

# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

### Product Information

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® 70G30HSLR NC010 is a 30% glass fiber reinforced, heat stabilized, hydrolysis resistant polyamide 66 resin for injection molding.**

Product information	Value	Unit	Test Standard
Resin Identification	PA66-GF30	-	ISO 1043
Part Marking Code	PA66-GF30	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Viscosity number	4150 <sup>(1)</sup> / *	in <sup>3</sup> /lb	ISO 307, 1157, 1628
Molding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.1 / -	%	ISO 294-4, 2577
1: acid sulphuric 96%			
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	1.45E6 / 1.02E6	psi	ISO 527-1/-2
Stress at break	29000 / 18900	psi	ISO 527-1/-2
Strain at break	3.3 / 5	%	ISO 527-1/-2
Flexural Modulus	1.31E6 / 914000	psi	ISO 178
Flexural Strength	40600 / 29000	psi	ISO 178
Tensile creep modulus			ISO 899-1
1h	* / 986000	psi	
1000h	* / 740000	psi	
Charpy impact strength			ISO 179/1eU
73°F	38.1 / 42.8	ftlb/in <sup>2</sup>	
-22°F	33.3 / 33.3	ftlb/in <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	6.18 / 7.14	ftlb/in <sup>2</sup>	
-22°F	4.76 / 4.76	ftlb/in <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
73°F	5.71 / 6.66	ftlb/in <sup>2</sup>	
-22°F	5.71 / 4.76	ftlb/in <sup>2</sup>	
Ball indentation hardness, H 961/30	39200 / 26800	psi	ISO 2039-1 DS
Hardness, Rockwell, M-scale	104 / 88	-	ISO 2039-2
Coefficient of static friction, against steel	- / 0.25	-	ASTM 1894
Coefficient of sliding friction, 1h against steel	- / 0.31	-	ASTM 1894
DS: Derived from similar grade			
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	504 / *	°F	ISO 11357-1/-3
Glass transition temperature, 18°F/min	167 / 68	°F	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	487 / *	°F	
65 psi	502 / *	°F	
Vicat softening temperature, 90°F/h, 11 lbf	482 / *	°F	ISO 306
Coeff. of linear therm. expansion, parallel	1.44E-5 / *	in/in/°F	ISO 11359-1/-2

To find out more, visit [DuPont Performance Polymers](#) or contact nearest DuPont location.

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Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	4.44E-5 / *	in/in/°F	
Normal, -40-23°C	3.89E-5 / *	in/in/°F	
Normal, 55-160°C	7.22E-5 / *	in/in/°F	
Parallel, -40-23°C	1.44E-5 / *	in/in/°F	
Parallel, 55-160°C	7.22E-6 / *	in/in/°F	
Thermal conductivity of melt	0.21	W/(m K)	-
Spec. heat capacity of melt	2290	J/(kg K)	-
Eff. thermal diffusivity	1.1E-7	m <sup>2</sup> /s	-
RTI, electrical			UL 746B
30mil	284	°F	
60mil	284	°F	
120mil	284	°F	
RTI, impact			UL 746B
30mil	257	°F	
60mil	257	°F	
120mil	257	°F	
RTI, strength			UL 746B
30mil	284	°F	
60mil	284 / *	°F	
120mil	284	°F	
<b>Flammability</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Burning Behav. at 60mil nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	0.0591 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.0295 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Oxygen index	24 / *	%	ISO 4589-1/-2
Glow Wire Ignition Temperature			IEC 60695-2-13
40mil	1250 / -	°F	
80mil	1250 / -	°F	
Glow Wire Temperature, No Flame			IEC 60335-1
40mil	1200 / -	°F	
80mil	1200 / -	°F	
FMVSS Class	SE/B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	0.945	in/min	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity			IEC 62631-2-1
100Hz	4.3 / 11	-	
1MHz	4.1 / 4.6	-	
Dissipation factor			IEC 62631-2-1
100Hz	70 / 4600	E-4	
1MHz	150 / 650	E-4	
Volume resistivity	>1E13 / 1E9	Ohm*m	IEC 62631-3-1
Surface resistivity	* / 1E13	Ohm	IEC 62631-3-2
Electric strength	965 / 813	kV/in	IEC 60243-1
Comparative tracking index			
Comparative tracking index	450 / -	-	IEC 60112
3.0mm	1 / -	PLC	UL 746A
<b>Other properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 80mil	1.9 / *	%	Sim. to ISO 62
Water absorption, 80mil	6 / *	%	Sim. to ISO 62
Density	1.37 / -	g/cm <sup>3</sup>	ISO 1183
Density of melt	74.9	lb/ft <sup>3</sup>	-

