Zytel® MT409AHS BK010

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® MT409AHS BK010 is a Medium Toughened, high performance, heat stabilised polyamide 66 resin having good stiffness, improved knit line strength, surface appearance with outstanding processability.

Product information

Resin Identification	PA66-I	ISO 1043
Part Marking Code	>PA66-I<	ISO 11469
ISO designation	ISO 16396-PA66-I,,M1CG1HR,S14-020	

Rheological properties

	dry/cond.		
Moulding shrinkage, parallel	1.7/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.7/-	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile Modulus	2400/1100	MPa	ISO 527-1/-2
Yield stress	61/43	MPa	ISO 527-1/-2
Yield strain	5/28	%	ISO 527-1/-2
Stress at break, 50mm/min	50/-	MPa	ISO 527-1/-2
Nominal strain at break	25/>50	%	ISO 527-1/-2
Strain at break, 50mm/min	45/-	%	ISO 527-1/-2
Flexural Modulus	2200/1000	MPa	ISO 178
Flexural Strength	75/-	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	17/40	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	13/12	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	12/12	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	17/90	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	13/15	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	11/-	kJ/m²	ISO 180/1A

Zytel® MT409AHS BK010

NYLON RESIN

Ball indentation hardness, H 358/30	125/60[DS, 1]	MPa	ISO 2039-1
Poisson's ratio	0.38/0.45	-	

[DS]: Derived from similar grade

[1]: 132/30

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	262/*	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	65/*	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	187/*	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	100/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	100/*	E-6/K	ISO 11359-1/-2
Thermal conductivity solid	0.21	W/(m K)	
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	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	0.8/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Thickness tested	3/*	mm	IEC 60695-11-20
UL recognition	yes/*	-	UL 94
Oxygen index	21/*	%	ISO 4589-1/-2
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	29	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	3.9/9.8	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.7/4	-	IEC 62631-2-1
Dissipation factor, 100Hz	60/4350	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	130/5100	E-4	IEC 62631-2-1
Volume resistivity	>1E13/9.7E9	Ohm.m	IEC 62631-3-1
Surface resistivity	*/4.7E11	Ohm	IEC 62631-3-2
Comparative tracking index	600/-	-	IEC 60112
Electric Strength, Short Time, 2mm	25/22	kV/mm	IEC 60243-1

Zytel® MT409AHS BK010

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Other properties

	dry/cond.		
Humidity absorption, 2mm	2.1/*	%	Sim. to ISO 62
Density	1110/-	kg/m³	ISO 1183
Water Absorption, Immersion 24h	0.9/*	%	Sim. to ISO 62

VDA Properties

	dry/cond.		
Weather stability delta l	2.9	-	DIN 53236
Weather stability delta a	0.3	-	DIN 53236
Weather stability delta b	1.6	-	DIN 53236
Weather stability delta E	2.5	-	DIN 53236
Weather stability grey scale	2-3	-	ISO 105-A02
Emission of organic compounds	10	µgC/g	VDA 277
Odour	4	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
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Max. screw tangential speed	0.3	m/s
Mold Temperature Optimum	80	°C
Min. mould temperature	50	°C
Max. mould temperature	100	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	4	s/mm
Ejection temperature	190	°C

