Celanese
The chemistry inside innovation™

Zytel® 70G30HSLR 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® 70G30HSLR NC010 is a 30% glass fiber reinforced, heat stabilised, hydrolysis resistant polyamide 66 resin for injection moulding.

Product information

Resin Identification	PA66-GF30	ISO 1043
Part Marking Code	>PA66-GF30<	ISO 11469
ISO designation	ISO 16396-PA66,GF30,M1GHNRW,S14-100	

Rheological properties

	dry/cond.		
Viscosity number	150[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]: acid sulphuric 96%

Typical mechanical properties

	dry/cond.		
Tensile Modulus	10000/7000	MPa	ISO 527-1/-2
Stress at break	200/130	MPa	ISO 527-1/-2
Strain at break	3.3/5	%	ISO 527-1/-2
Flexural Modulus	9000/6300	MPa	ISO 178
Flexural Strength	280/200	MPa	ISO 178
Tensile creep modulus, 1h	*/6800	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/5100	MPa	ISO 899-1
Charpy impact strength, 23°C	70/80	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	70/70	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	12/15	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	10/10	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	10/-	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	12/14	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	12/10	kJ/m²	ISO 180/1A

Zytel® 70G30HSLR NC010

NYLON RESIN

Izod impact strength, 23°C	70 / -	kJ/m²	ISO 180/1U
Izod impact strength, -30°C	60 / -	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	104 / 88		ISO 2039-2
Hardness, Rockwell, R-scale	124 / 117		ISO 2039-2
Ball indentation hardness, H 961/30	270 / 185[DS]	MPa	ISO 2039-1
Poisson's ratio	0.34 / 0.35		
Multiaxial Impact, Total Energy, 4.5m/s, 2mm	5 / -	J	ISO 6603-2

[DS]: Derived from similar grade

Tribological properties

	dry/cond.		
Coefficient of static friction, against steel	- / 0.25		ASTM 1894
Coefficient of sliding friction, 1h against steel	- / 0.31		ASTM 1894

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
Temp. of deflection under load, 1.8 MPa	253 / *	°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	250 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	26 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	26 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	13 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	70 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	80 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	130 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity	0.36	W/(m K)	ISO 22007-2
Thermal conductivity of melt	0.21	W/(m K)	ISO 22007-2
Eff. thermal diffusivity	1.1E-7	m²/s	
Spec. heat capacity of melt	2290	J/(kg K)	
Spec. heat capacity solid	1380[DS]	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

[DS]: Derived from similar grade

Celanese
The chemistry inside innovation™

Zytel® 70G30HSLR NC010

NYLON RESIN

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
Oxygen index	24/*	%	ISO 4589-1/-2
Glow Wire Flammability Index, 1mm	700/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2mm	750/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	800/-	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1mm	675/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2mm	675/-	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 1mm	650/-	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 2mm	650/-	°C	IEC 60335-1
FMVSS Class	SE/B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	24	mm/min	ISO 3795 (FMVSS 302)

[2]: UL yellow card with (f1)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.3/11		IEC 62631-2-1
Relative permittivity, 1MHz	4.1/4.6		IEC 62631-2-1
Dissipation factor, 100Hz	70/4600	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150/650	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	38/32	kV/mm	IEC 60243-1
Comparative tracking index	450/-		IEC 60112
Comparative tracking index, 3.0mm	1/-	PLC	UL 746A

Other properties

	dry/cond.		
Humidity absorption, 2mm	1.9/*	%	Sim. to ISO 62
Water absorption, 2mm	6/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.3/*	%	Sim. to ISO 62
Density	1370/-	kg/m³	ISO 1183
Density of melt	1200	kg/m³	

VDA Properties

	dry/cond.		
Emission of organic compounds	3.2	µgC/g	VDA 277
Thermal desorption analysis of organic emissions	5	µg/g	VDA 278
Odour	4.5	class	VDA 270
Fogging, F-value (refraction)	95/*	%	ISO 6452
Fogging, G-value (condensate)	0.3/*	mg	ISO 6452

Zytel® 70G30HSLR NC010

NYLON RESIN

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

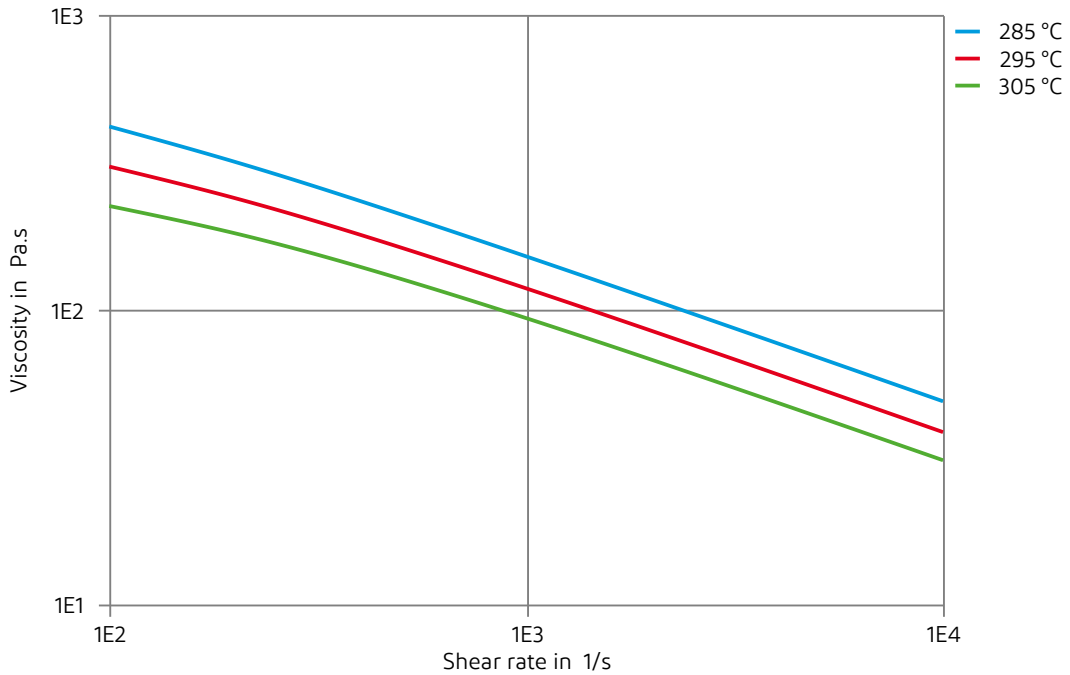
Characteristics

Additives	Release agent

Zytel® 70G30HSLR NC010

NYLON RESIN

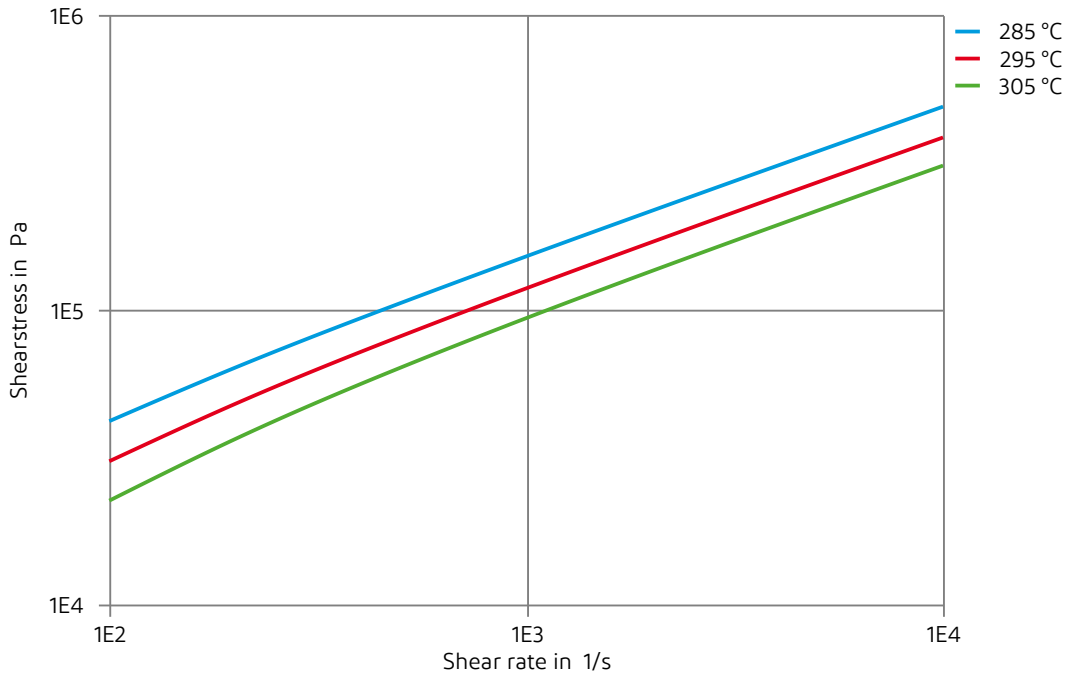
Viscosity-shear rate
(measured on Zytel® 70G30HSLR BK099)



