

Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT 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® XT70G35HSL BK044A is a 35% glass fiber reinforced, heat stabilized polyamide 66 resin for injection molding. It has been developed for automotive applications requiring good retention of properties over time at temperatures up to 220 °C and with good high temperature fatigue and properties.

Product information

Resin Identification	PA66-GF35	ISO 1043
Part Marking Code	>PA66-GF35<	ISO 11469
ISO designation	ISO 16396-PA66,GF35,M1CGHR,S14-110	

Rheological properties

	dry/cond.		
Viscosity number	140 ^[1] /*	cm ³ /g	ISO 307, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.9/-	%	ISO 294-4, 2577

[1]: sulfuric acid 96% (130 cm³/g in formic acid 90%)

Typical mechanical properties

	dry/cond.		
Tensile modulus	11000/7500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	200/140	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2/5	%	ISO 527-1/-2
Flexural modulus	10000/7000	MPa	ISO 178
Flexural strength	260/-	MPa	ISO 178
Charpy impact strength, 23 °C	90/100	kJ/m ²	ISO 179/1eU
Charpy impact strength, -30 °C	80/-	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23 °C	13/16	kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -40 °C	11/10	kJ/m ²	ISO 179/1eA
Poisson's ratio	0.34/0.34		

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	258/*	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	65/20	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	240/*	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23 °C	19/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	19/*	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 23-55 °C (73-130 °F)	20/-	E-6/K	ASTM E 831
Coeff. of linear therm. expansion, parallel, 55-160 °C	15/*	E-6/K	ISO 11359-1/-2

Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

Coeff. of linear therm. expansion, normal, -40-23°C	55 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	90 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	150 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal, 23-55°C (73-130°F)	70 / -	E-6/K	ASTM E 831
Thermal conductivity of melt	0.25	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2050	J/(kg K)	ISO 22007-4

Flammability

FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	33 mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Electric strength	35 / 16	kV/mm	IEC 60243-1

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	2.1 / *	%	Sim. to ISO 62
Density	1410 / -	kg/m ³	ISO 1183
Density of melt	1240	kg/m ³	

VDA Properties

Coeff. of linear therm. expansion -40°C to +100°C, parallel	19	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion -40°C to +100°C, normal	90	E-6/K	ISO 11359-1/-2

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
Mold Temperature Optimum	95 °C
Min. mould temperature	70 °C
Max. mould temperature	120 °C
Ejection temperature	211 °C

Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	Heat stabilised or stable to heat

Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

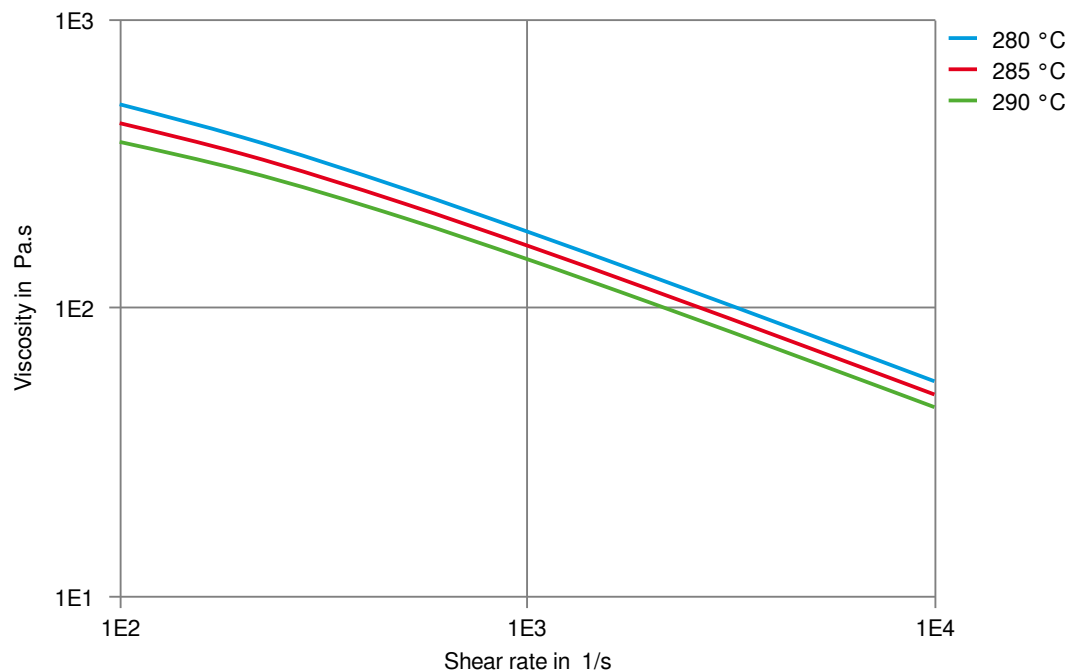
Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
BMW	GS93016-PA66-GF35	(Highly Heat Aging Resistant)
General Motors	GMW17961P-PA-GF35-T2	Black
Hyundai	MS211-72 Type B	
Hyundai	MS211-72 Type B	
Mercedes-Benz	DBL5408.50 PA66 GF35	
Renault-Nissan	AS23-b, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	AS24, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	AS24-a, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	UB02a, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	UB02d, No Spec, Special Part Approval, See Your CE Account Manager.	
Stellantis	B62 0300 / 61/219M-/221E/11/H114/H412 + S620001 (3000h/190°)	CPN5077;01994_15_00257
Stellantis - Chrysler	MS-500177 CPN-5077	Black
VW Group	VW 50133 PA66-7-A	
Valeo	PDTNVC15006 RevE	PA66-GF35 Class 5A
Valeo	PDTNVC15006 RevE	PA66-GF35 Class 6

Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

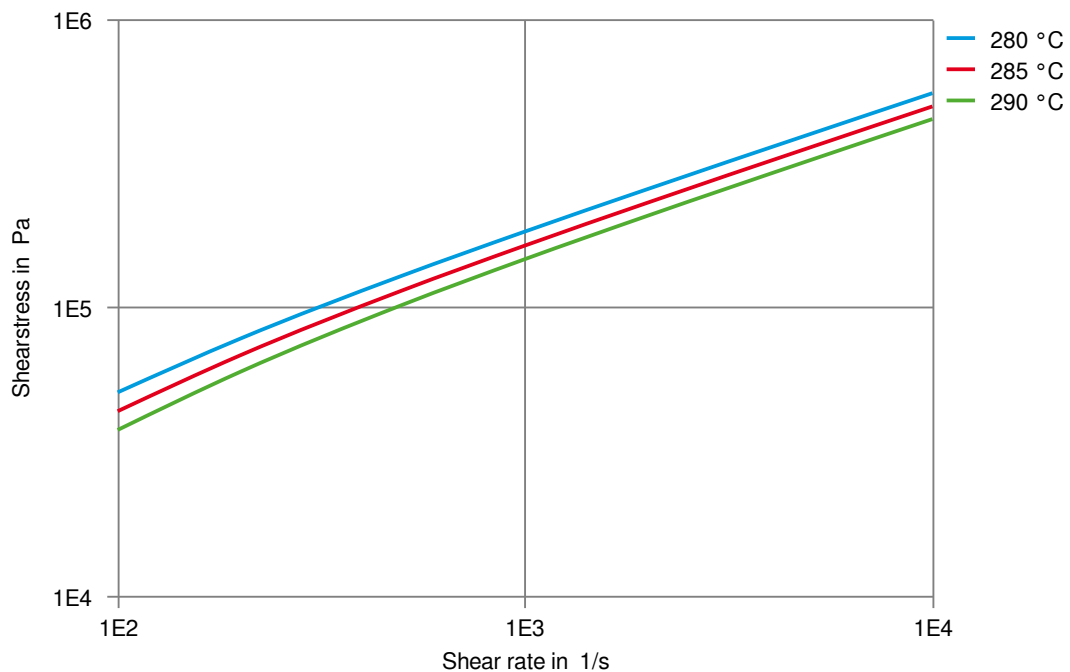
Viscosity-shear rate



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

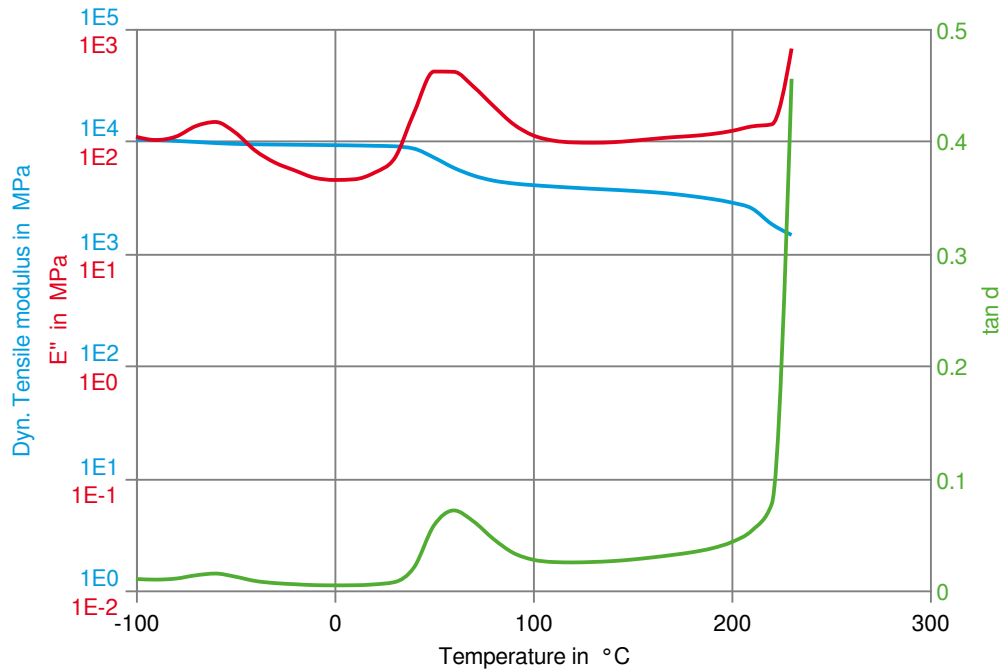
Shearstress-shear rate



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

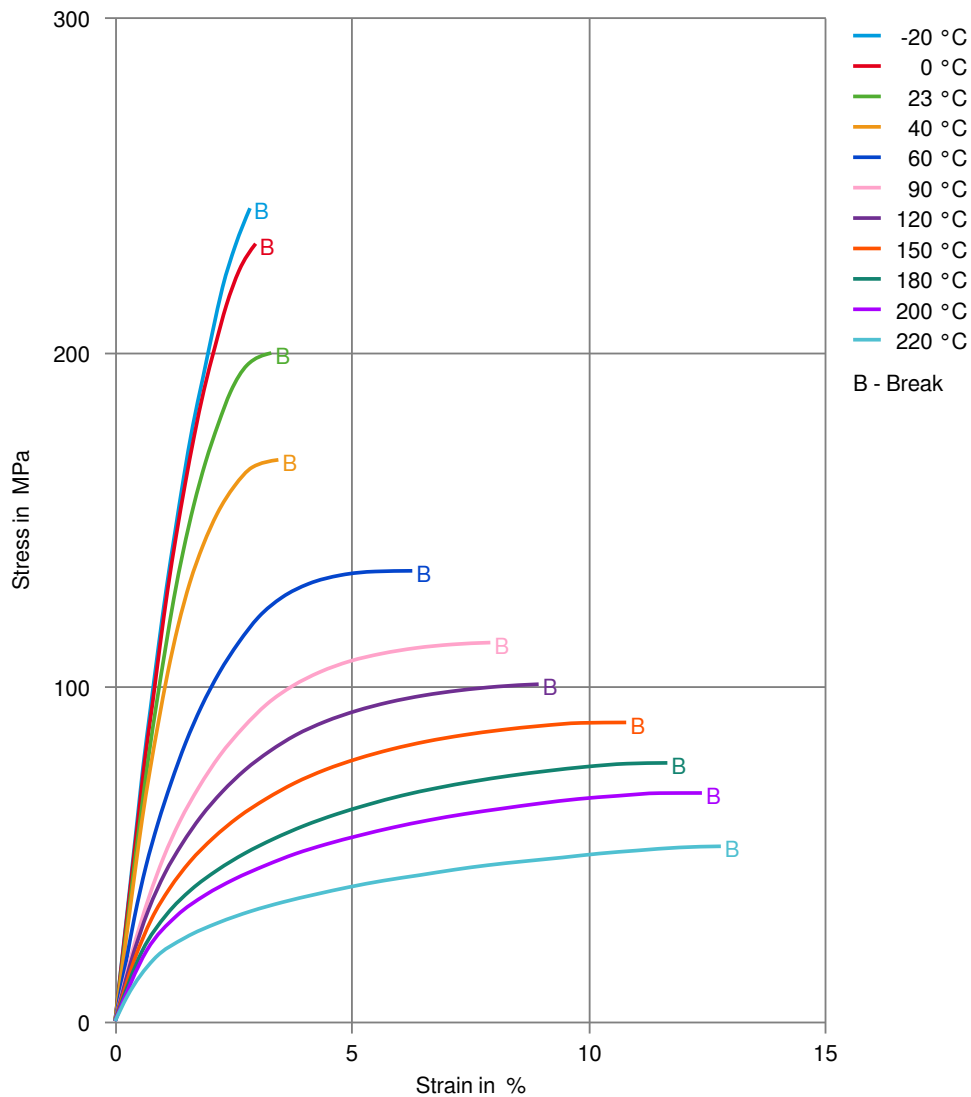
Dynamic Tensile modulus-temperature (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

