Zytel® 103HSL BKB080

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® 103HSL BKB080 is a heat stabilized, lubricated polyamide 66 resin for injection molding.

Product information

Resin Identification	PA66	ISO 1043
Part Marking Code	>PA66<	ISO 11469
ISO designation	ISO 16396-PA66,,M1CG1HR,S14-030	

Rheological properties

	dry/cond.		
Melt mass-flow rate	36/*	g/10min	ISO 1133
Melt mass-flow rate, Temperature	275/*	°C	ISO 1133
Melt mass-flow rate, Load	2.16/*	kg	ISO 1133
Viscosity number	150/*[1]	cm³/g	ISO 307, 1157, 1628
Molding shrinkage, parallel	1.3/-	%	ISO 294-4, 2577
Molding shrinkage, normal	1.3/-	%	ISO 294-4, 2577

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile Modulus	3100/1400	MPa	ISO 527-1/-2
Yield stress	85/55	MPa	ISO 527-1/-2
Yield strain	4.3/25	%	ISO 527-1/-2
Nominal strain at break	20/>50	%	ISO 527-1/-2
Strain at break, 50mm/min	40/-	%	ISO 527-1/-2
Flexural Modulus	2800/1300[DS]	MPa	ISO 178
Flexural Stress at 3.5%	95/65	MPa	ISO 178
Tensile creep modulus, 1h	*/1200	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/650	MPa	ISO 899-1
Charpy notched impact strength, 73°F	5.5/12	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -22°F	3/3	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°F	2.5/2.5	kJ/m²	ISO 179/1eA

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Izod notched impact strength, 73°F	5 / 11[DS]	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°F	5 / 4[DS]	kJ/m²	ISO 180/1A
Ball indentation hardness, H 358/30	180 / 85	MPa	ISO 2039-1
Ball indentation hardness, H 961/30	160 / -	MPa	ISO 2039-1
Poisson's ratio	0.37 / 0.43	-	

[DS]: Derived from similar grade

Thermal properties

	dry/cond.		
Melting temperature, 18°F/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 18°F/min	60 / 40	°C	ISO 11357-1/-2
Temp. of deflection under load, 260 psi	70 / *	°C	ISO 75-1/-2
Temp. of deflection under load, 65 psi	200 / *	°C	ISO 75-1/-2
RTI, electrical, 30mil	140	°C	UL 746B
RTI, electrical, 60mil	140	°C	UL 746B
RTI, electrical, 120mil	140	°C	UL 746B
RTI, impact, 30mil	95	°C	UL 746B
RTI, impact, 60mil	110	°C	UL 746B
RTI, impact, 120mil	110	°C	UL 746B
RTI, strength, 30mil	115	°C	UL 746B
RTI, strength, 60mil	125 / *	°C	UL 746B
RTI, strength, 120mil	125	°C	UL 746B

Flammability

	dry/cond.		
Burning Behav. at 60mil nom. thickn.	V-2 / *	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	0.71 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Glow Wire Flammability Index, 30mil	850 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 60mil	960 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 120mil	960 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 30mil	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 60mil	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 120mil	725 / -	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 30mil	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 40mil	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 60mil	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 80mil	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 120mil	700 / -	°C	IEC 60335-1
FMVSS Class	SE	-	ISO 3795 (FMVSS 302)

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Electrical properties

	dry/cond.		
Comparative tracking index	600/-		IEC 60112

Other properties

	dry/cond.		
Humidity absorption, 80mil	2.6/*	%	Sim. to ISO 62
Water absorption, 80mil	8.5/*	%	Sim. to ISO 62
Density	1140/-	kg/m³	ISO 1183
Water Absorption, Immersion 24h	1.2/*[2]	%	Sim. to ISO 62

[2]: 3mm wall thickness

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
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Max. screw tangential speed	0.4	m/s
Mold Temperature Optimum	70	°C
Min. mold temperature	50	°C
Max. mold temperature	90	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	4	s/mm
Ejection temperature	190	°C

