Zytel® 73G30HSL 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, DuPont recommends, 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® 73G30HSL NC010 is a 30% glass fibre reinforced, heat stabilised polyamide 6 for injection molding.

Product information

Resin Identification	PA6-GF30	ISO 1043
Part Marking Code	>PA6-GF30<	ISO 11469
ISO designation	ISO 16396-PA6,GF30,M1GHNR,S14-090	

Rheological properties

	dry/cond.		
Viscosity number	140/*	cm³/g	ISO 307, 1157, 1628
Molding shrinkage, parallel	0.2/-	%	ISO 294-4, 2577
Molding shrinkage, normal	0.6/-	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile Modulus	9500/6000	MPa	ISO 527-1/-2
Stress at break	190/120	MPa	ISO 527-1/-2
Strain at break	3.5/6	%	ISO 527-1/-2
Flexural Modulus	8500/5500	MPa	ISO 178
Flexural Strength	280/180	MPa	ISO 178
Tensile creep modulus, 1h	*/5500	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/4500	MPa	ISO 899-1
Charpy impact strength, 73°F	100/100	kJ/m²	ISO 179/1eU
Charpy impact strength, -22°F	80/80	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 73°F	16/23	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -22°F	10/11	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°F	10/10	kJ/m²	ISO 179/1eA
Puncture energy, 73°F	3.5/6.5	J	ISO 6603-2
Izod notched impact strength, 73°F	15/20	kJ/m²	ISO 180/1A
Izod notched impact strength, -22°F	10/11	kJ/m²	ISO 180/1A
Izod impact strength, 73°F	80/-	kJ/m²	ISO 180/1U

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Hardness, Rockwell, R-scale	121/-	-	ISO 2039-2
Ball indentation hardness, H 961/30	230/150	MPa	ISO 2039-1
Poisson's ratio	0.34/0.35	-	

Thermal properties

	dry/cond.		
Melting temperature, 18°F/min	221/*	°C	ISO 11357-1/-3
Glass transition temperature, 18°F/min	60/-	°C	ISO 11357-1/-2
Temp. of deflection under load, 260 psi	210/*	°C	ISO 75-1/-2
Temp. of deflection under load, 65 psi	220/*	°C	ISO 75-1/-2
Vicat softening temperature, 90°F/h, 11 lbf	215/*	°C	ISO 306
Coeff. of linear therm. expansion, parallel	26/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	75/*	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.26	W/(m K)	
Eff. thermal diffusivity	9.1E-8	m²/s	
Spec. heat capacity of melt	2280	J/(kg K)	
RTI, electrical, 30mil	65	°C	UL 746B
RTI, electrical, 60mil	65	°C	UL 746B
RTI, electrical, 120mil	65	°C	UL 746B
RTI, impact, 30mil	65	°C	UL 746B
RTI, impact, 60mil	65	°C	UL 746B
RTI, impact, 120mil	65	°C	UL 746B
RTI, strength, 30mil	65	°C	UL 746B
RTI, strength, 60mil	65/*	°C	UL 746B
RTI, strength, 120mil	65	°C	UL 746B

Flammability

	dry/cond.		
Burning Behav. at 60mil 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	0.75/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Oxygen index	21/*DS	%	ISO 4589-1/-2
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	50	mm/min	ISO 3795 (FMVSS 302)

DS: Derived from similar grade

Other properties

	dry/cond.		
Humidity absorption, 80mil	2.1/*	%	Sim. to ISO 62
Water absorption, 80mil	6.3/*	%	Sim. to ISO 62
Density	1360/-	kg/m³	ISO 1183
Density of melt	1200	kg/m³	

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VDA Properties

	dry/cond.		
Emission of organic compounds	8.5	µgC/g	VDA 277
Odor test	3.5	class	VDA 270
Fogging, F-value (refraction)	95/*	%	ISO 6452
Fogging, G-value (condensate)	0.1/*	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	270	°C
Min. melt temperature	260	°C
Max. melt temperature	280	°C
Max. screw tangential speed	0.2	m/s
Mold Temperature Optimum	100	°C
Min. mold temperature	70	°C
Max. mold temperature	120	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm

Characteristics

Additives	Release agent

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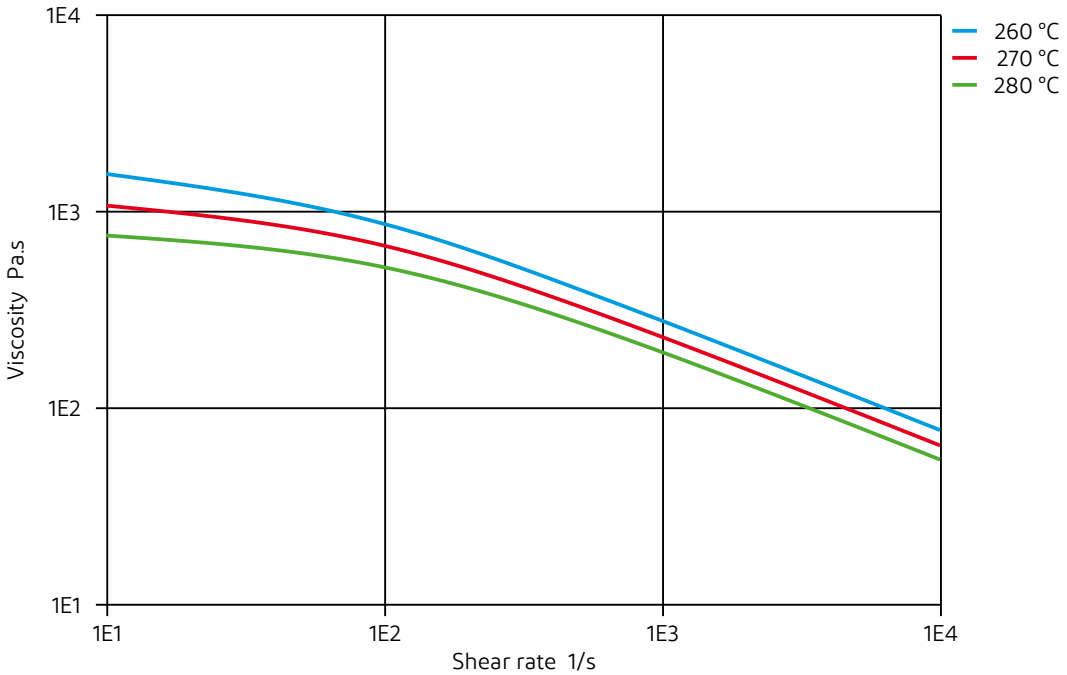
Viscosity-shear rate



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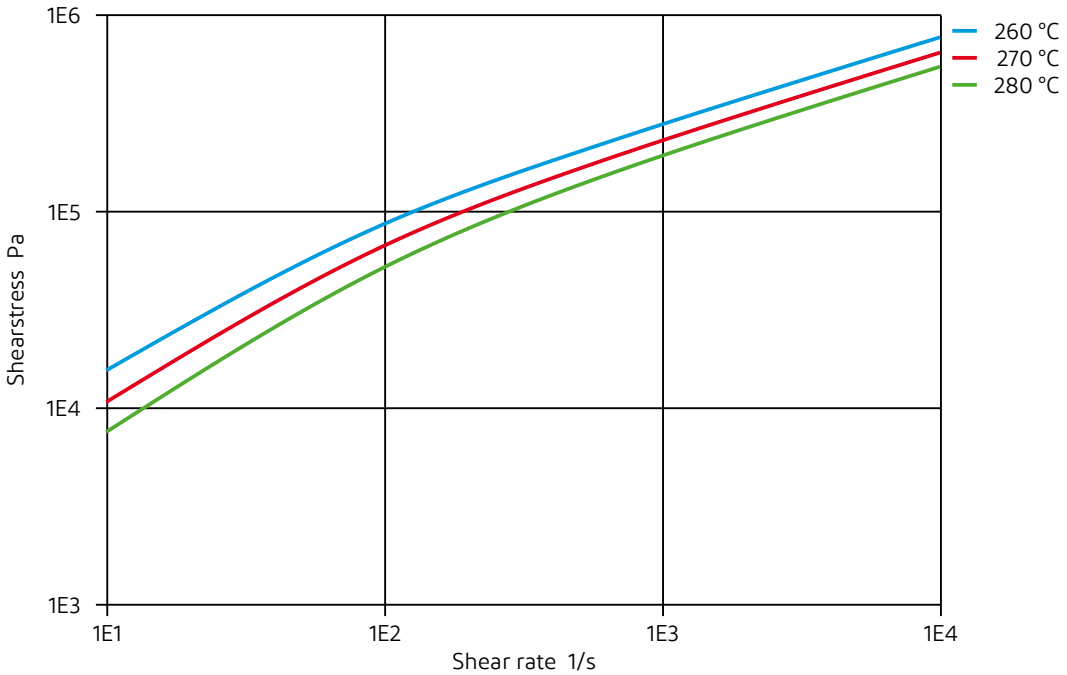
NYLON RESIN

