



# Zytel® 70G50HSLR BK509

## 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® 70G50HSLR BK509 is a 50% Glass Reinforced, Heat Stabilized, Hydrolysis Resistant, Polyamide 66

### Product information

Resin Identification	PA66-GF50	ISO 1043
Part Marking Code	>PA66-GF50<	ISO 11469
ISO designation	ISO 16396-PA66,GF50,M1CGHW,S14-160	

### Rheological properties

	dry/cond.		
Viscosity number	150/*	cm <sup>3</sup> /g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.2/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8/-	%	ISO 294-4, 2577

### Typical mechanical properties

	dry/cond.		
Tensile Modulus	17000/13000	MPa	ISO 527-1/-2
Stress at break	240/170	MPa	ISO 527-1/-2
Strain at break	2.8/4	%	ISO 527-1/-2
Charpy impact strength, 23°C	95/100	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	95/90 <sup>[DS]</sup>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	16/18	kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.33/0.33	-	

[DS]: Derived from similar grade

### Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	261/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	70/20	°C	ISO 11357-1/-2
Temp. of deflection under load, 1.8 MPa	255/*	°C	ISO 75-1/-2
CLTE, Parallel, -40-23°C	13/*	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 23-55°C(73-130°F)	17/-	E-6/K	ASTM E 831



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CLTE, Parallel, 55-160°C	20/*	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	44/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal, 23-55°C (73-130°F)	61/-	E-6/K	ASTM E 831
Coeff. of linear therm. expansion, Normal, 55-160°C	113/*	E-6/K	ISO 11359-1/-2

## Flammability

FMVSS Class	B -	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80 mm/min	ISO 3795 (FMVSS 302)

## Other properties

	dry/cond.		
Humidity absorption, 2mm	1.3/*	%	Sim. to ISO 62
Density	1570/-	kg/m <sup>3</sup>	ISO 1183

## Injection

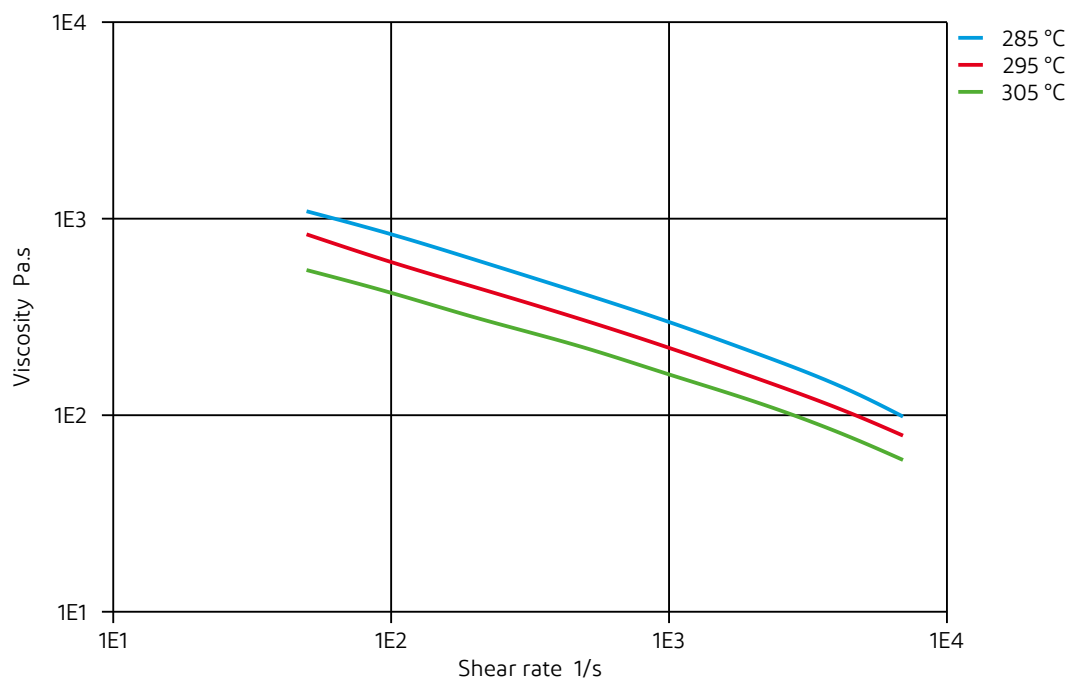
Drying Recommended	yes
Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	295 °C
Min. melt temperature	285 °C
Max. melt temperature	305 °C
Max. screw tangential speed	0.2 m/s
Mold Temperature Optimum	100 °C
Min. mould temperature	70 °C
Max. mould temperature	120 °C
Hold pressure range	50 - 100 MPa
Hold pressure time	3 s/mm
Ejection temperature	210 °C