Extrusion

Drying Temperature	≤80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.05	%
Melt Temperature Optimum	290	°C
Melt Temperature Range	280 - 300	°C

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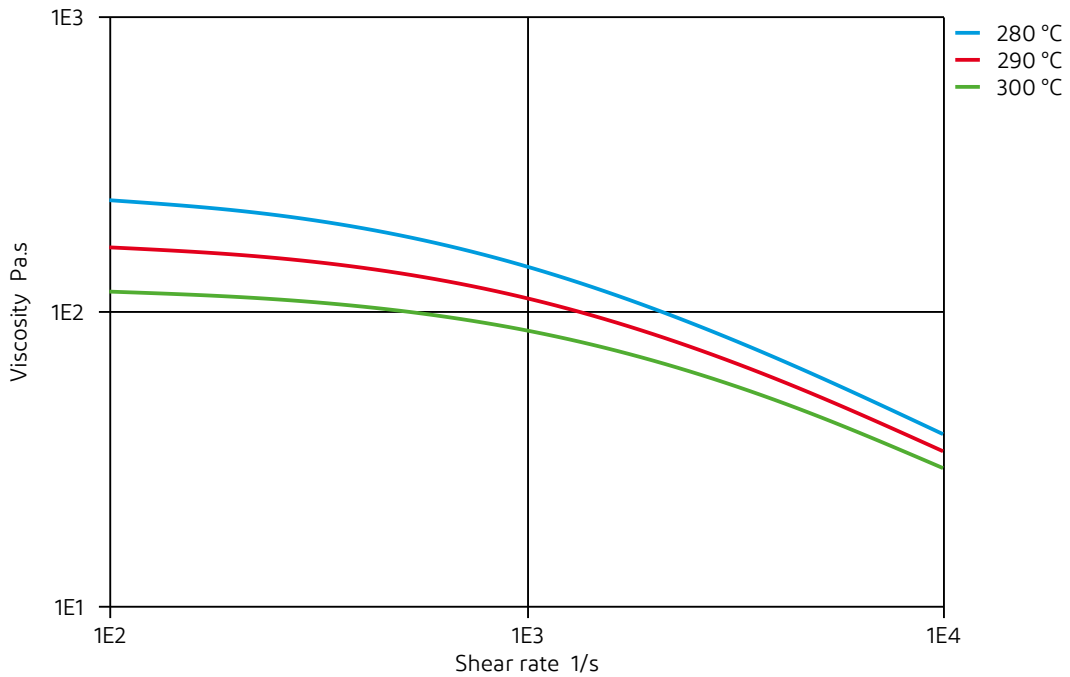
Viscosity-shear rate
(measured on Zytel® 103HSL NC010)