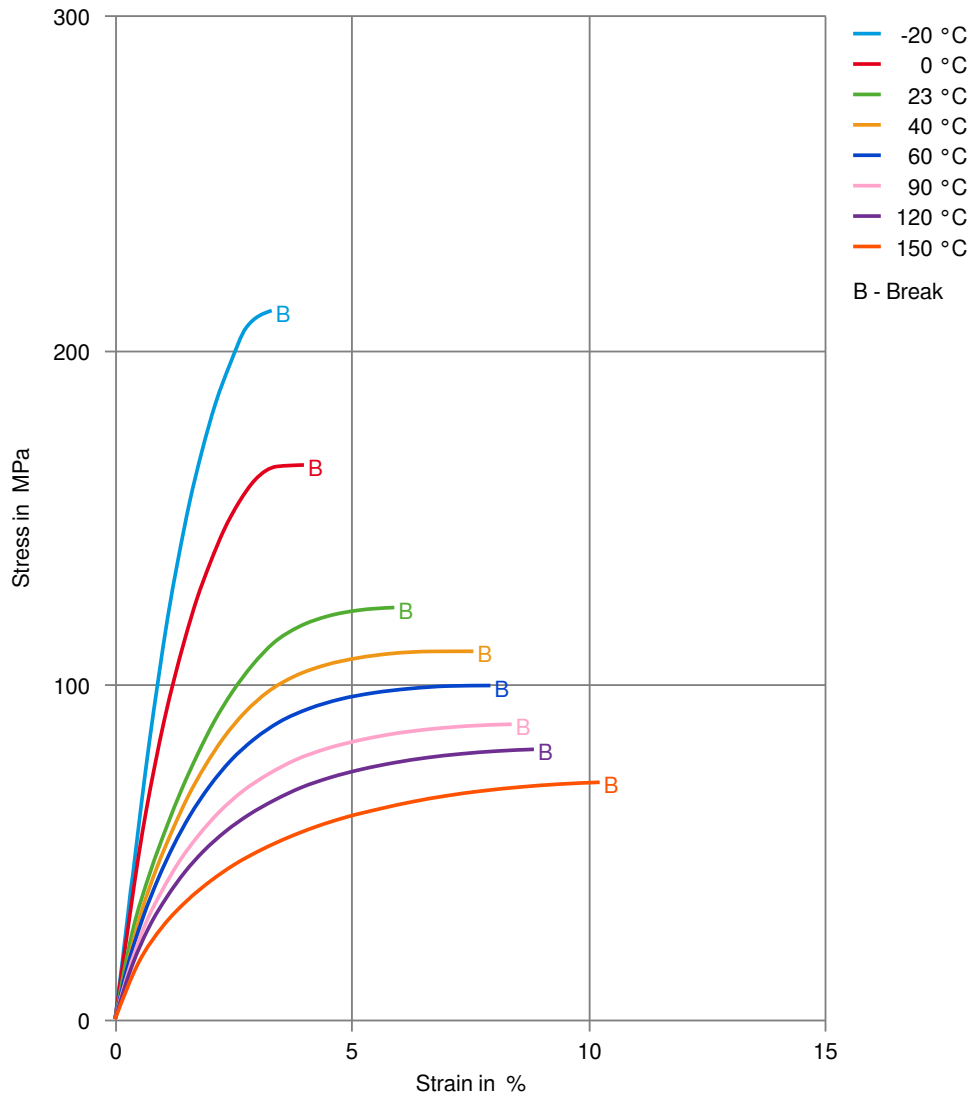
Stress-strain (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