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Page: 2 of 21

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VDA Properties	dry / cond	Unit	Test Standard
Emission of organic compounds	3.2	µgC/g	VDA 277
Thermal desorption analysis of organic emissions	5	µg/g	VDA 278
Odor test	4.5	class	VDA 270
Fogging, F-value (refraction)	95 / *	%	ISO 6452
Fogging, G-value (condensate)	0.3 / *	mg	ISO 6452
Injection	dry / cond	Unit	Test Standard
Drying Recommended	yes	-	-
Drying Temperature	≥176	°F	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	563	°F	-
Min. melt temperature	545	°F	-
Max. melt temperature	581	°F	-
Max. screw tangential speed	0.2 / *	m/s	-
Mold Temperature Optimum	212	°F	-
Min. mold temperature	158	°F	-
Max. mold temperature	248	°F	-
Hold pressure range	7250 - 14500	psi	-
Hold pressure time	0.0762	s/mil	-
Ejection temperature	410	°F	-

Characteristics			
Processing	• Injection Molding		
Delivery form	• Pellets		
Additives	• Lubricants	• Release agent	
Special characteristics	• Heat stabilized or stable to heat		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

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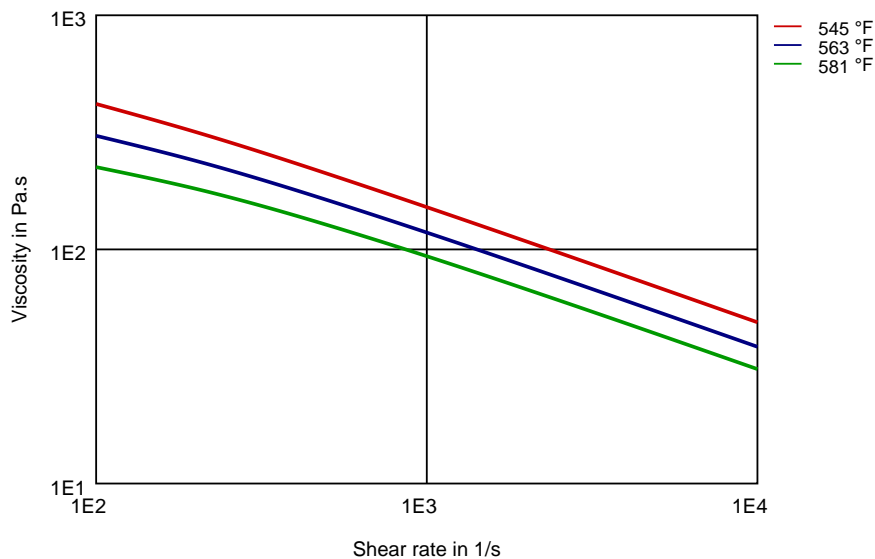


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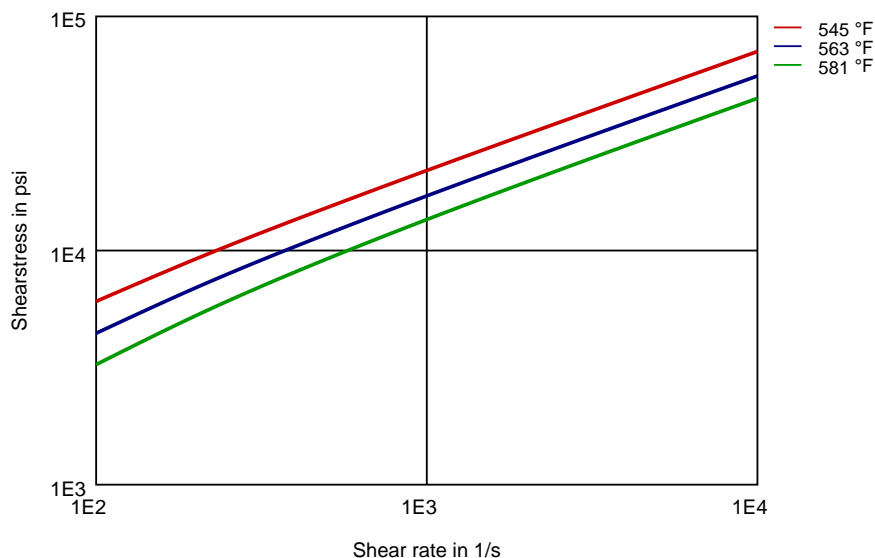
## NYLON RESIN

### Diagrams

Viscosity-shear rate (measured on Zytel® 70G30HSLR BK099)



Shearstress-shear rate (measured on Zytel® 70G30HSLR BK099)



