

# DuPont™ Zytel® 70G35EF 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® 70G35EF NC010 is a 35% glass reinforced polyamide 66 developed for electrical and electronics applications.**

Product information	Value	Unit	Test Standard
Resin Identification	PA66-GF35	-	ISO 1043
Part Marking Code	PA66-GF35	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	0.4 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.0 / -	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	1.6E6 / 1.23E6	psi	ISO 527-1/-2
Stress at break	29000 / 20300	psi	ISO 527-1/-2
Strain at break	3.5 / 4.6	%	ISO 527-1/-2
Flexural Modulus	1.45E6 / 1.09E6	psi	ISO 178
Flexural Strength	42100 / 33400	psi	ISO 178
Tensile creep modulus			ISO 899-1
1h	* / 1.23E6	psi	
1000h	* / 870000	psi	
Charpy impact strength			ISO 179/1eU
73°F	42.8 / 47.6	ftlb/in <sup>2</sup>	
-22°F	38.1 / 38.1	ftlb/in <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	6.66 / 8.56	ftlb/in <sup>2</sup>	
-22°F	5.23 / 4.76	ftlb/in <sup>2</sup>	
-40°F	5.71 / -	ftlb/in <sup>2</sup>	
Puncture energy, 73°F	6 / -	J	ISO 6603-2
Izod notched impact strength			ISO 180/1A
73°F	7.14 / -	ftlb/in <sup>2</sup>	
-40°F	6.18 / -	ftlb/in <sup>2</sup>	
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	500 / *	°F	ISO 11357-1/-3
Glass transition temperature, 18°F/min	158 / 68	°F	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	482 / *	°F	
1200 psi	230 / *	°F	
Vicat softening temperature, 90°F/h, 11 lbf	491 / *	°F	ISO 306
Coeff. of linear therm. expansion, parallel	9.44E-6 / *	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	4.72E-5 / *	in/in/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.24	W/(m K)	-
Spec. heat capacity of melt	2130	J/(kg K)	-
Flammability	dry / cond	Unit	Test Standard
Oxygen index	24 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 80mil	1200 / -	°F	IEC 60695-2-12

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

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FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	1.02	in/min	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity, 1MHz	4.1 / 4.7	-	IEC 62631-2-1
Dissipation factor, 1MHz	140 / 620	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 1E9	Ohm*m	IEC 62631-3-1
Electric strength	914 / 787	kV/in	IEC 60243-1
Comparative tracking index	575 / -	-	IEC 60112
<b>Other properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 80mil	1.7 / *	%	Sim. to ISO 62
Water absorption, 80mil	5.5 / *	%	Sim. to ISO 62
Density	1.4 / -	g/cm <sup>3</sup>	ISO 1183
Density of melt	77.4	lb/ft <sup>3</sup>	-
<b>VDA Properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Odor test	3	class	VDA 270
Fogging, G-value (condensate)	0.5 / *	mg	ISO 6452
<b>Injection</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
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	• Release agent		
Regional Availability	• North America	• Asia Pacific	• Near East/Africa
	• Europe	• South and Central America	• Global

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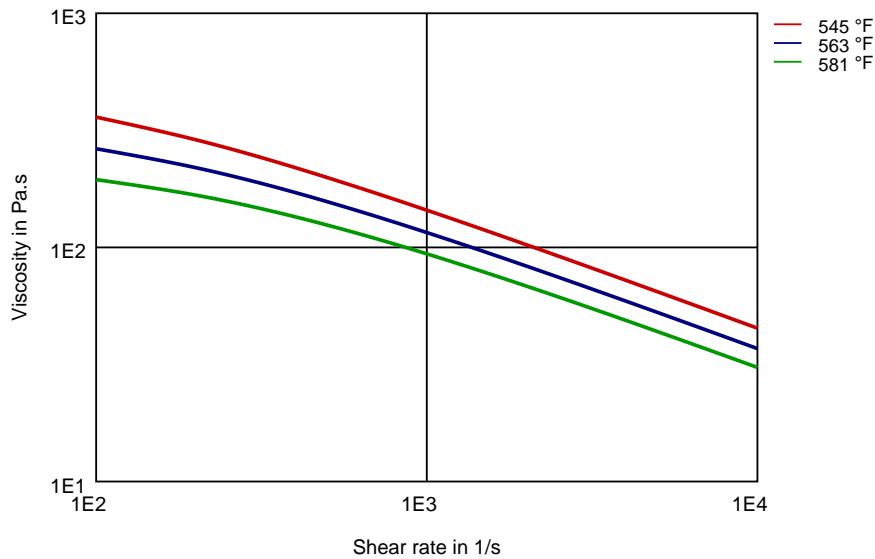


