Celanese
The chemistry inside innovation™

Zytel® ST801AHS 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® ST801AHS NC010 is a Super Tough, high performance polyamide 66 resin. It offers outstanding moulding performance in injection molding applications.

Product information

Resin Identification	PA66-HI	ISO 1043
Part Marking Code	>PA66-HI<	ISO 11469
ISO designation	ISO 16396-PA66-I,,M1G1HNR,S12-020	

Rheological properties

	dry/cond.		
Viscosity number	120 / *	cm^3/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	1.8 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C	0.05 / *	%	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C	0.05 / *	%	ISO 294-4

Typical mechanical properties

	dry/cond.		
Tensile Modulus	2000 / 900	MPa	ISO 527-1/-2
Yield stress, 50mm/min	52 / *	MPa	ISO 527-1/-2
Yield strain, 50mm/min	4 / *	%	ISO 527-1/-2
Stress at 50% strain	* / 45	MPa	ISO 527-1/-2
Nominal strain at break	50 / *	%	ISO 527-1/-2
Strain at break, 5mm/min	* / >50	%	ISO 527-1/-2
Strain at break, 50mm/min	50 / -	%	ISO 527-1/-2
Flexural Modulus	1900 / 800	MPa	ISO 178
Flexural Stress at 3.5%	55 / -	MPa	ISO 178
Charpy impact strength, 23°C	N / N	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	80 / 110	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -30°C	20 / 17	kJ/m^2	ISO 179/1eA
Izod notched impact strength, 23°C	80 / 95	kJ/m^2	ISO 180/1A
Izod notched impact strength, -30°C	19 / 19	kJ/m^2	ISO 180/1A
Izod notched impact strength, -40°C	19 / 16	kJ/m^2	ISO 180/1A

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Hardness, Rockwell, R-scale	107 / 69		ISO 2039-2
Ball indentation hardness, H 358/30	104 / -	MPa	ISO 2039-1
Poisson's ratio	0.4 / 0.45		

[1]: 50%

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	62 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	160 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	90 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	120 / *	E-6/K	ISO 11359-1/-2
RTI, electrical, 0.75mm	130	°C	UL 746B
RTI, electrical, 1.5mm	130	°C	UL 746B
RTI, electrical, 3mm	130	°C	UL 746B
RTI, impact, 0.75mm	65	°C	UL 746B
RTI, impact, 1.5mm	105	°C	UL 746B
RTI, impact, 3mm	105	°C	UL 746B
RTI, strength, 0.75mm	95	°C	UL 746B
RTI, strength, 1.5mm	105 / *	°C	UL 746B
RTI, strength, 3mm	110	°C	UL 746B

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB / *	class	UL 94
Thickness tested	1.5 / *	mm	UL 94
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	HB / *	class	UL 94
Thickness tested	0.75 / *	mm	UL 94
UL recognition	yes / *		UL 94
Glow Wire Flammability Index, 0.4mm	750 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	750 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1mm	750 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	750 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2mm	750 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	750 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	725 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3mm	725 / -	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 0.75mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1.5mm	700 / -	°C	IEC 60335-1

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Glow Wire Temperature, No Flame, 2mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 3mm	700 / -	°C	IEC 60335-1
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	24	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	3.5 / 6.2		IEC 62631-2-1
Relative permittivity, 1MHz	3.3 / 3.6		IEC 62631-2-1
Dissipation factor, 100Hz	50 / 1770	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	110 / 400	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 2.7E10	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 5E12	Ohm	IEC 62631-3-2
Electric strength	24 / 24	kV/mm	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112
Electric Strength, Short Time, 2mm	24 / 24	kV/mm	IEC 60243-1

Other properties

	dry/cond.		
Humidity absorption, 2mm	2 / *	%	Sim. to ISO 62
Water absorption, 2mm	6.5 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.1[2] / *	%	Sim. to ISO 62
Density	1080 / -	kg/m³	ISO 1183

[2]: 3mm wall thickness

Film Properties

	dry/cond.		
Strain at yield, parallel	4.4 / *	%	ISO 527-3

VDA Properties

	dry/cond.		
Emission of organic compounds	13	µgC/g	VDA 277
Odour	5	class	VDA 270
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	290	°C	Internal
Min. melt temperature	280	°C	
Max. melt temperature	300	°C	
Screw tangential speed	≤0.3	m/s	
Mold Temperature Optimum	80	°C	
Min. mould temperature	50	°C	
Max. mould temperature	100	°C	

