

Zytel® 42A 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® 42A is a high viscosity polyamide 66 for injection moulding and extrusion.

Product information

Resin Identification	PA66	ISO 1043
Part Marking Code	>PA66<	ISO 11469
ISO designation	ISO 16396-PA66,,M1G1NR,S32-030	

Rheological properties

	dry/cond.		
Melt mass-flow rate	2.5 / *	g/10min	ISO 1133
Melt mass-flow rate, Temperature	275 / *	°C	
Melt mass-flow rate, Load	2.16 / *	kg	
Viscosity number	300 ^[1] / *	cm³/g	ISO 307, 1628
Moulding shrinkage, parallel	1.4 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577
[1]: Sulfuric acid 96%			

Typical mechanical properties

	dry/cond.		
Tensile modulus	3100 / 1300	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	83 / 55	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.4 / 27	%	ISO 527-1/-2
Nominal strain at break	>50 / >50	%	ISO 527-1/-2
Flexural modulus	2800 / 1070	MPa	ISO 178
Charpy impact strength, 23 °C	N / N	kJ/m²	ISO 179/1eU
Charpy impact strength, -30 °C	N / N	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23 °C	6 / 20	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	6 / 4	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23 °C	6 / 23	kJ/m²	ISO 180/1A
Izod notched impact strength, -30 °C	7.0 / 6.0	kJ/m²	ISO 180/1A
Izod impact strength, 23 °C	N / N	kJ/m²	ISO 180/1U
Izod impact strength, -30 °C	N / N	kJ/m²	ISO 180/1U
Poisson's ratio	0.37 / 0.44		
Abrasion resistance	3.5 / *	mm³	ISO 4649

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Tribological properties

	dry/cond.	
Coefficient of sliding friction, 1h against steel	-/0.65	ASTM 1894

Thermal properties

	dry/cond.	
Melting temperature, 10°C/min	262/*	°C ISO 11357-1/-3
Glass transition temperature, 10°C/min	70/40	°C ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	70/*	°C ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	200/*	°C ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	244/*	°C ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	100/*	E-6/K ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	100/*	E-6/K ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K) ISO 22007-2
Effective thermal diffusivity, flow	7E-8	m²/s ISO 22007-4
Specific heat capacity of melt	2790	J/(kg K) ISO 22007-4
RTI, electrical, 0.75mm	125	°C UL 746B
RTI, electrical, 1.5mm	125	°C UL 746B
RTI, electrical, 3.0mm	125	°C UL 746B
RTI, electrical, 6mm	125	°C UL 746B
RTI, impact, 0.75mm	65	°C UL 746B
RTI, impact, 1.5mm	75	°C UL 746B
RTI, impact, 3.0mm	75	°C UL 746B
RTI, impact, 6mm	75	°C UL 746B
RTI, strength, 0.75mm	65	°C UL 746B
RTI, strength, 1.5mm	85/*	°C UL 746B
RTI, strength, 3.0mm	85	°C UL 746B
RTI, strength, 6mm	85	°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	V-2/*	class IEC 60695-11-10
Thickness tested	3/*	mm IEC 60695-11-10
UL recognition	yes/*	UL 94
Oxygen index	28/*	% ISO 4589-1/-2
Glow Wire Flammability Index, 0.4mm	960/-	°C IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	960/-	°C IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	960/-	°C IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	960/-	°C IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	960/-	°C IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	960/-	°C IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	930/-	°C IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	930/-	°C IEC 60695-2-12
Glow Wire Ignition Temperature, 2.0mm	800/-	°C IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725/-	°C IEC 60695-2-13
Glow Wire Temperature, No Flame, 1mm	750/-	°C IEC 60335-1

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Glow Wire Temperature, No Flame, 2mm
FMVSS Class