Shearstress-shear rate



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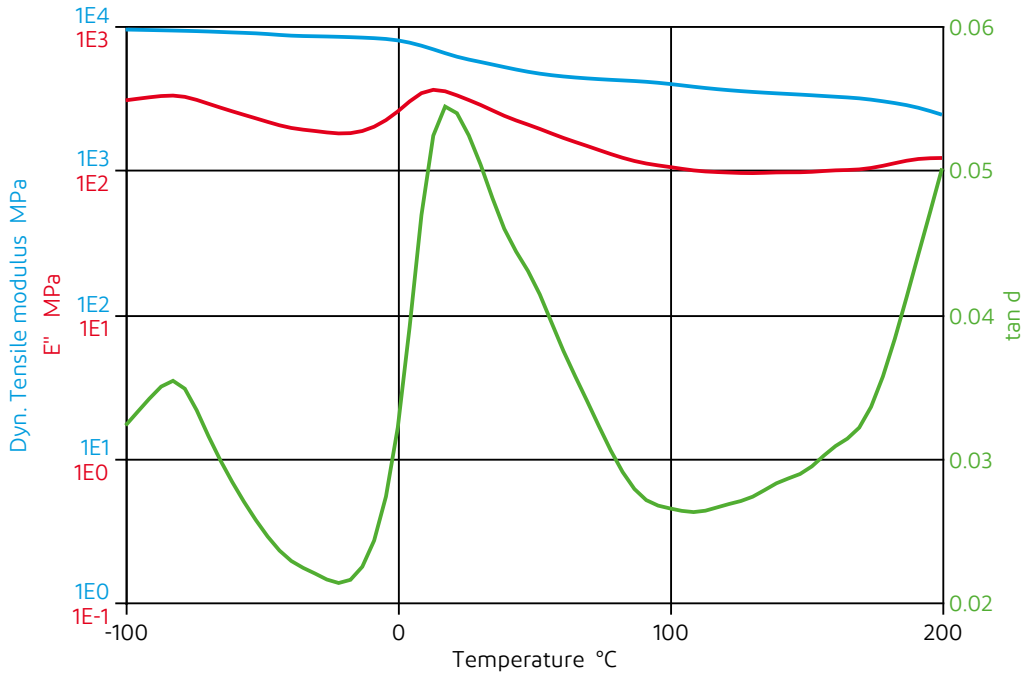
Dynamic Tensile modulus-temperature (cond.)



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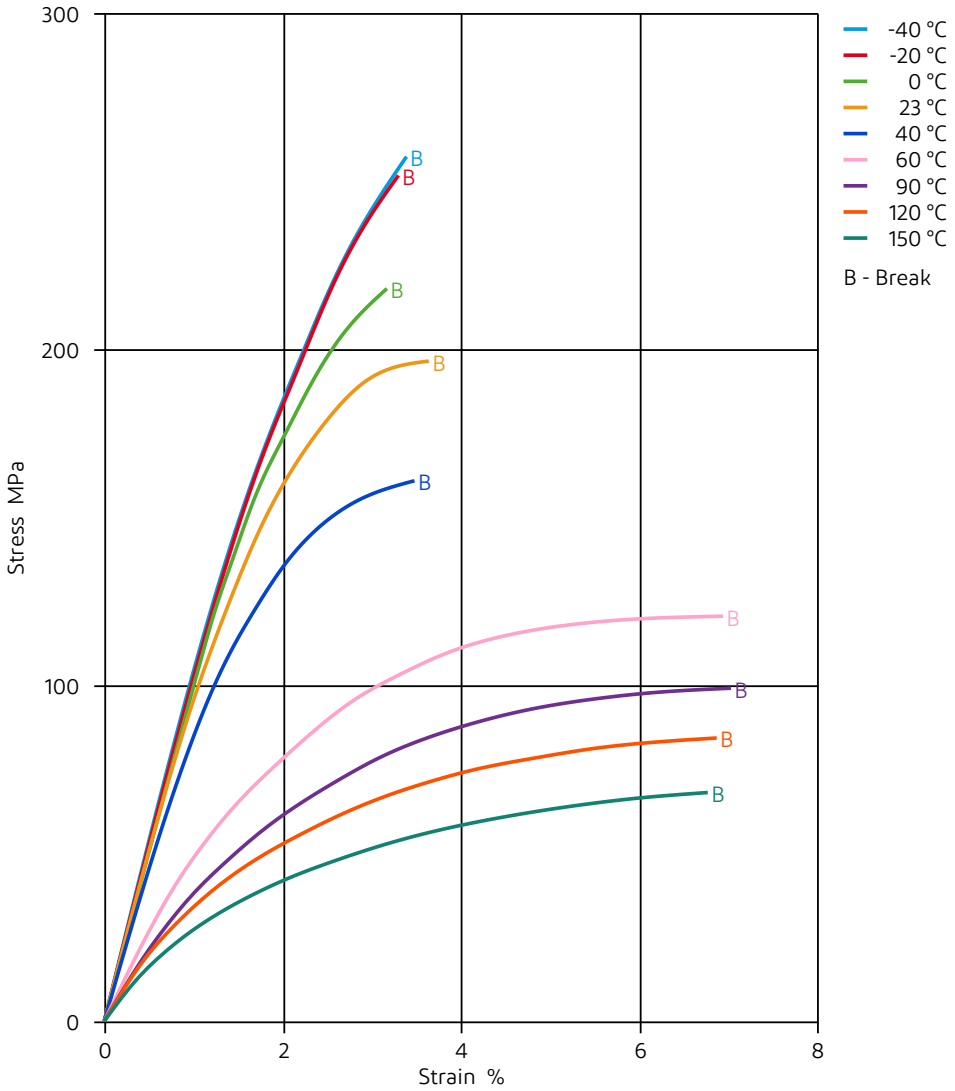
NYLON RESIN

Stress-strain (dry)



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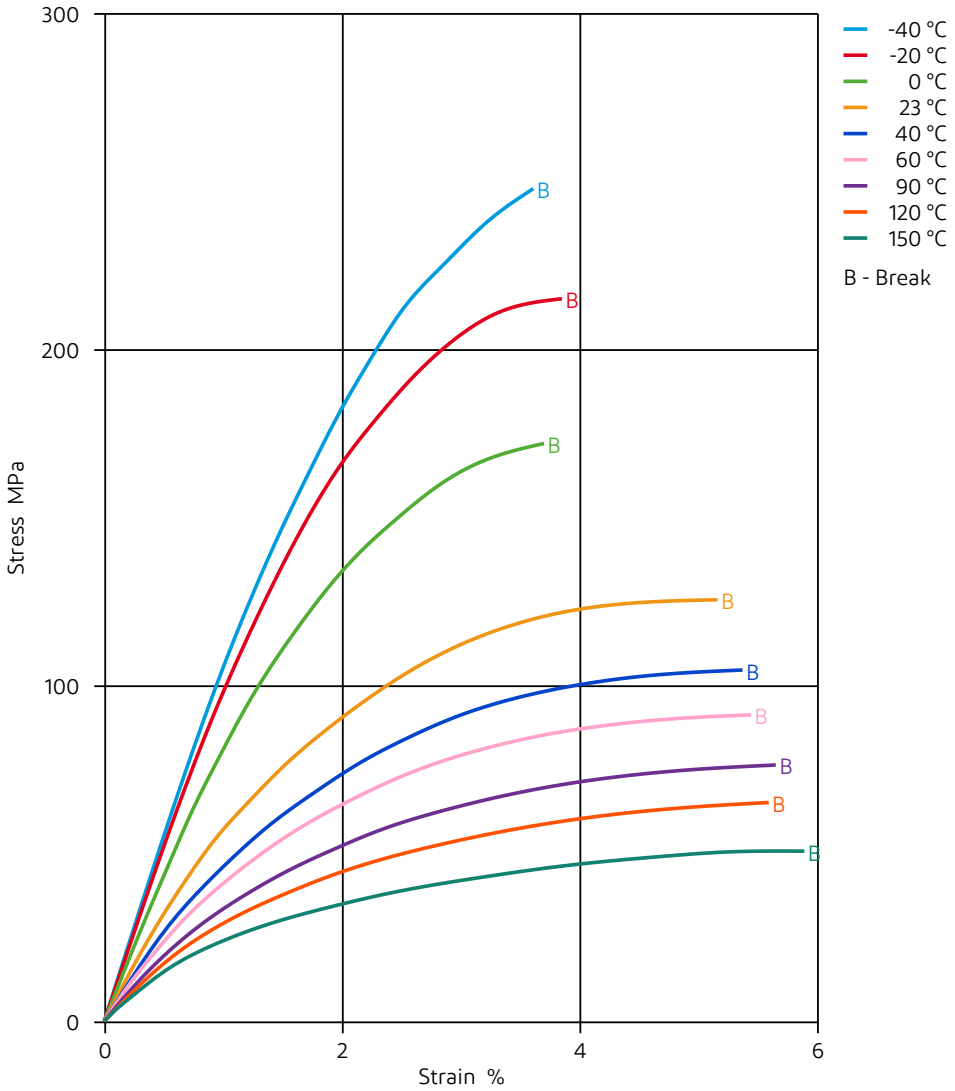
NYLON RESIN

Stress-strain (cond.)