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Hold pressure range	50 - 100	MPa	
Hold pressure time	4	s/mm	
Ejection temperature	190	°C	Internal

Extrusion

Drying Temperature	≤80	°C
Drying Time, Dehumidified Dryer	3 - 4	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	280	°C
Melt Temperature Range	275 - 290	°C

Characteristics

Additives	Release agent

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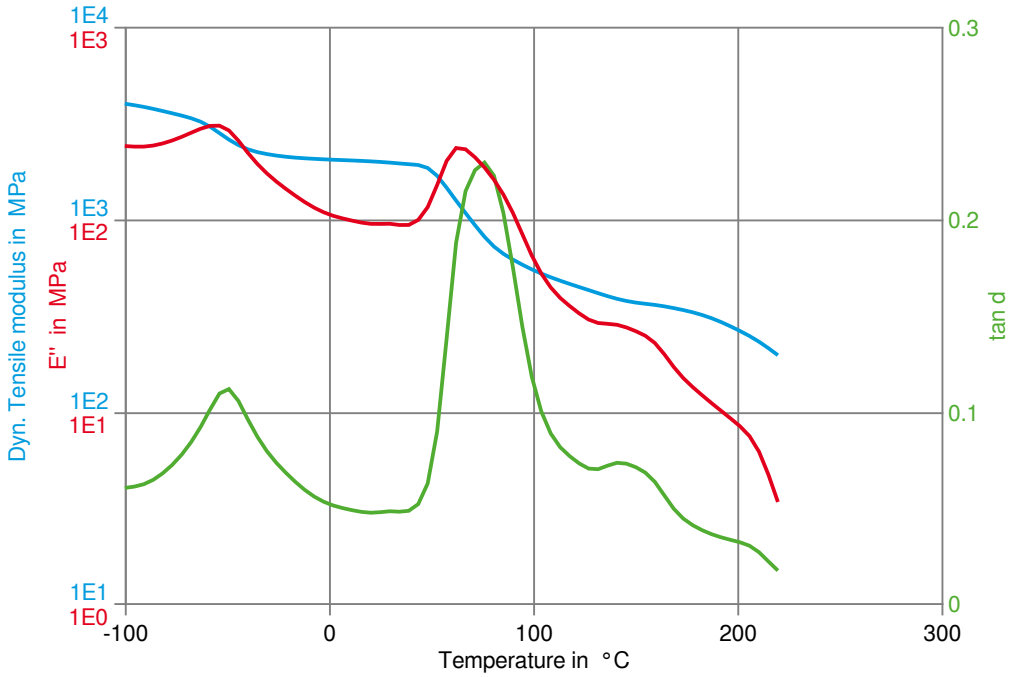
Dynamic Tensile modulus-temperature (dry)