725/-
SE °C

IEC 60335-1
ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz
Relative permittivity, 1MHz
Dissipation factor, 100Hz
Dissipation factor, 1MHz
Volume resistivity
Electric strength

dry/cond.
4.3/10.3
3.6/4.2
150/2000 E-4
240/750 E-4
1E13/1E11 Ohm.m
30.5/- kV/mm

IEC 62631-2-1
IEC 62631-2-1
IEC 62631-2-1
IEC 62631-2-1
IEC 62631-3-1
IEC 60243-1

Physical/Other properties

Humidity absorption, 2mm
Water absorption, 2mm
Density
Density of melt

dry/cond.
2.6/* %
8.5/* %
1140/- kg/m³
1010 kg/m³

Sim. to ISO 62
Sim. to ISO 62
ISO 1183

Injection

Drying Recommended
Drying Temperature
Drying Time, Dehumidified Dryer
Processing Moisture Content
Melt Temperature Optimum
Min. melt temperature
Max. melt temperature
Screw tangential speed
Mold Temperature Optimum
Min. mould temperature
Max. mould temperature
Hold pressure range
Hold pressure time
Ejection temperature

yes
80 °C
2 - 4 h
≤0.05 %
290 °C
280 °C
300 °C
≤0.3 m/s
70 °C
50 °C
90 °C
50 - 100 MPa
4 s/mm
190 °C

Extrusion

Drying Temperature
Drying Time, Dehumidified Dryer
Processing Moisture Content
Melt Temperature Range

80 °C
4 - 6 h
≤0.06 %
275 - 290 °C

Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coatable, Casting
Delivery form	Pellets
Additives	Release agent

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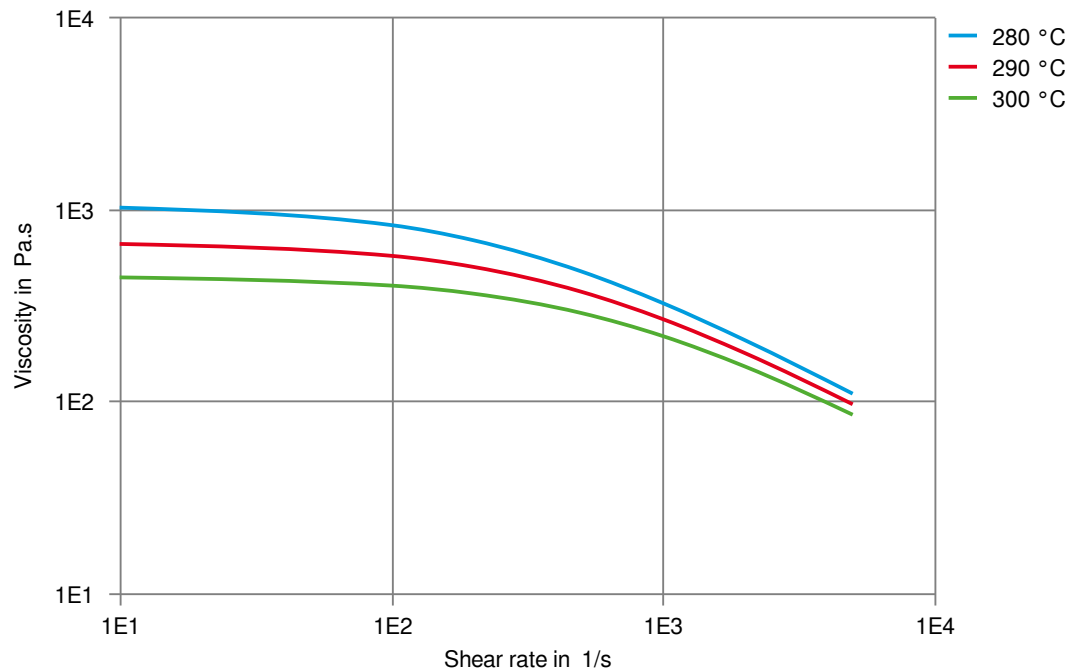
Automotive