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Viscosity-shear rate

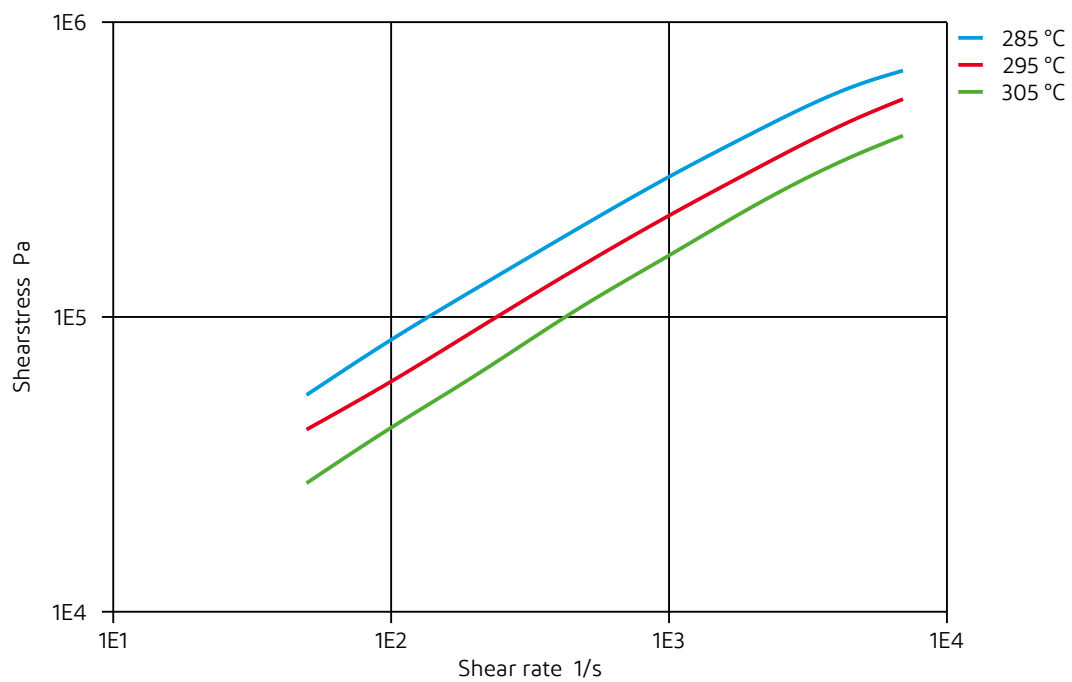




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NYLON