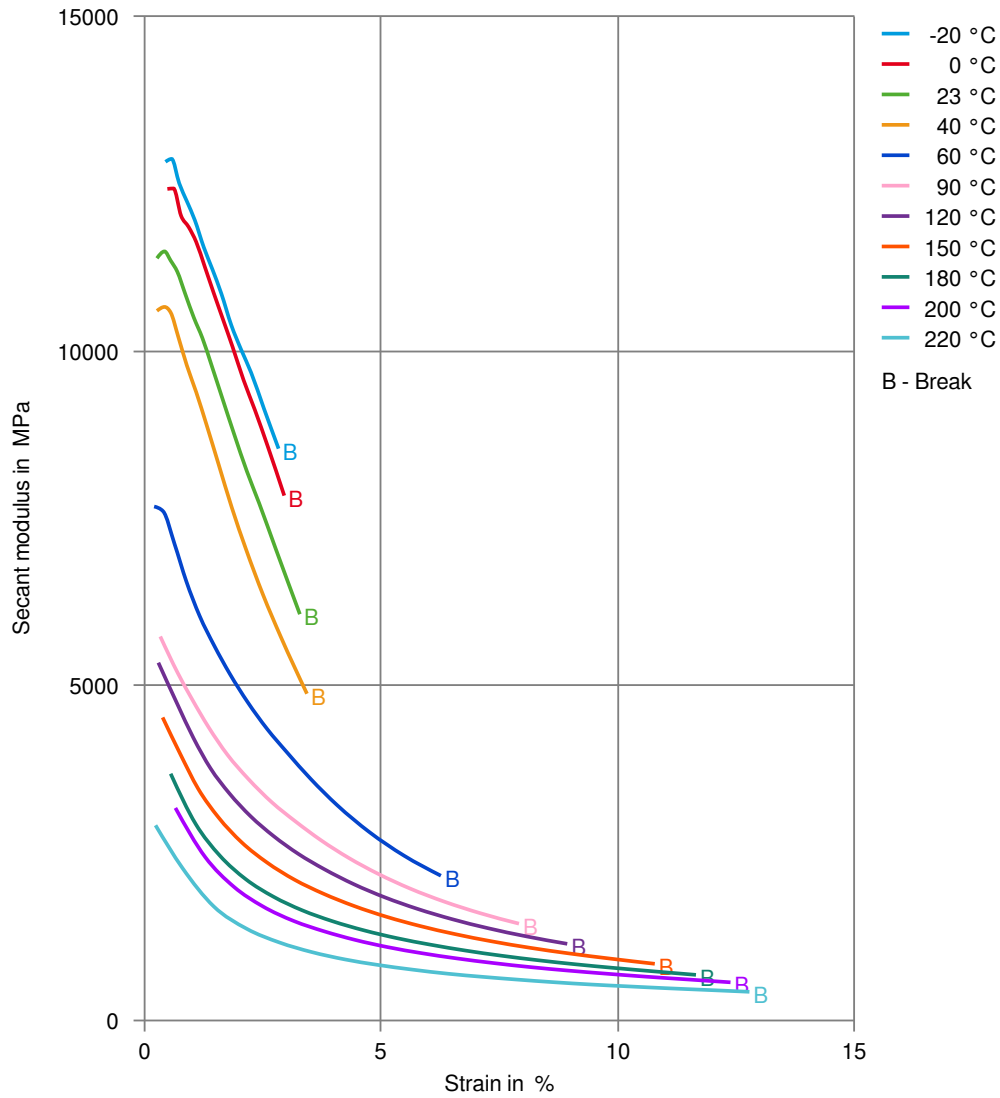
Stress-strain (cond.)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

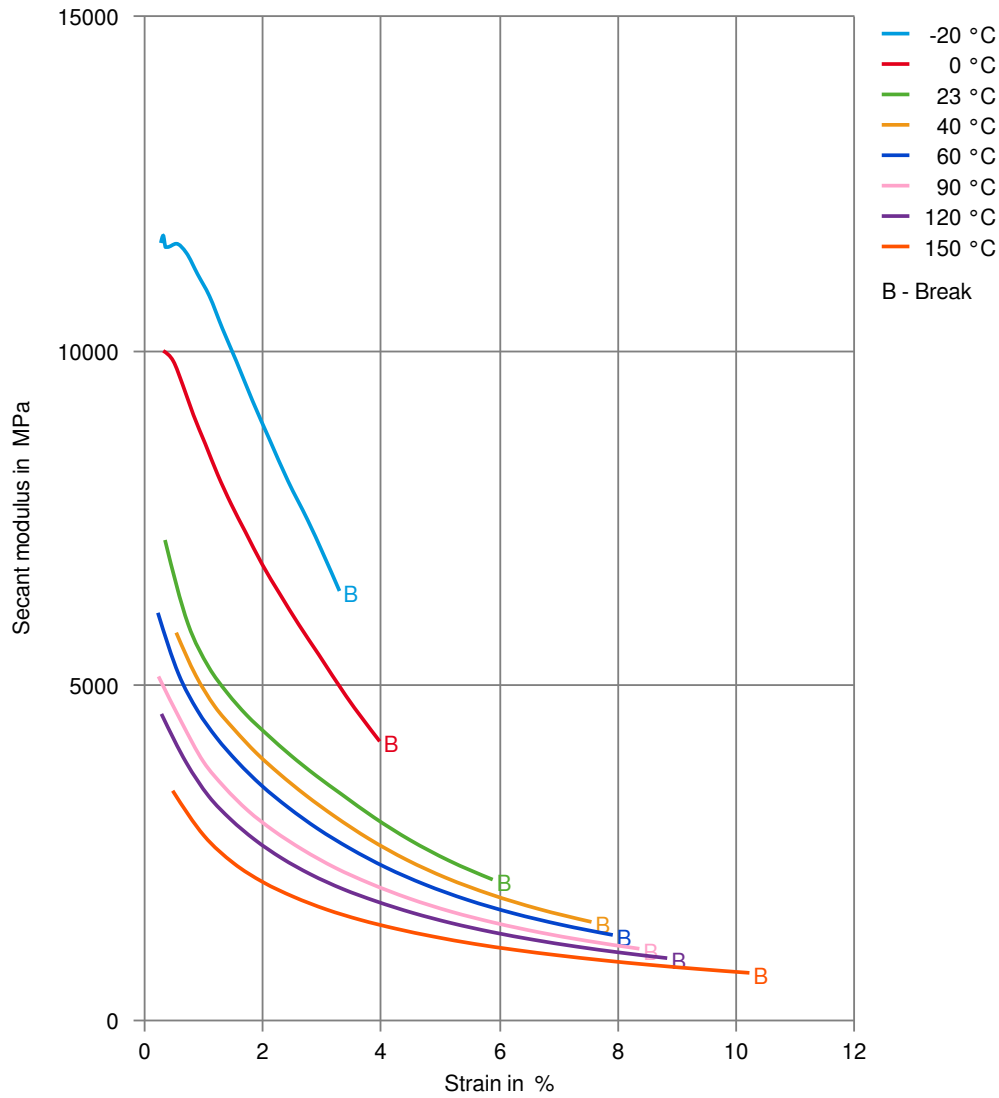
Secant modulus-strain (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