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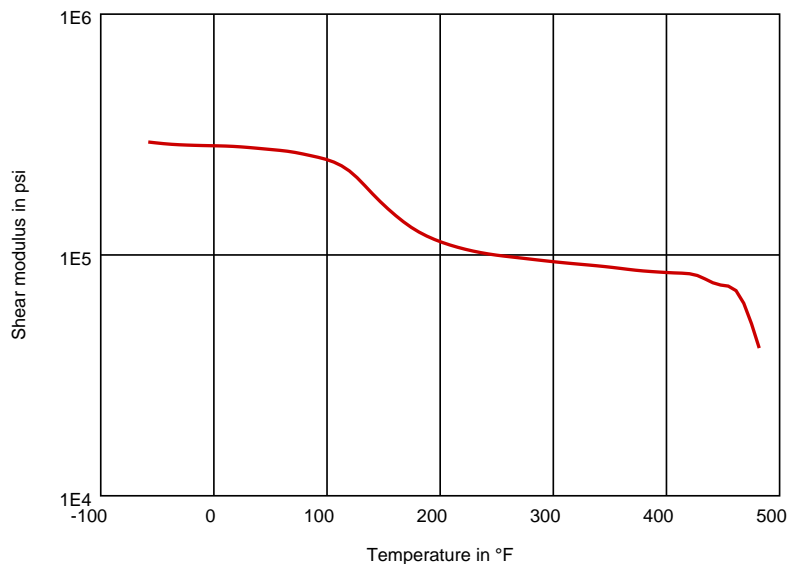
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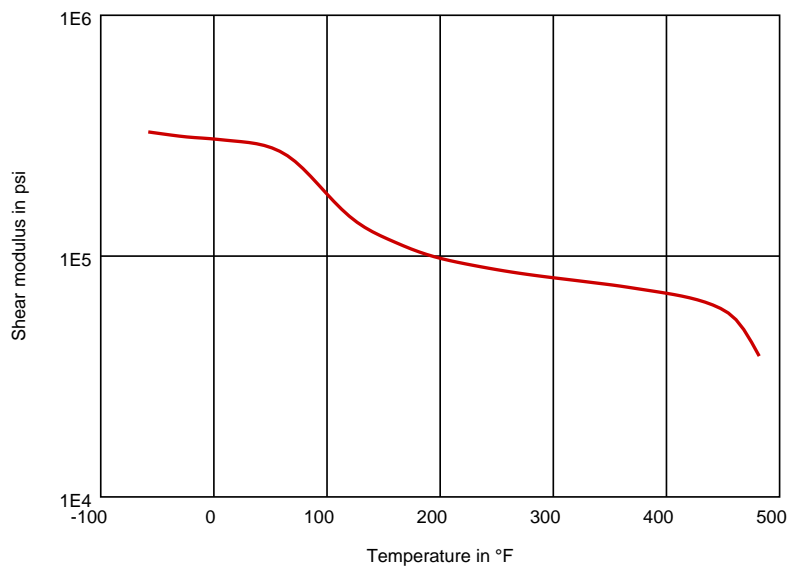
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## NYLON RESIN

Dynamic Shear modulus-temperature (dry)



Dynamic Shear modulus-temperature (cond.)



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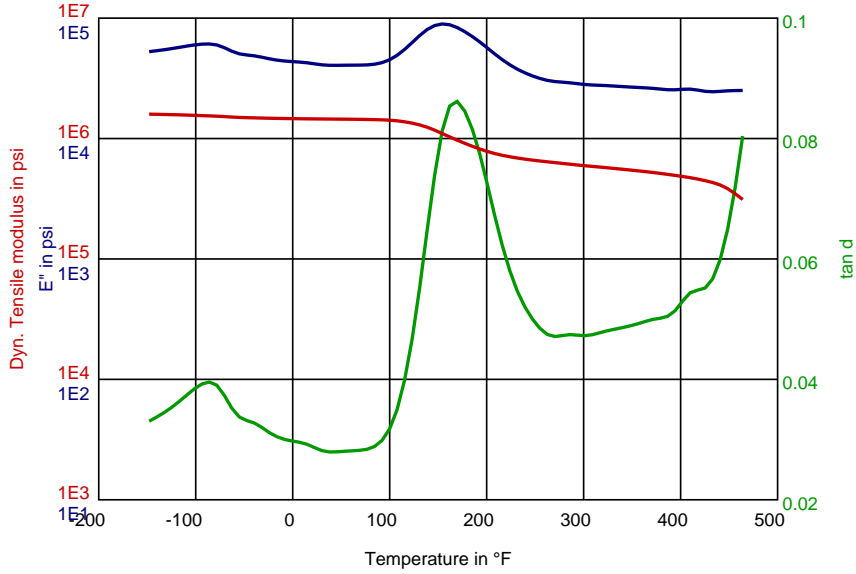
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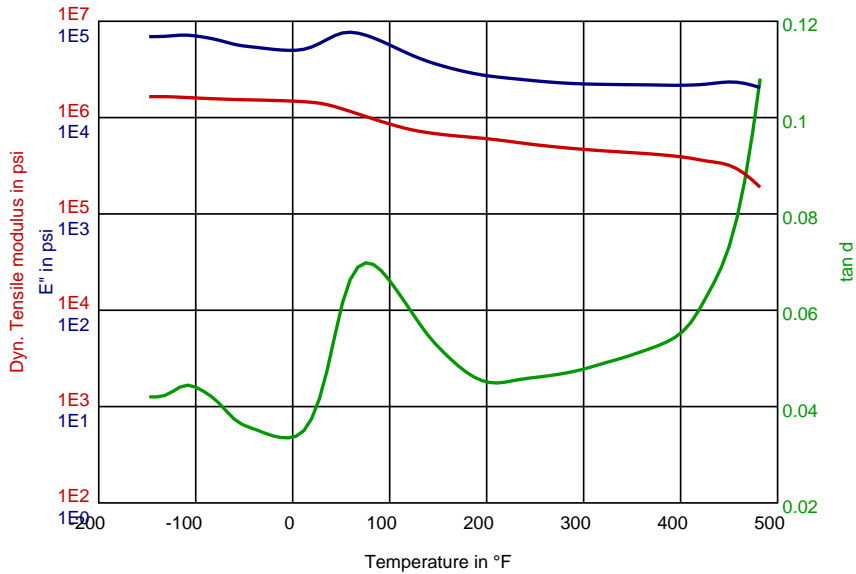
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## NYLON RESIN