OEM
Stellantis - Chrysler

STANDARD
MS.50017 / CPN-1618

ADDITIONAL INFORMATION
Natural

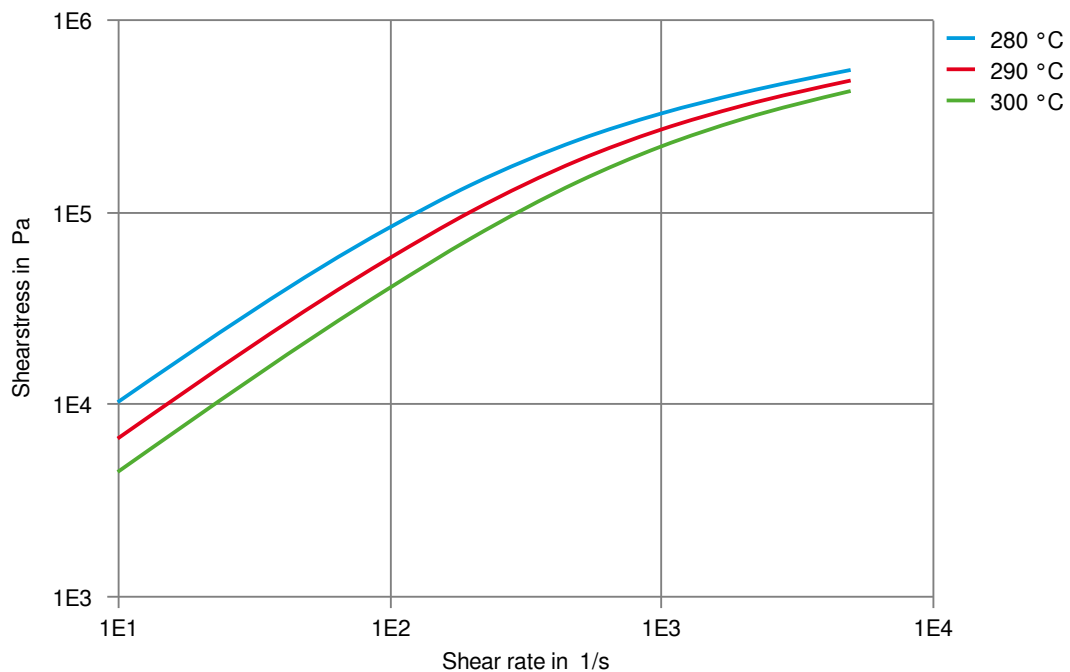
Viscosity-shear rate



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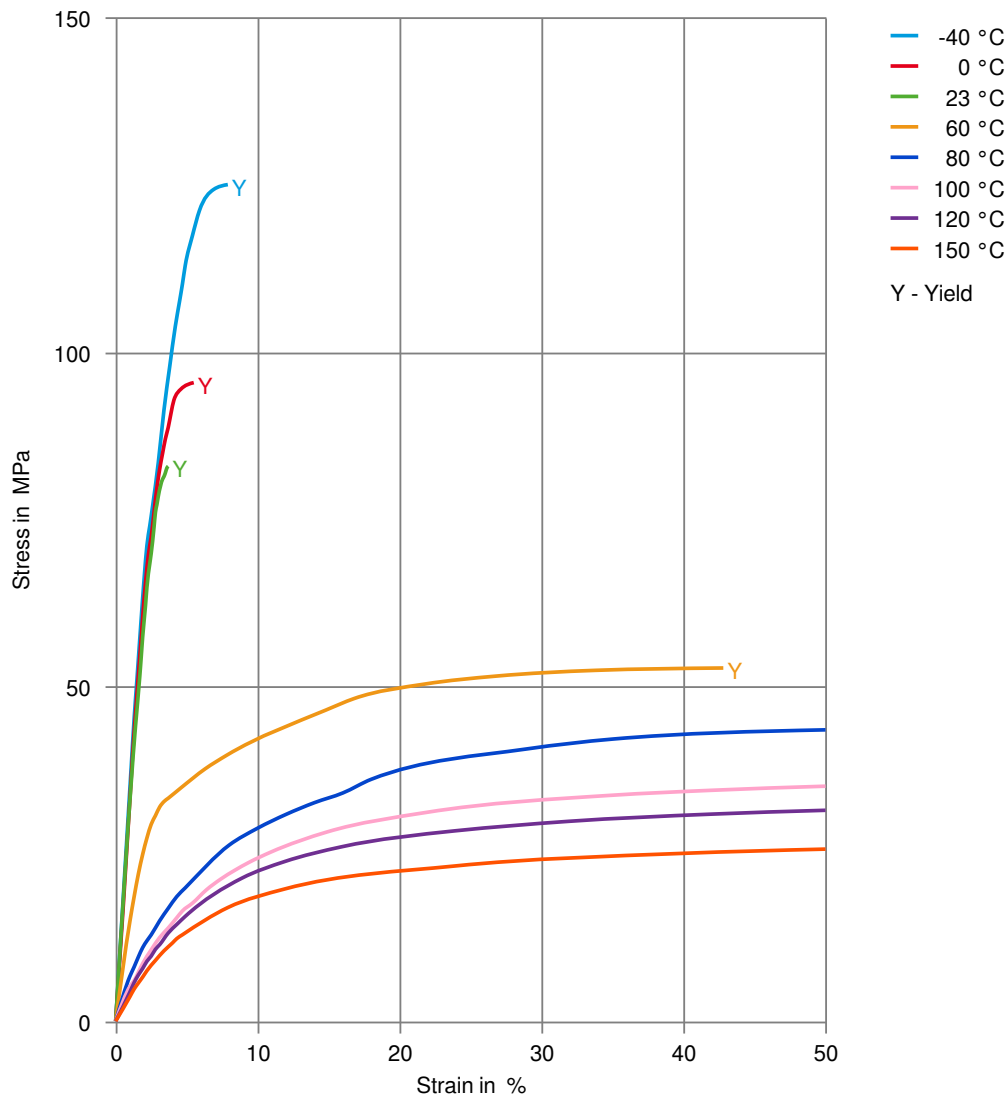
Shearstress-shear rate