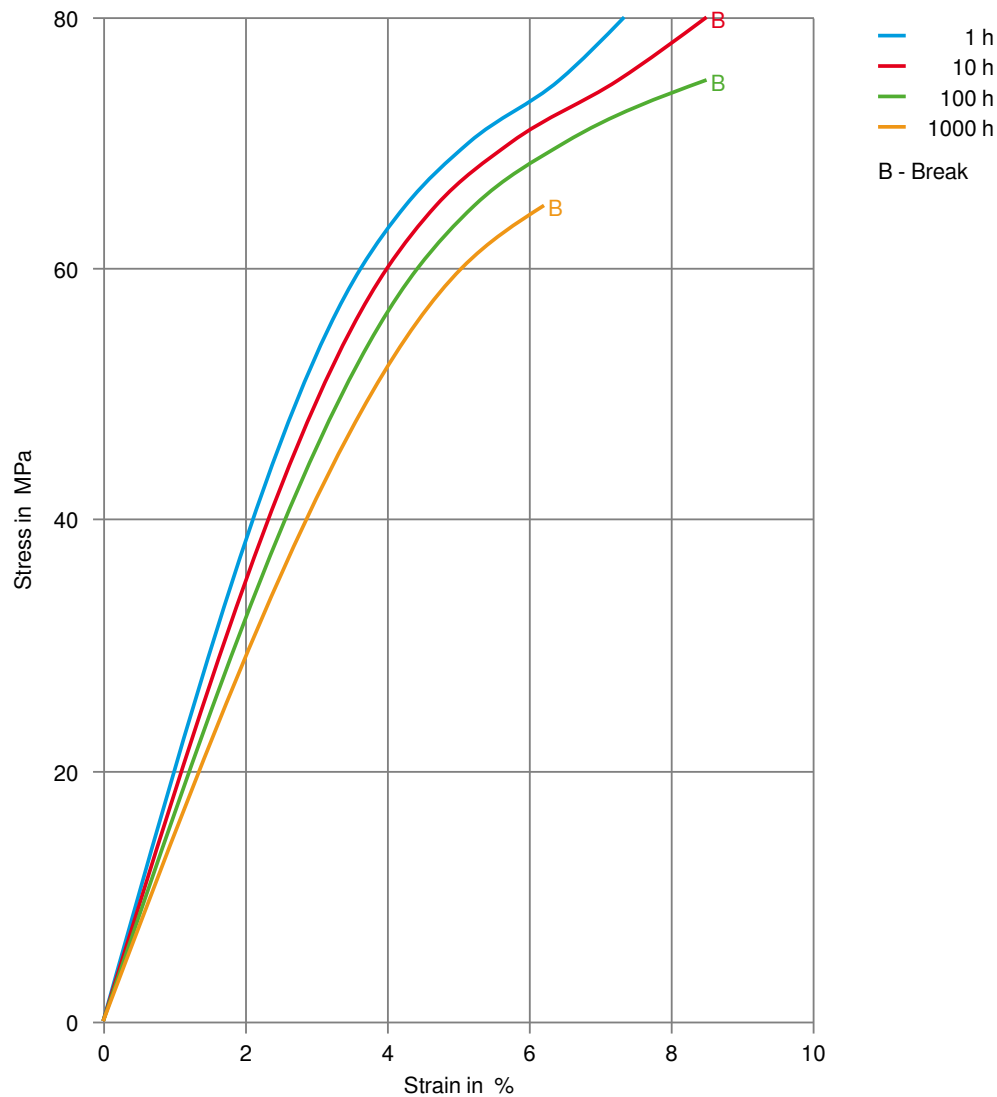
Secant modulus-strain (cond.)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

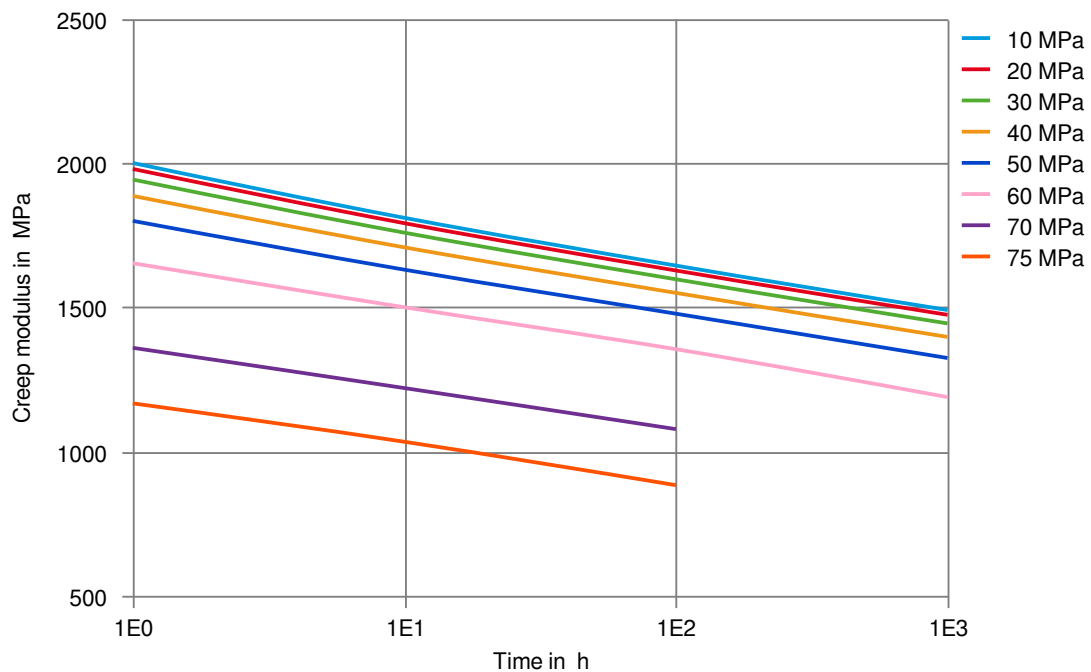
Stress-strain (isochronous) 160°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