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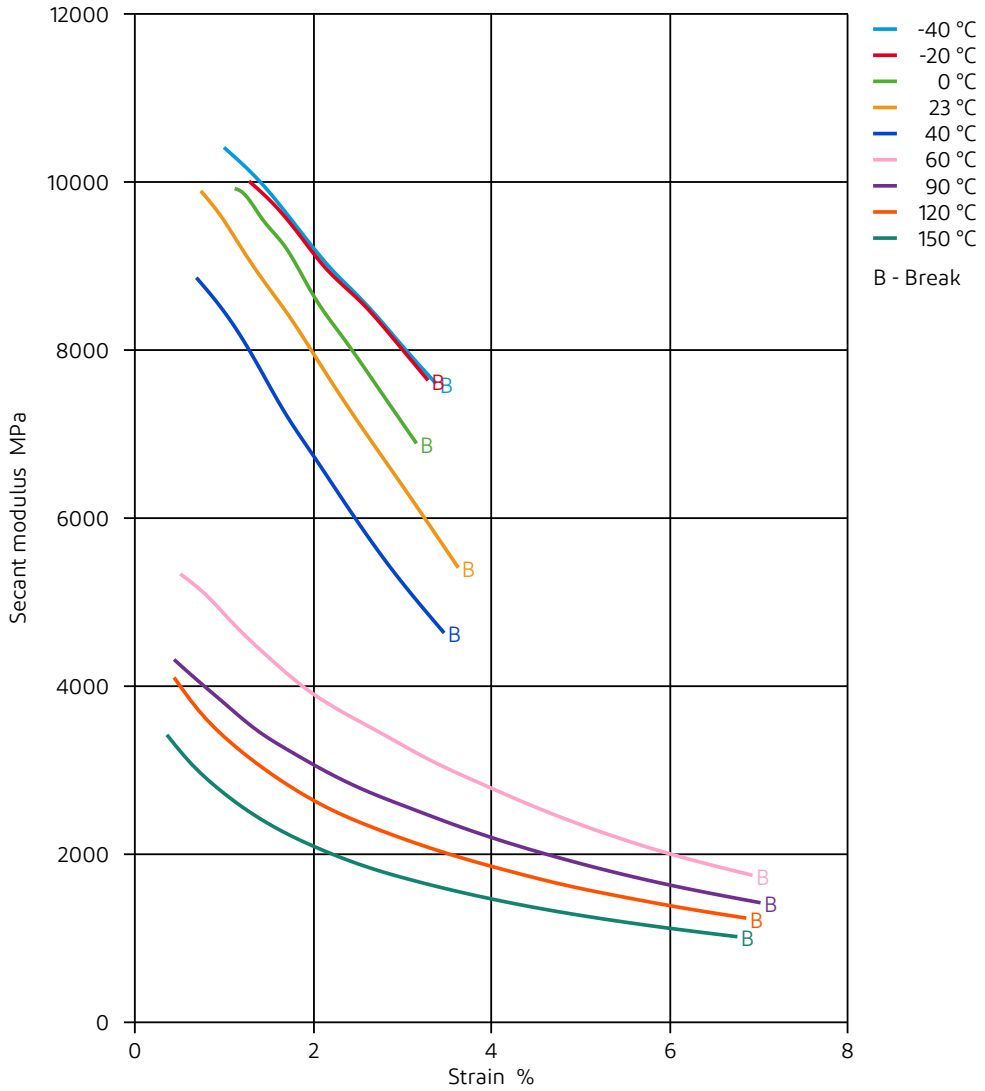
NYLON RESIN

Secant modulus-strain (dry)



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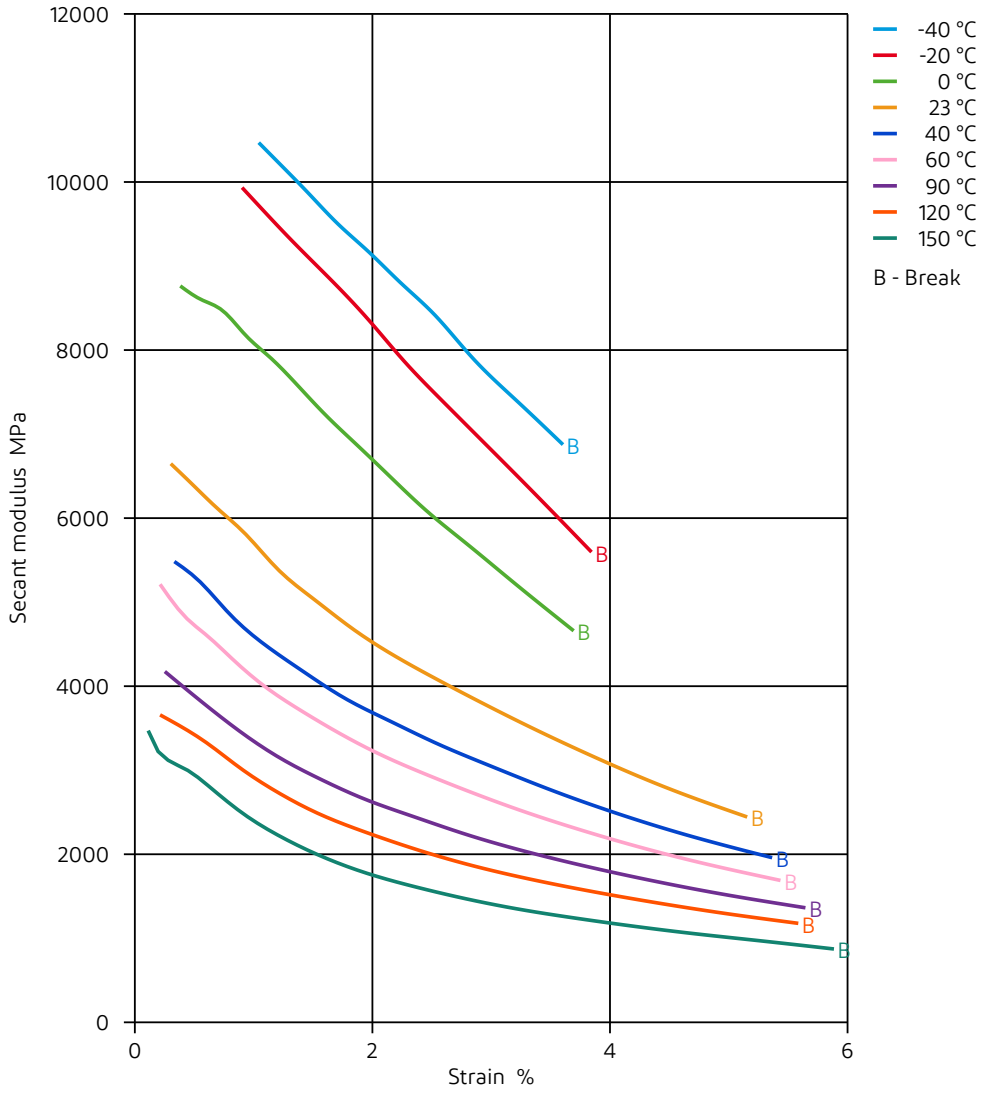
NYLON RESIN

Secant modulus-strain (cond.)



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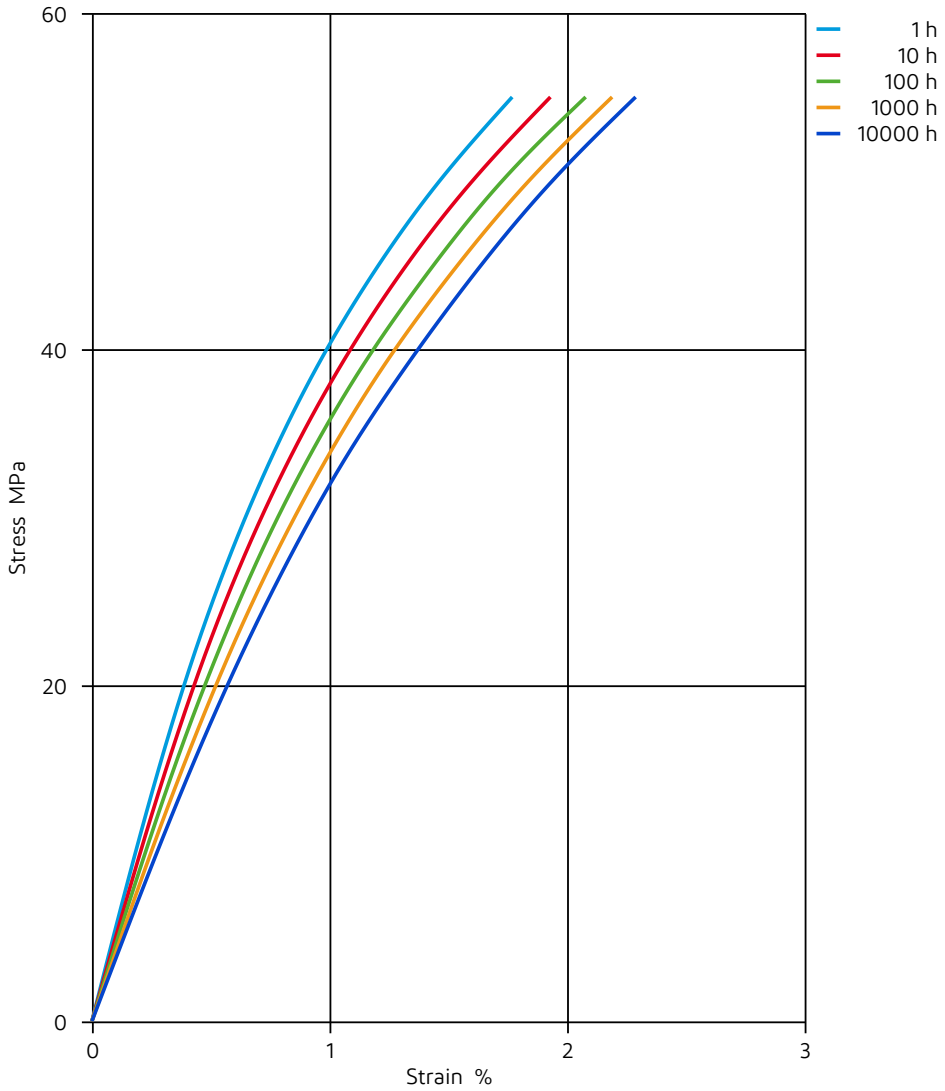
NYLON RESIN

