Celanese
The chemistry inside innovation™

Zytel® 70G35HSL 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® 70G35HSL NC010 is a 35% glass fiber reinforced, heat stabilised polyamide 66 resin for injection moulding.

Product information

Resin Identification	PA66-GF35	ISO 1043
Part Marking Code	>PA66-GF35<	ISO 11469
ISO designation	ISO 16396-PA66,GF35,M1GHNR,S14-110	

Rheological properties

	dry/cond.		
Viscosity number	145[1]/*	cm³/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1/-	%	ISO 294-4, 2577

[1]: sulphuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile Modulus	11000/8500	MPa	ISO 527-1/-2
Stress at break	210/140	MPa	ISO 527-1/-2
Strain at break	3.2/4.6	%	ISO 527-1/-2
Flexural Modulus	9500/7500	MPa	ISO 178
Flexural Strength	300/230	MPa	ISO 178
Tensile creep modulus, 1h	*/8400	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/6000	MPa	ISO 899-1
Charpy impact strength, 23°C	90/100	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	80/80	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	15/18	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	10/10	kJ/m²	ISO 179/1eA
Puncture energy, 23°C	6/-	J	ISO 6603-2
Izod notched impact strength, 23°C	12/15	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	10/10	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	10/-	kJ/m²	ISO 180/1A

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Izod impact strength, 23°C	60 / -	kJ/m²	ISO 180/1U
Izod impact strength, -30°C	60 / -	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	105 / 89		ISO 2039-2
Hardness, Rockwell, R-scale	125 / 117		ISO 2039-2
Ball indentation hardness, H 961/30	285 / -	MPa	ISO 2039-1
Poisson's ratio	0.34 / 0.34		

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	70 / 20	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	252 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	261 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	255 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	17 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	85 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.24	W/(m K)	ISO 22007-2
Eff. thermal diffusivity	9.5E-8	m²/s	
Spec. heat capacity of melt	2130	J/(kg K)	
RTI, electrical, 0.75mm	140	°C	UL 746B
RTI, electrical, 1.5mm	140	°C	UL 746B
RTI, electrical, 3mm	140	°C	UL 746B
RTI, impact, 0.75mm	125	°C	UL 746B
RTI, impact, 1.5mm	125	°C	UL 746B
RTI, impact, 3mm	125	°C	UL 746B
RTI, strength, 0.75mm	140	°C	UL 746B
RTI, strength, 1.5mm	140 / *	°C	UL 746B
RTI, strength, 3mm	140	°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	0.71 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Oxygen index	24 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 2mm	650 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	750 / -	°C	IEC 60695-2-12
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	26	mm/min	ISO 3795 (FMVSS 302)

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Electrical properties

	dry/cond.		
Relative permittivity, 1MHz	4.1/4.7		IEC 62631-2-1
Dissipation factor, 1MHz	140/620	E-4	IEC 62631-2-1
Volume resistivity	>1E13/1E9	Ohm.m	IEC 62631-3-1
Surface resistivity	*/1E13	Ohm	IEC 62631-3-2
Electric strength	36/31	kV/mm	IEC 60243-1
Comparative tracking index	400/-		IEC 60112

Other properties

	dry/cond.		
Humidity absorption, 2mm	1.7/*	%	Sim. to ISO 62
Water absorption, 2mm	5.5/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.1/*	%	Sim. to ISO 62
Density	1410/-	kg/m³	ISO 1183
Density of melt	1240	kg/m³	

VDA Properties

	dry/cond.		
Odour	3	class	VDA 270
Fogging, G-value (condensate)	0.5/*	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	285	°C
Max. melt temperature	305	°C
Max. 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	210	°C