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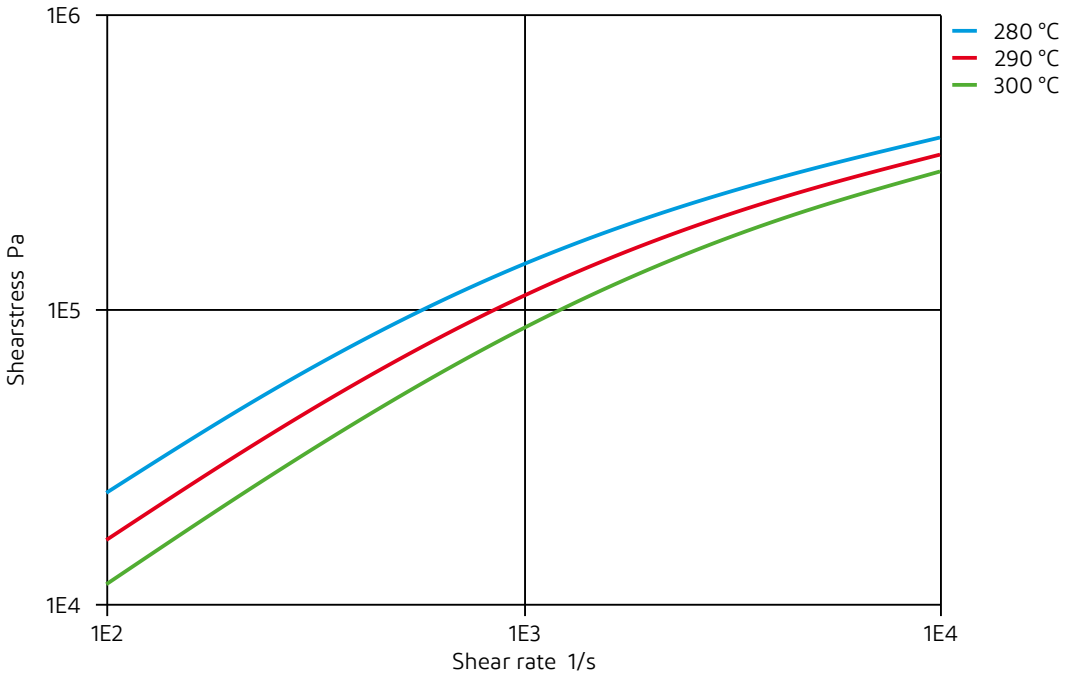
NYLON RESIN

Shearstress-shear rate
(measured on Zytel® 103HSL NC010)



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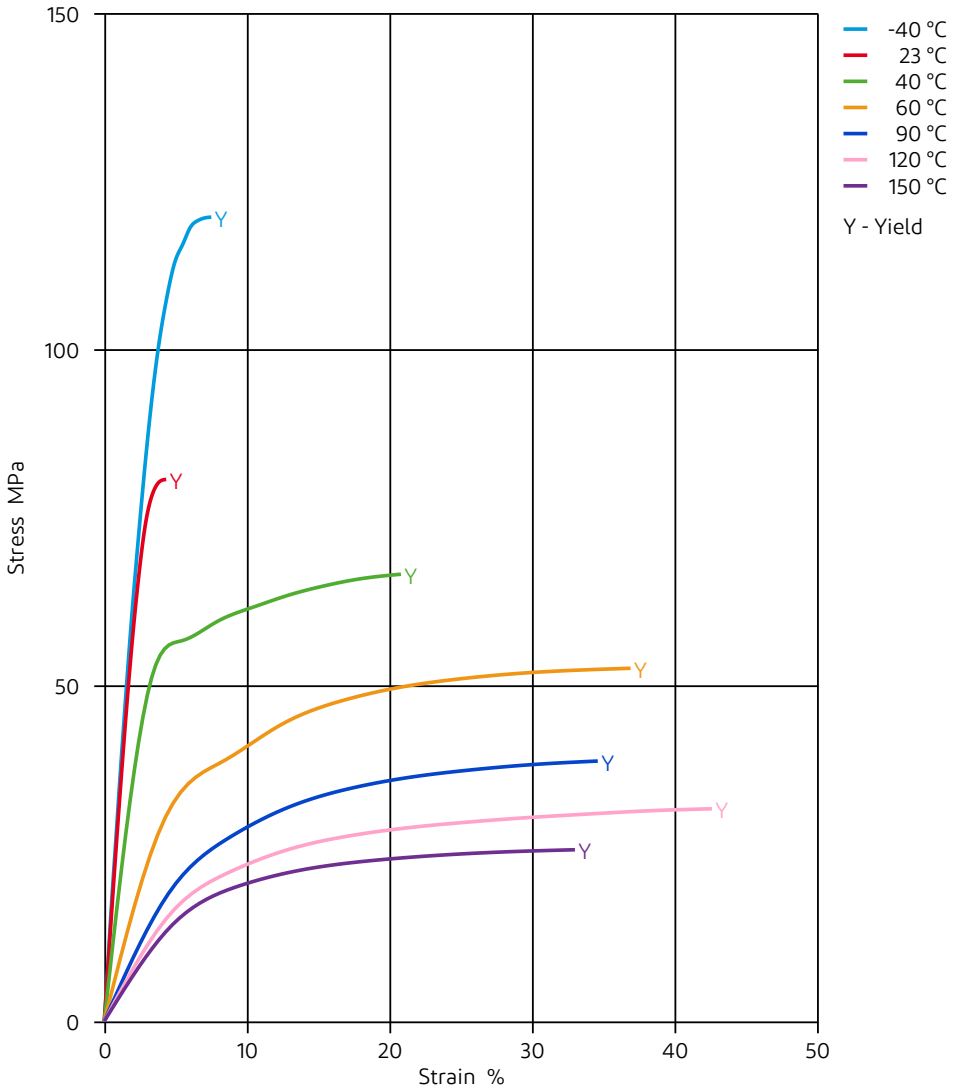
NYLON RESIN