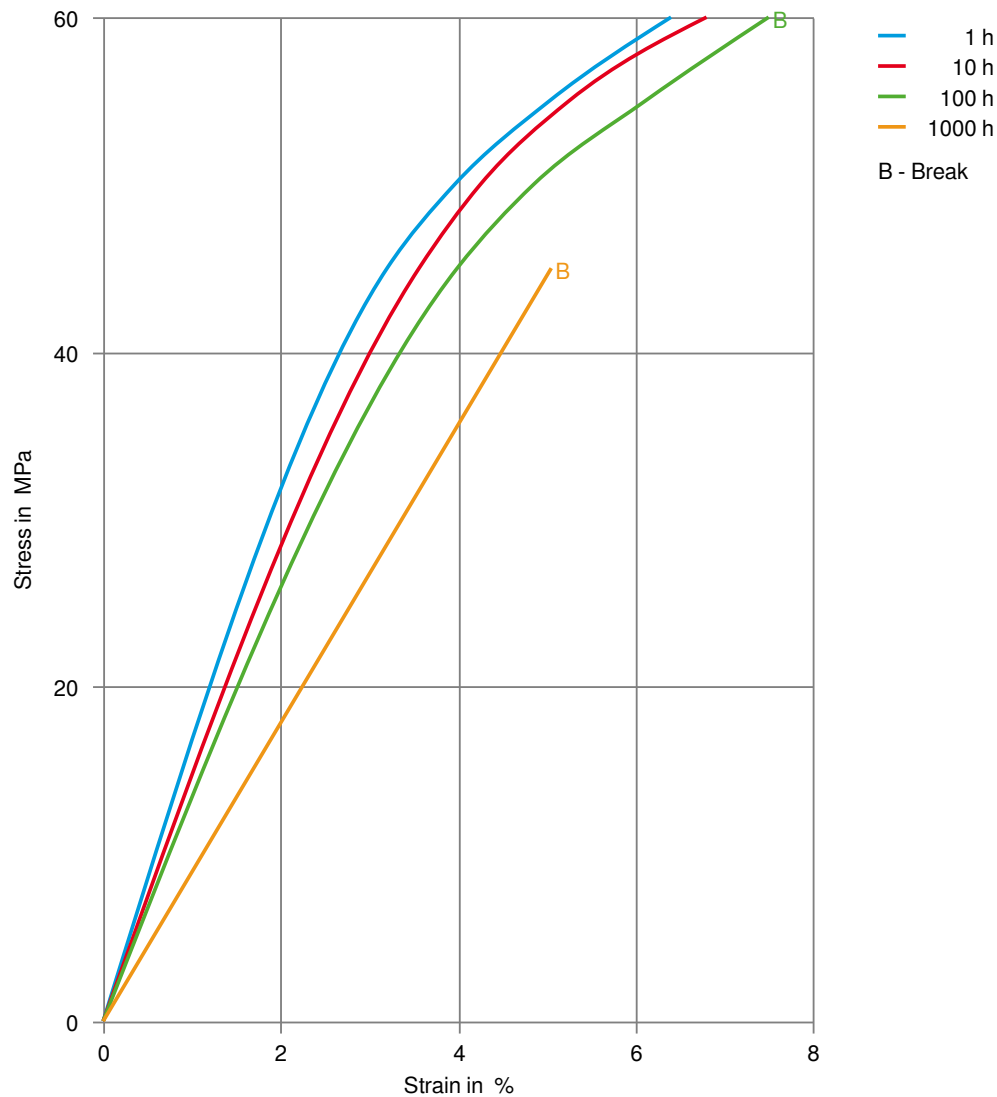
Creep modulus-time 160°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

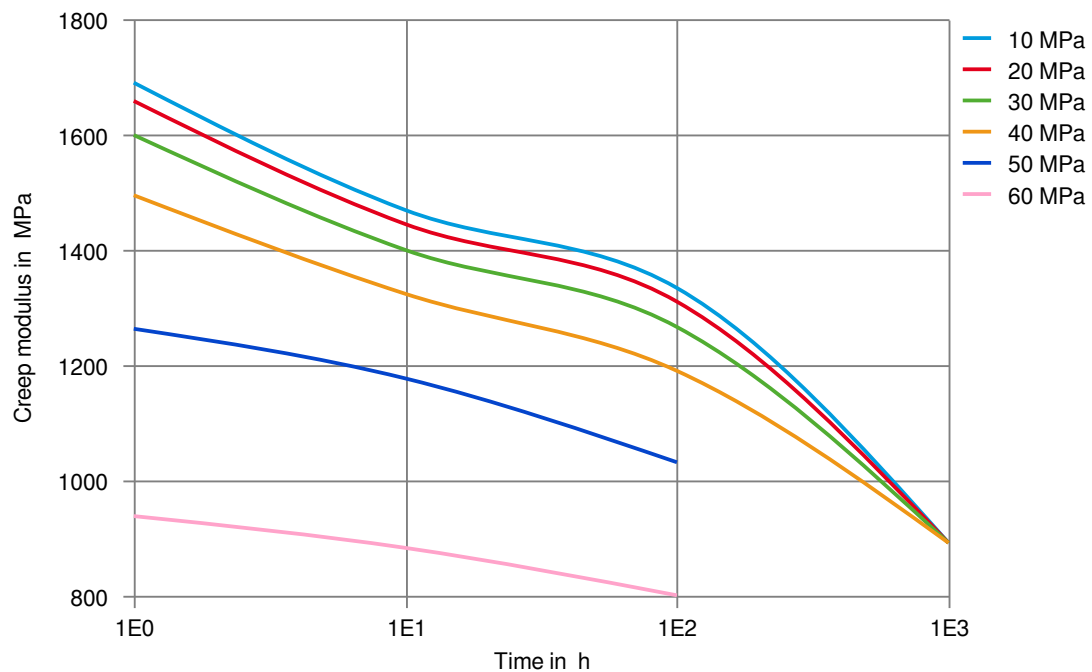
Stress-strain (isochronous) 190°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