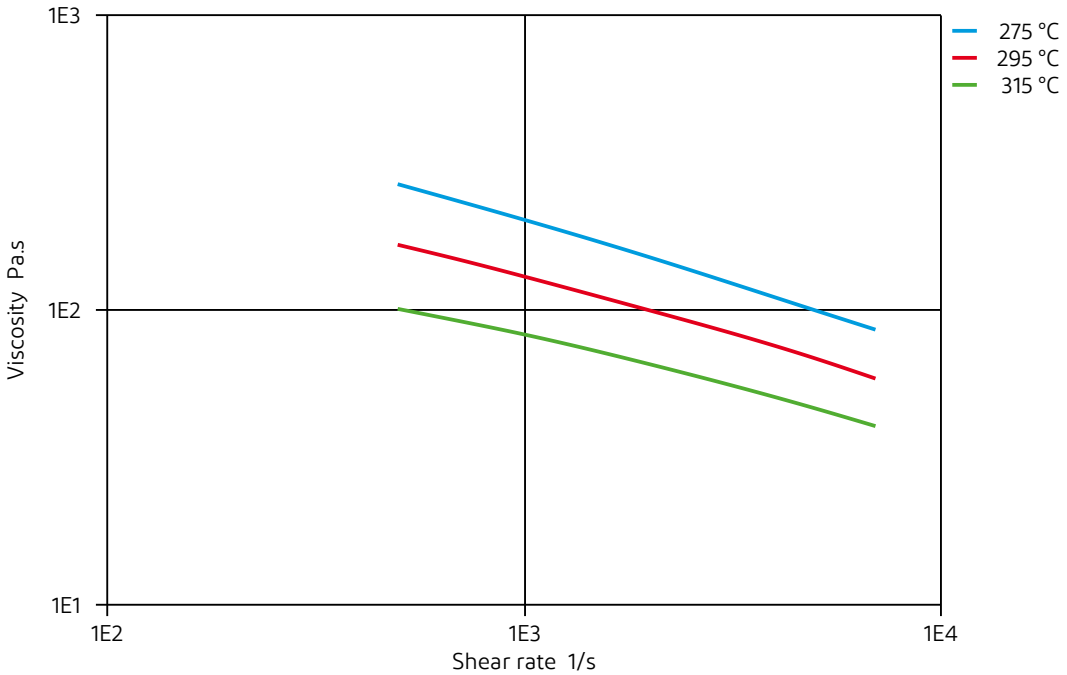
Extrusion

Drying Temperature	≤80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	290	°C
Melt Temperature Range	280 - 300	°C

Zytel® MT409AHS BK010

NYLON RESIN

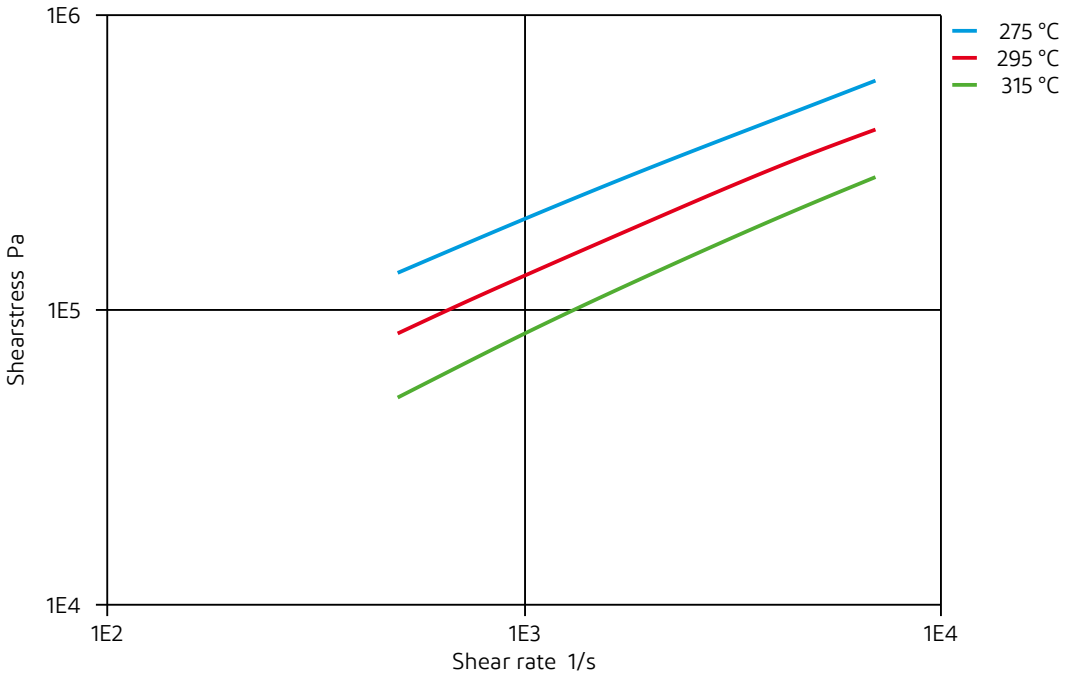
Viscosity-shear rate
(measured on Zytel® MT409AHS NC010)