RESIN

Shearstress-shear rate

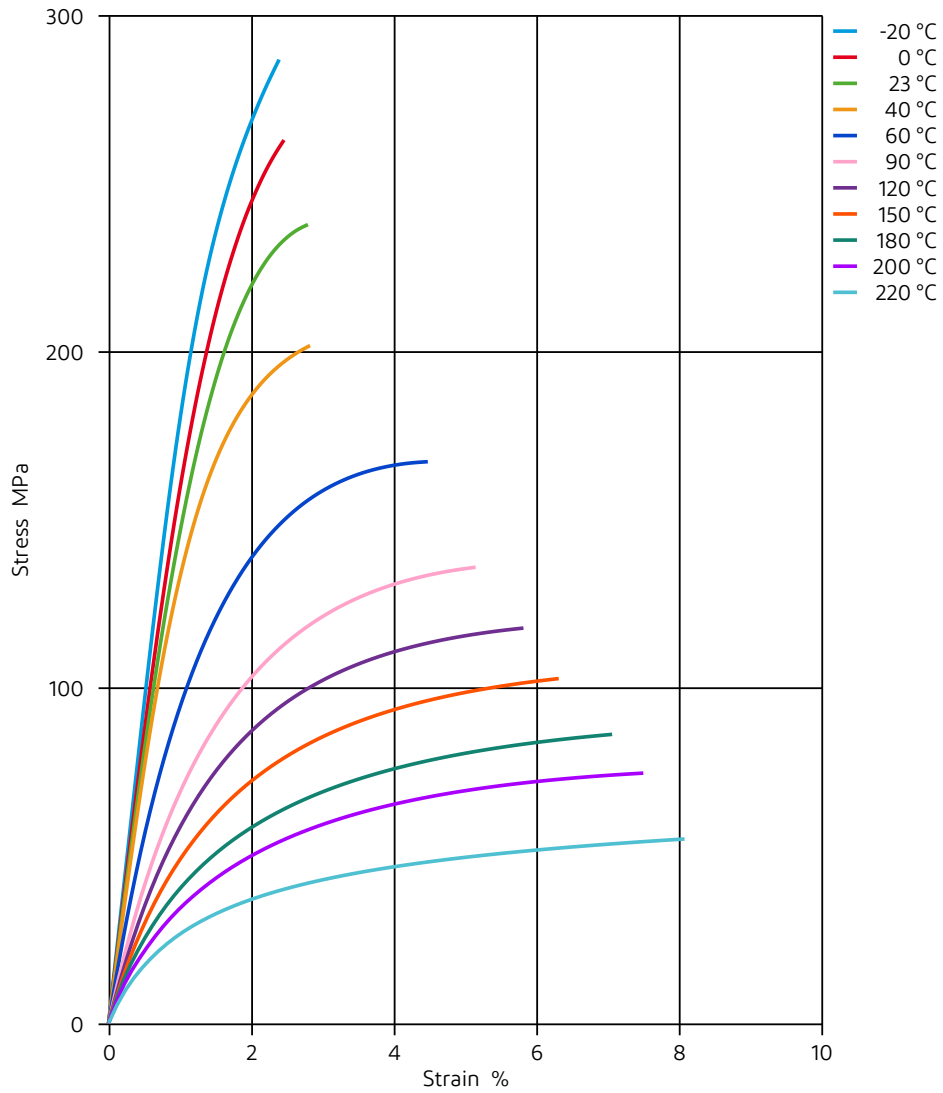




# Zytel® 70G50HSLR BK509

NYLON RESIN

Stress-strain (dry)