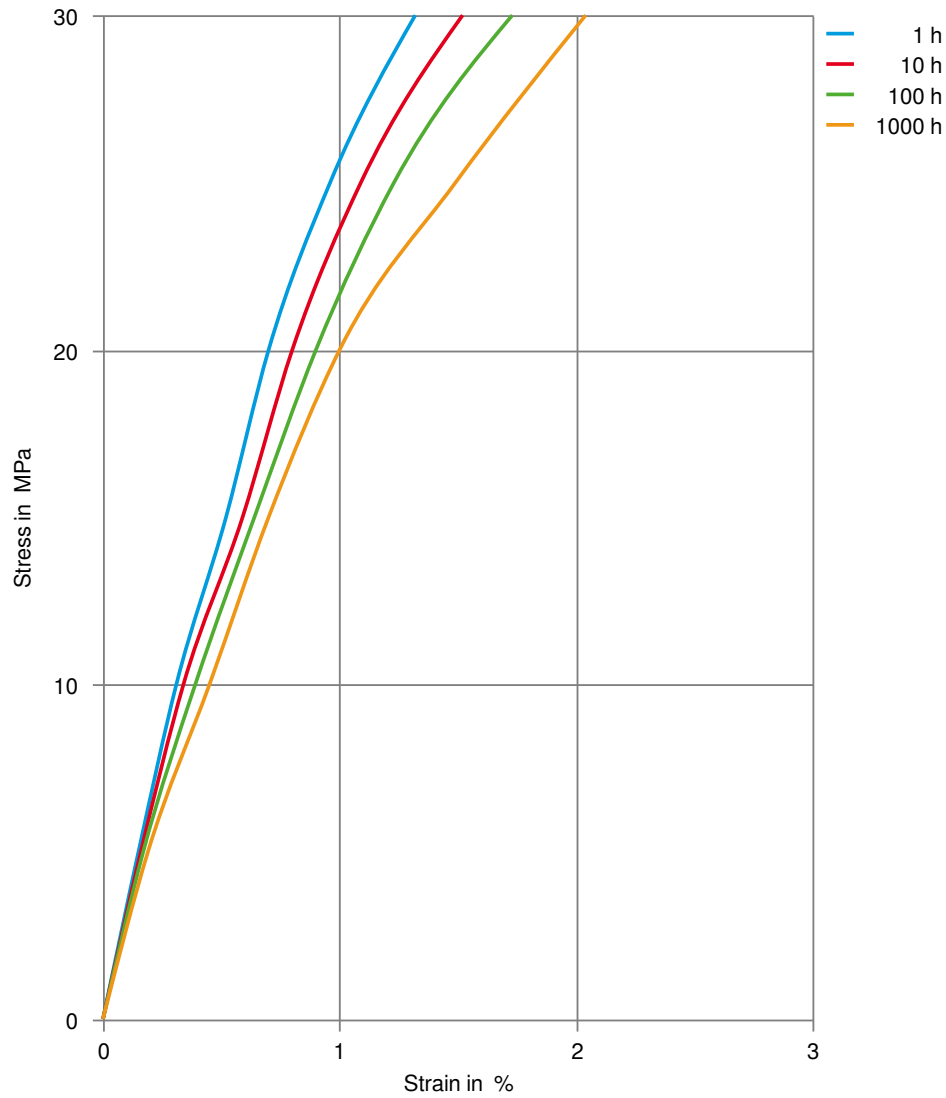
Creep modulus-time 190°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

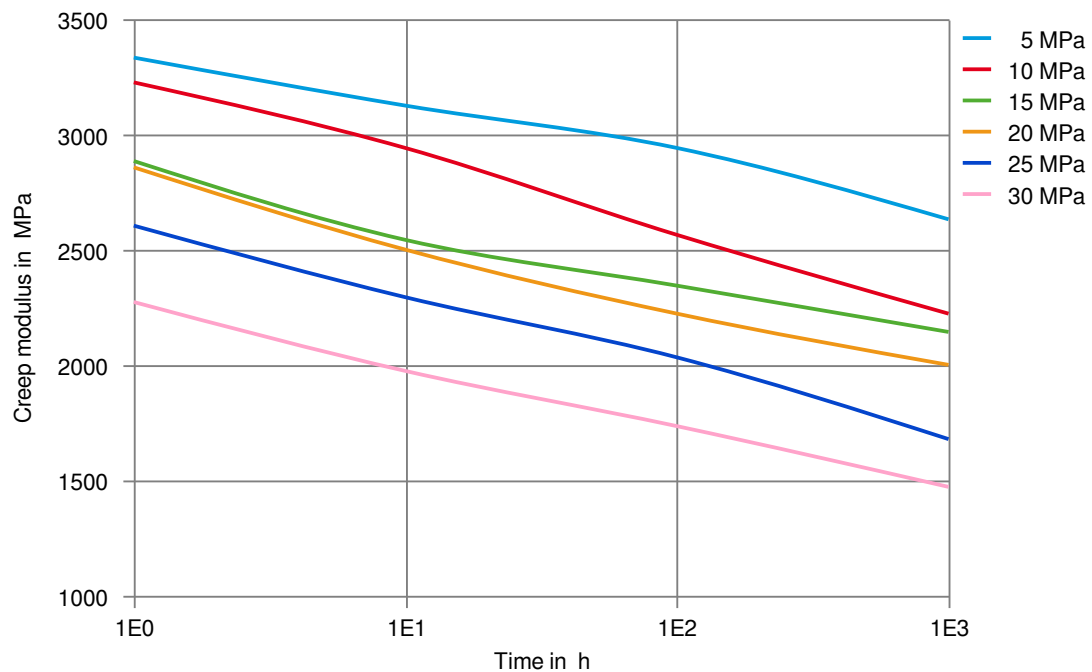
Stress-strain (isochronous) 200°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