Characteristics

Additives	Release agent

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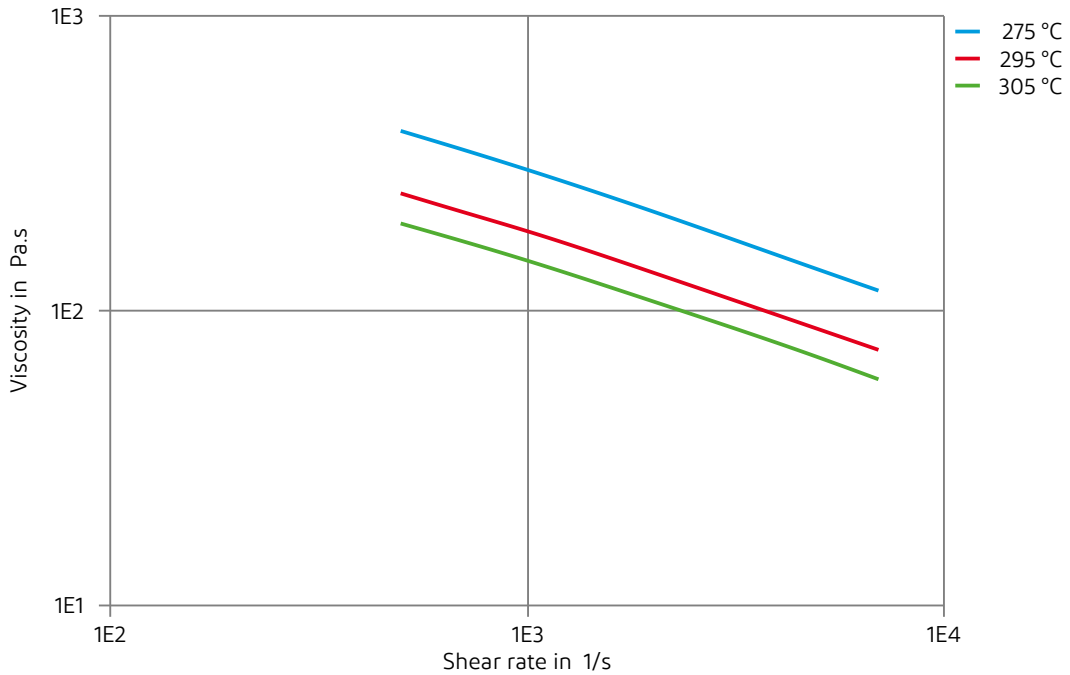
Viscosity-shear rate



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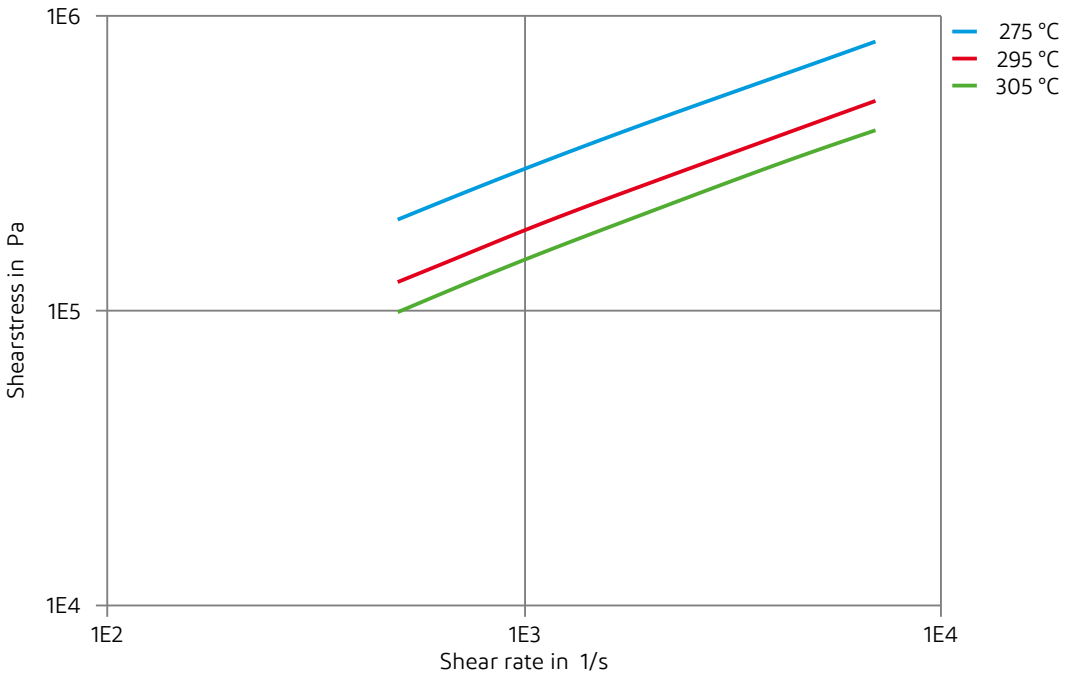
Shearstress-shear rate