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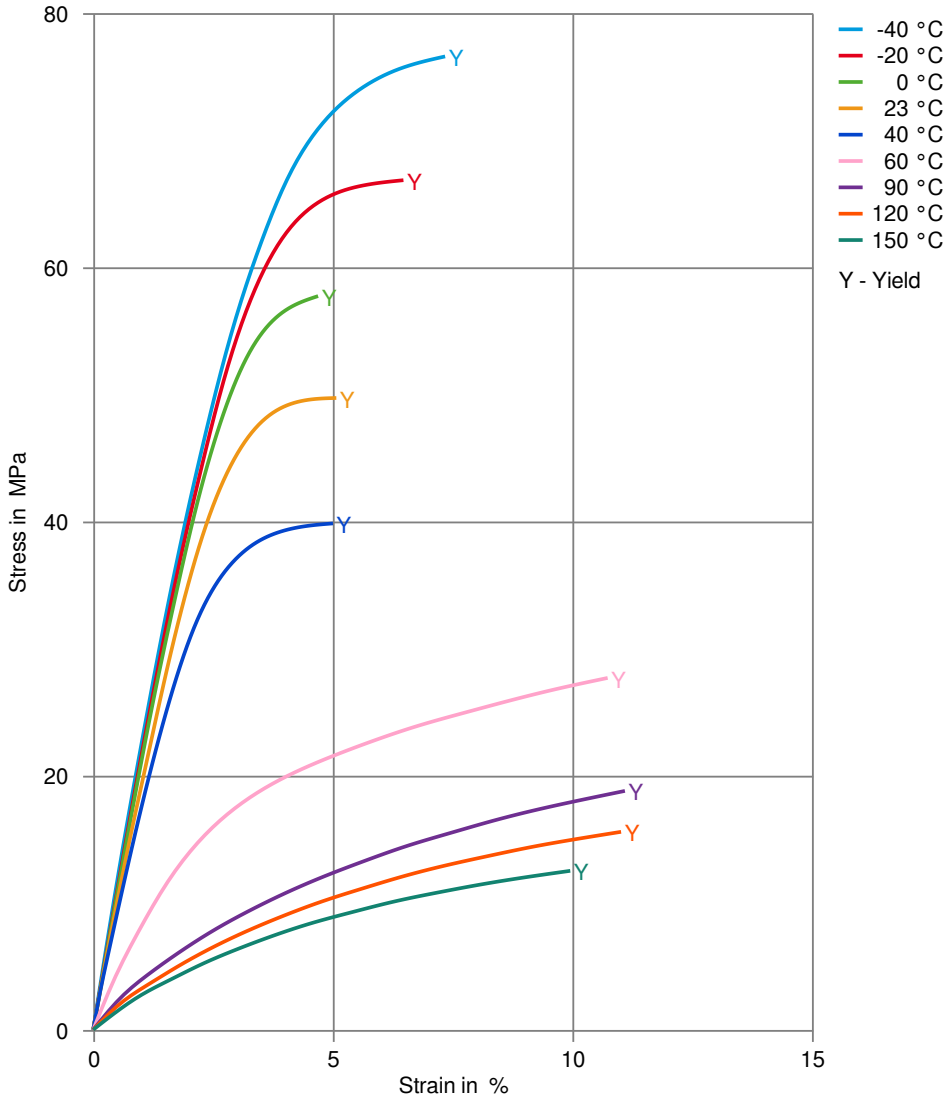
Stress-strain (dry)



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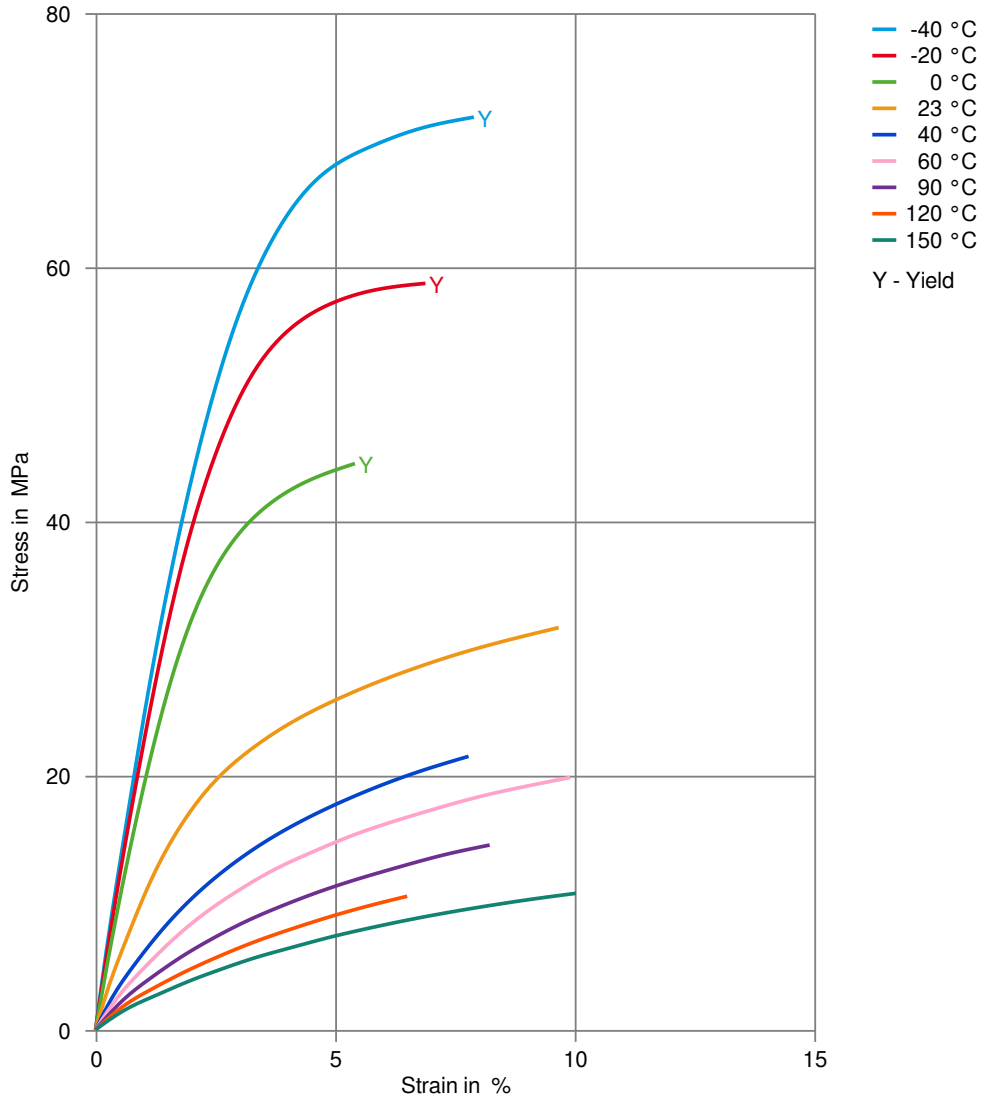
NYLON RESIN