Zytel® 70G30HSLR NC010

NYLON RESIN

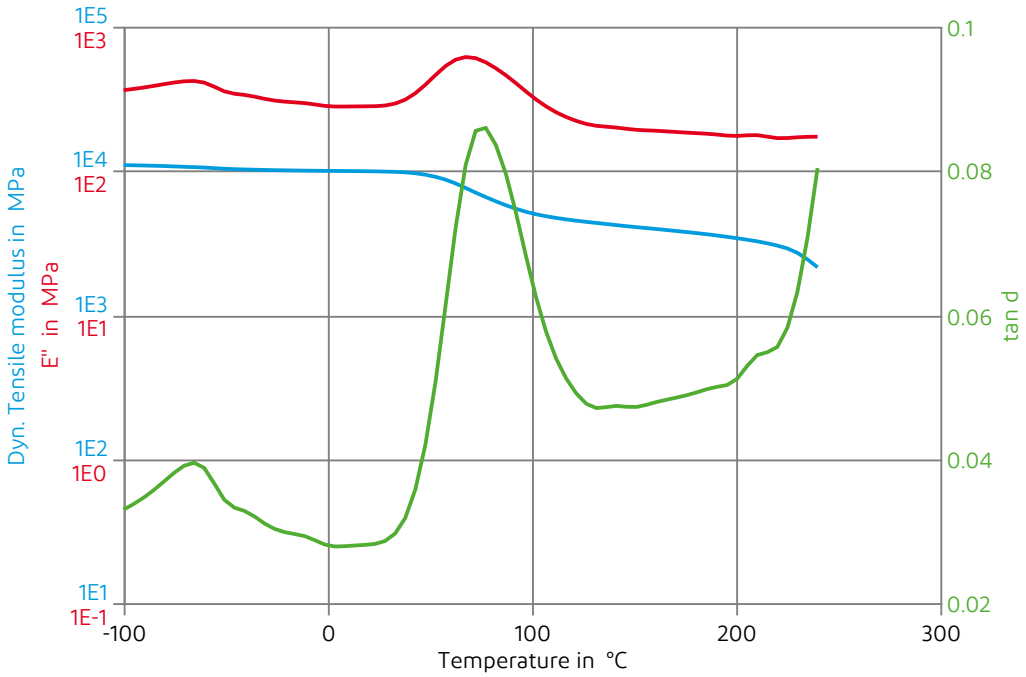
Shearstress-shear rate
(measured on Zytel® 70G30HSLR BK099)



Zytel® 70G30HSLR NC010

NYLON RESIN

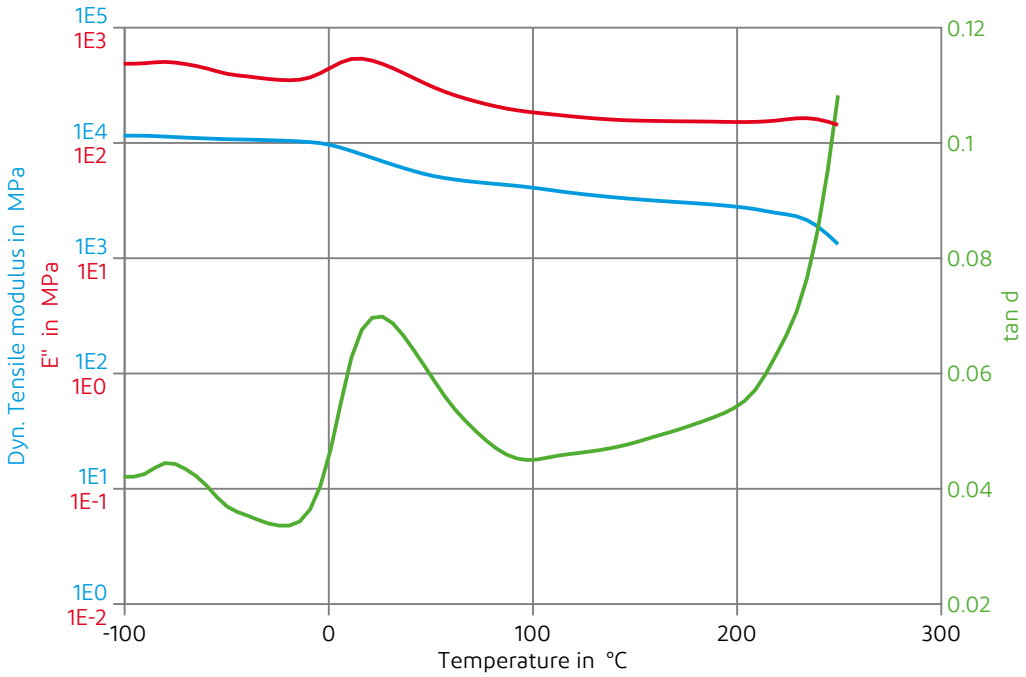
Dynamic Tensile modulus-temperature (dry)