Dynamic Tensile modulus-temperature (dry)



Dynamic Tensile modulus-temperature (cond.)



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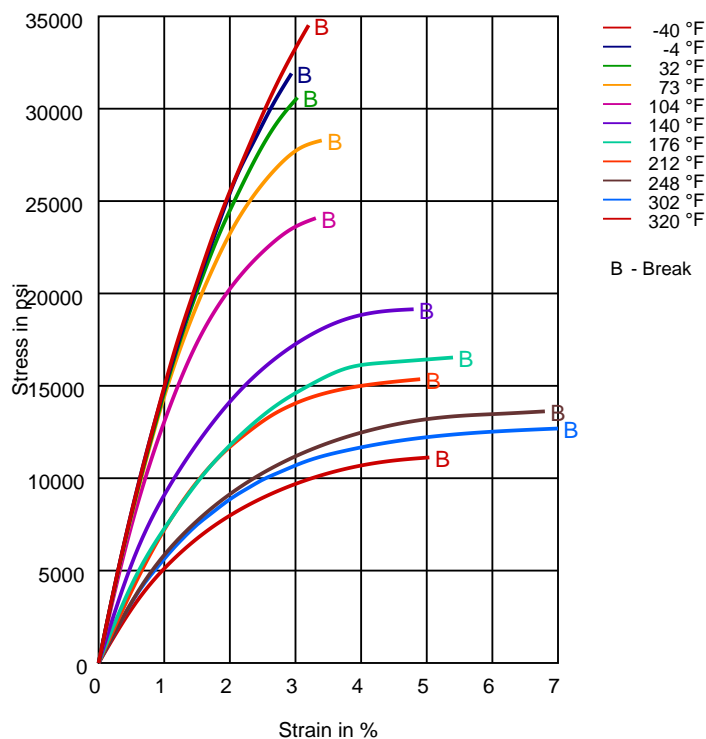
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## NYLON RESIN

Stress-strain (dry)



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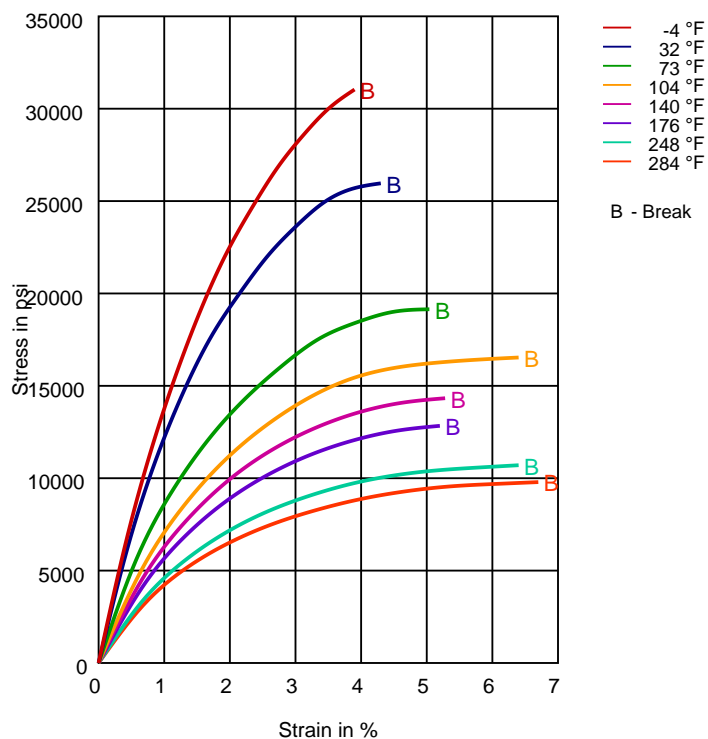
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Stress-strain (cond.)