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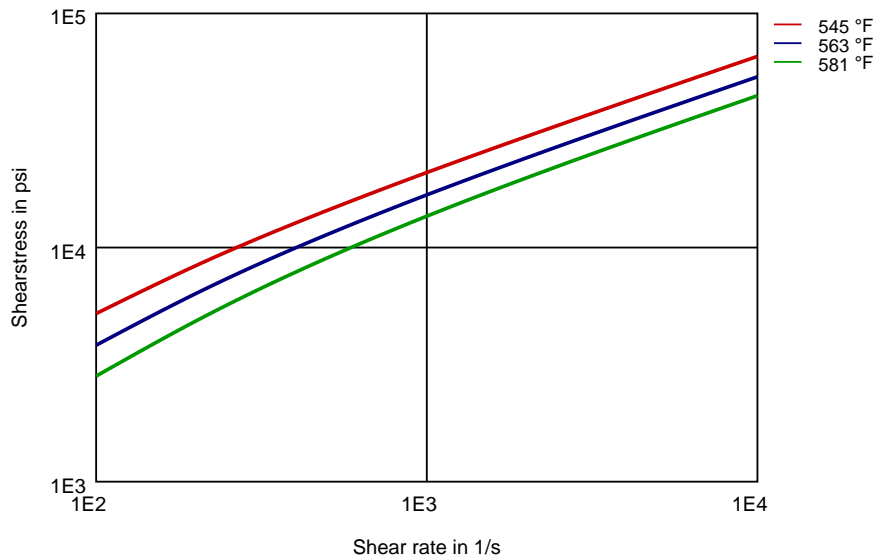
## NYLON RESIN

### Diagrams

#### Viscosity-shear rate



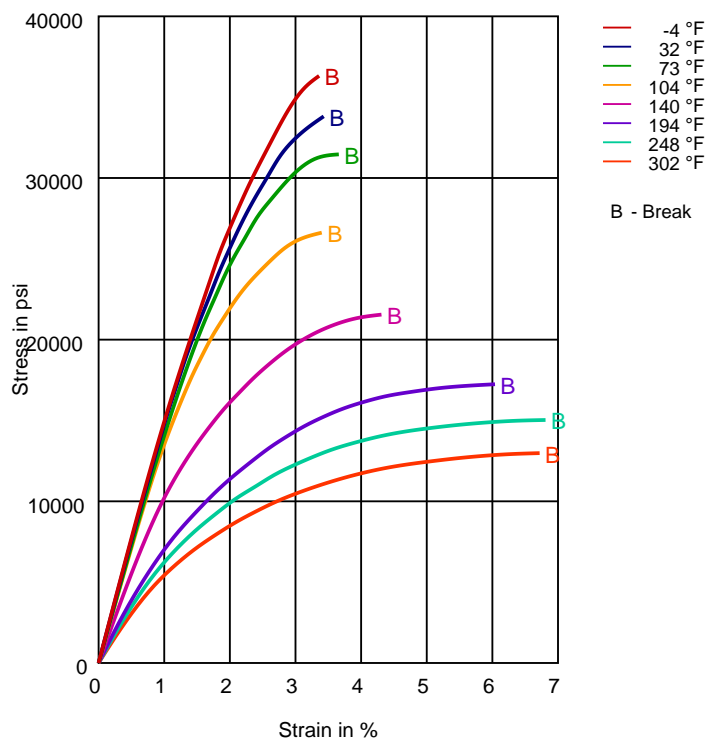
#### Shearstress-shear rate



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## NYLON RESIN

Stress-strain (dry)