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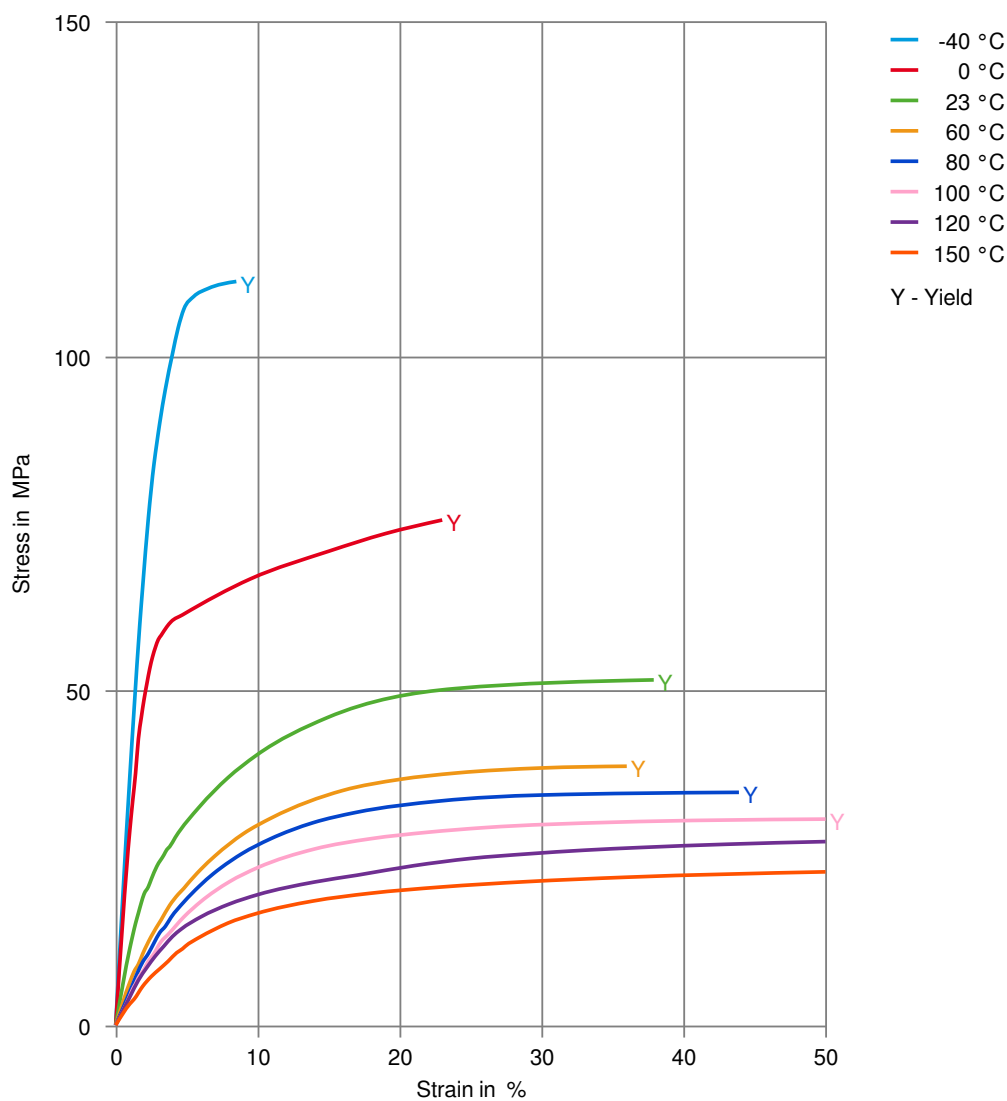
Stress-strain (dry)