Zytel® MT409AHS BK010

NYLON RESIN

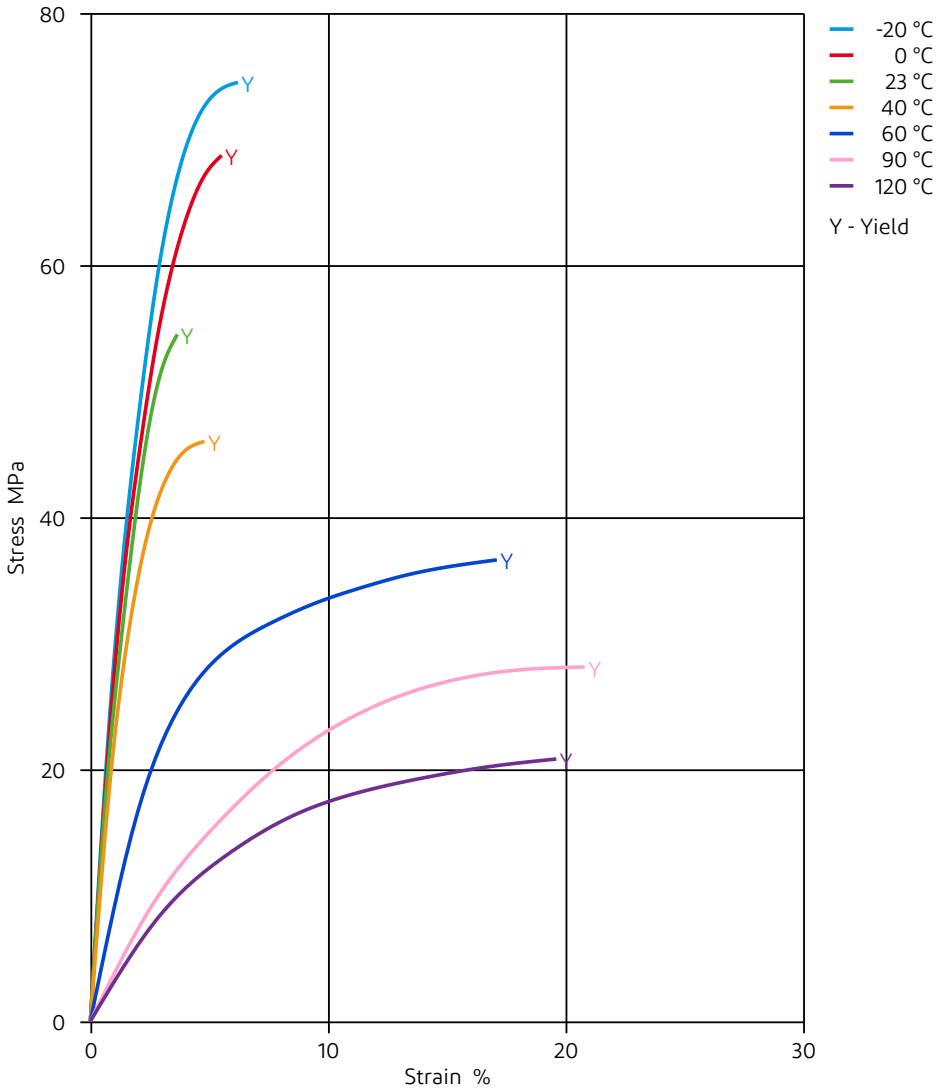
Shearstress-shear rate
(measured on Zytel® MT409AHS NC010)