Stress-strain (cond.)



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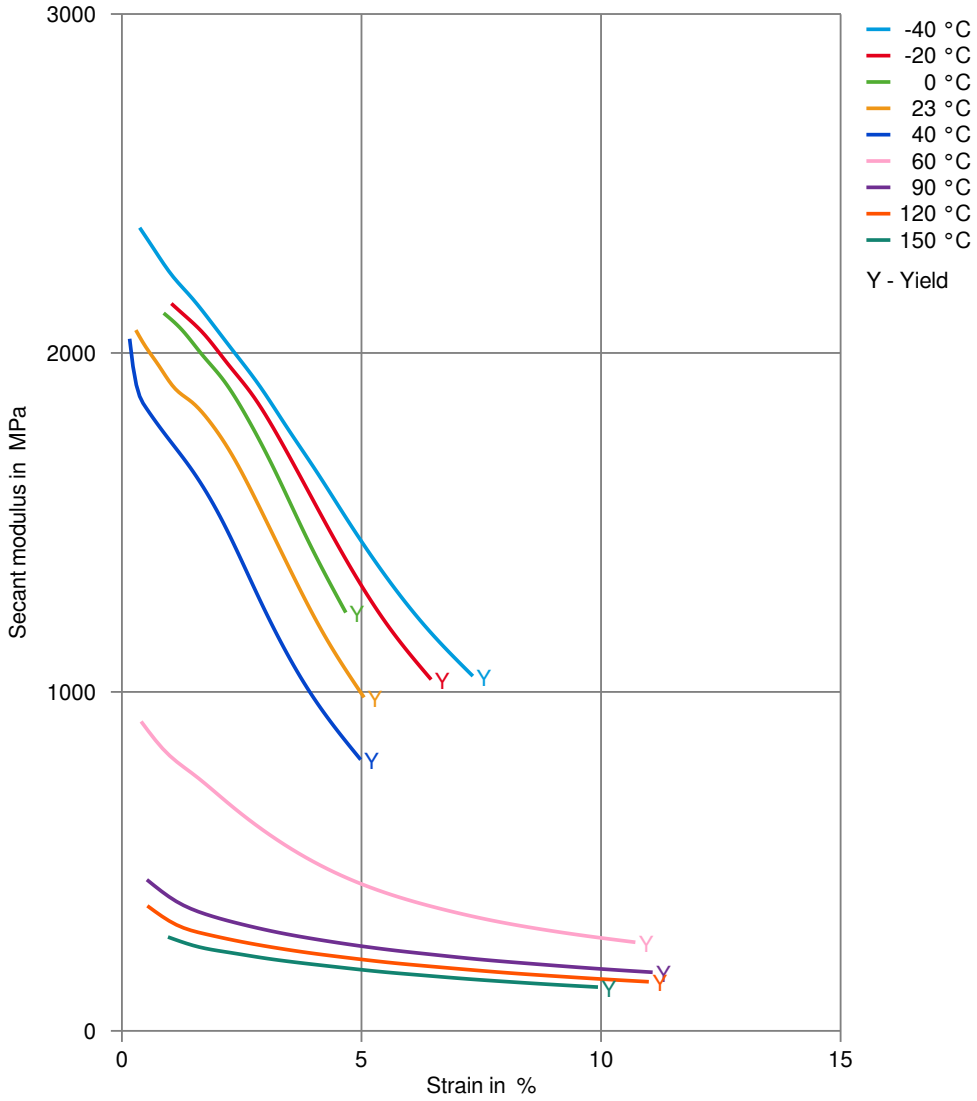
Secant modulus-strain (dry)