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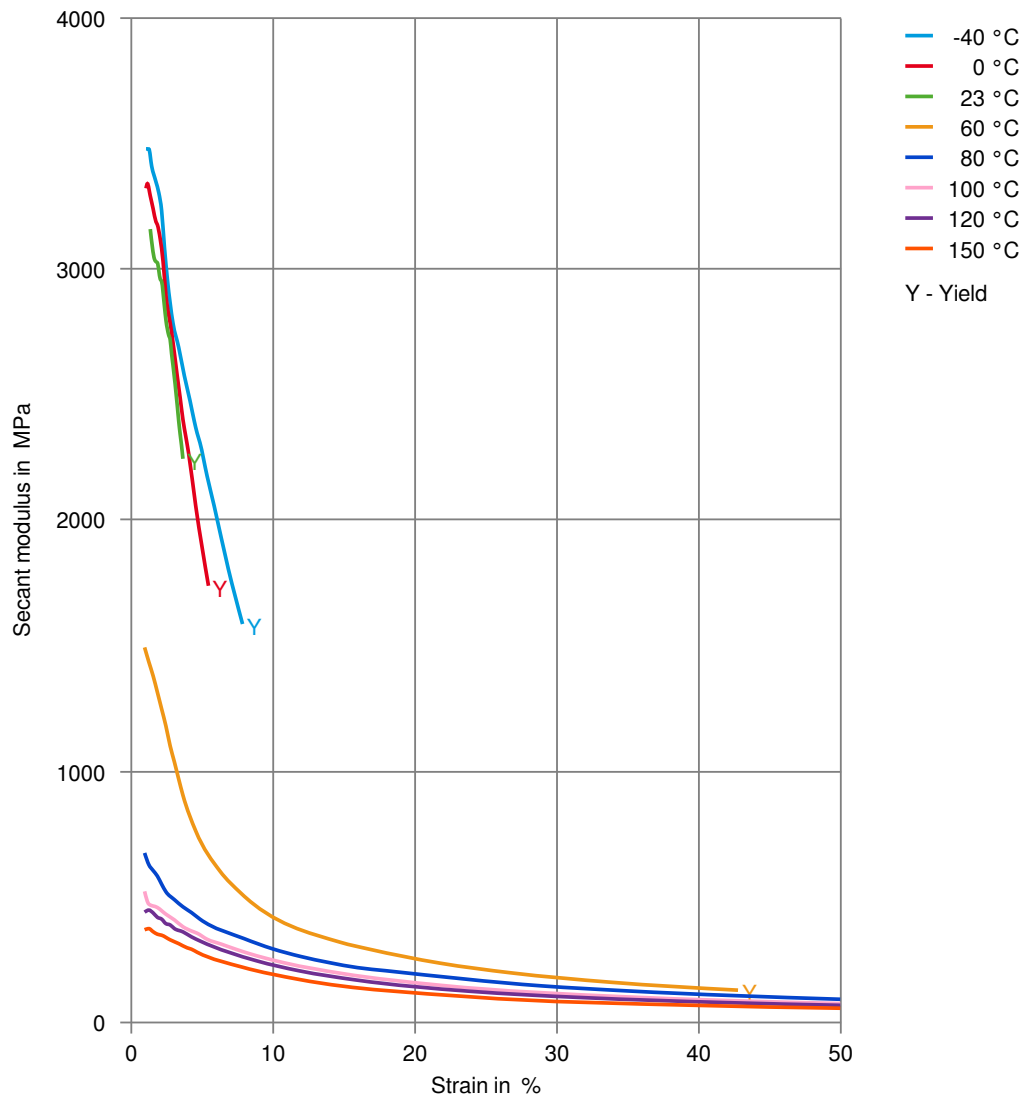
Stress-strain (cond.)