Zytel® MT409AHS BK010

NYLON RESIN

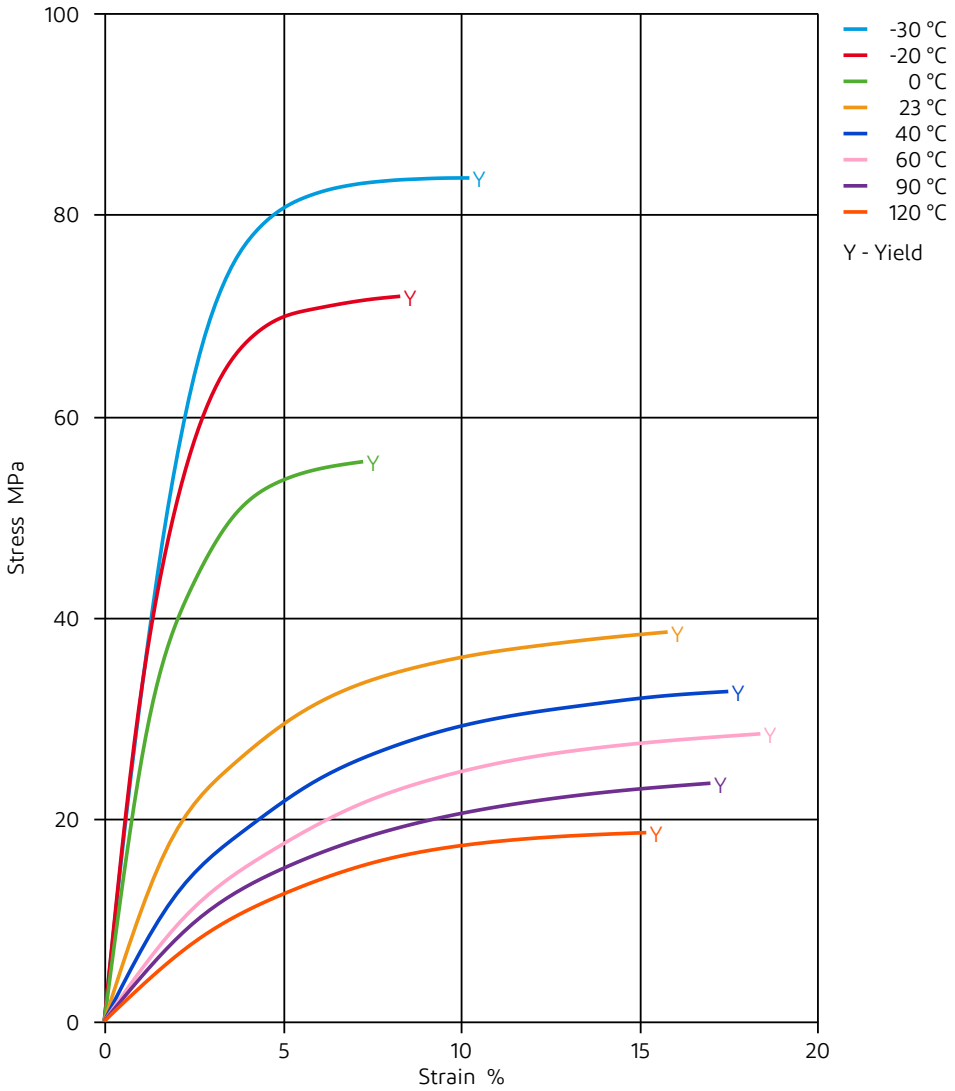
Stress-strain (dry)



Zytel® MT409AHS BK010

NYLON RESIN

Stress-strain (cond.)