Zytel® 70G30HSLR NC010

NYLON RESIN

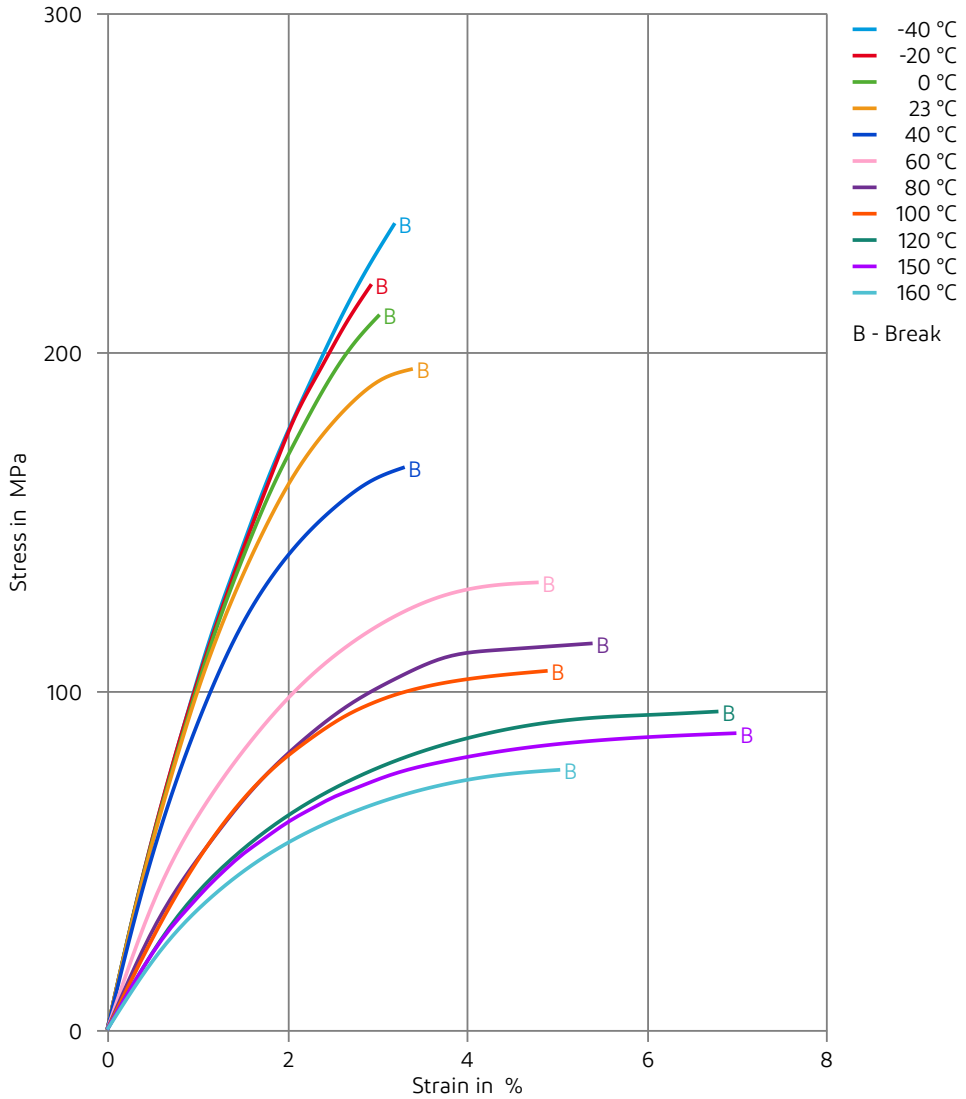
Dynamic Tensile modulus-temperature (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

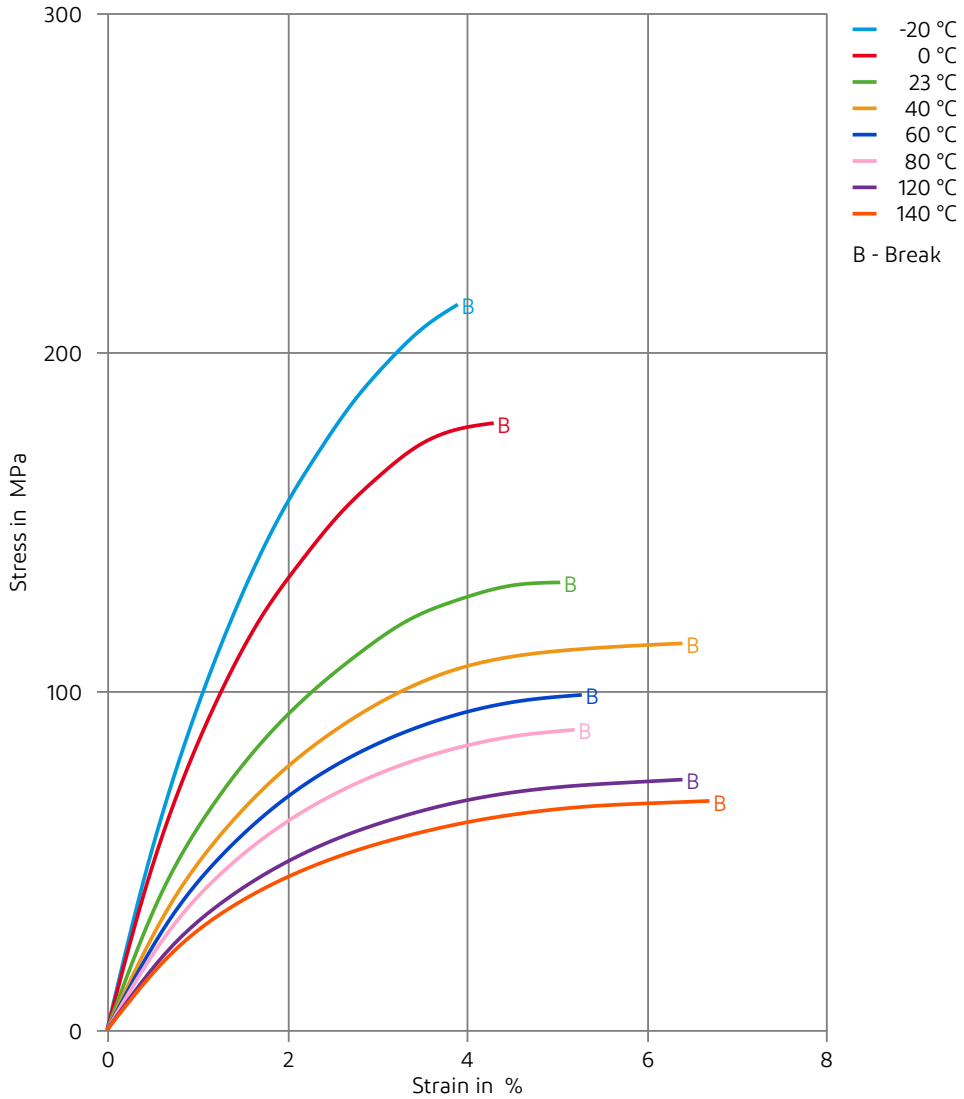
Stress-strain (dry)



Zytel® 70G30HSLR NC010

NYLON RESIN

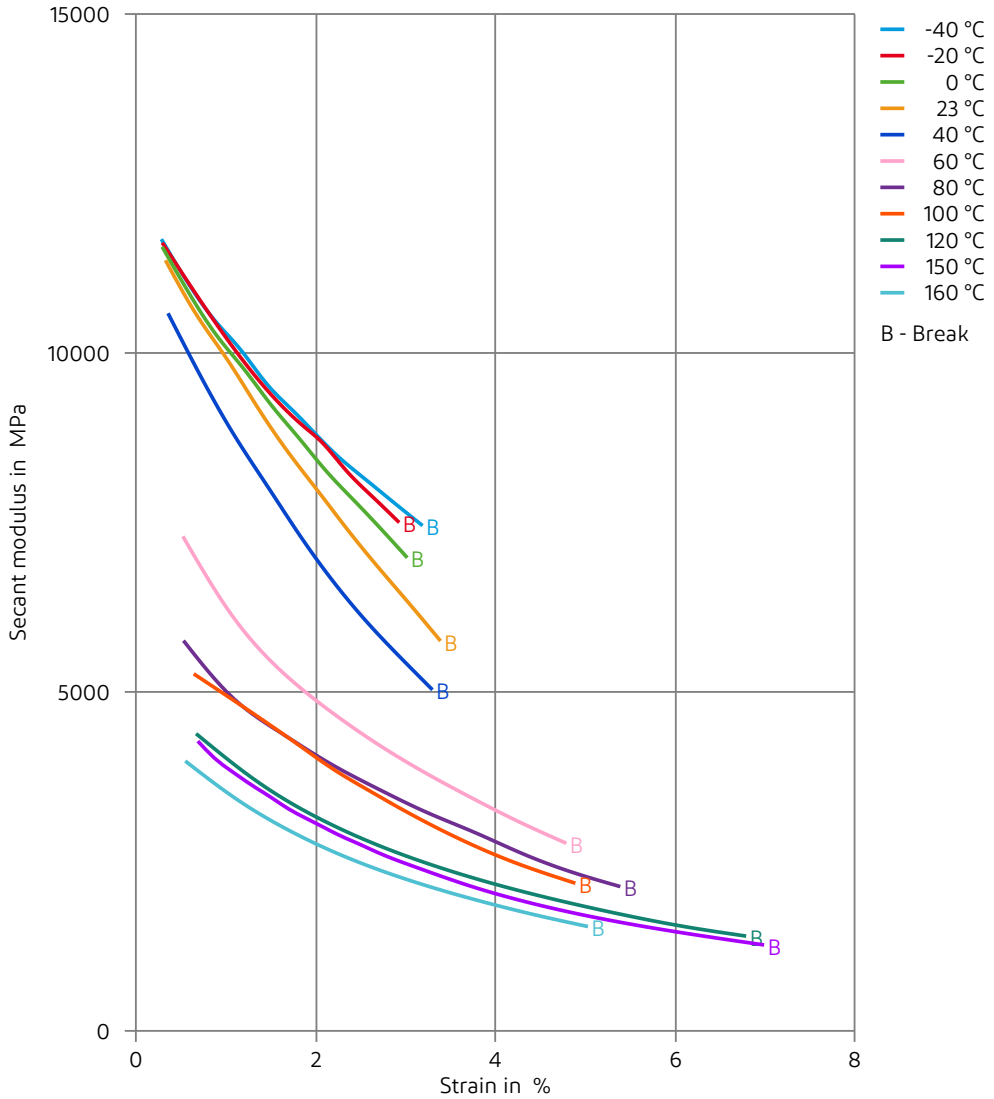
Stress-strain (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