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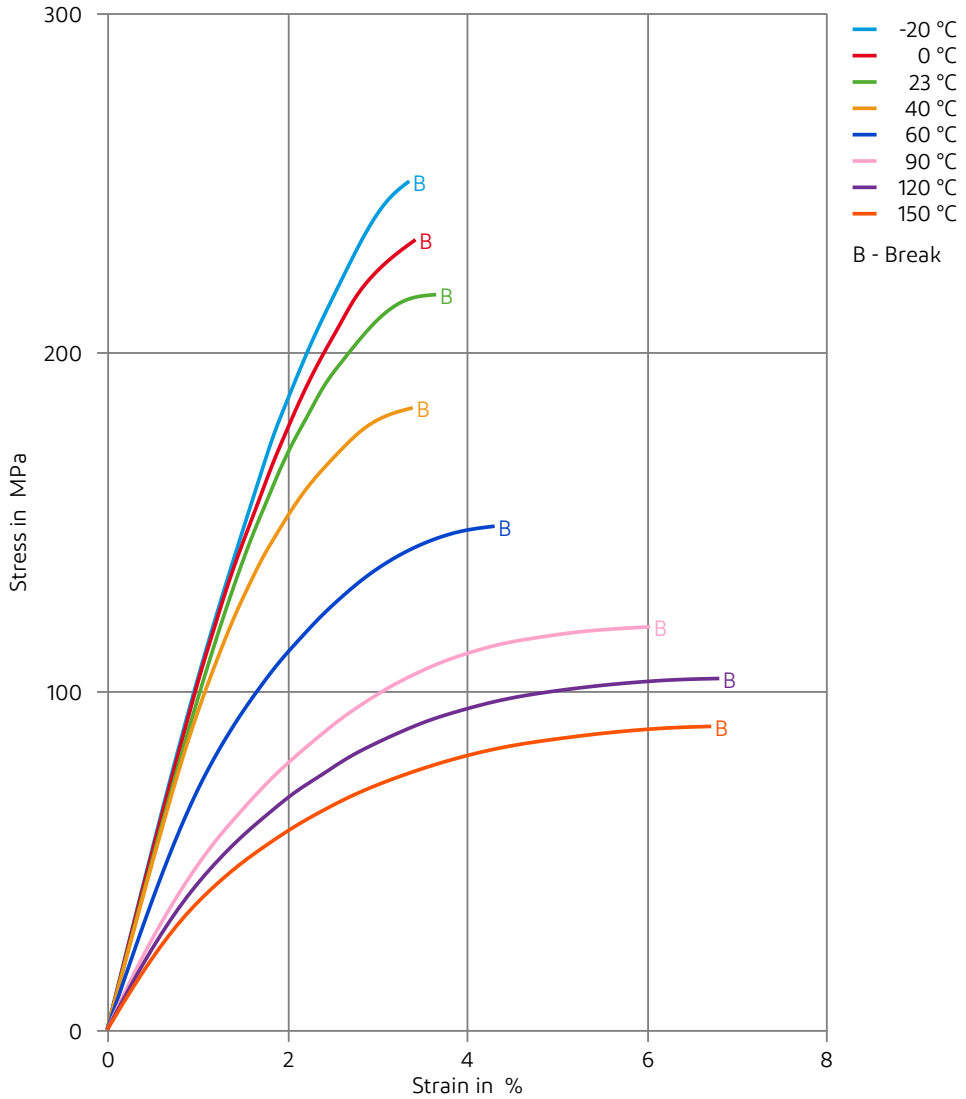
Stress-strain (dry)