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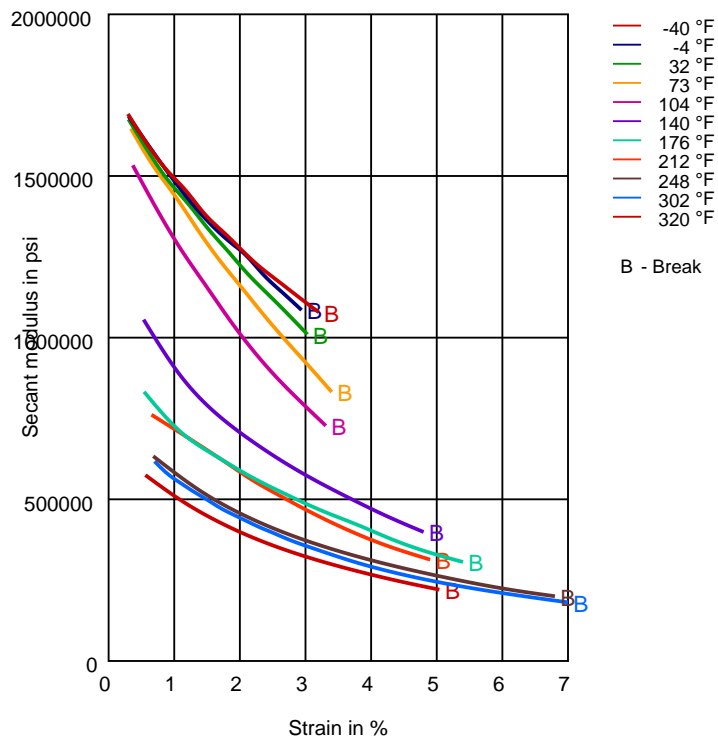




# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Secant modulus-strain (dry)



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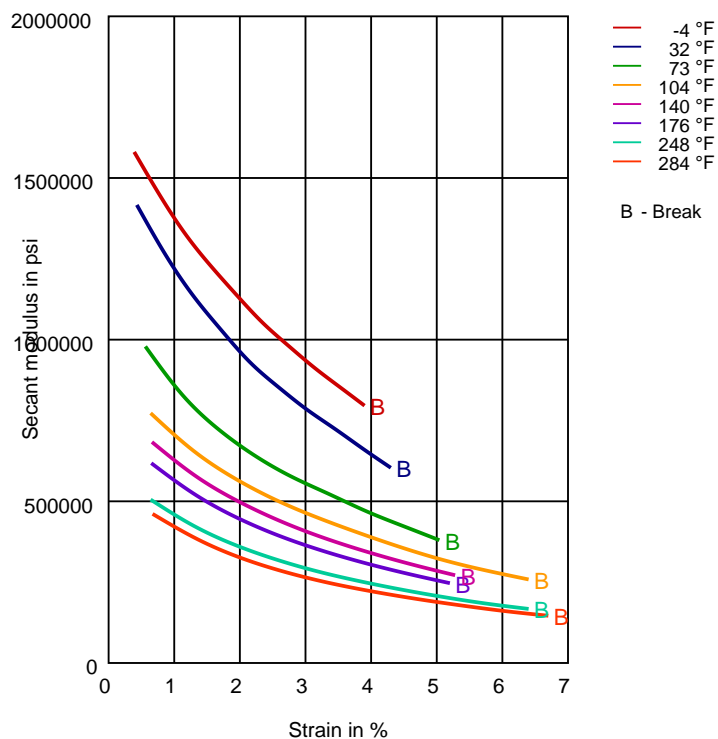
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## NYLON RESIN

Secant modulus-strain (cond.)



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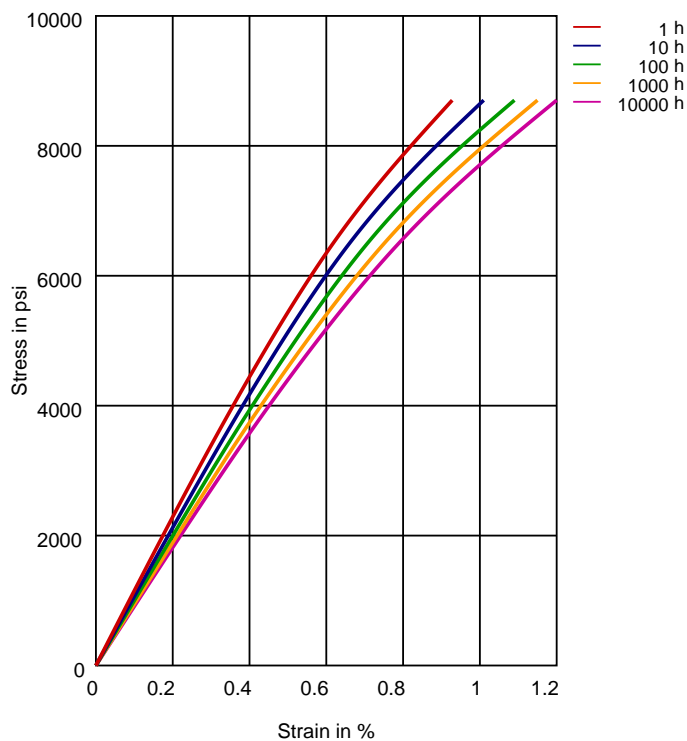
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Stress-strain (isochronous) 73°F(cond.)



