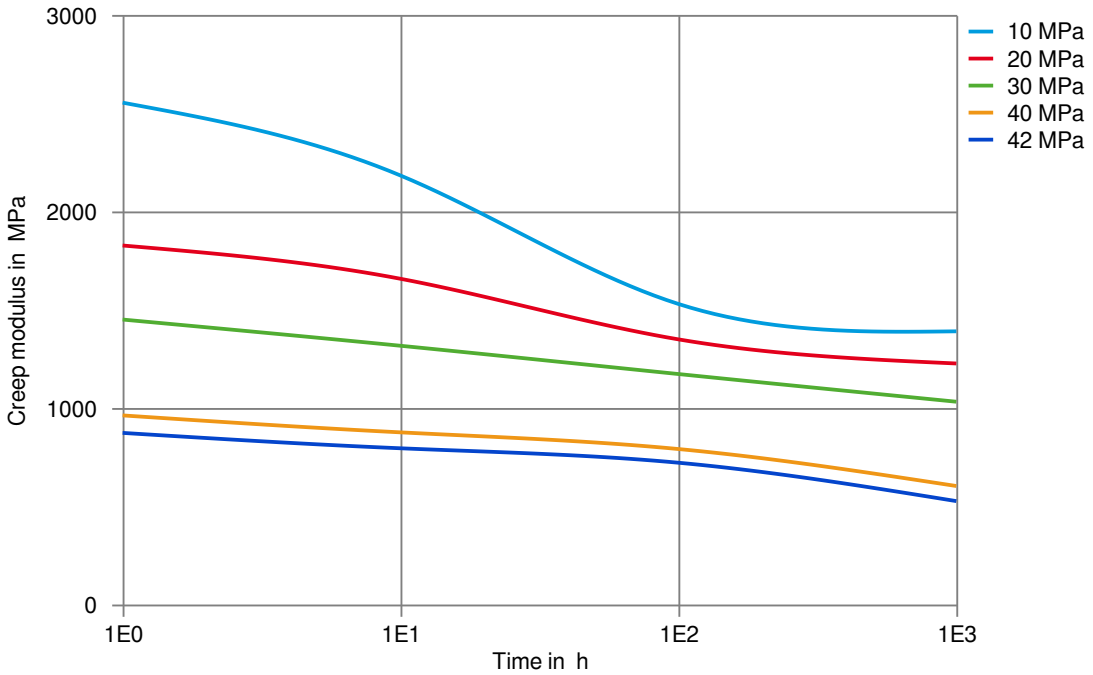
NYLON RESIN

Creep modulus-time 150 °C (dry)



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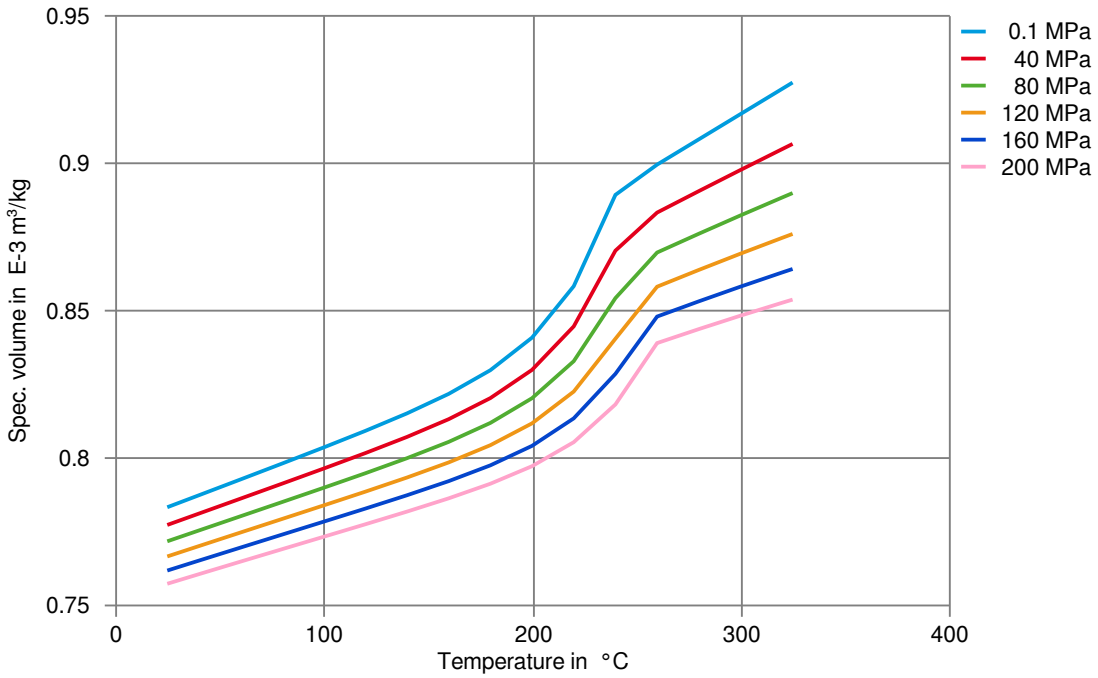
Specific volume-temperature (pvT)