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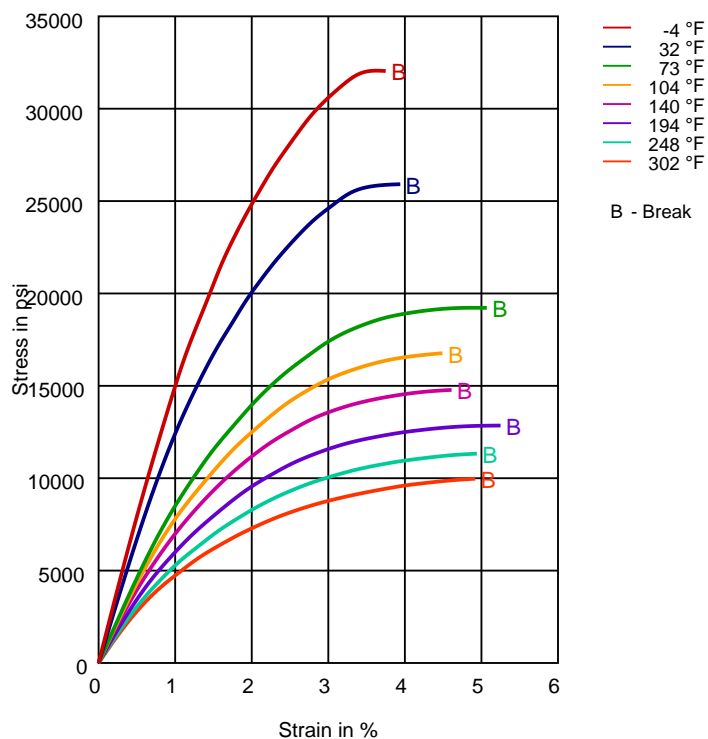
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Stress-strain (cond.)



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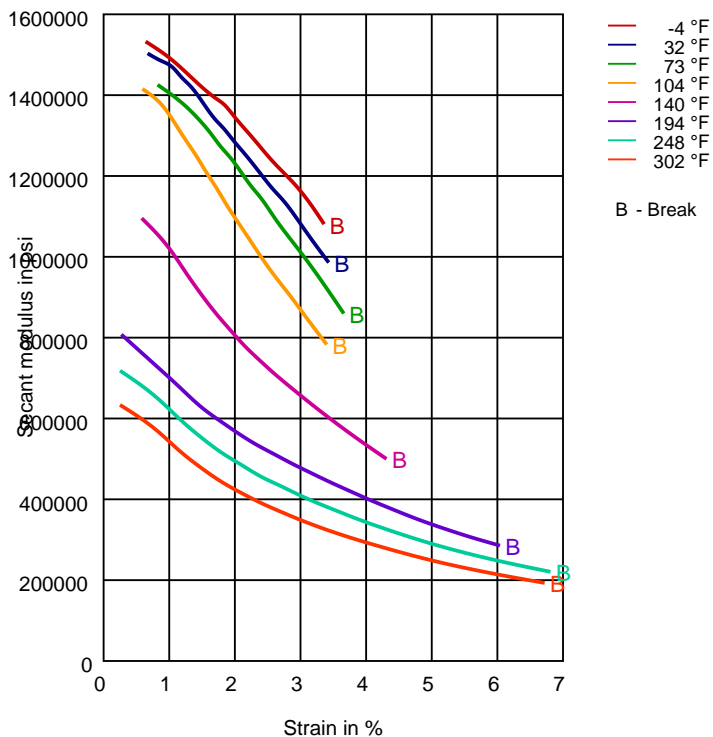
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Secant modulus-strain (dry)