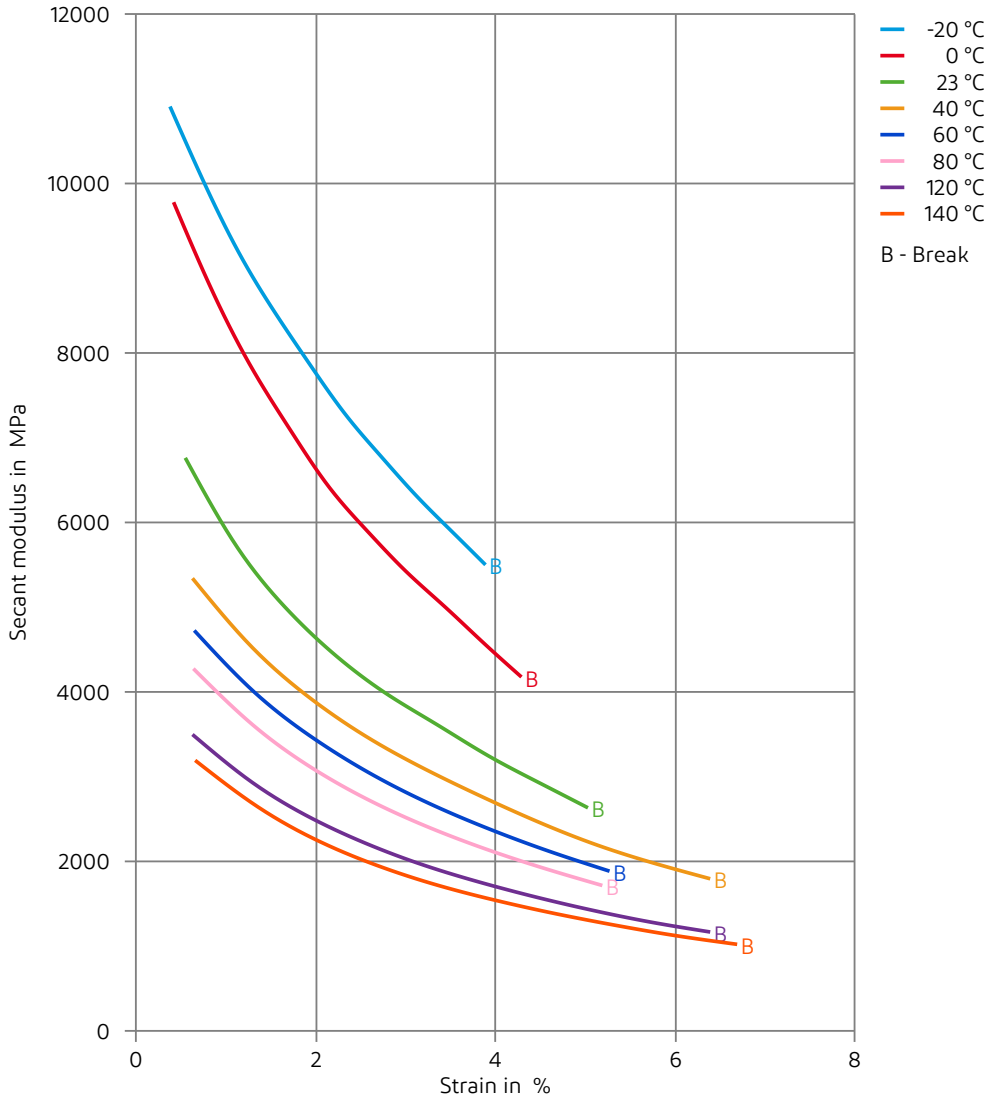
Secant modulus-strain (dry)



Zytel® 70G30HSLR NC010

NYLON RESIN

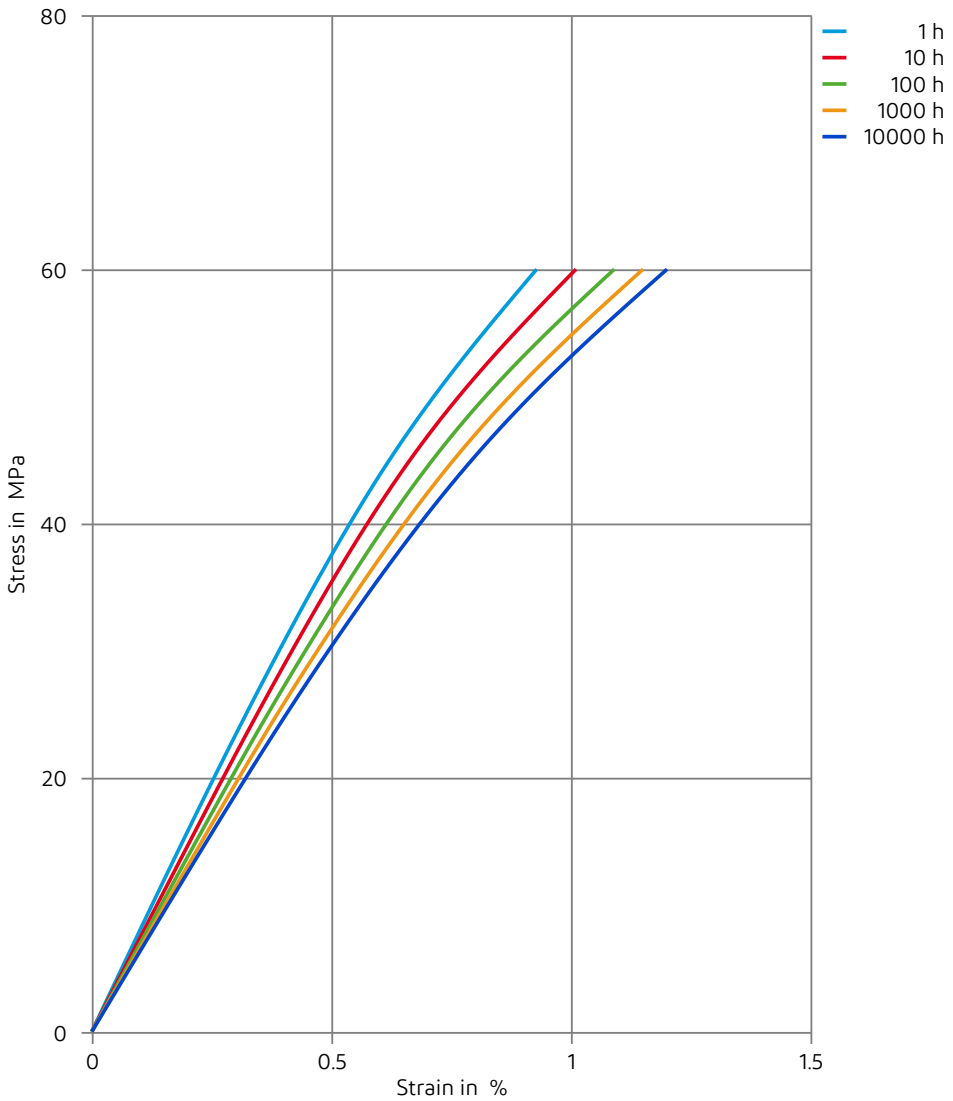
Secant modulus-strain (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