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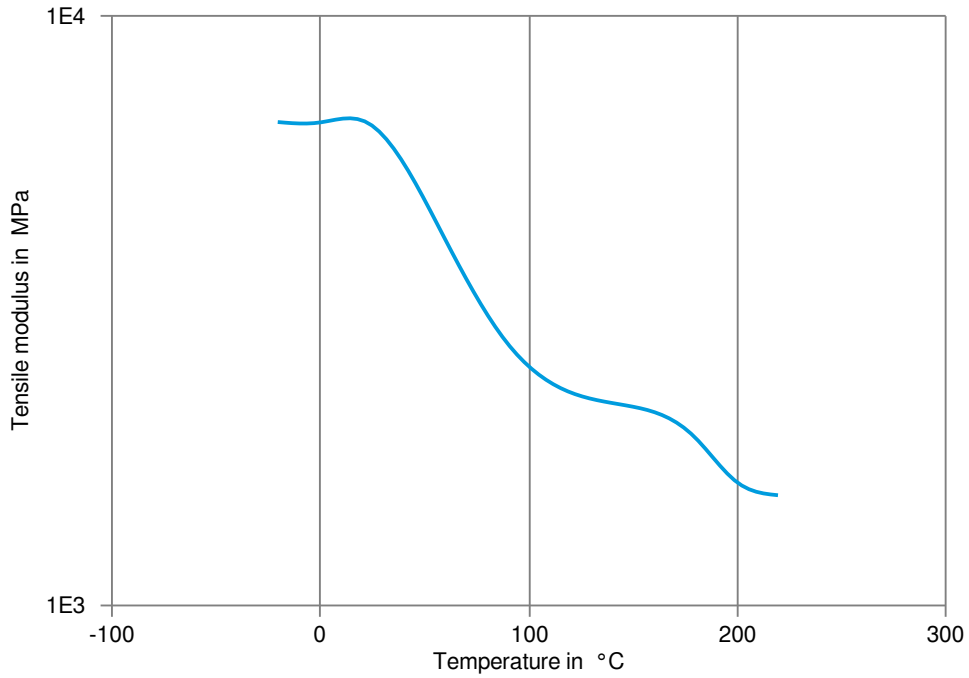
Tensile modulus-temperature (dry)



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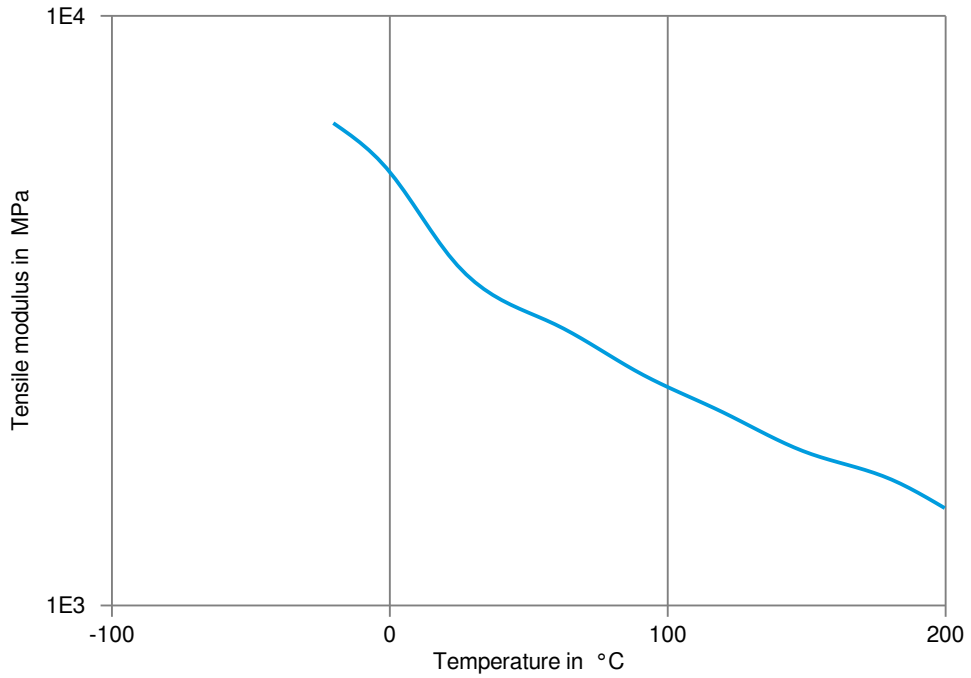
NYLON RESIN

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).