Stress-strain (dry)
(measured on Zytel® 103HSL NC010)



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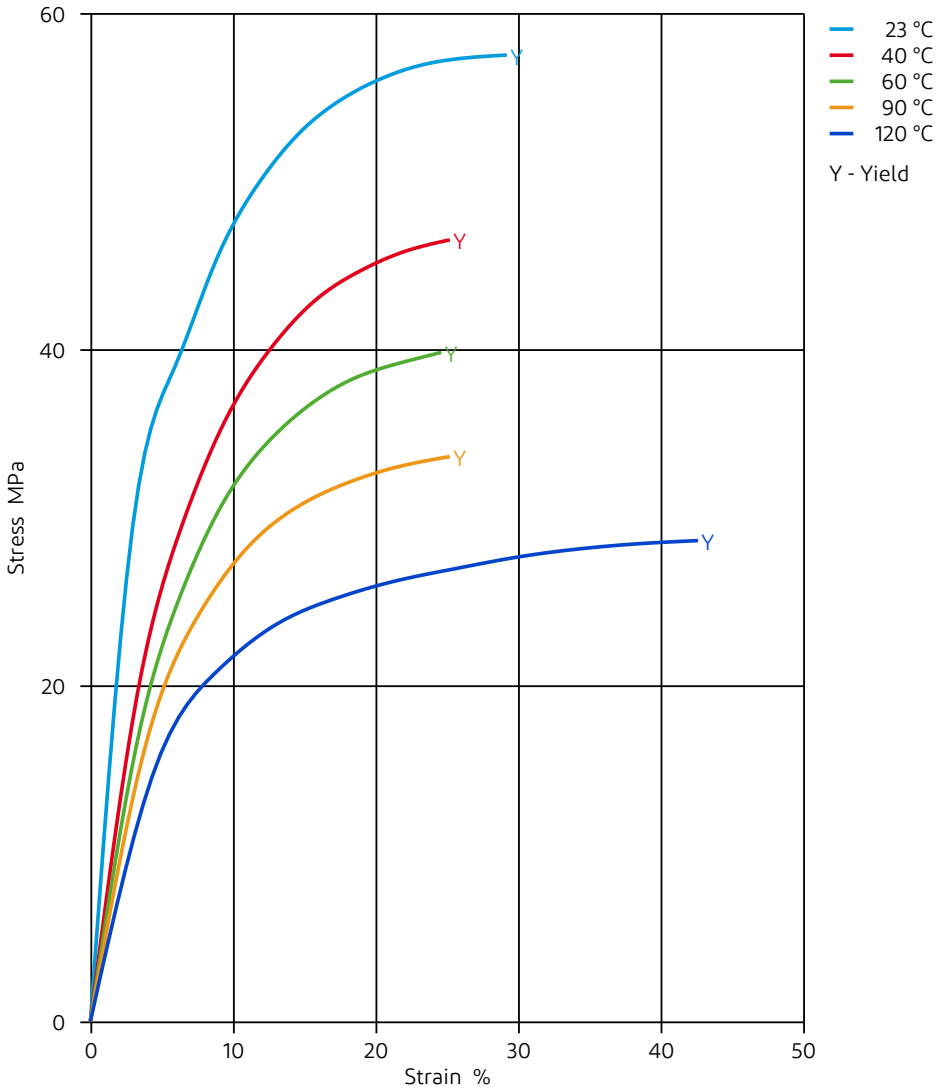
NYLON RESIN