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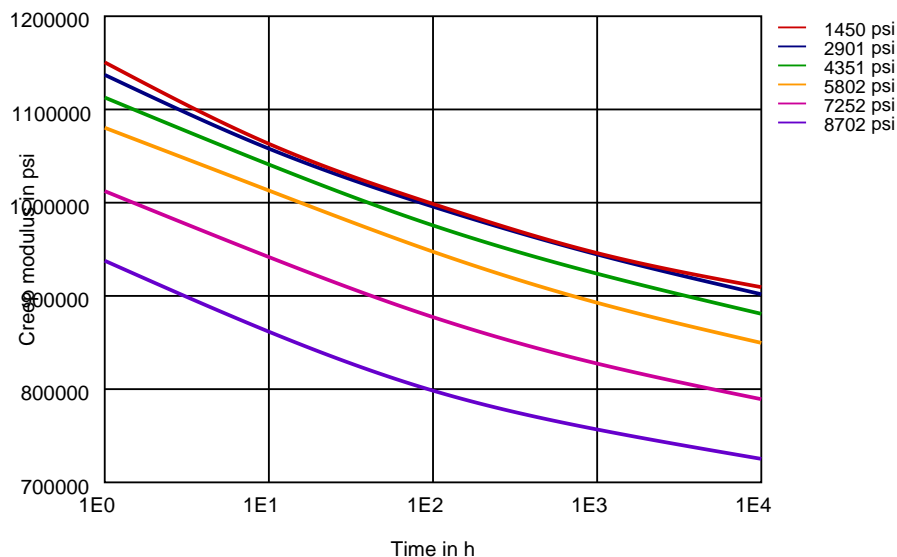
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Creep modulus-time 73°F(cond.)



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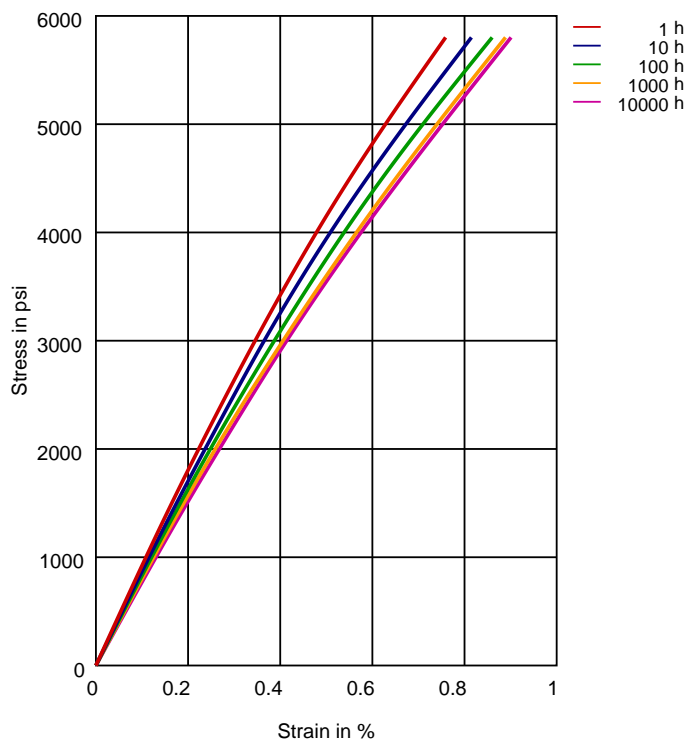
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Stress-strain (isochronous) 176° F(cond.)



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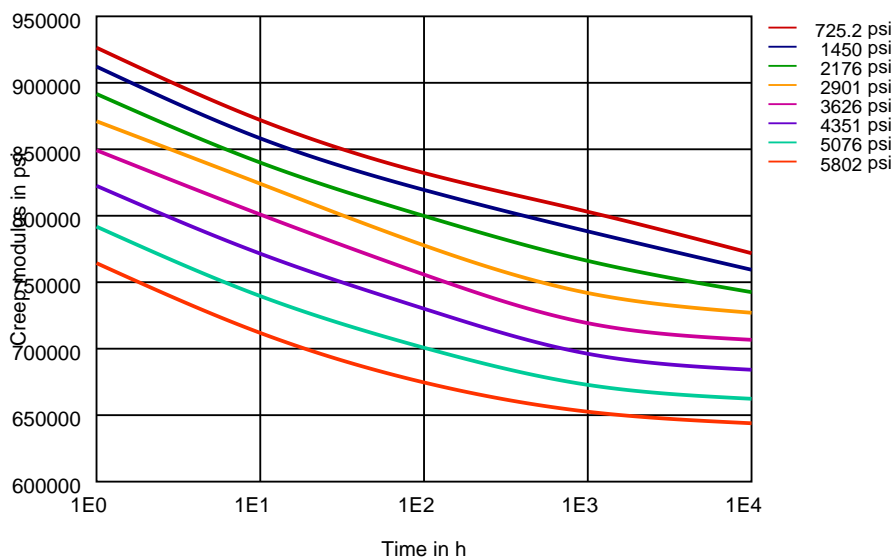
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Creep modulus-time 176 °F (cond.)