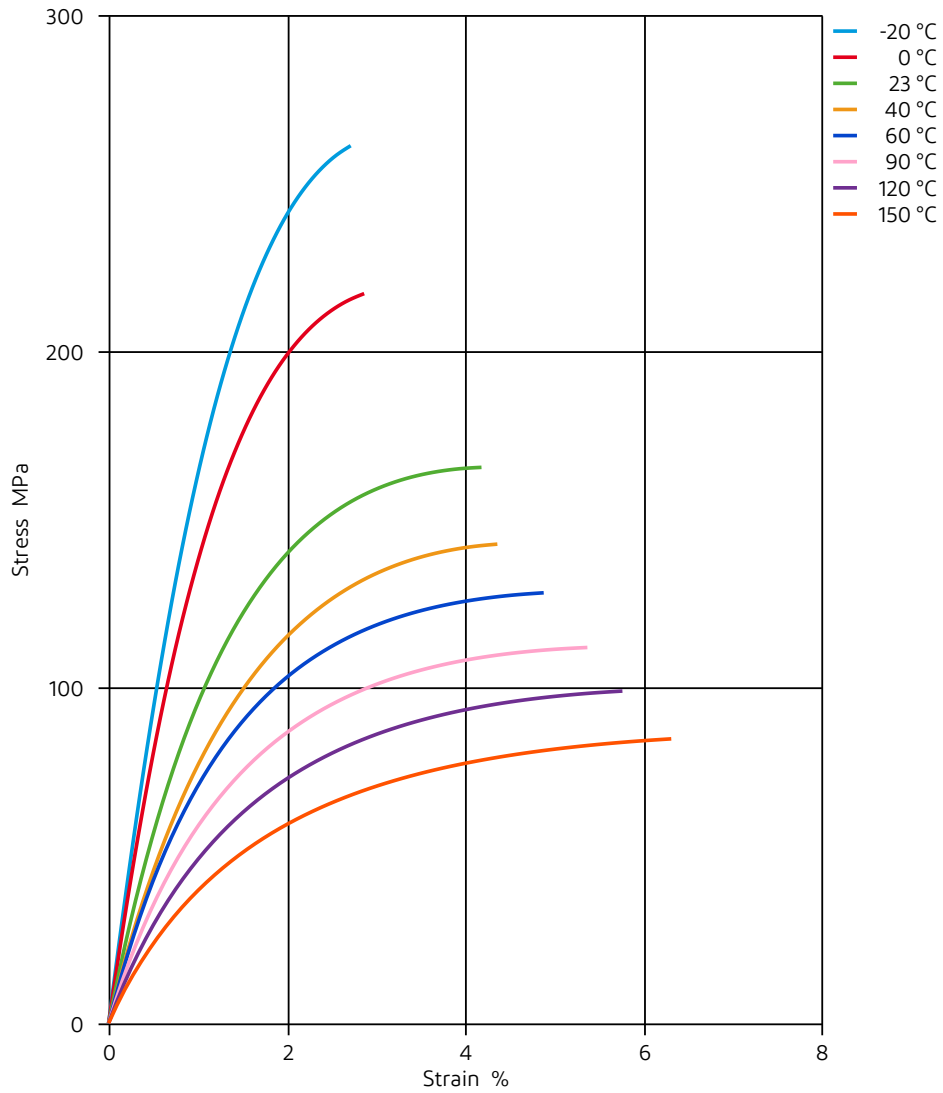




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NYLON RESIN

Stress-strain (cond.)