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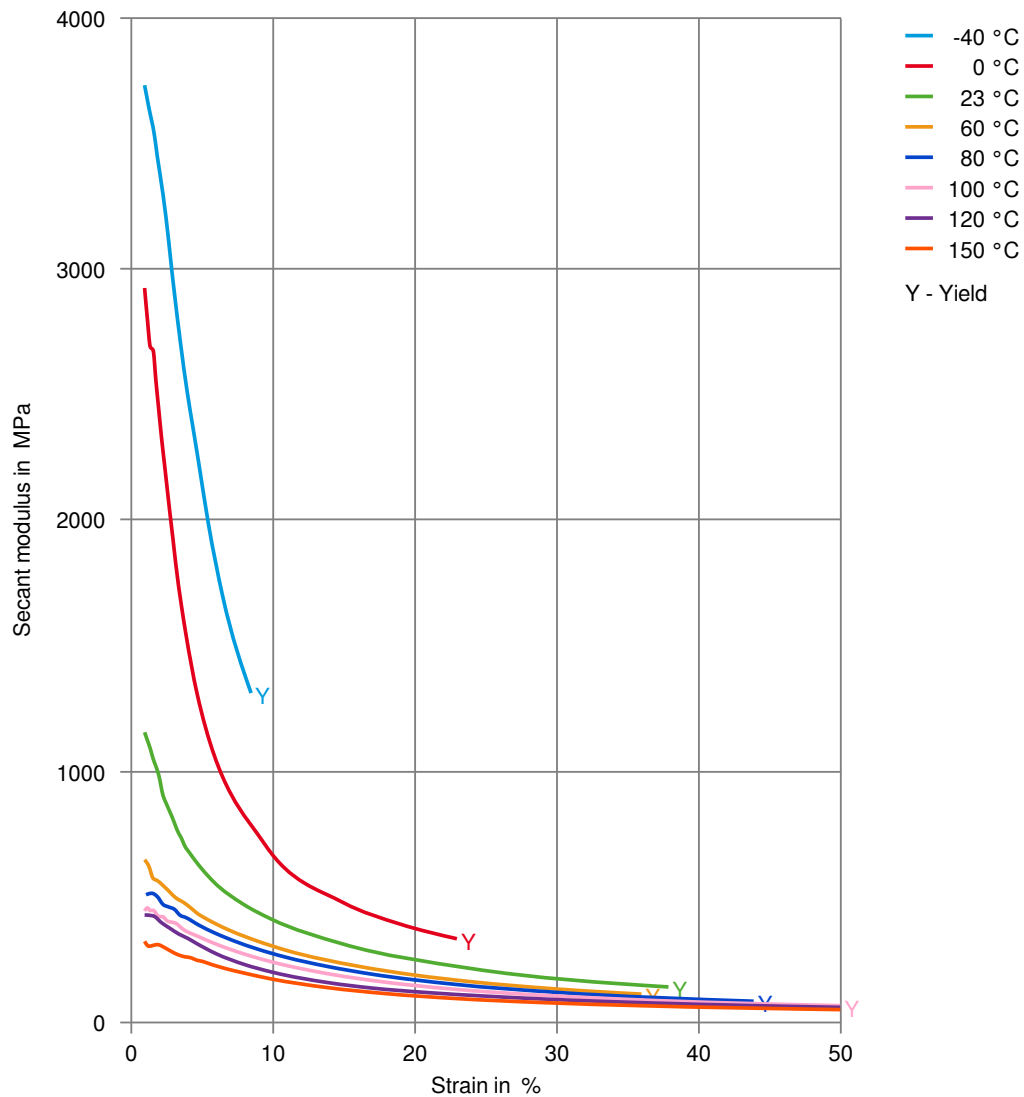
Secant modulus-strain (dry)