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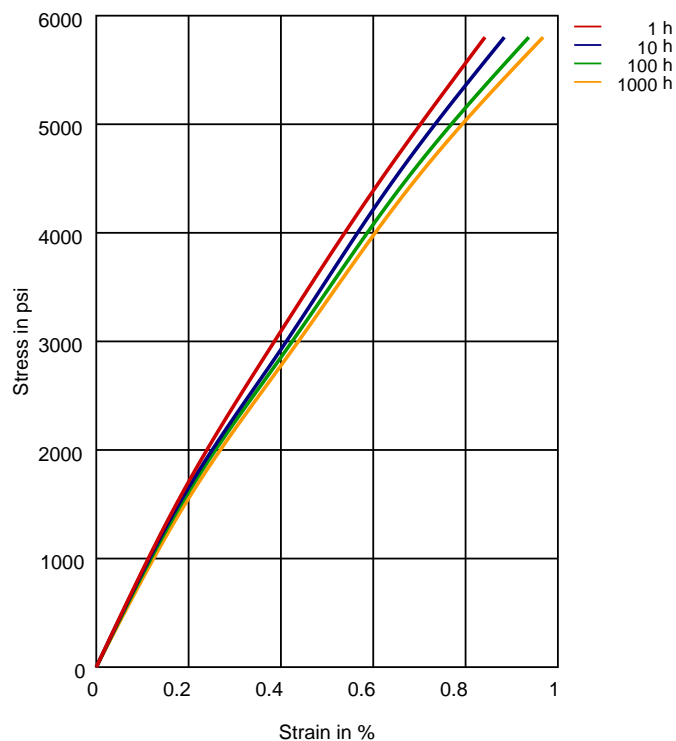
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Stress-strain (isochronous) 212°F(cond.)



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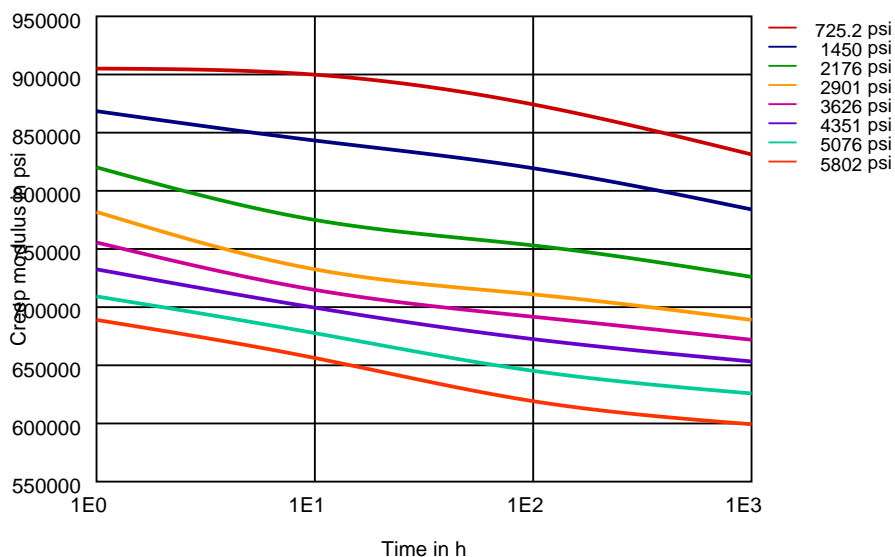
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# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Creep modulus-time 212°F (cond.)