Stress-strain (isochronous) 23°C (cond.)
(measured on Zytel® 73G30L NC010)



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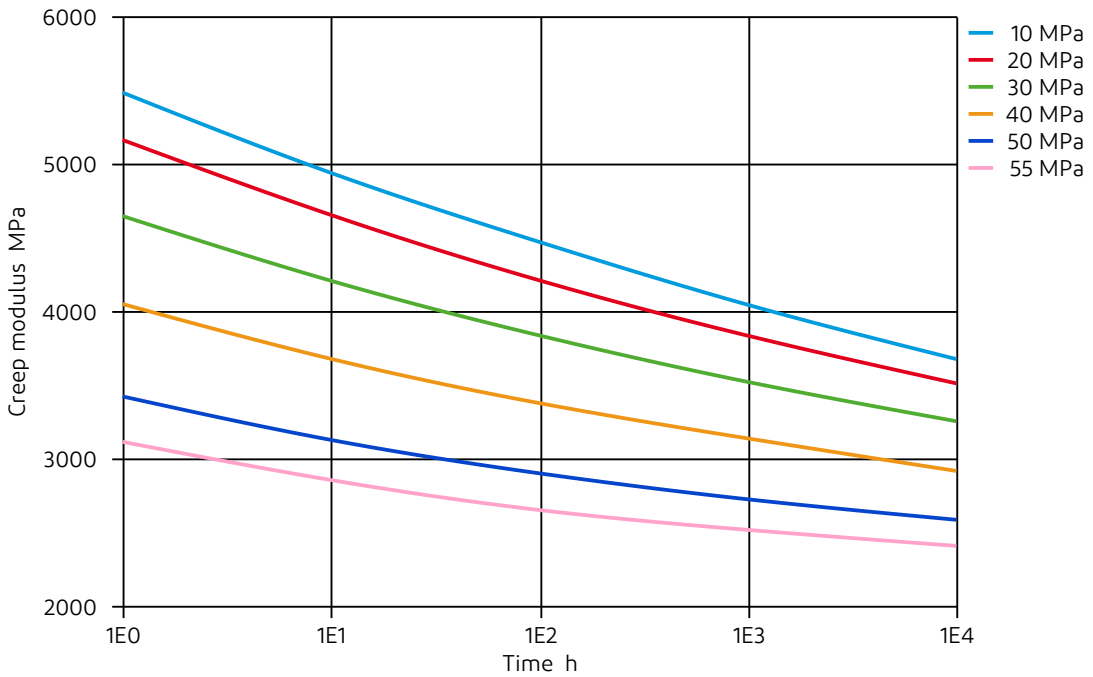
NYLON RESIN

Creep modulus-time 23°C (cond.)
(measured on Zytel® 73G30L NC010)



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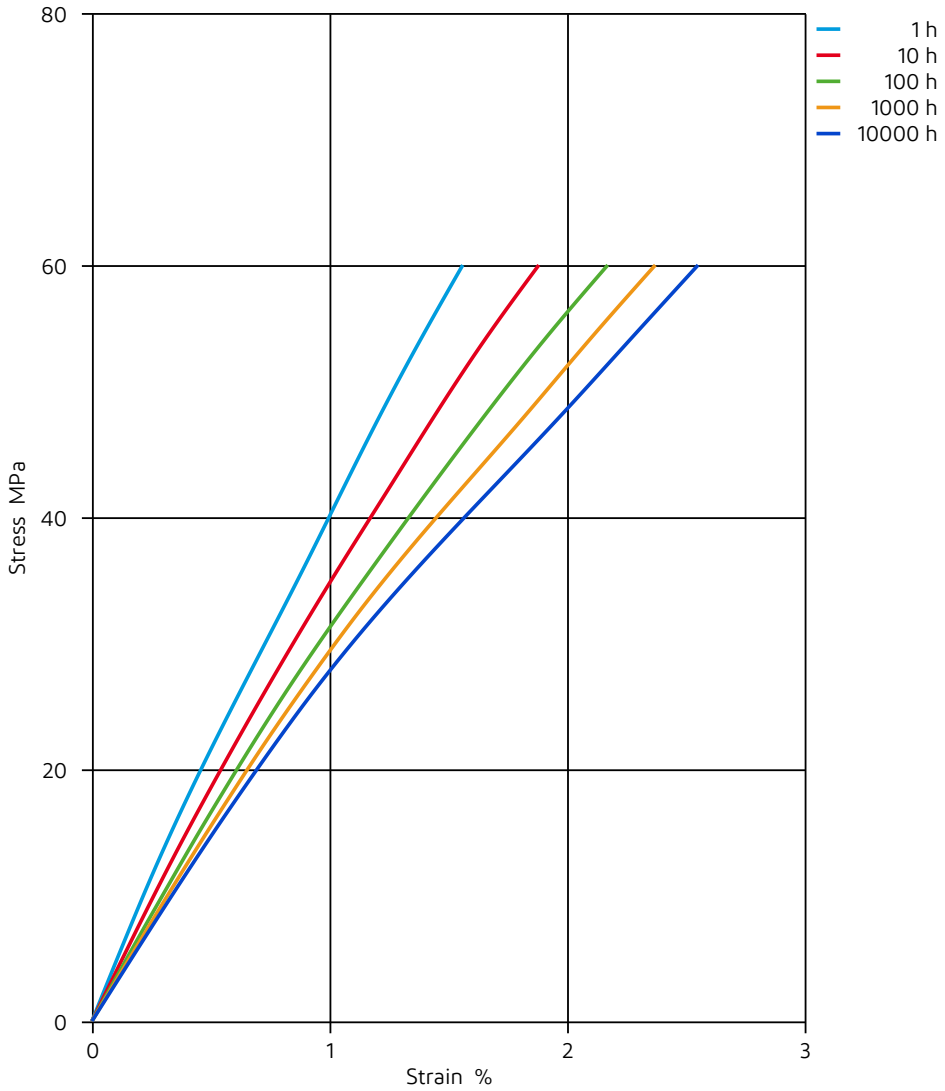
NYLON RESIN

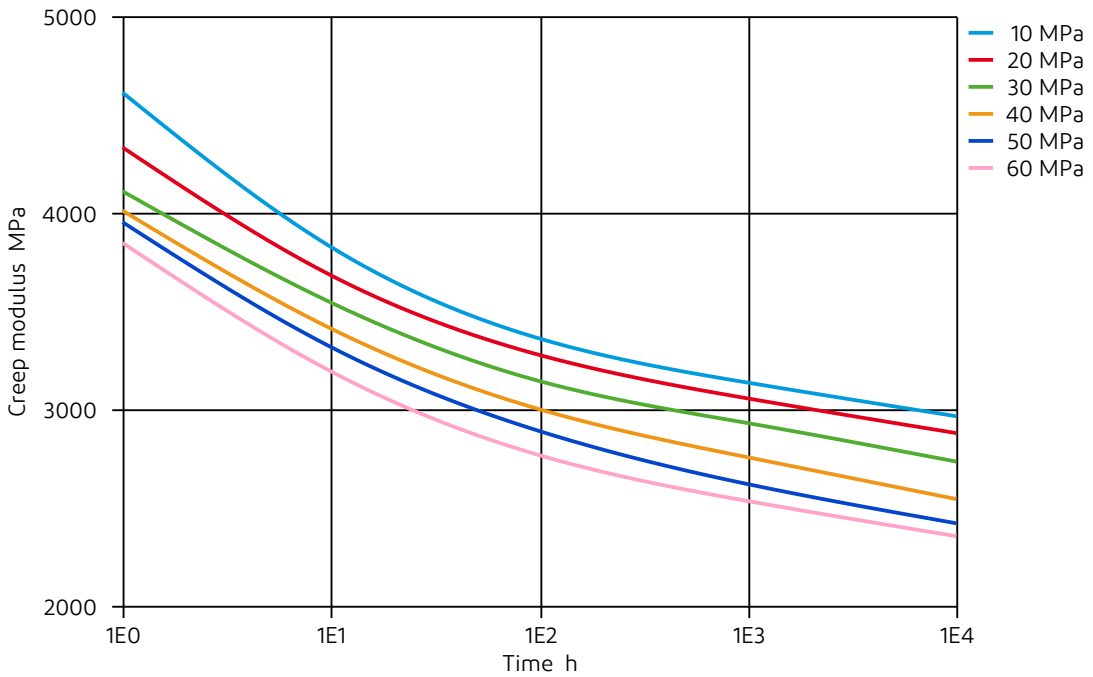
Stress-strain (isochronous) 60°C (dry)
(measured on Zytel® 73G30L NC010)