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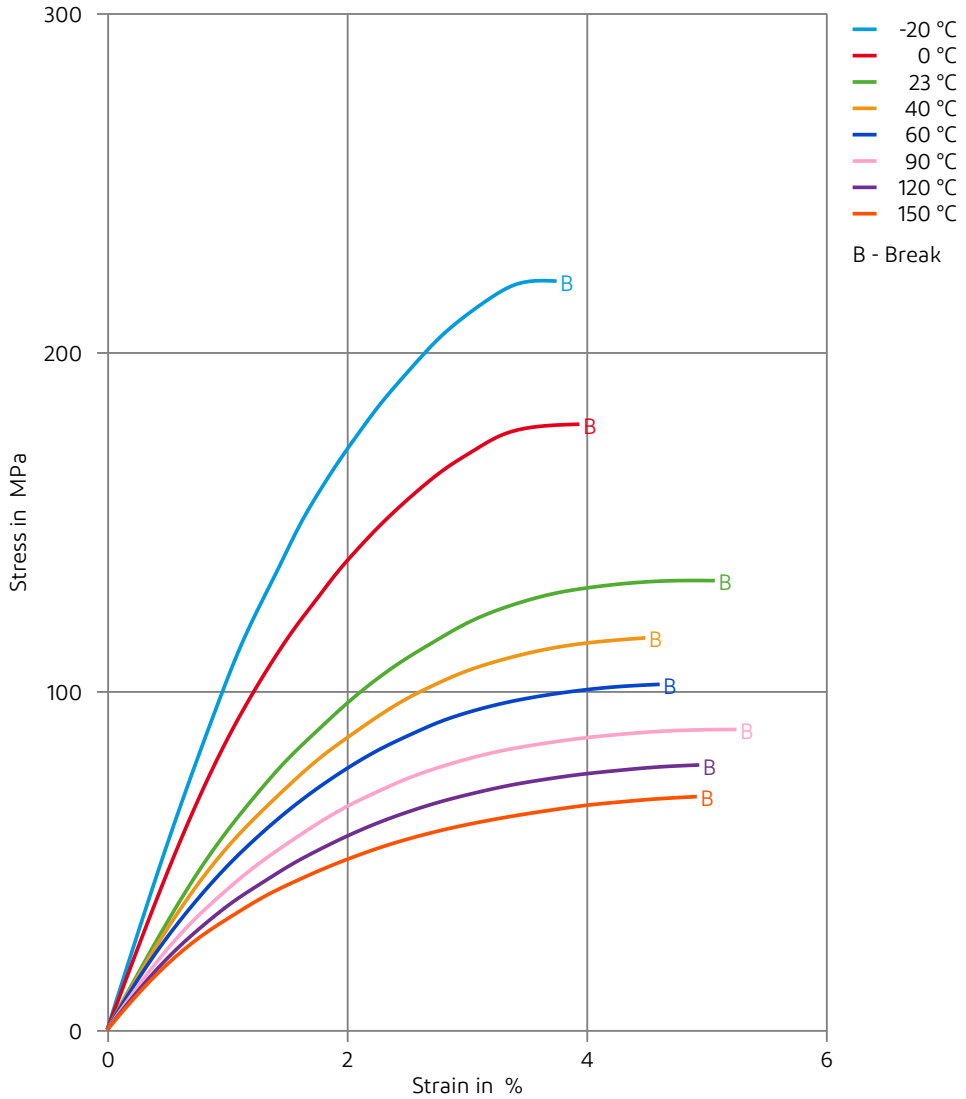
NYLON RESIN

Stress-strain (cond.)