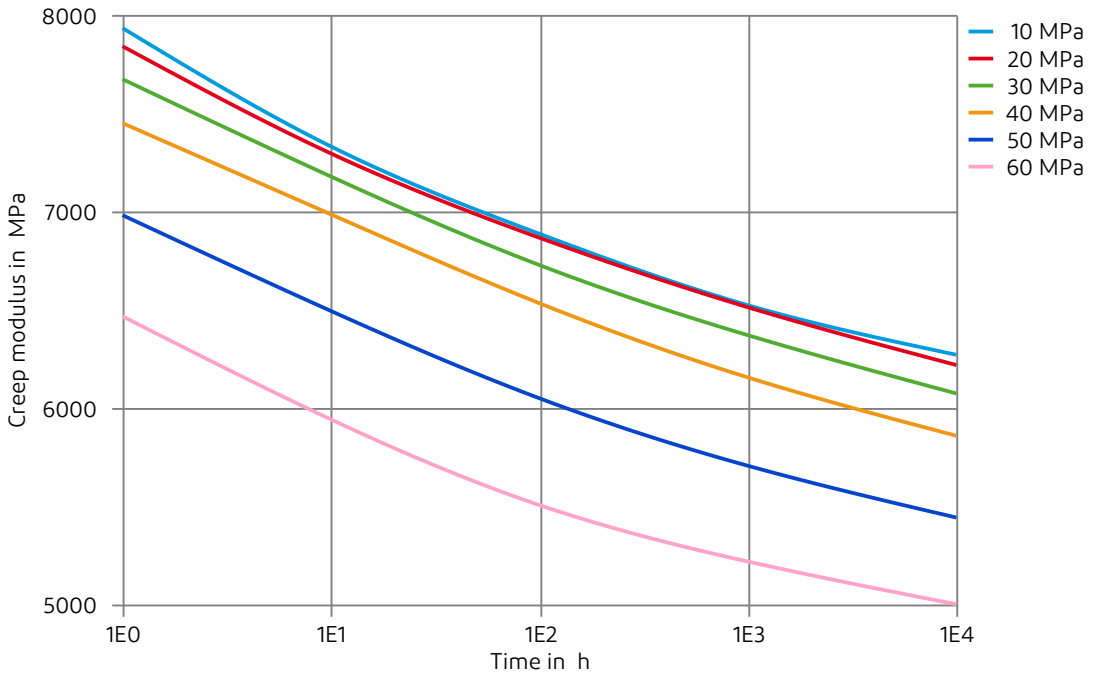
Stress-strain (isochronous) 23°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

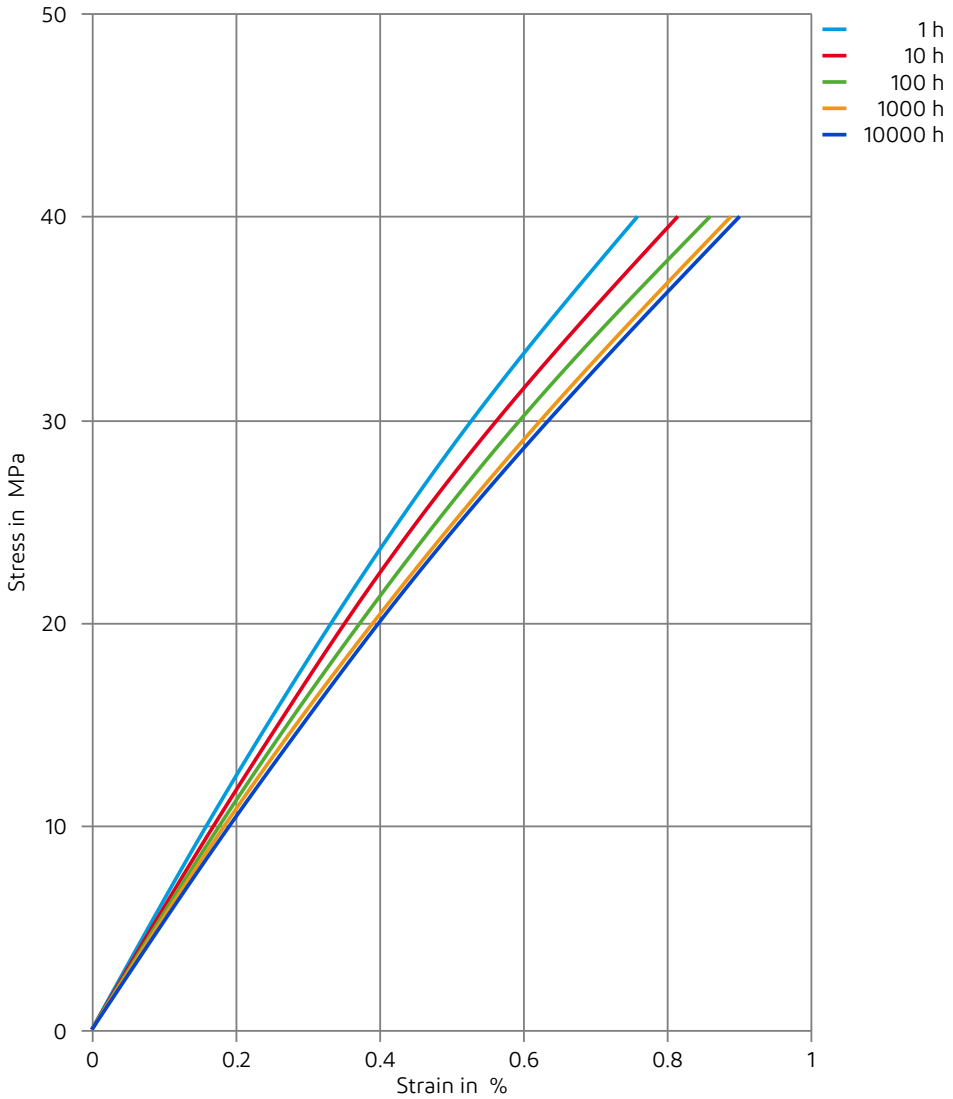
Creep modulus-time 23°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