Zytel® 73G30HSL NC010

NYLON RESIN

Creep modulus-time 60°C (dry)
(measured on Zytel® 73G30L NC010)



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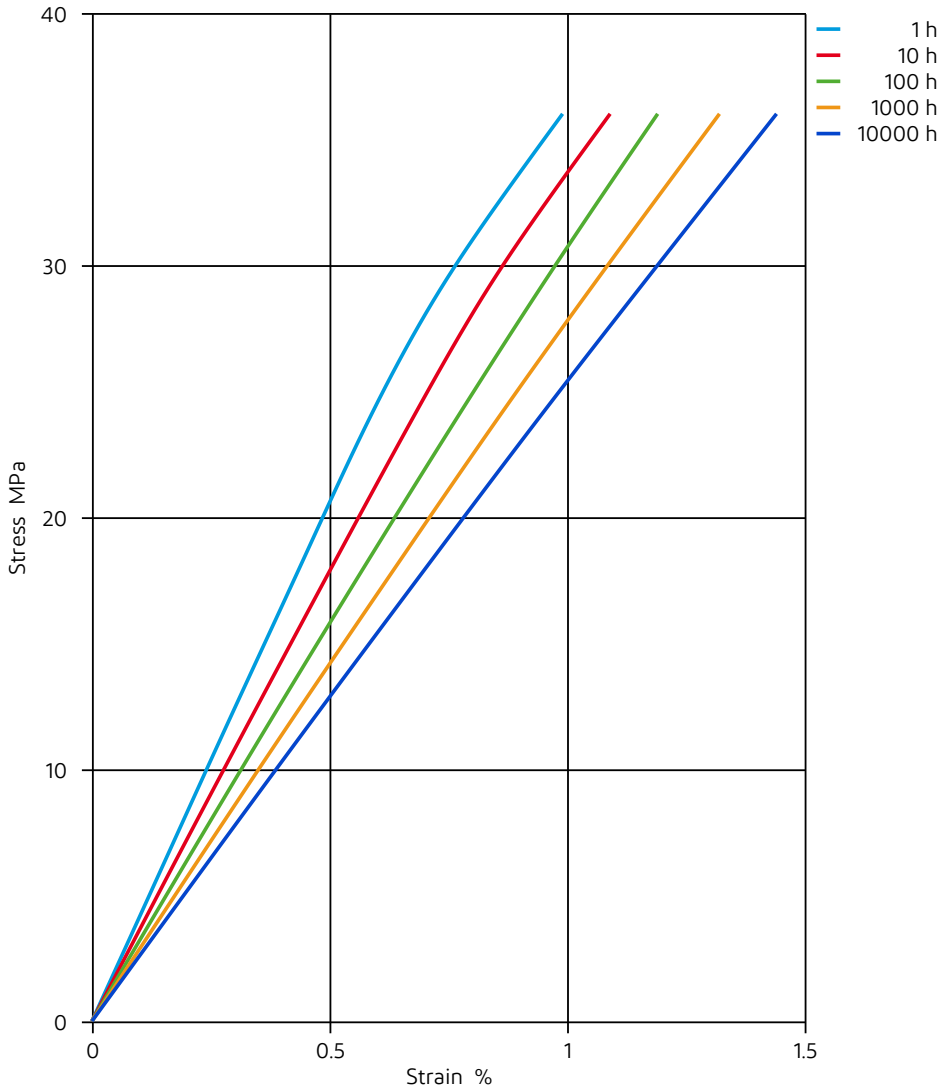
NYLON RESIN

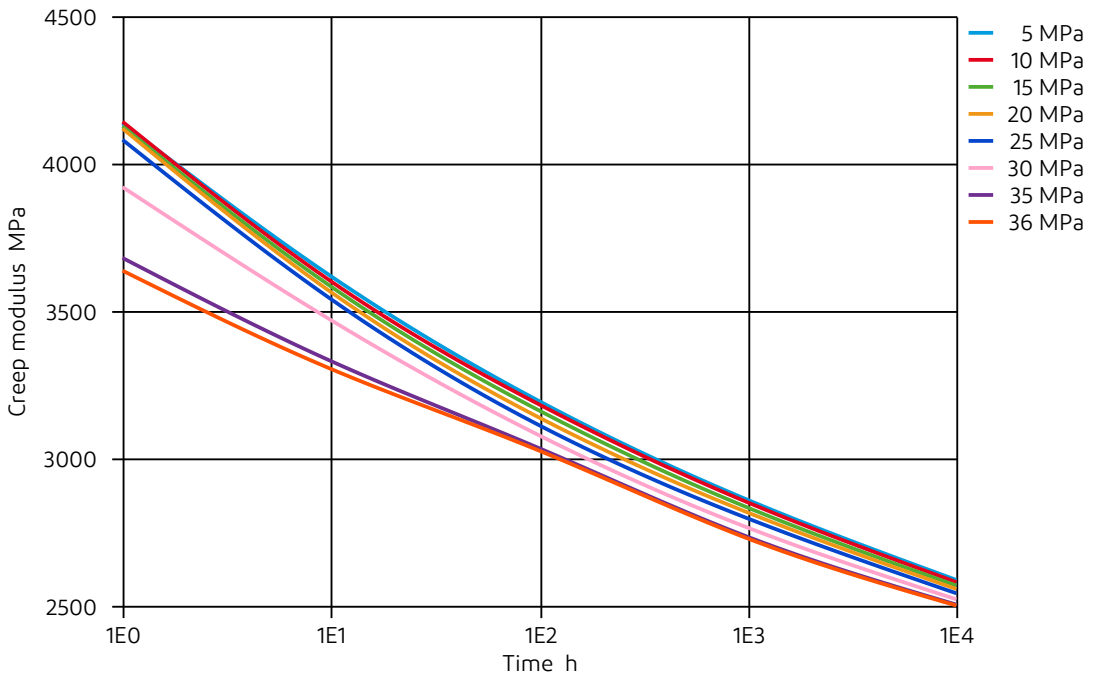
Stress-strain (isochronous) 90°C (dry)
(measured on Zytel® 73G30L NC010)



Zytel® 73G30HSL NC010

NYLON RESIN

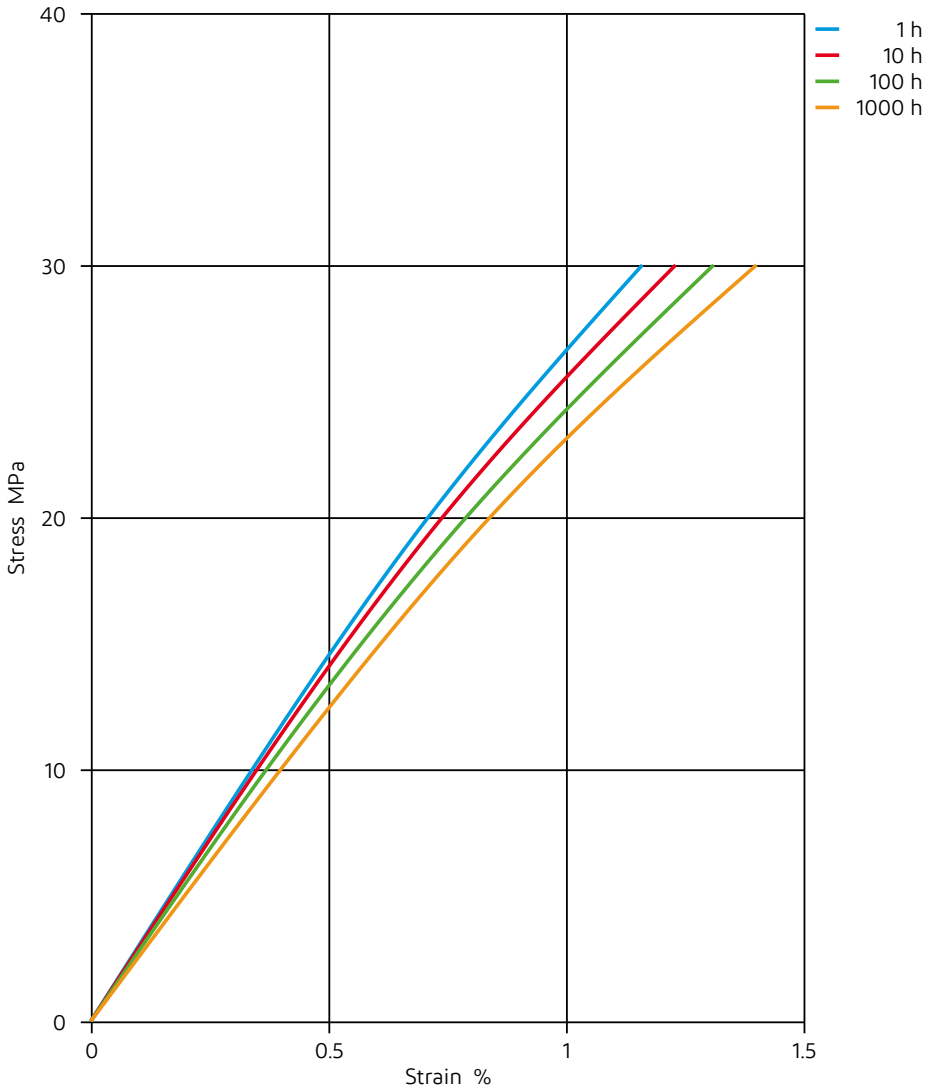
Creep modulus-time 90°C (dry)
(measured on Zytel® 73G30L NC010)