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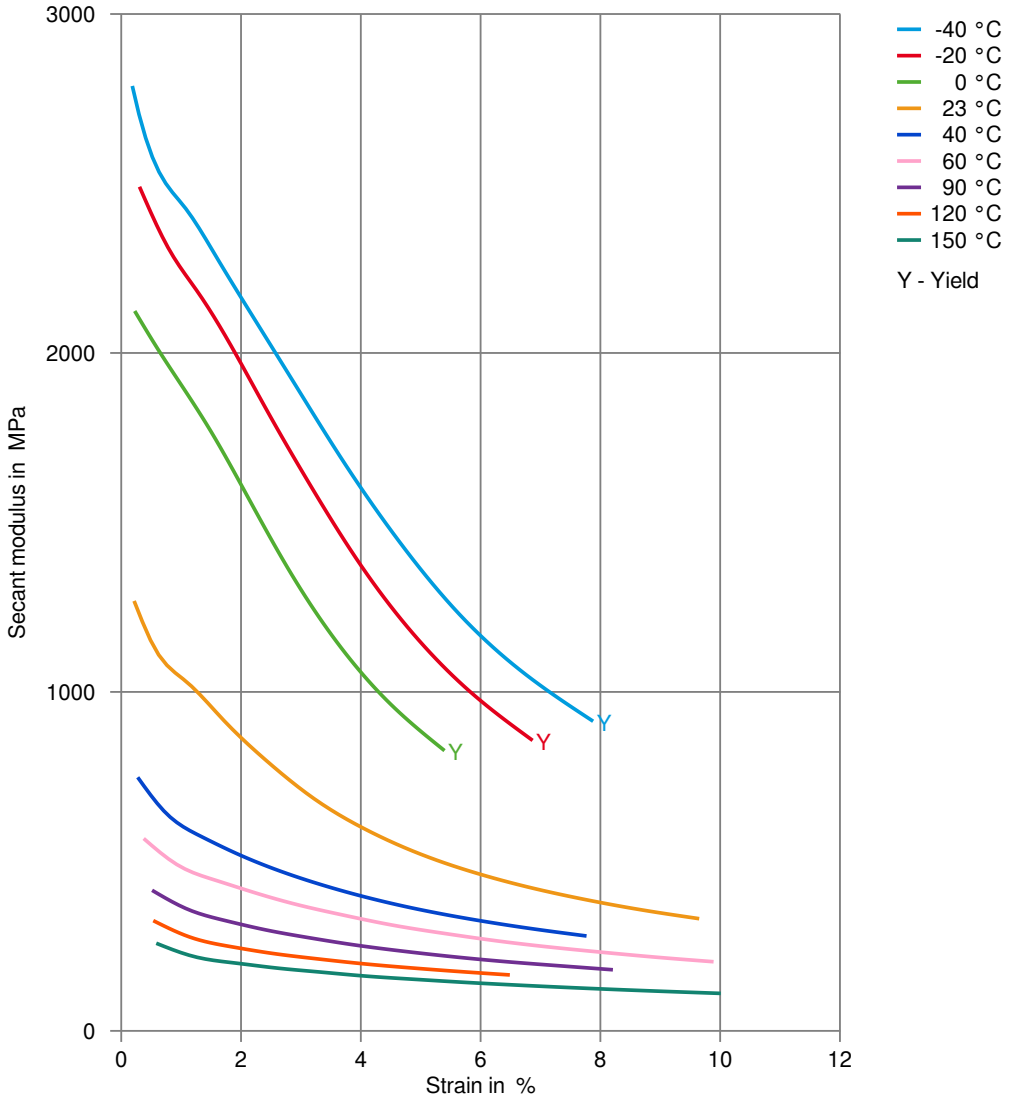
Secant modulus-strain (cond.)



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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
- ✔ 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

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- ✔ 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
- ✘ 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).