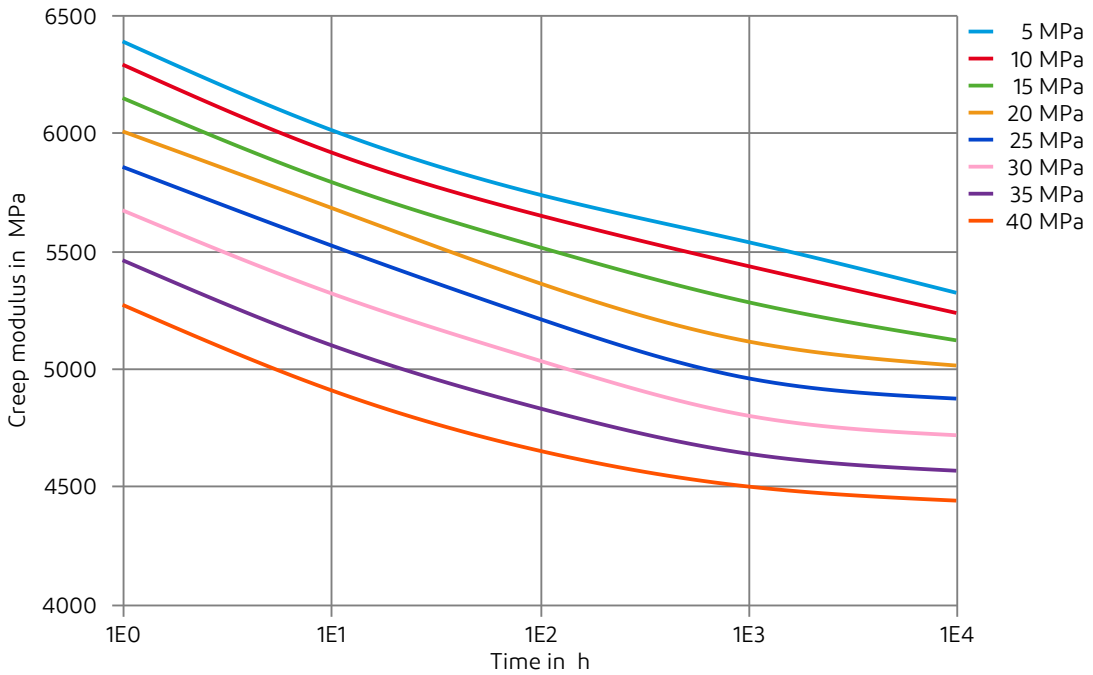
Stress-strain (isochronous) 80°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

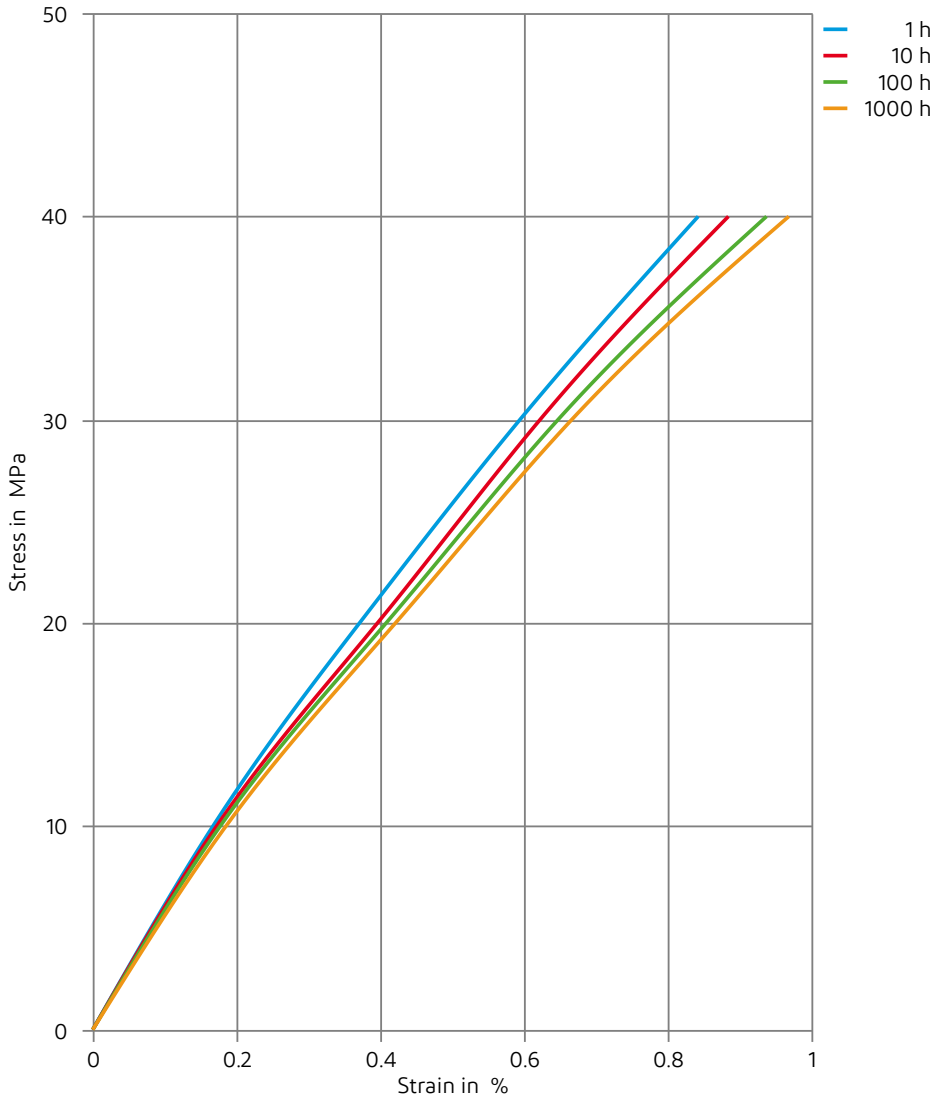
Creep modulus-time 80°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

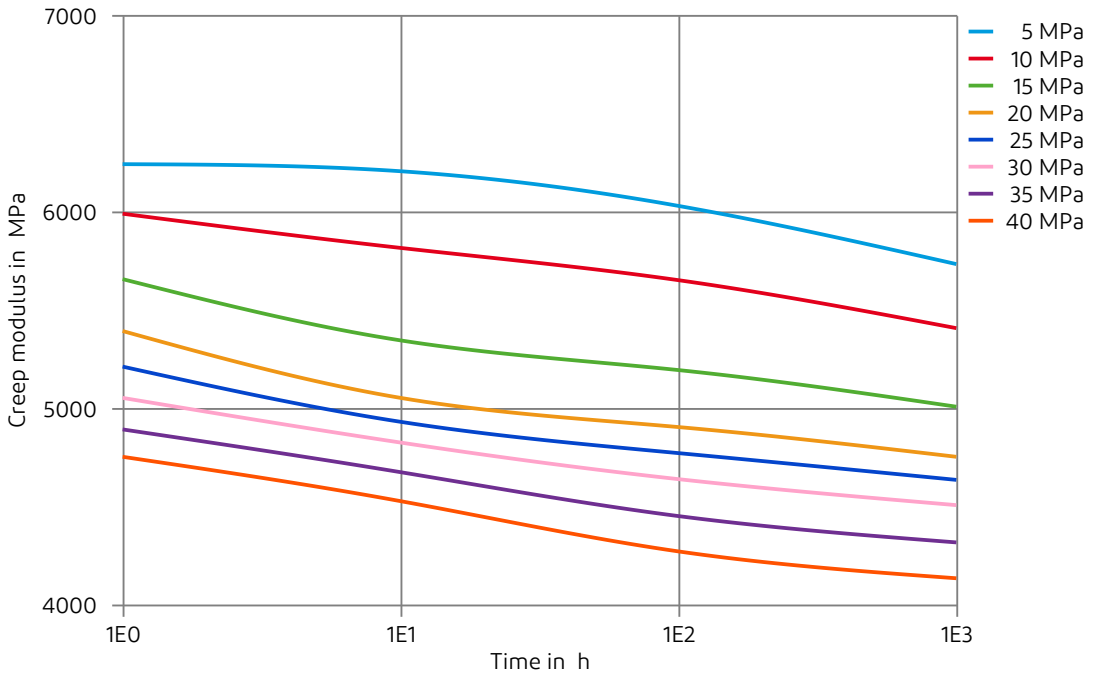
Stress-strain (isochronous) 100°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