Zytel® 73G30HSL NC010

NYLON RESIN

Stress-strain (isochronous) 100°C (dry)



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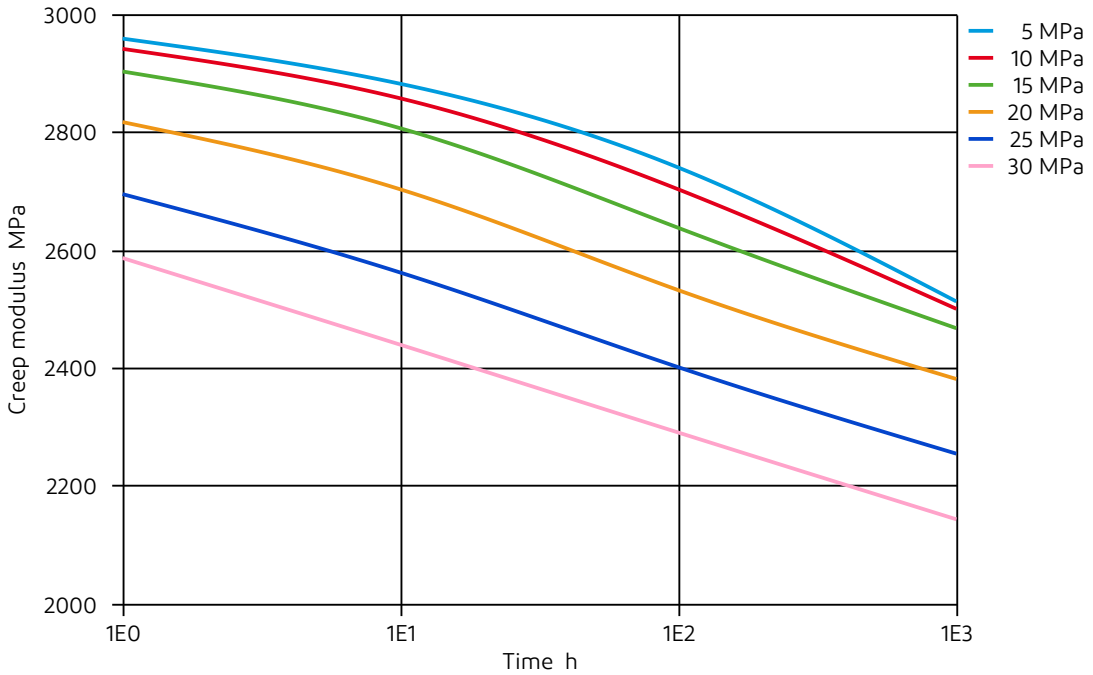
NYLON RESIN

Creep modulus-time 100°C (dry)



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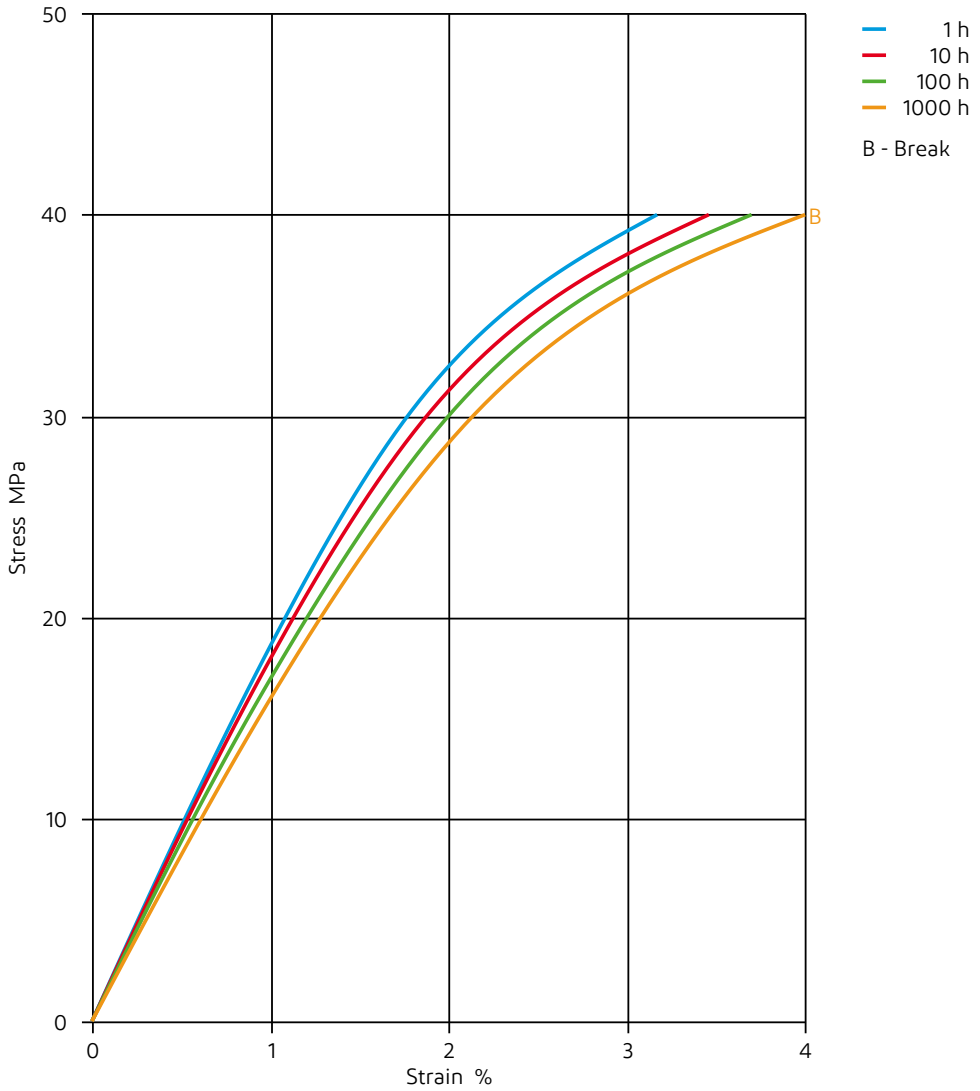
NYLON RESIN

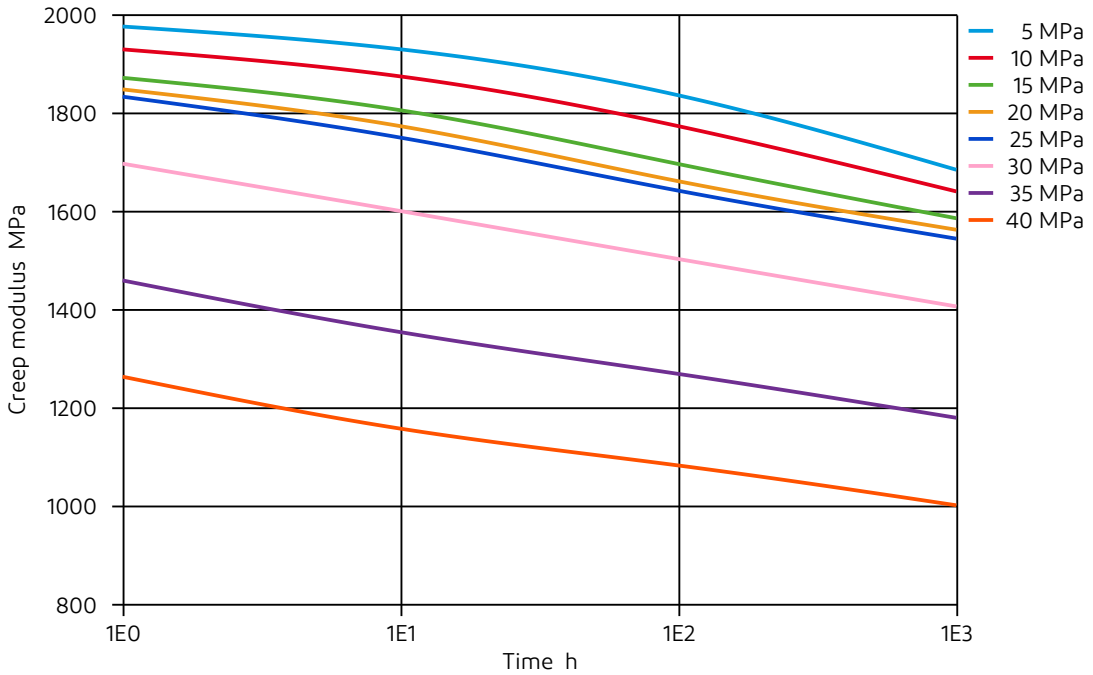
Stress-strain (isochronous) 150°C (dry)