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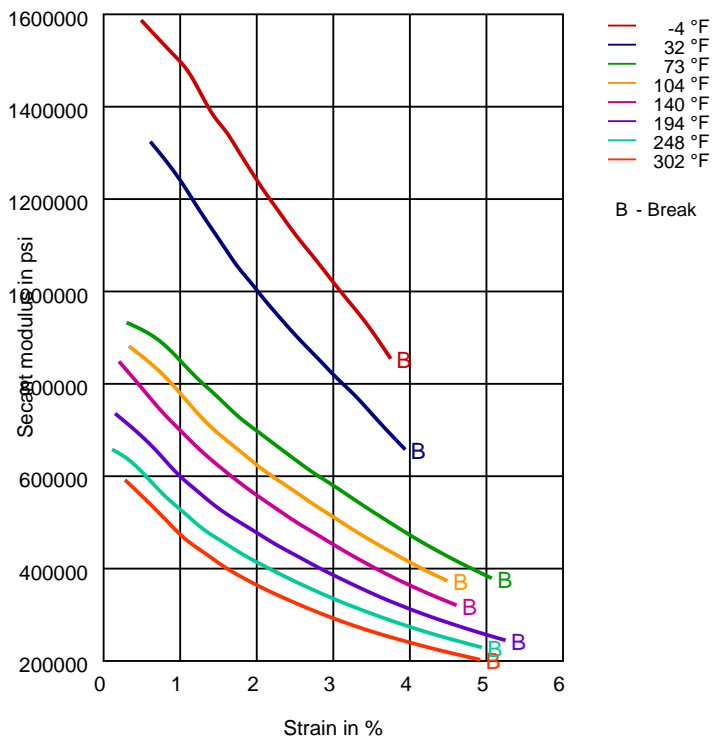
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## NYLON RESIN

Secant modulus-strain (cond.)



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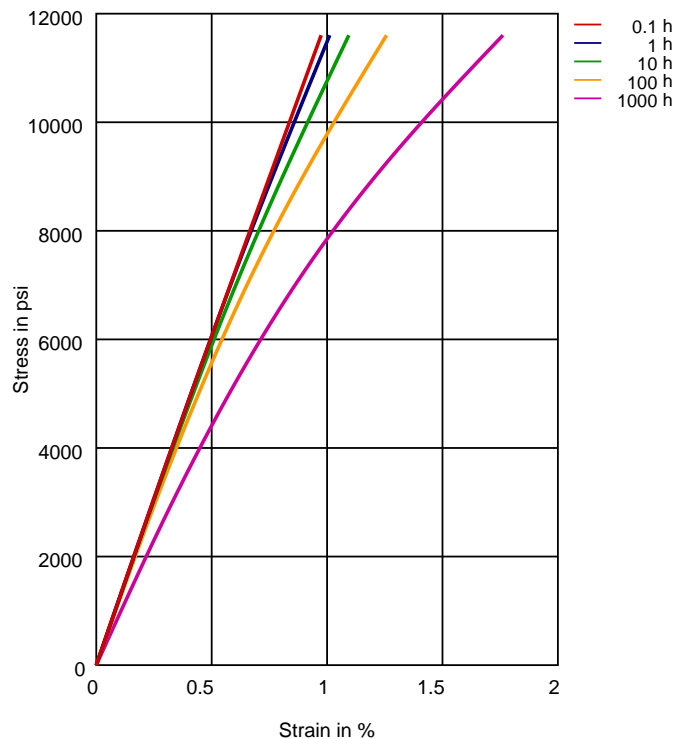
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

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



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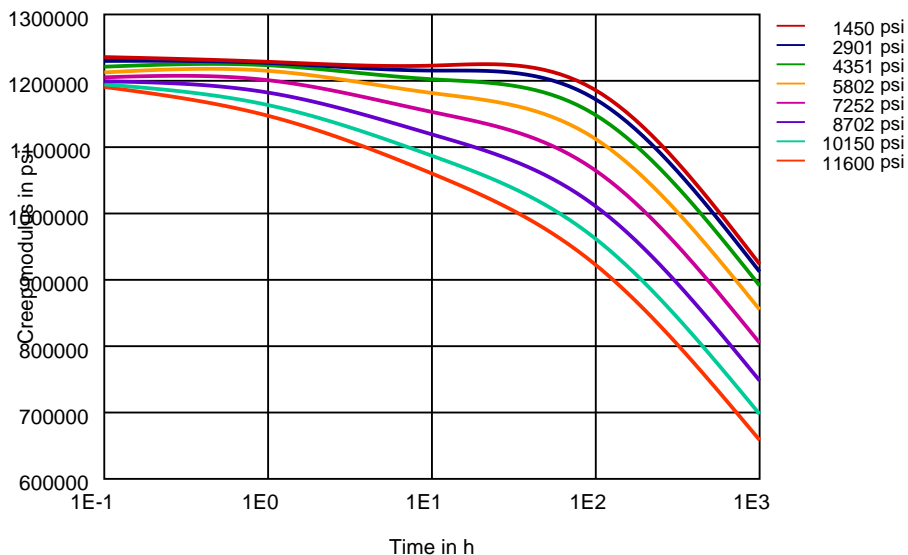




# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Creep modulus-time 73 °F (cond.)



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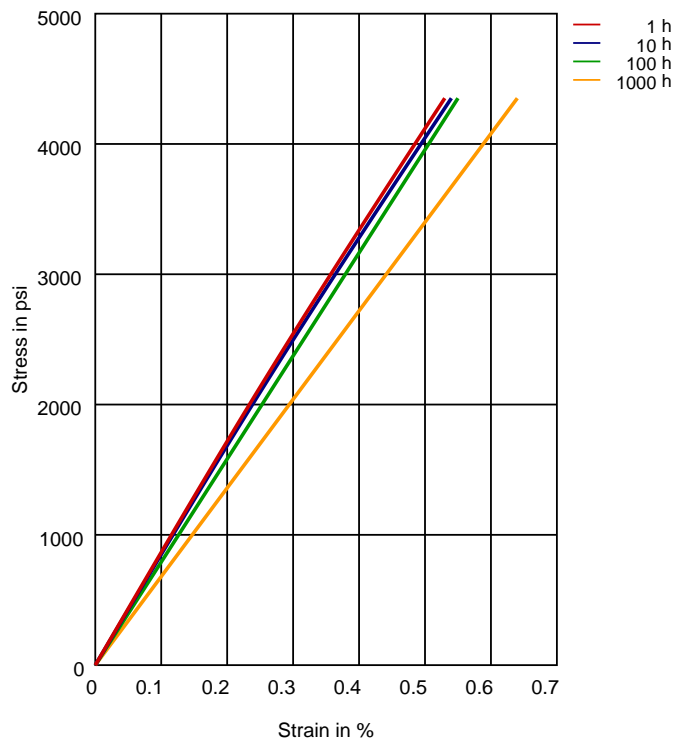
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Stress-strain (isochronous) 212°F(dry)



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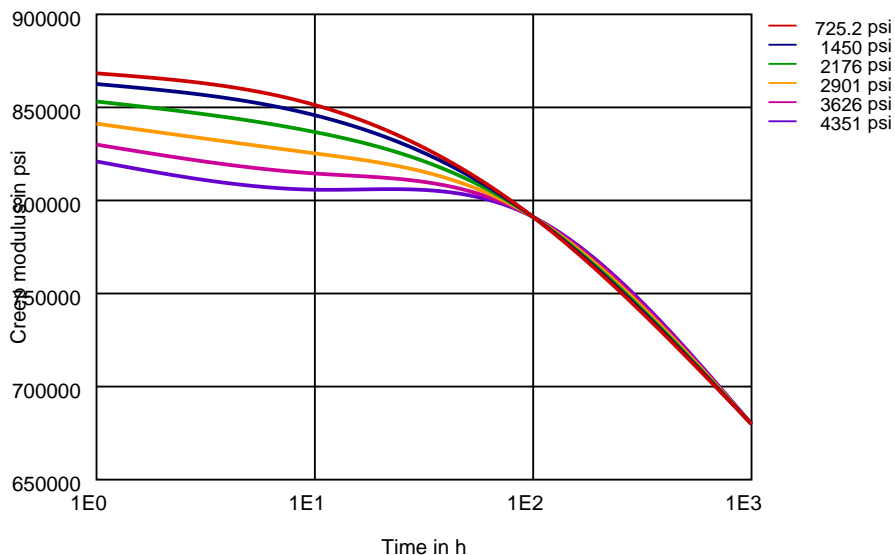
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Creep modulus-time 212°F(dry)