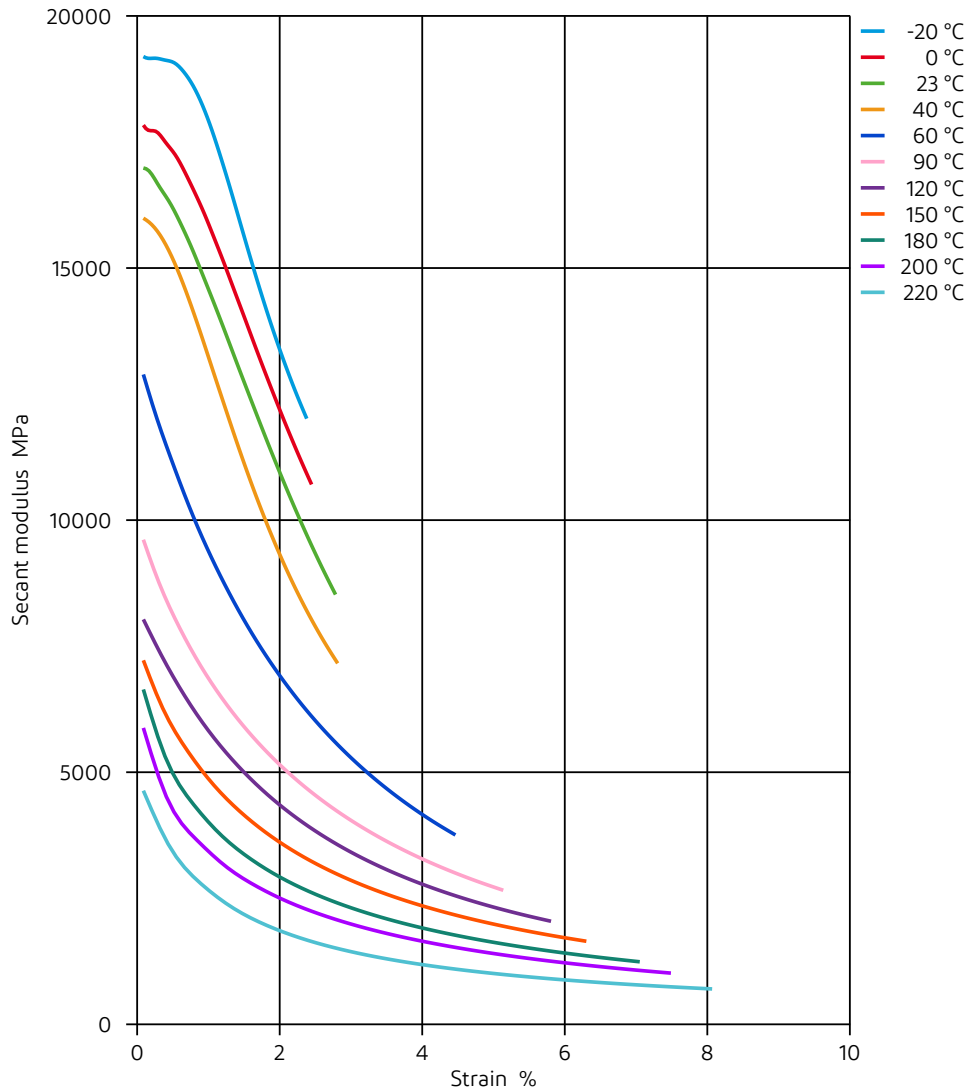




# Zytel® 70G50HSLR BK509

NYLON RESIN

Secant modulus-strain (dry)