Stress-strain (cond.)
(measured on Zytel® 103HSL NC010)



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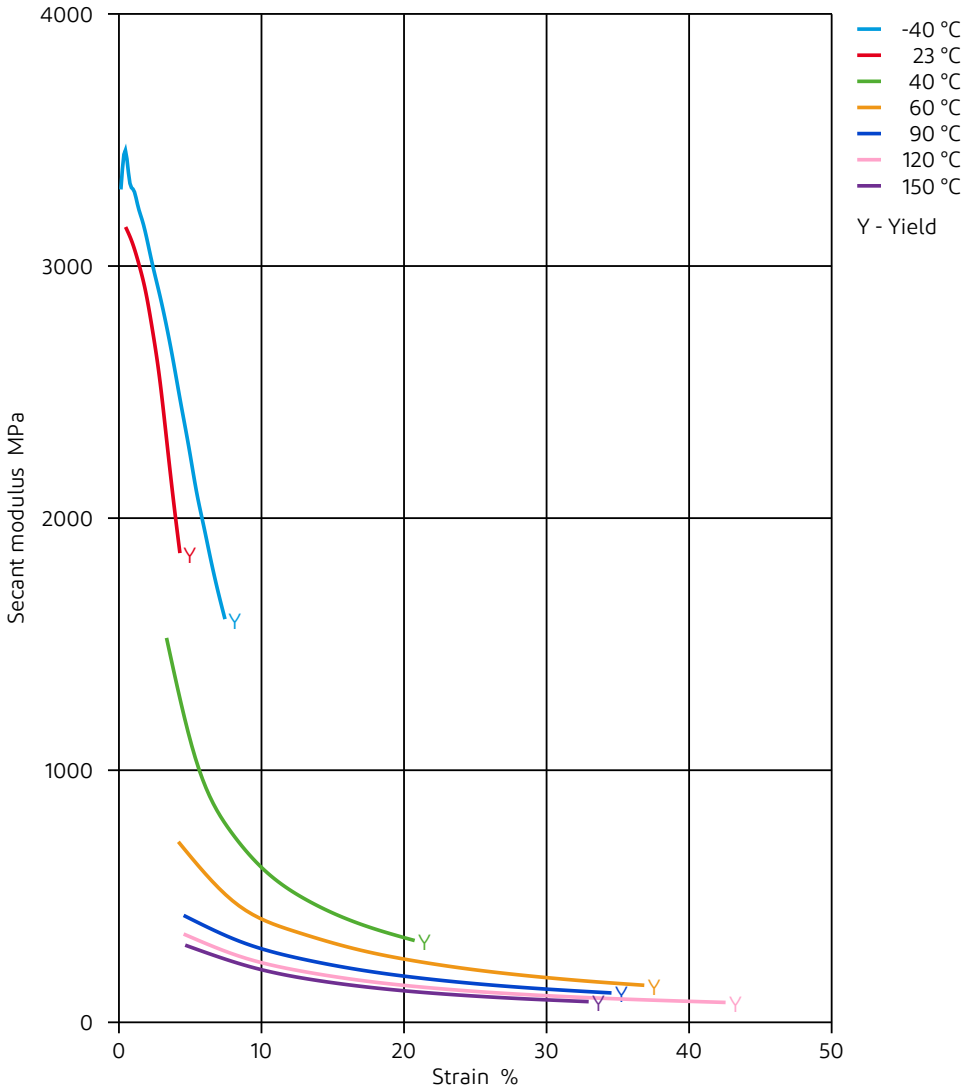
NYLON RESIN