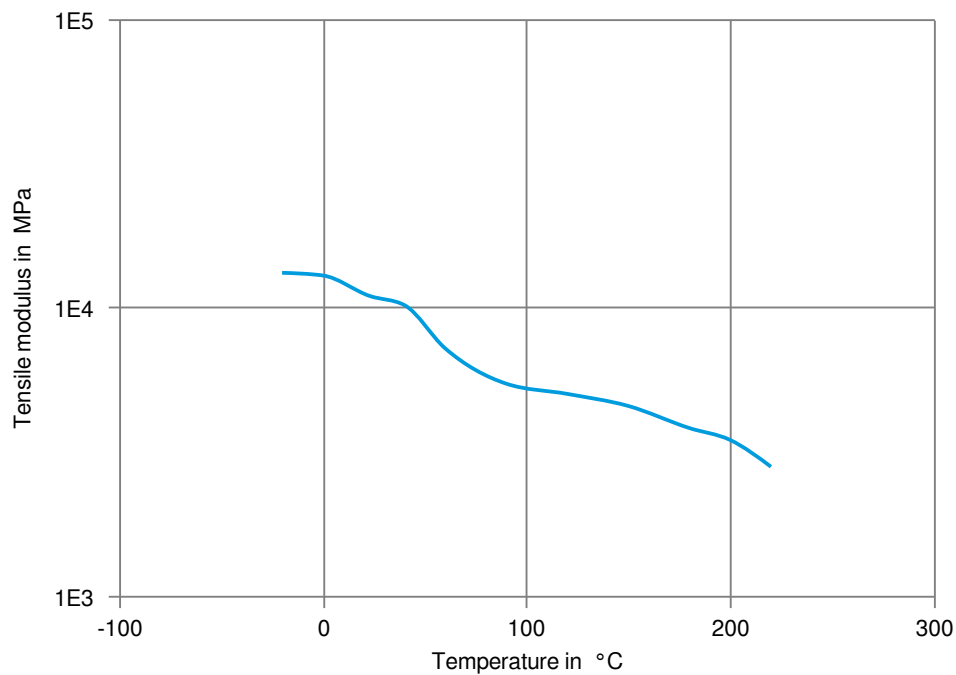
Creep modulus-time 200°C (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

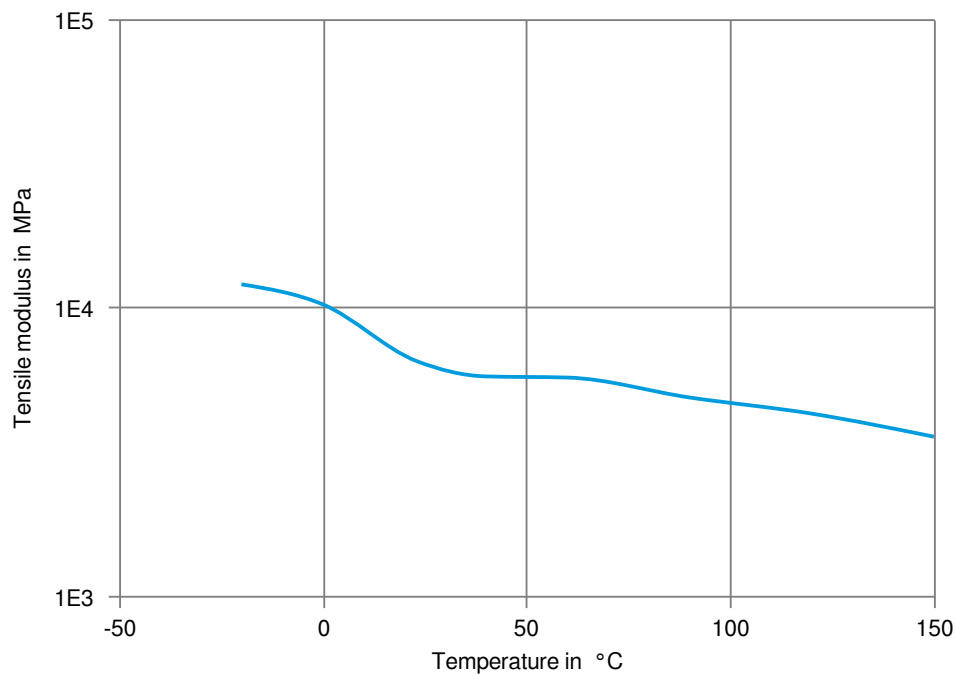
Tensile modulus-temperature (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

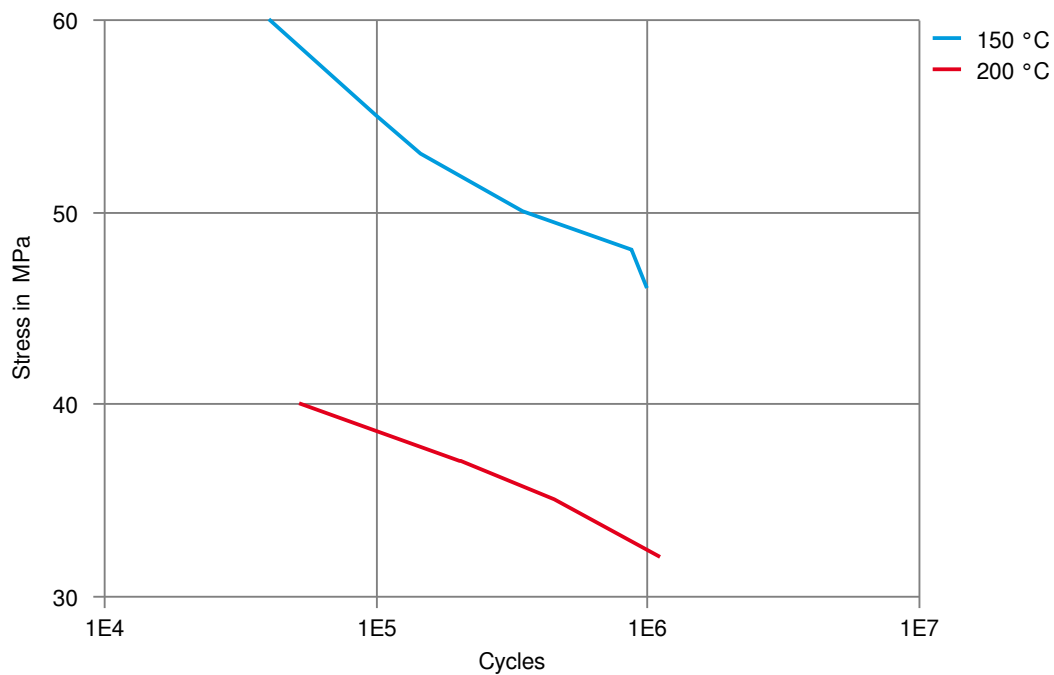
Tensile modulus-temperature (cond.)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

Tensile Fatigue, 10Hz, R=0.1 @ 2mm (dry)



Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT 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
- ✓ 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

Zytel® XT70G35HSL BK044A

ZYTEL® PLUS & XT NYLON RESIN

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
- ✗ 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).