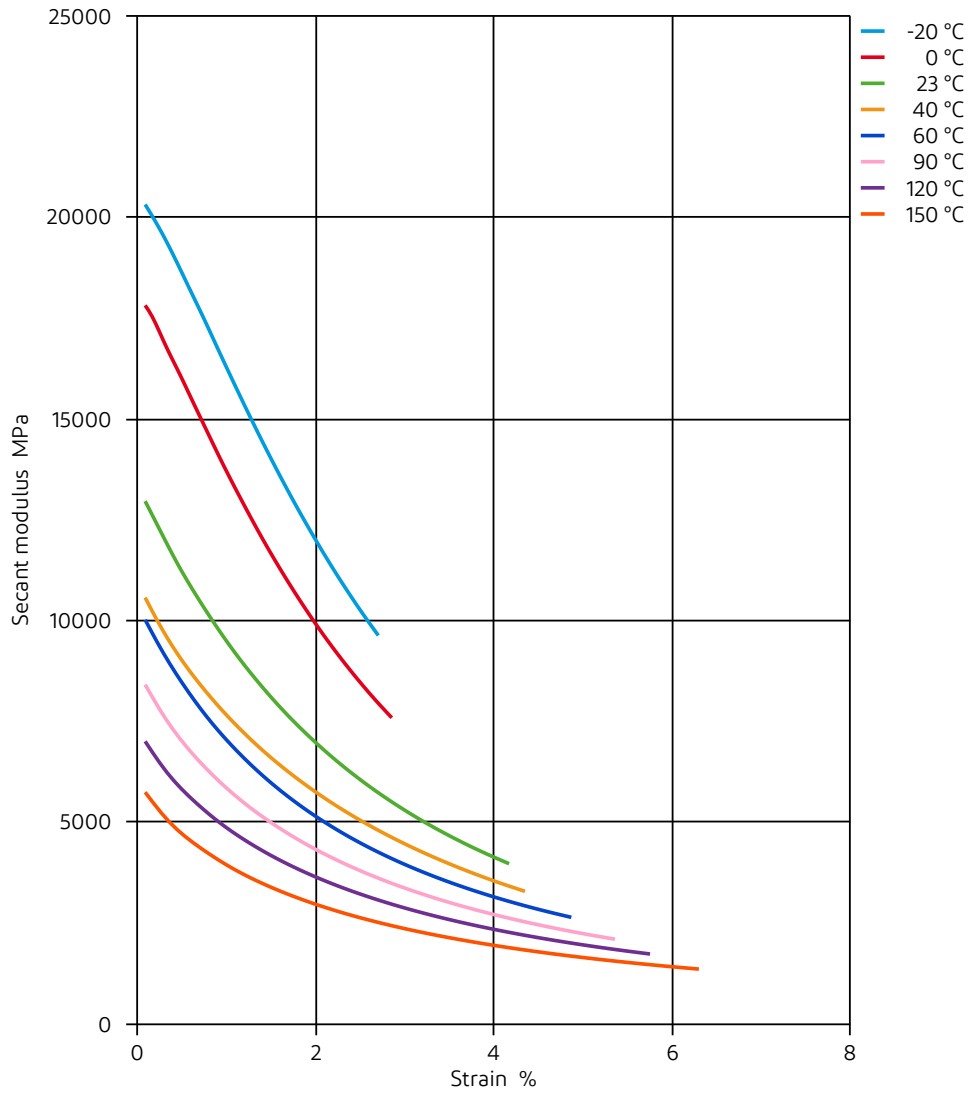




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NYLON RESIN

Secant modulus-strain (cond.)



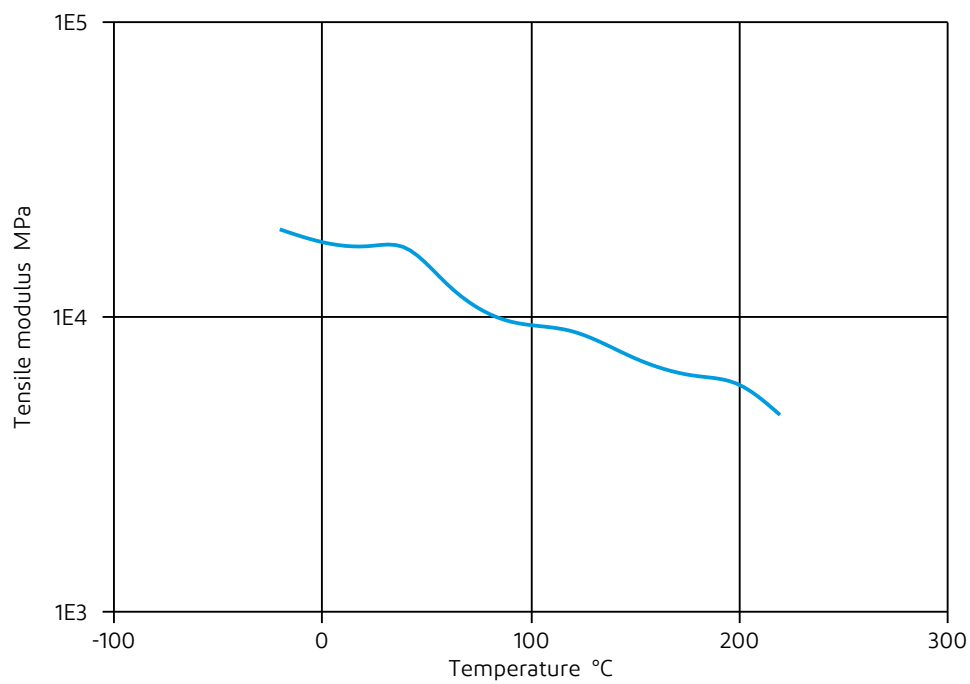




# Zytel® 70G50HSLR BK509

NYLON RESIN

Tensile modulus-temperature (dry)