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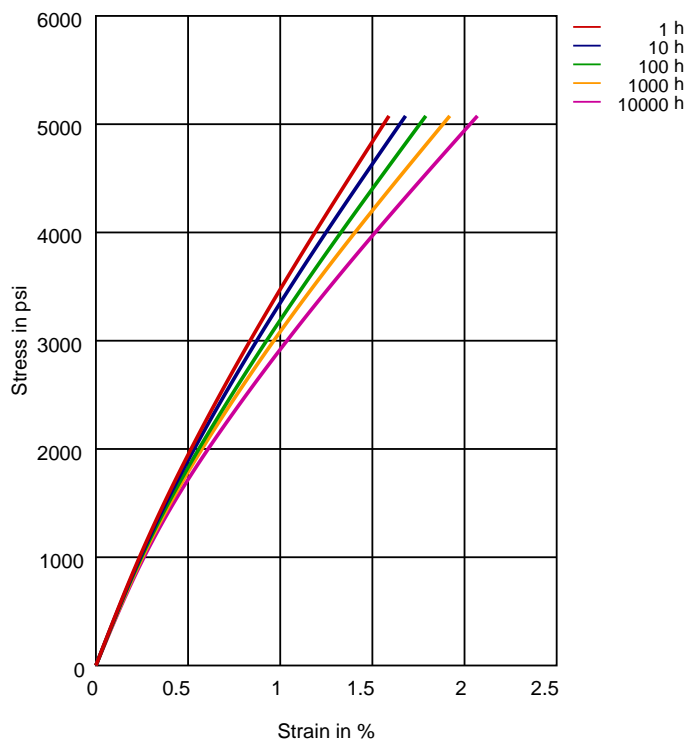




# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Stress-strain (isochronous) 284° F(cond.)(measured on Zytel® 70G30HSL BK039B)



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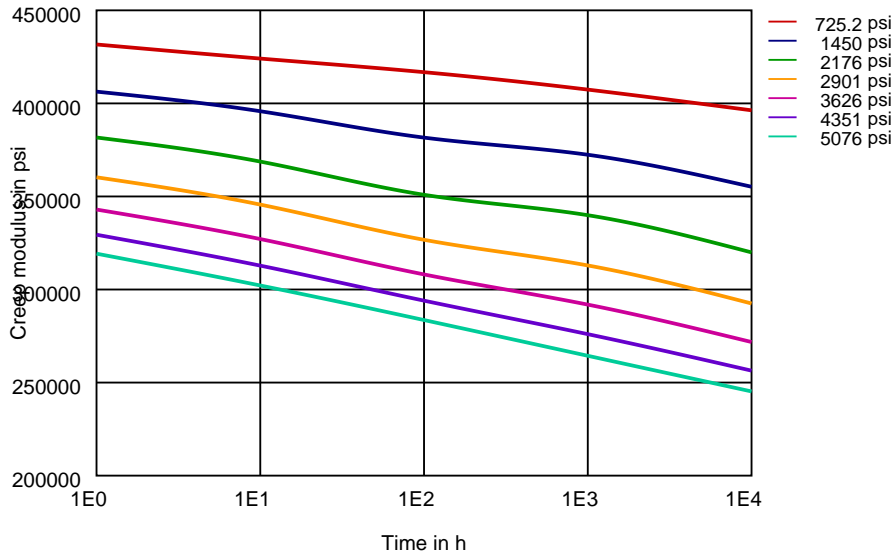
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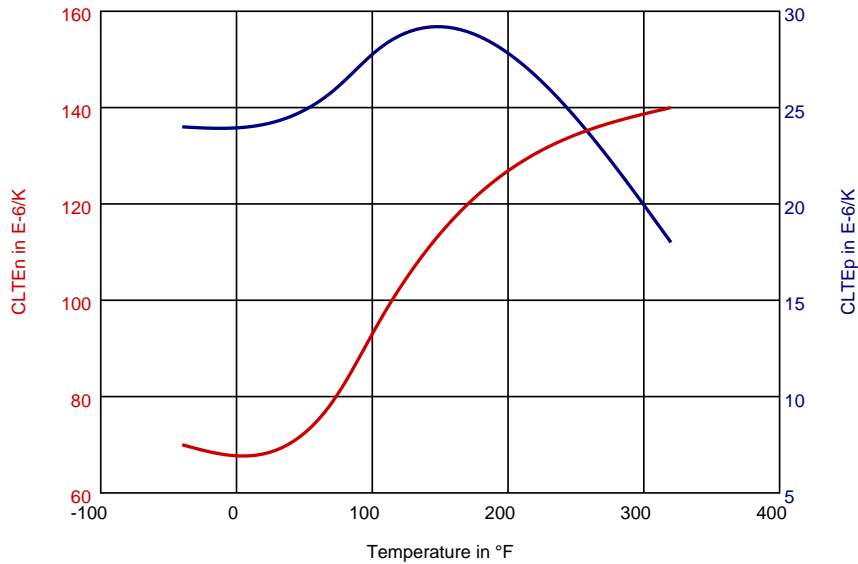
# DuPont™ Zytel® 70G30HSLR NC010

## NYLON RESIN

Creep modulus-time 284 °F (cond.) (measured on Zytel® 70G30HSL BK039B)



Coeff. of linear thermal expansion, normal



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# DuPont™ Zytel® 70G30HSLR NC010

## 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)

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Page: 19 of 21

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## NYLON RESIN

- ✓ 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)

### 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)
- ✓ 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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Revised: 2019-06-24

Page: 20 of 21

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