Zytel® 73G30HSL NC010

NYLON RESIN

Creep modulus-time 150°C (dry)



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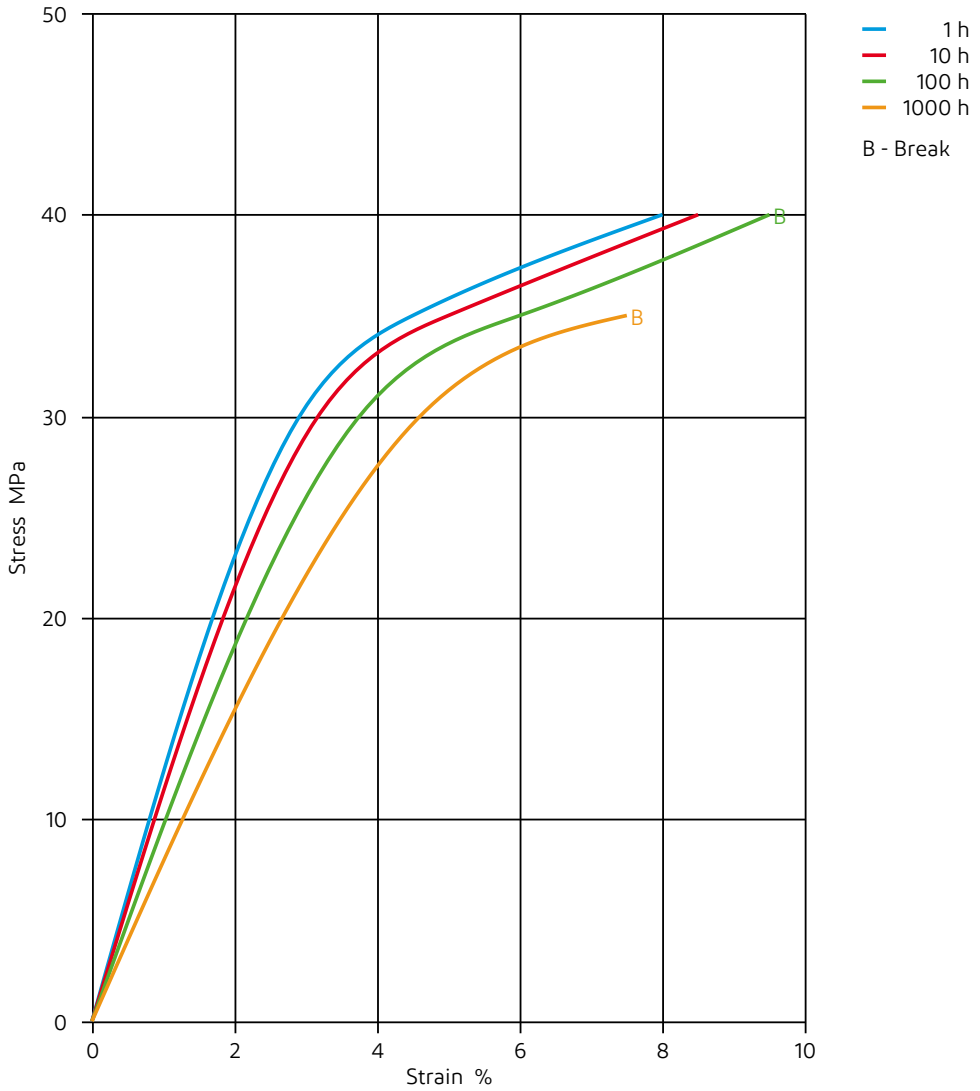
NYLON RESIN

Stress-strain (isochronous) 180°C (dry)



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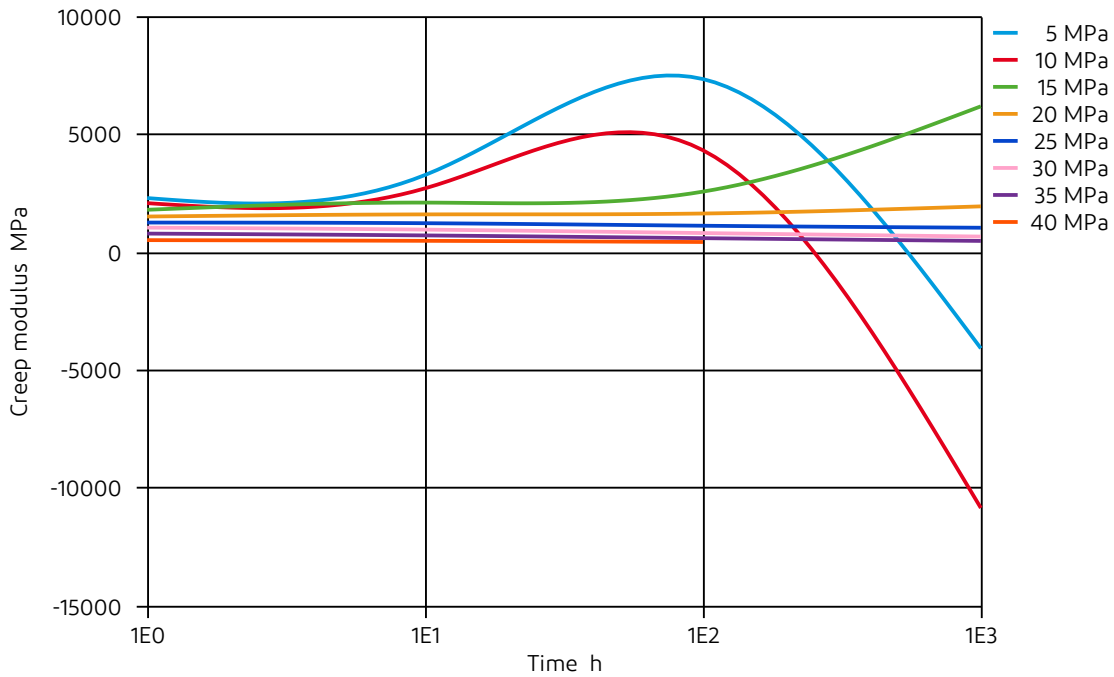
NYLON RESIN

Creep modulus-time 180°C (dry)



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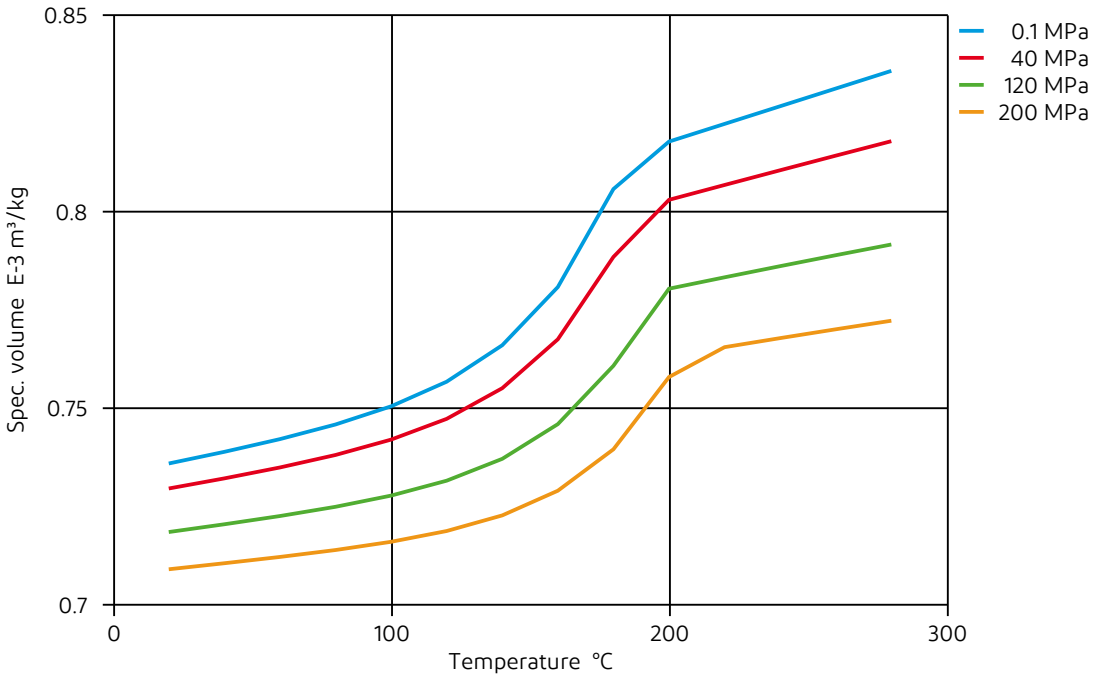
Specific volume-temperature (pvT)