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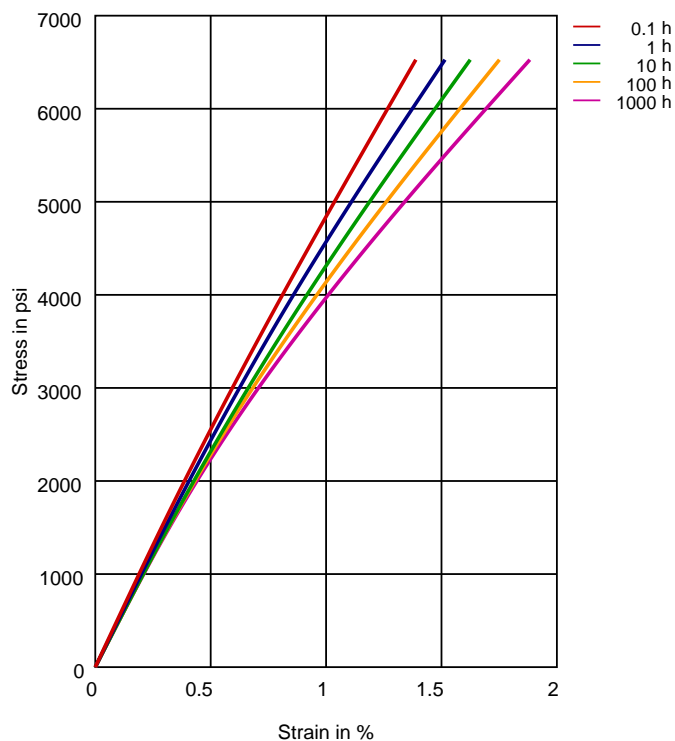
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Stress-strain (isochronous) 266° F(dry)



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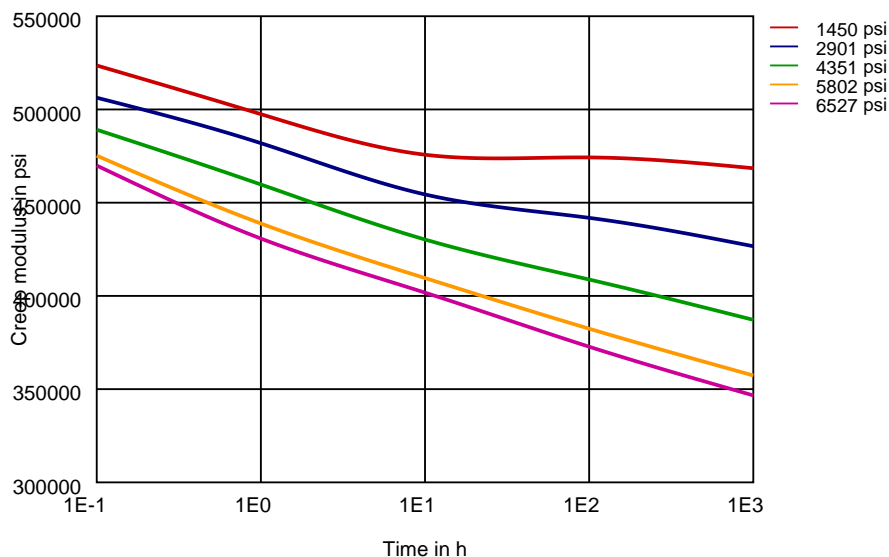
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Creep modulus-time 266 °F (dry)