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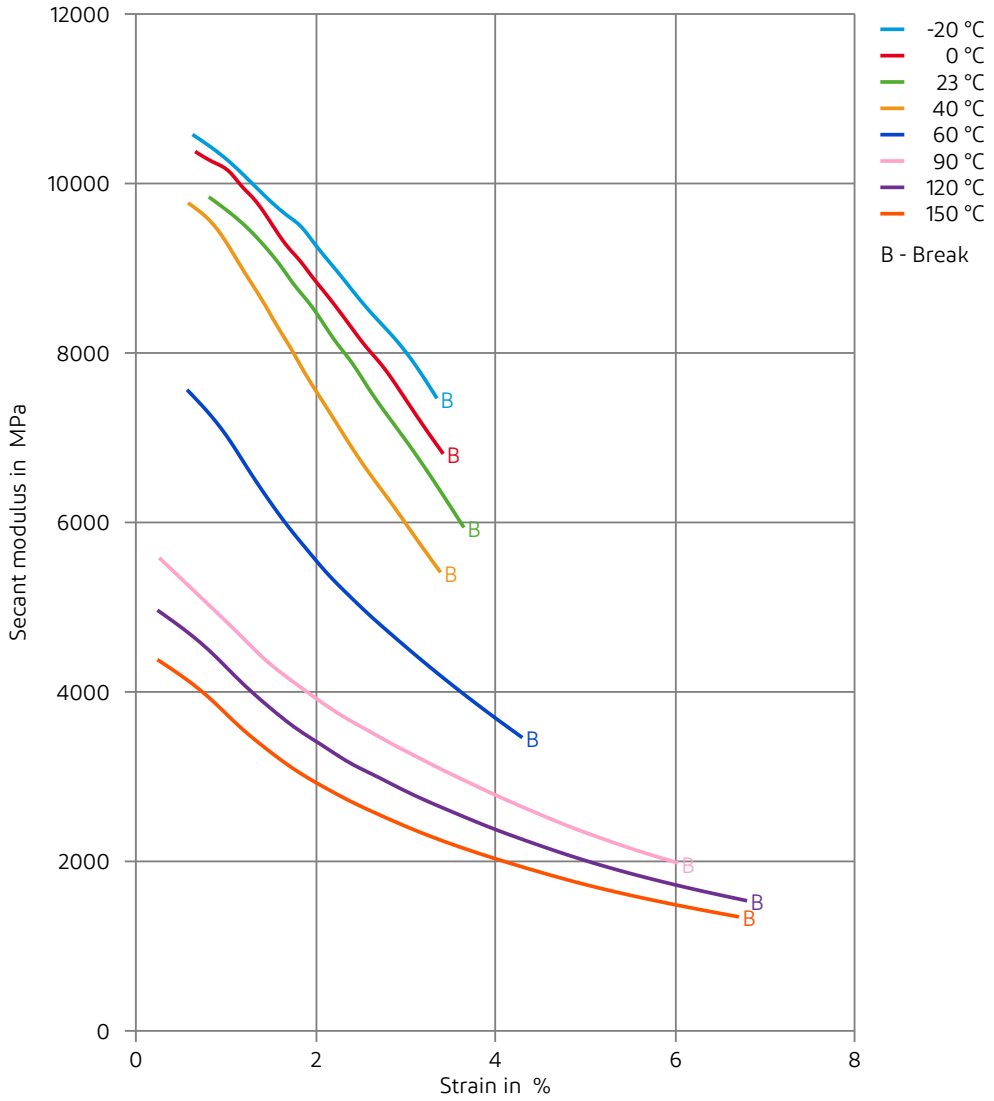
NYLON RESIN

Secant modulus-strain (dry)



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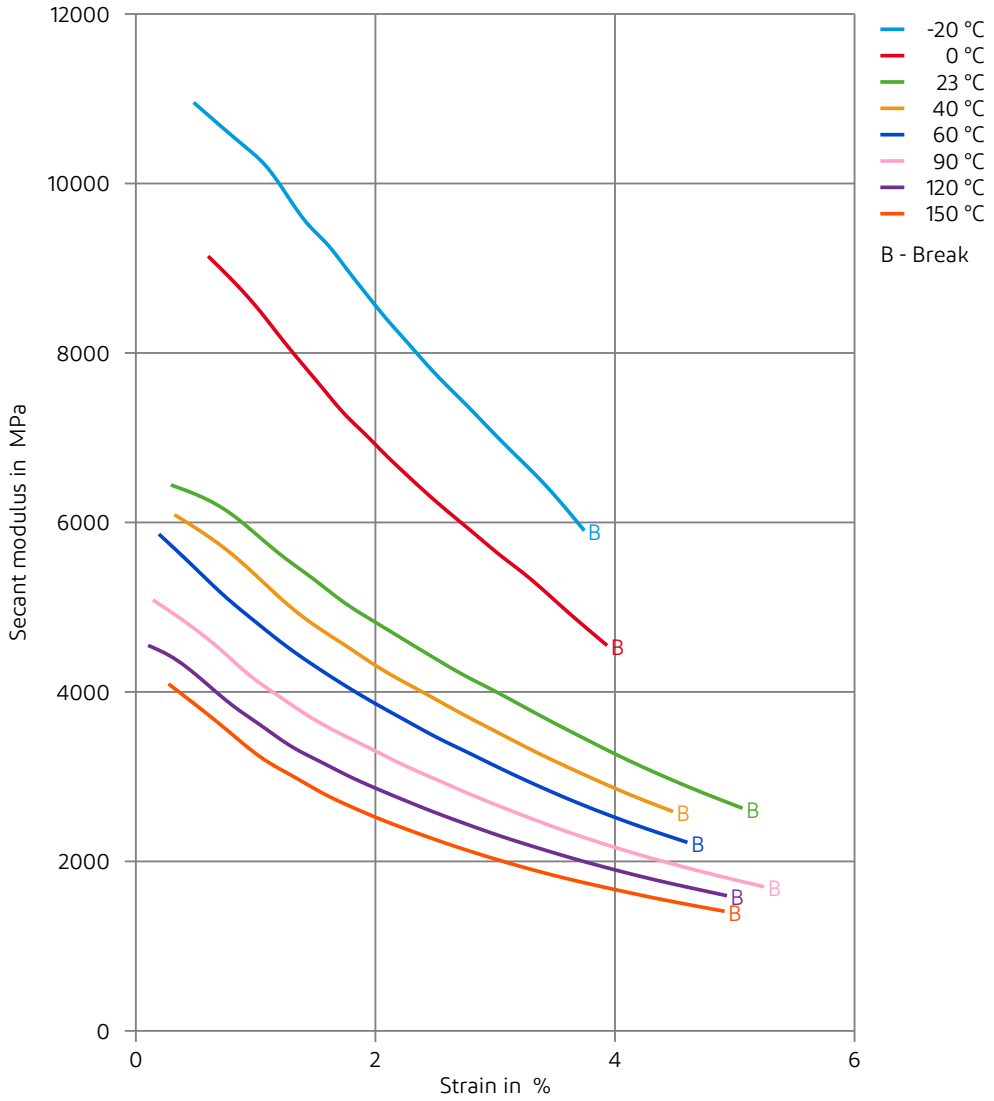
NYLON RESIN