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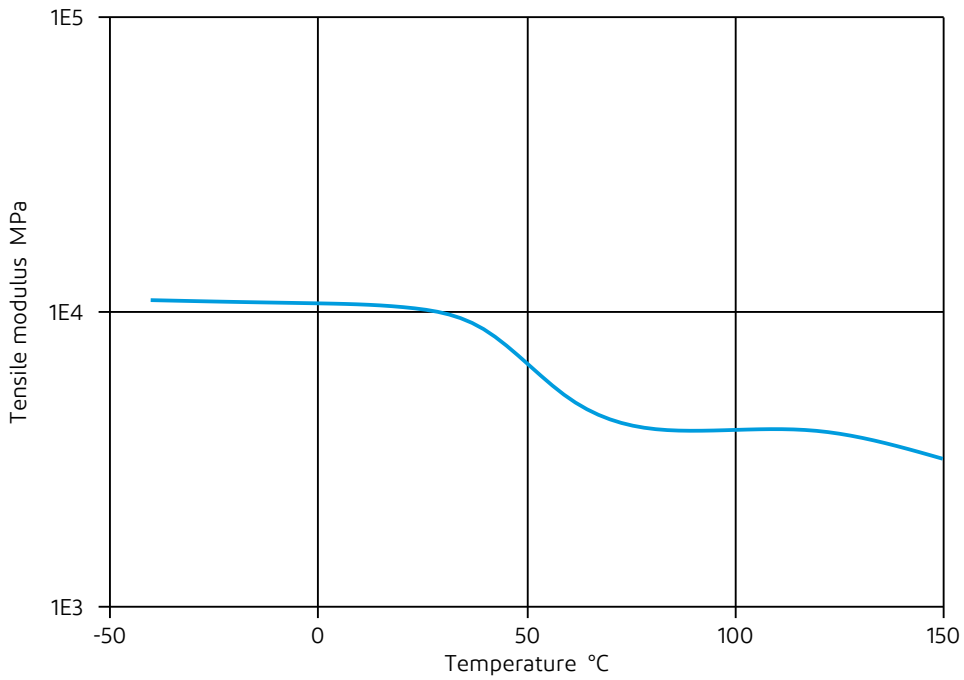
NYLON RESIN

Tensile modulus-temperature (dry)



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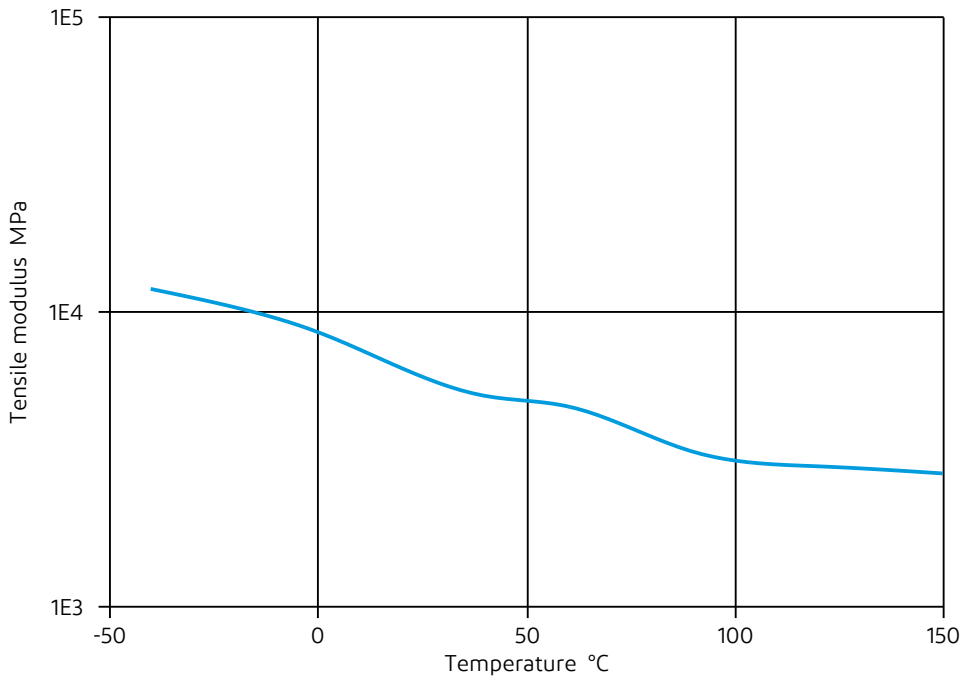
NYLON RESIN

Tensile modulus-temperature (cond.)



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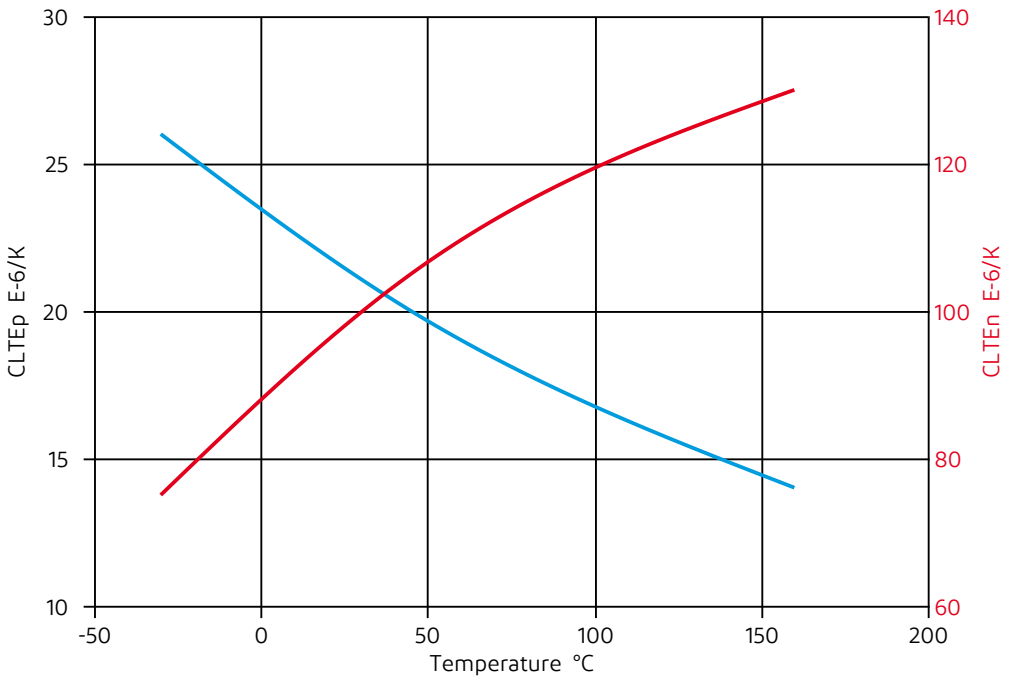
Coeff. of linear thermal expansion



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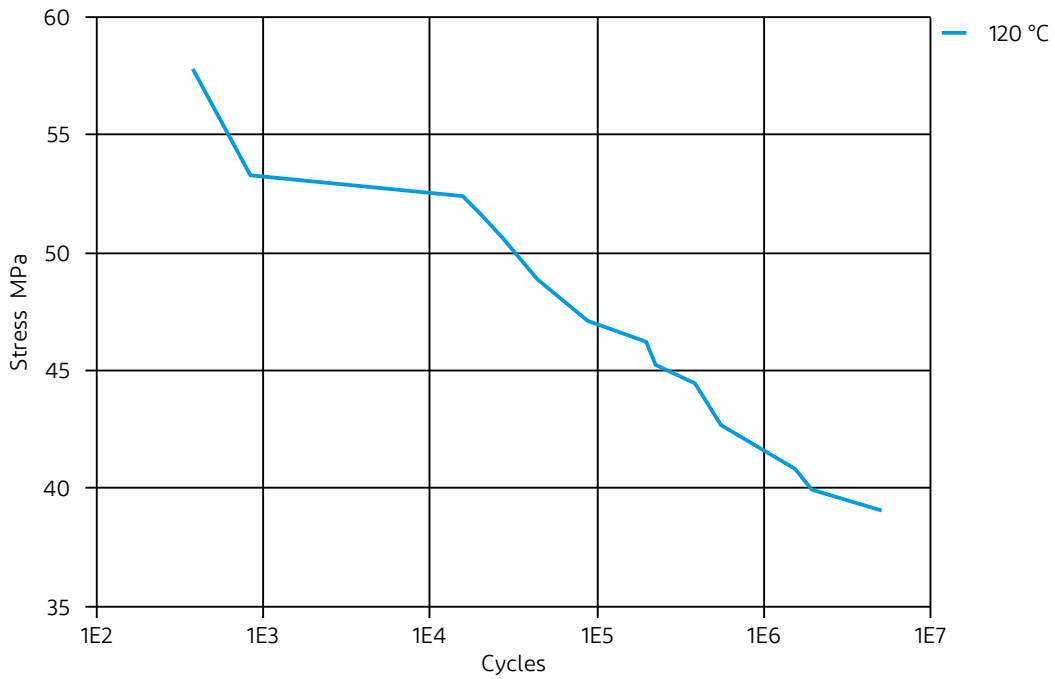
Tensile Fatigue, 10Hz, R=0.1 @ mm (dry)



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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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- ✗ Diesel EN 590, 100°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
- ✓ DOT No. 4 Brake fluid, 120°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
- ✗ Coolant Glysantin G48, 1:1 in water, 125°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).

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