Secant modulus-strain (dry)
(measured on Zytel® 103HSL NC010)



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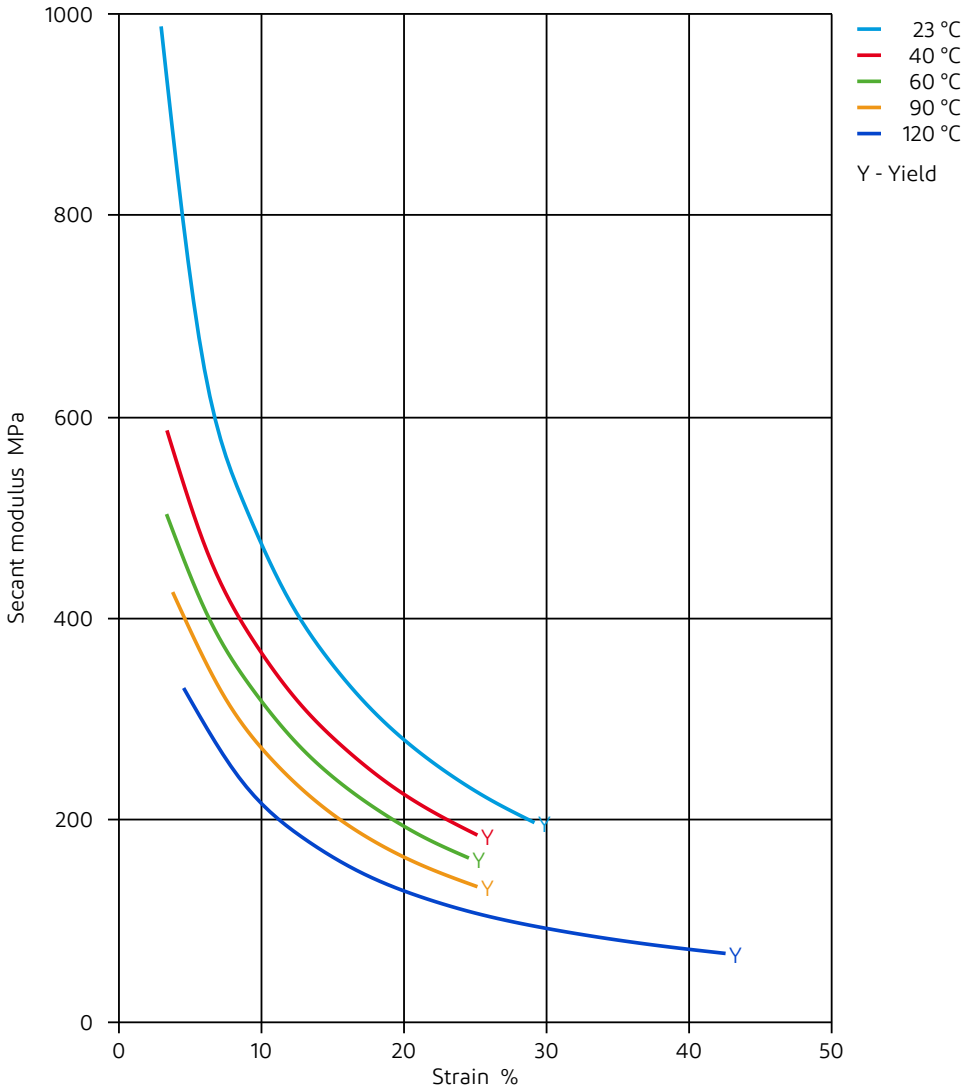
NYLON RESIN

Secant modulus-strain (cond.)
(measured on Zytel® 103HSL NC010)



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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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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
- ✔ Urea solution (32.5% 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).