Secant modulus-strain (cond.)



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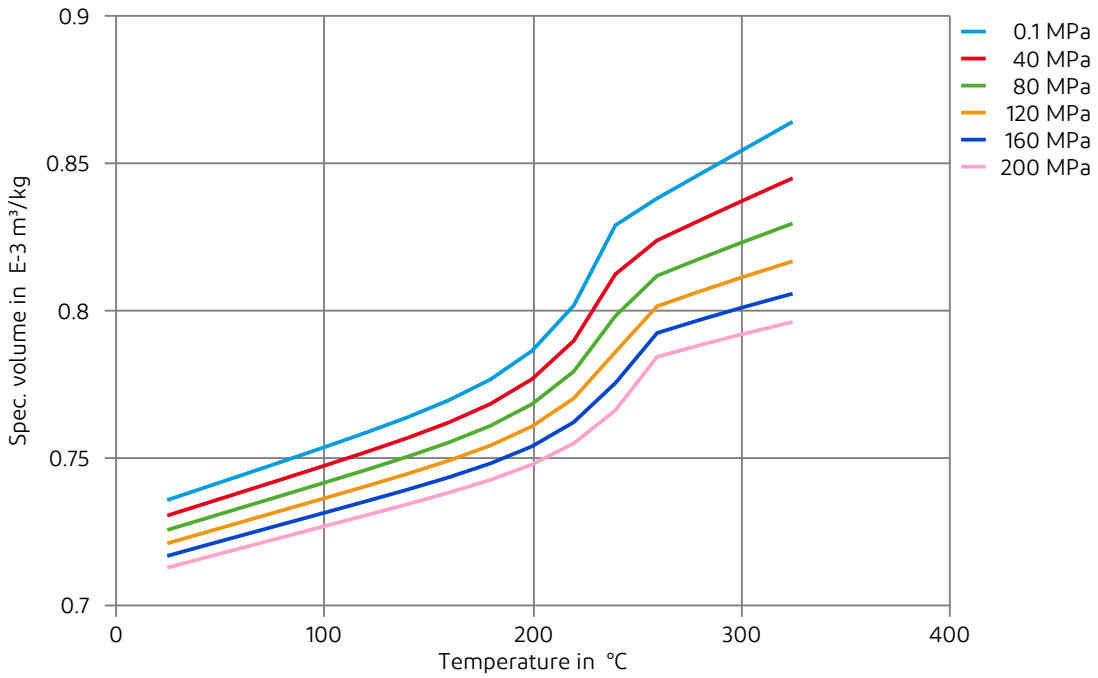
Specific volume-temperature (pvT)