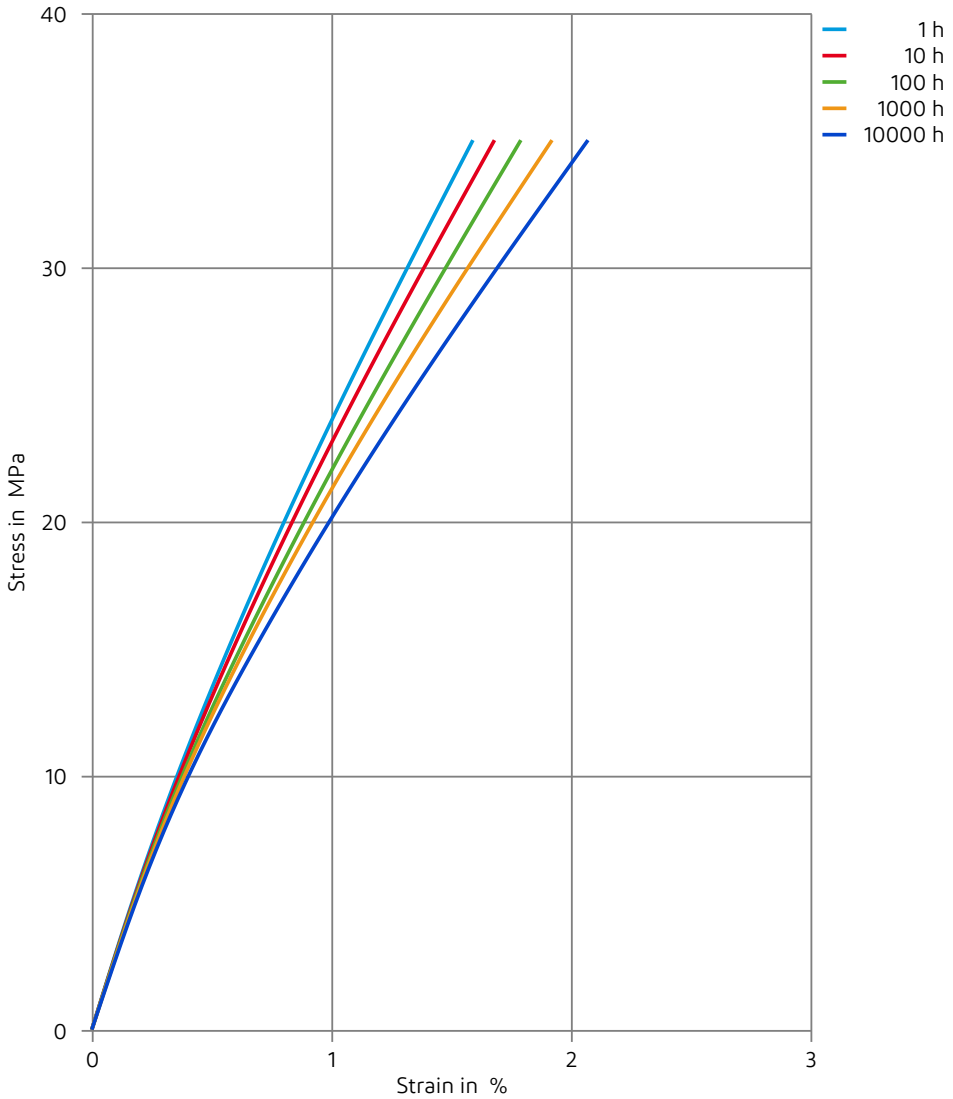
Creep modulus-time 100°C (cond.)



Zytel® 70G30HSLR NC010

NYLON RESIN

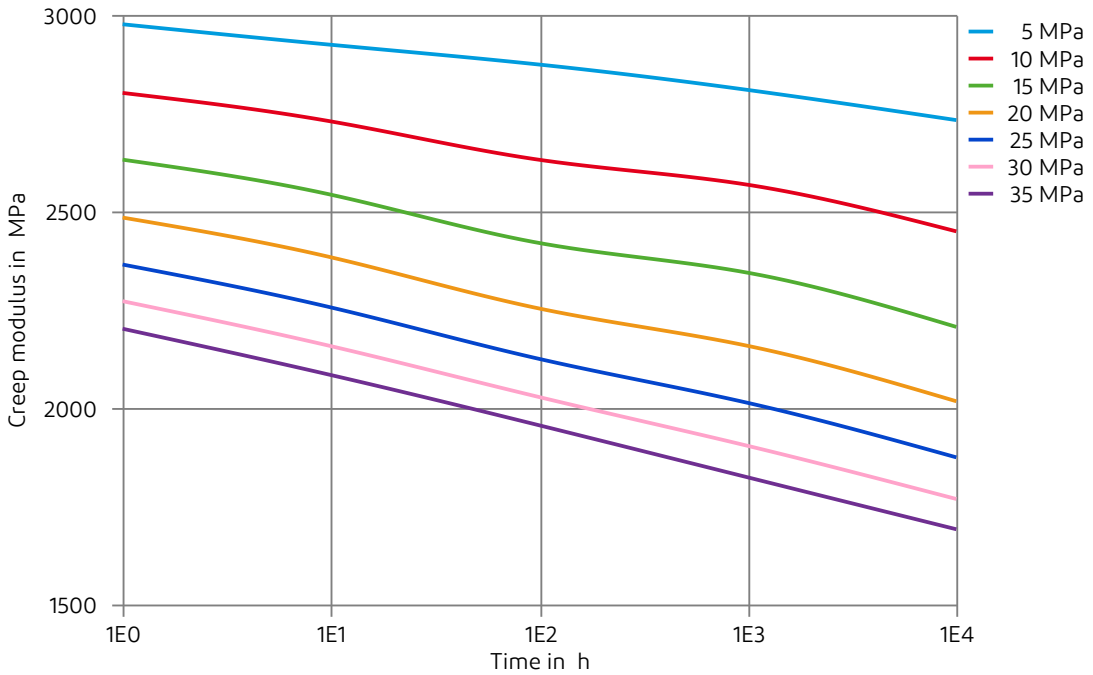
Stress-strain (isochronous) 140°C (cond.)
(measured on Zytel® 70G30HSL BK039B)



Zytel® 70G30HSLR NC010

NYLON RESIN

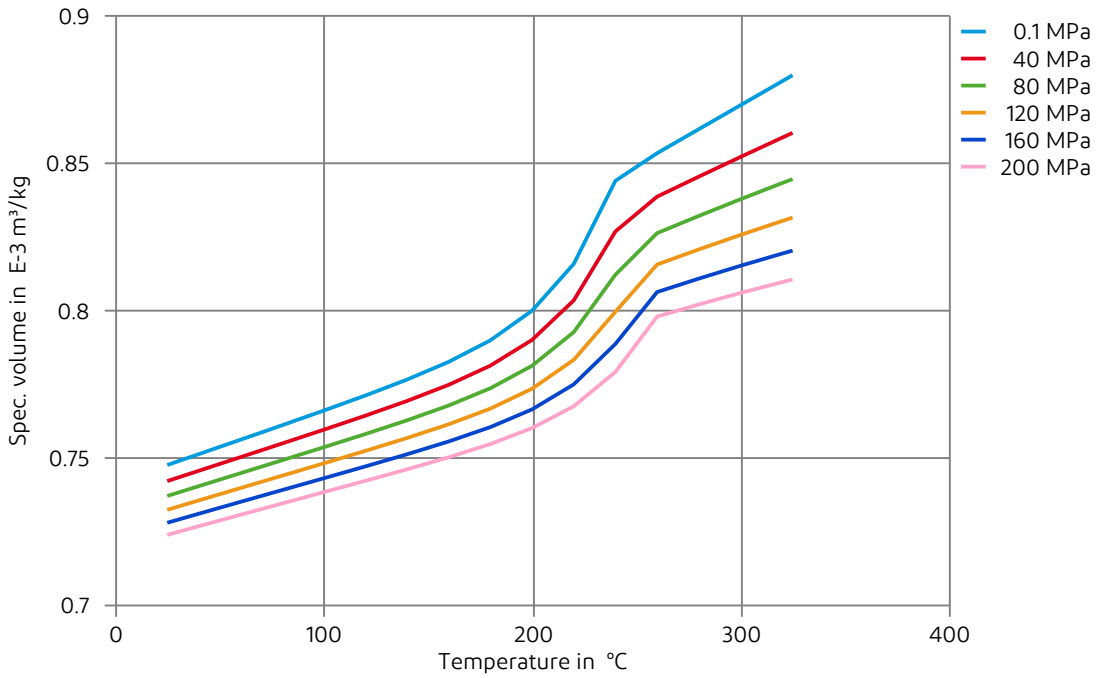
Creep modulus-time 140°C (cond.)
(measured on Zytel® 70G30HSL BK039B)