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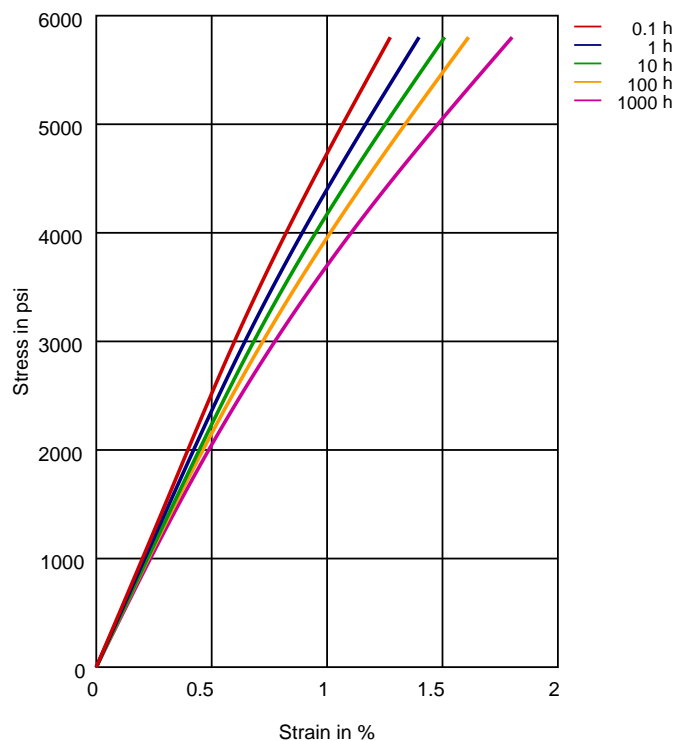
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Stress-strain (isochronous) 302°F(dry)



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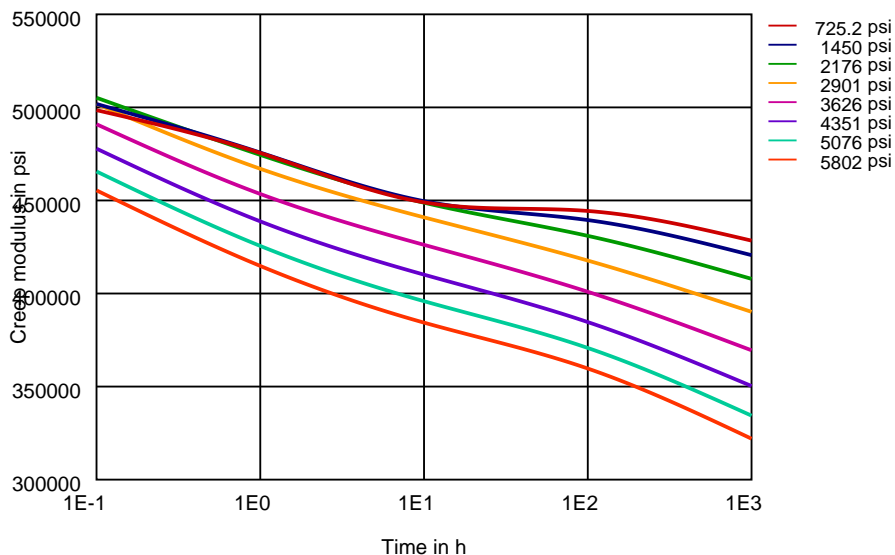
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Creep modulus-time 302°F(dry)



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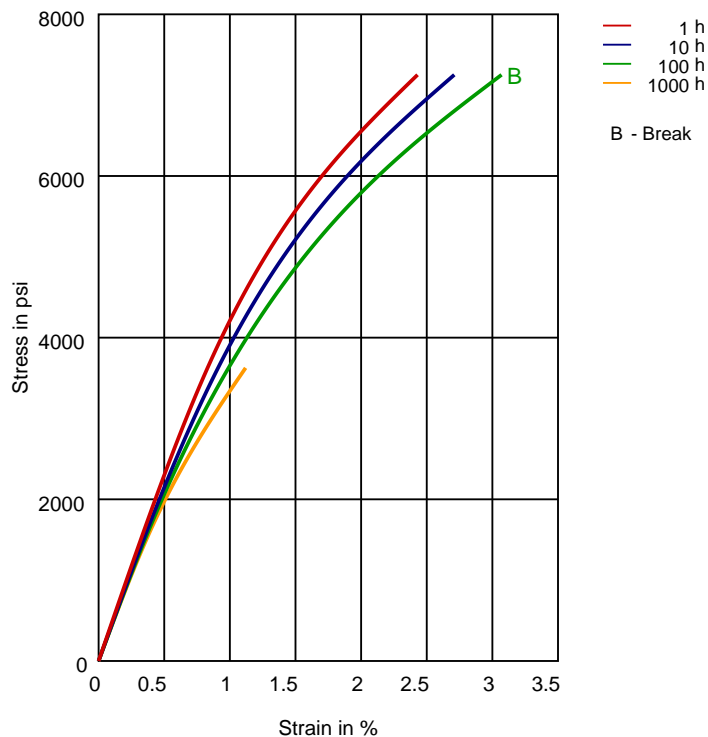
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# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Stress-strain (isochronous) 356° F(dry)