Zytel® MT409AHS BK010

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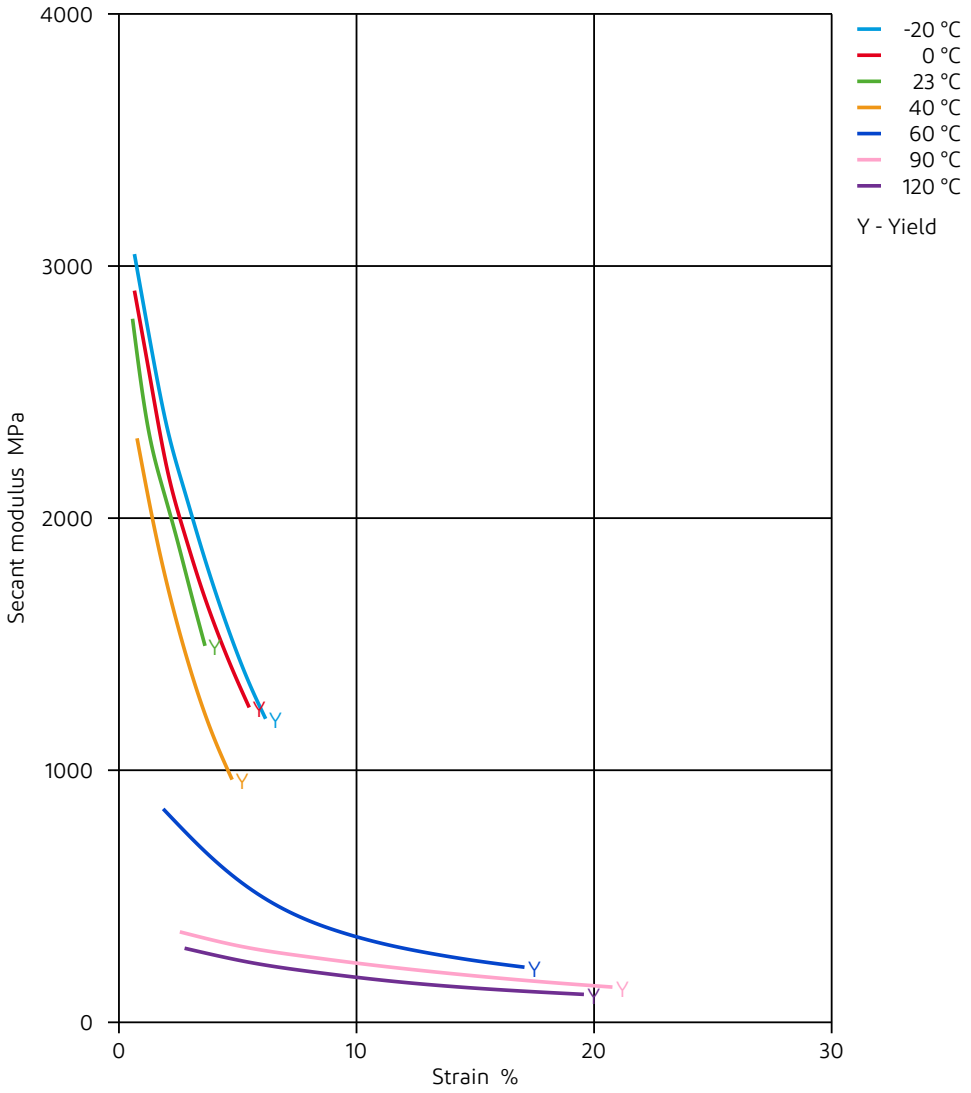
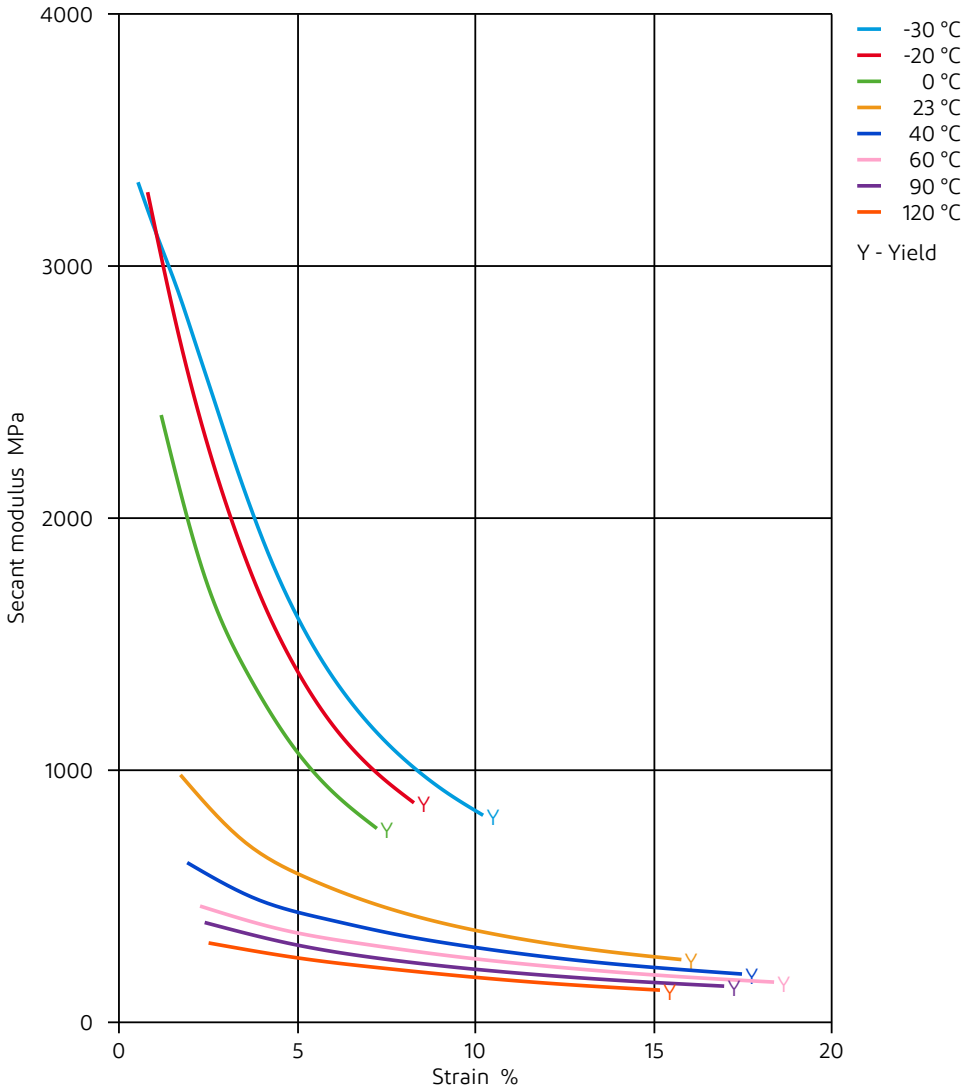
Secant modulus-strain (dry)