Zytel® 70G30HSLR NC010

NYLON RESIN

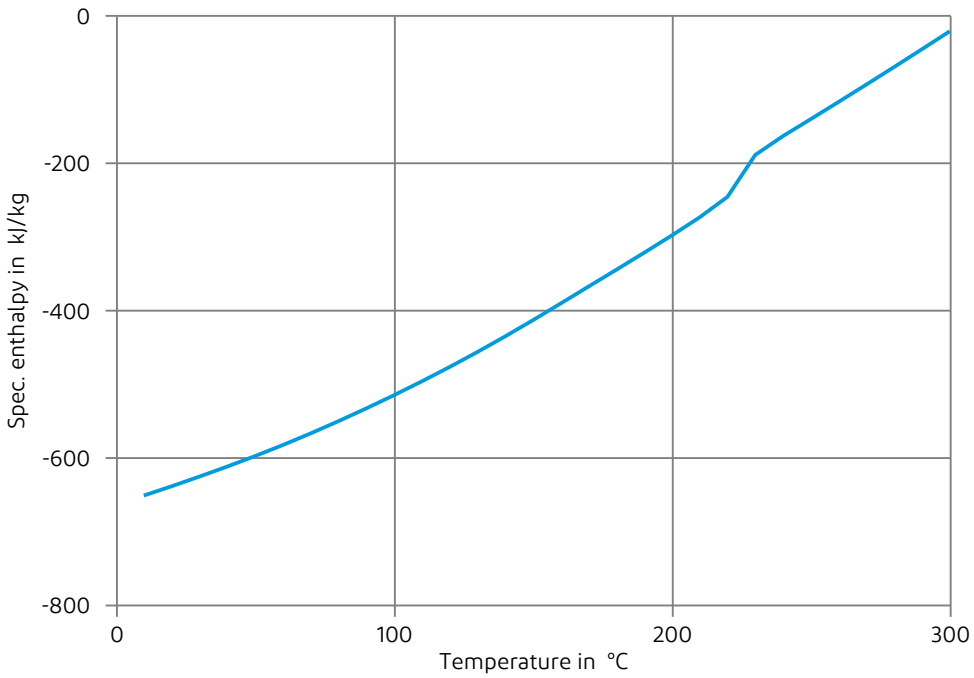
Specific volume-temperature (pvT)



Zytel® 70G30HSLR NC010

NYLON RESIN

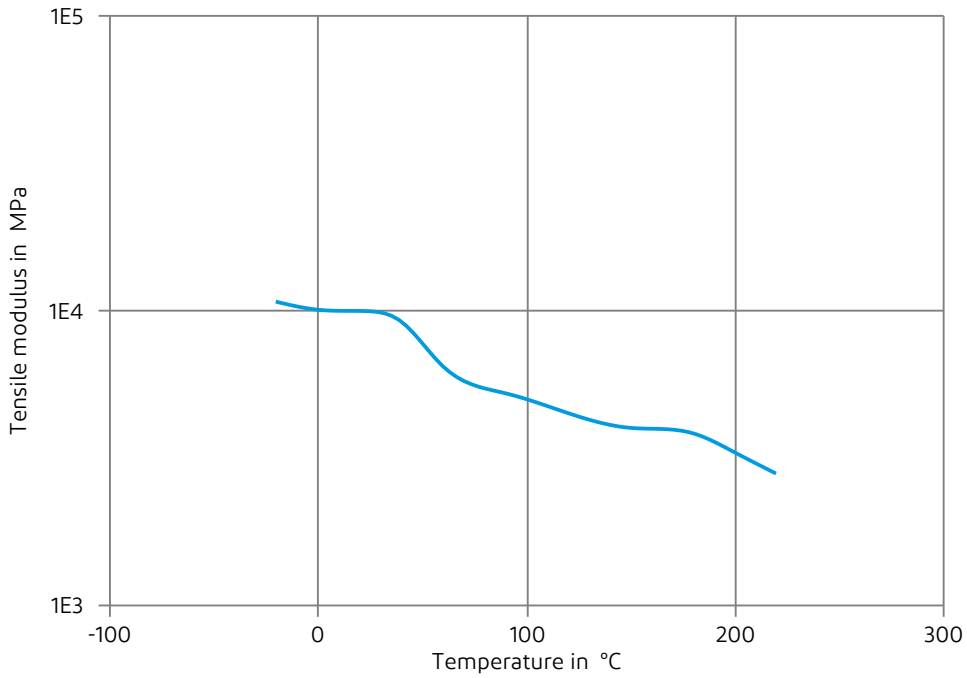
Spec. enthalpy/mass-temp. (DSC)



Zytel® 70G30HSLR NC010

NYLON RESIN

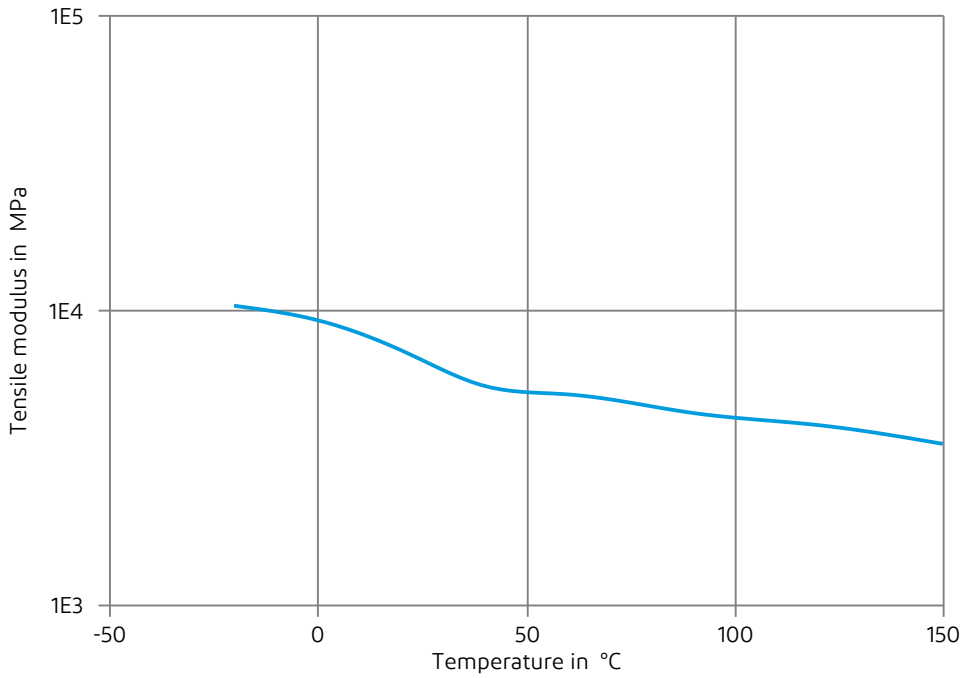
Tensile modulus-temperature (dry)
(measured on Zytel® 70G30HSLR BK099)



Zytel® 70G30HSLR NC010

NYLON RESIN

Tensile modulus-temperature (cond.)
(measured on Zytel® 70G30HSLR BK099)



Zytel® 70G30HSLR NC010

NYLON RESIN

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
- ✔ Automatic hypoid-gear oil Shell Donax TX, 135°C
- ✔ Hydraulic oil Pentosin CHF 202, 125°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

Zytel® 70G30HSLR NC010

NYLON RESIN

- ✔ 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
- ✔ 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).