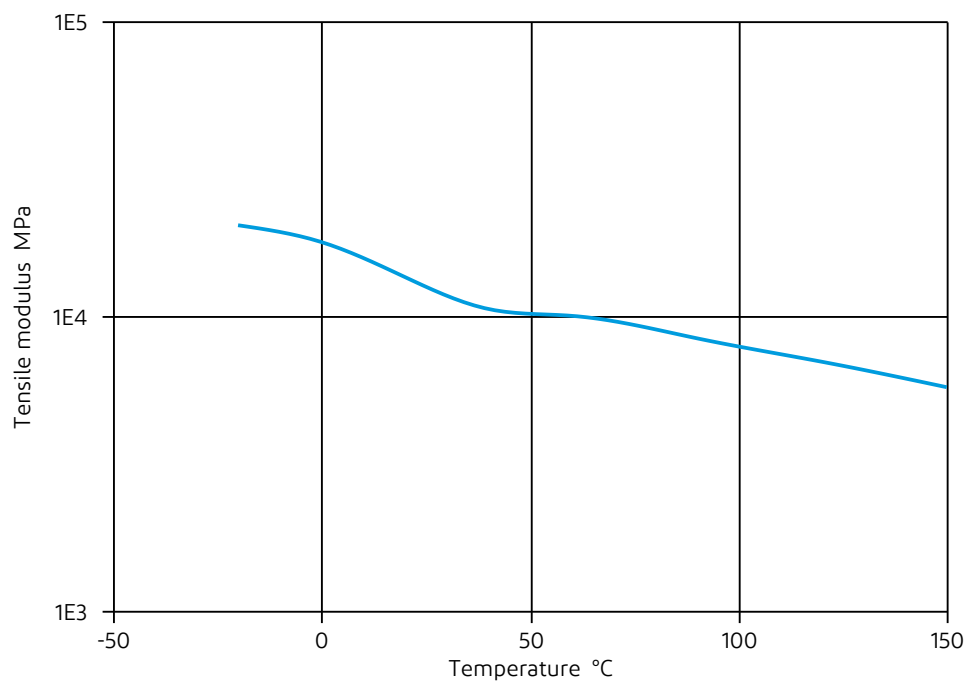




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NYLON RESIN

Tensile modulus-temperature (cond.)

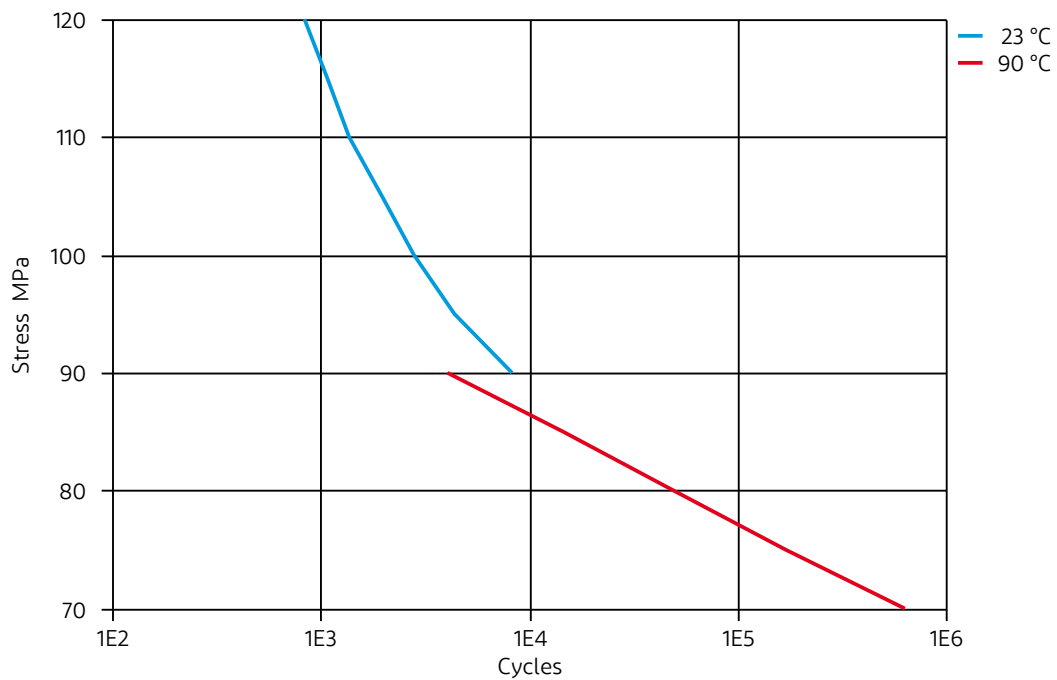




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Tensile Fatigue, 10Hz, R=0.1 @ 4mm (cond.)



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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
- ✓ 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

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- ✓ Diesel fuel (pref. ISO 1817 Liquid F), 90°C
- ✓ Diesel fuel (pref. ISO 1817 Liquid F), >90°C
- ✓ Diesel EN 590, 100°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
- ✓ DOT No. 4 Brake fluid, 120°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).

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