Zytel® MT409AHS BK010

NYLON RESIN

Secant modulus-strain (cond.)



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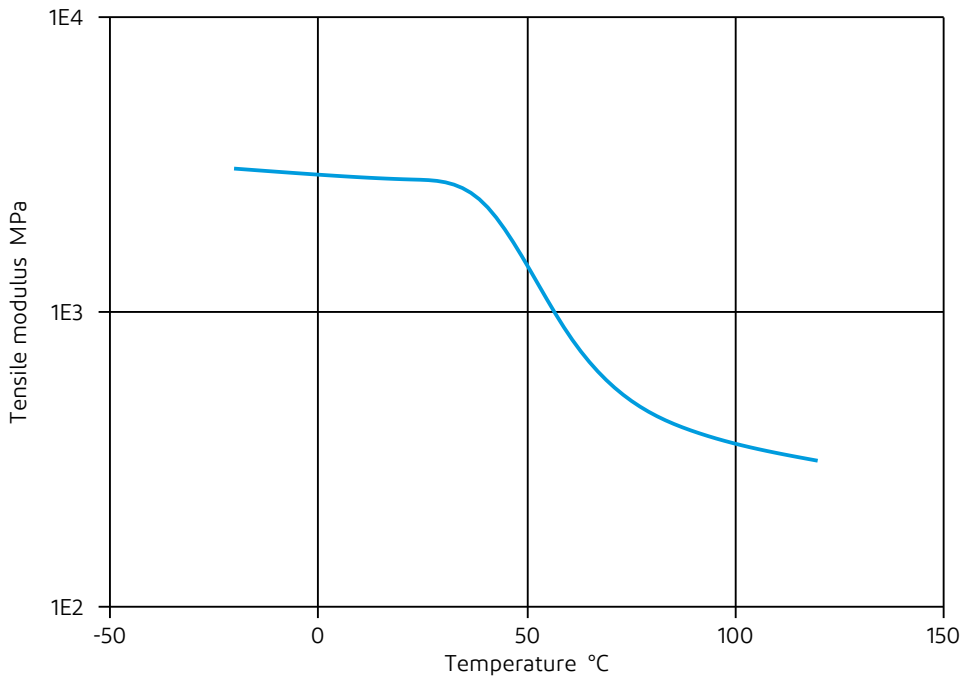
Tensile modulus-temperature (dry)
(measured on Zytel® MT409AHS NC010)



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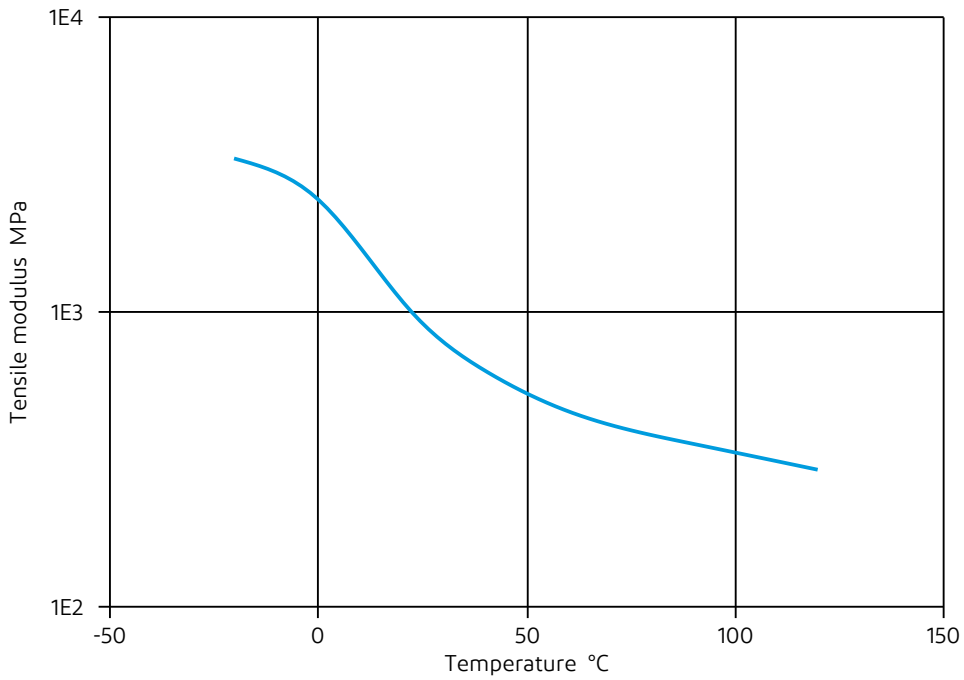
NYLON RESIN

Tensile modulus-temperature (cond.)
(measured on Zytel® MT409AHS 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

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).