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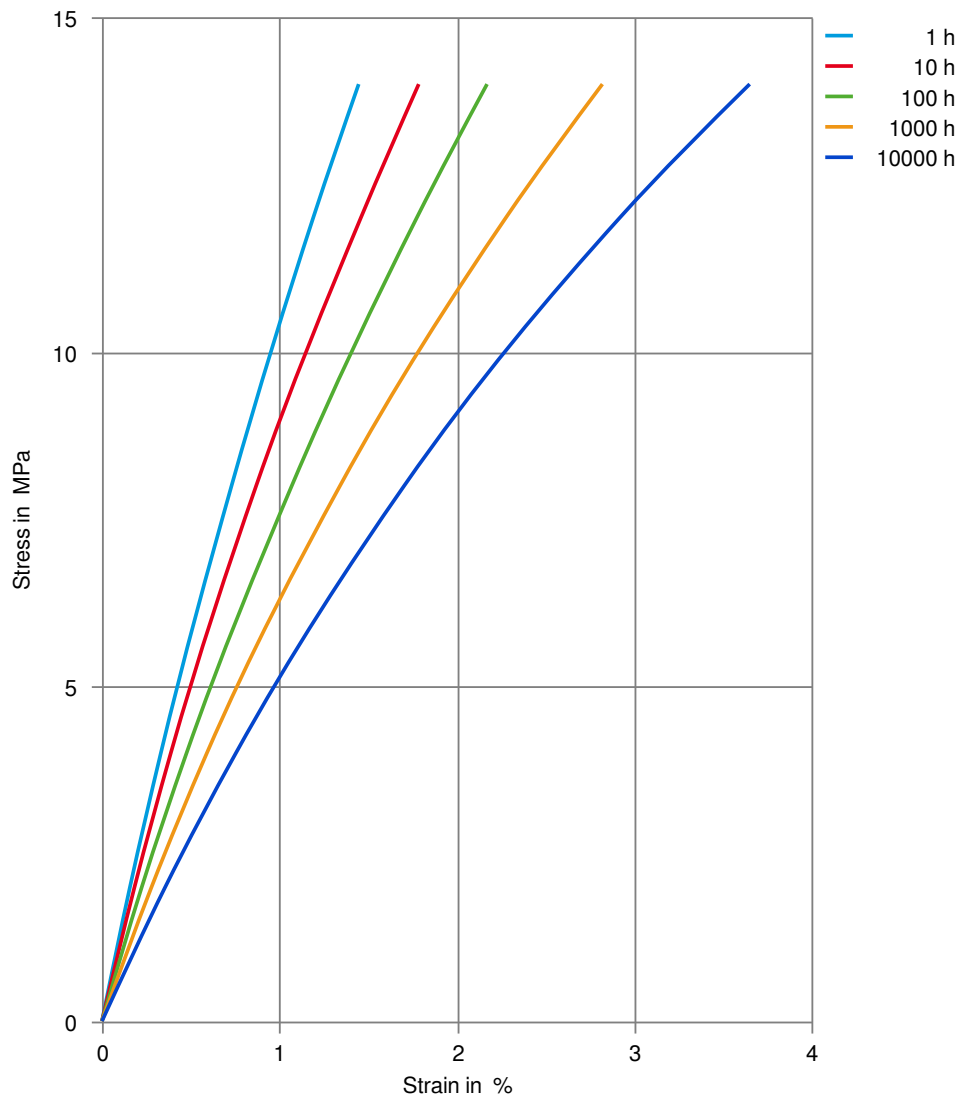
Secant modulus-strain (cond.)