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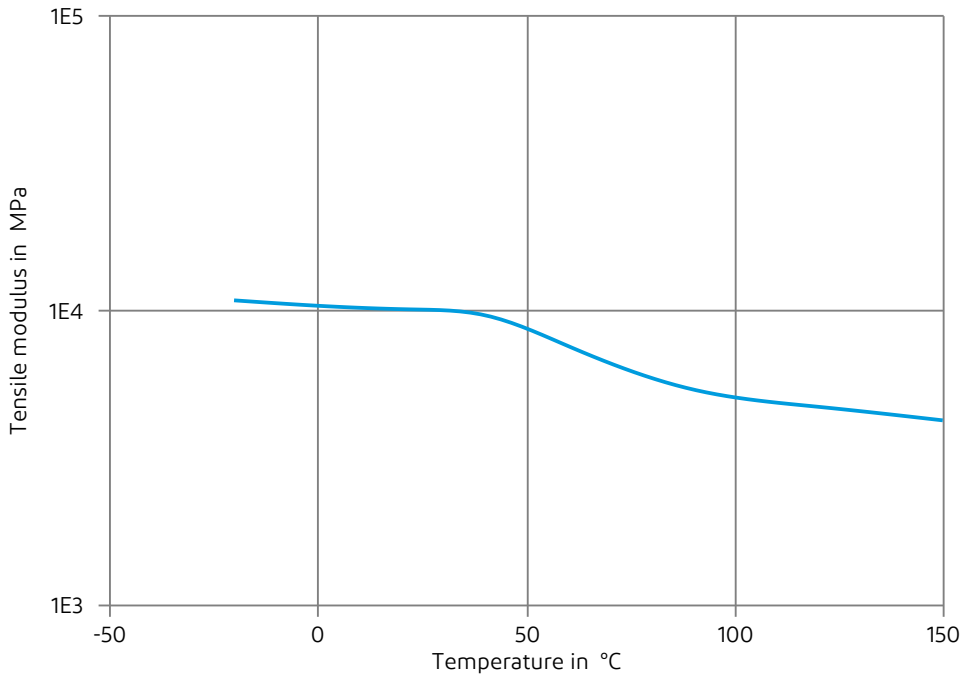
Tensile modulus-temperature (dry)



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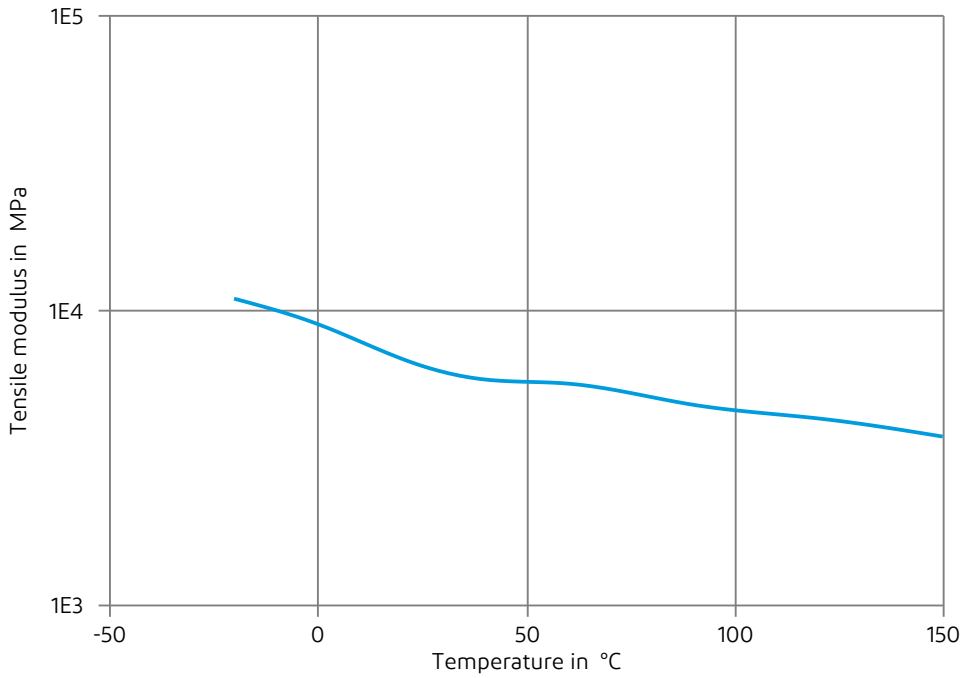
Tensile modulus-temperature (cond.)



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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
- ✔ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°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

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- ✗ 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
- ✓ 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).