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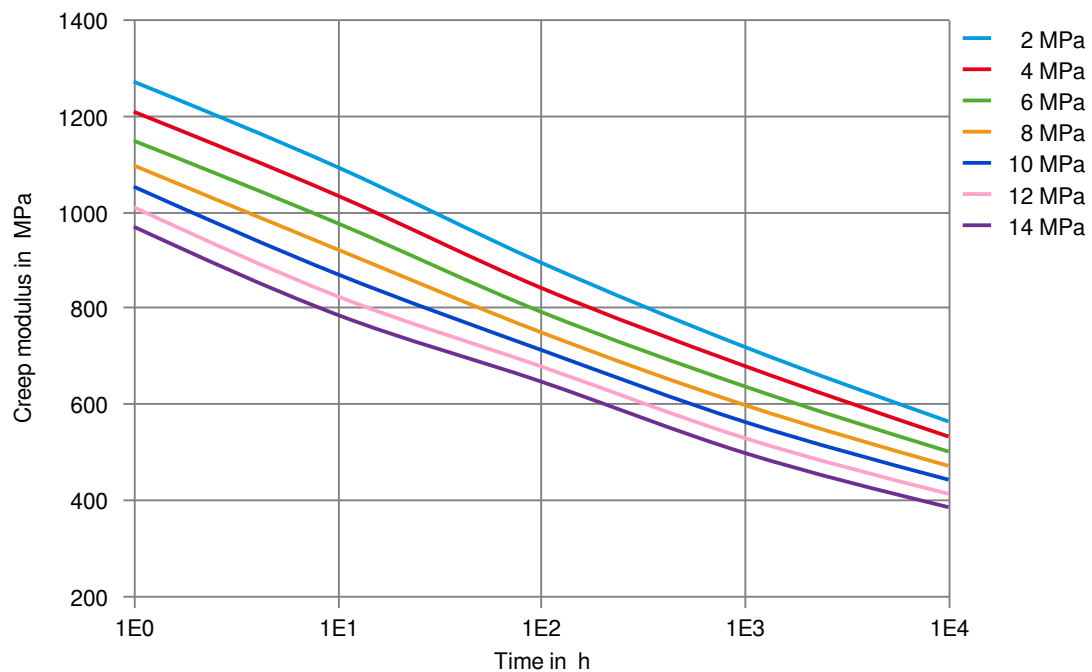
Stress-strain (isochronous) 23°C (cond.)



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Creep modulus-time 23°C (cond.)



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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

Salt solutions

- ✓ Sodium Chloride solution (10% by mass), 23°C
- ✗ Sodium Hypochlorite solution (10% by mass), 23°C

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- ✓ 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).