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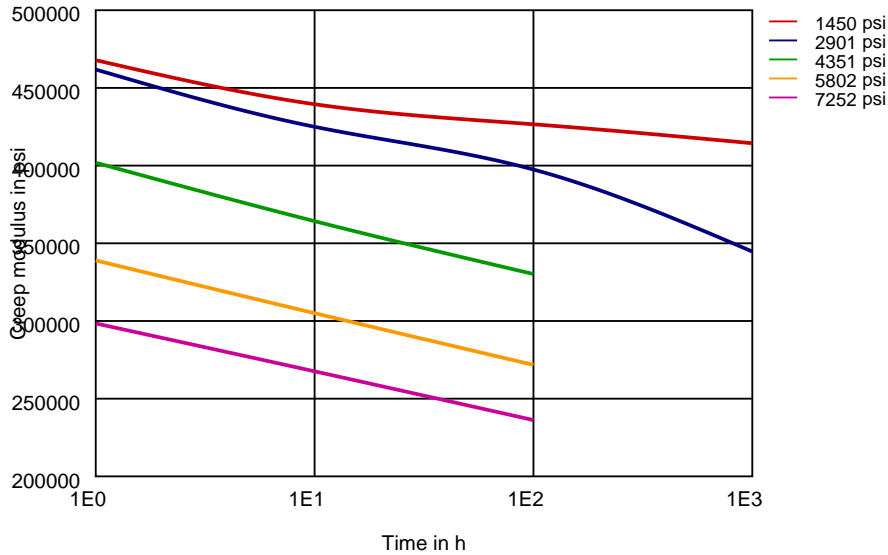




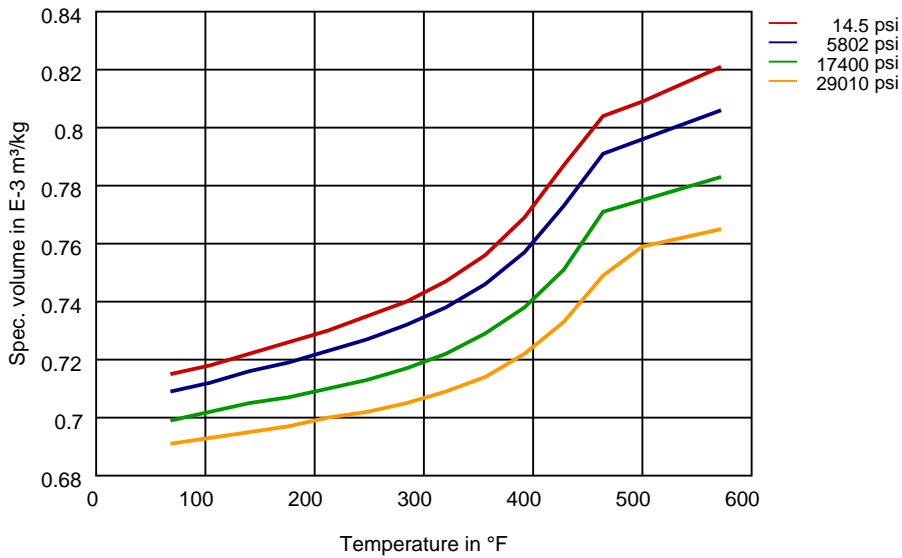
# DuPont™ Zytel® 70G35EF NC010

## NYLON RESIN

Creep modulus-time 356 °F (dry)



Specific volume-temperature (pvT)



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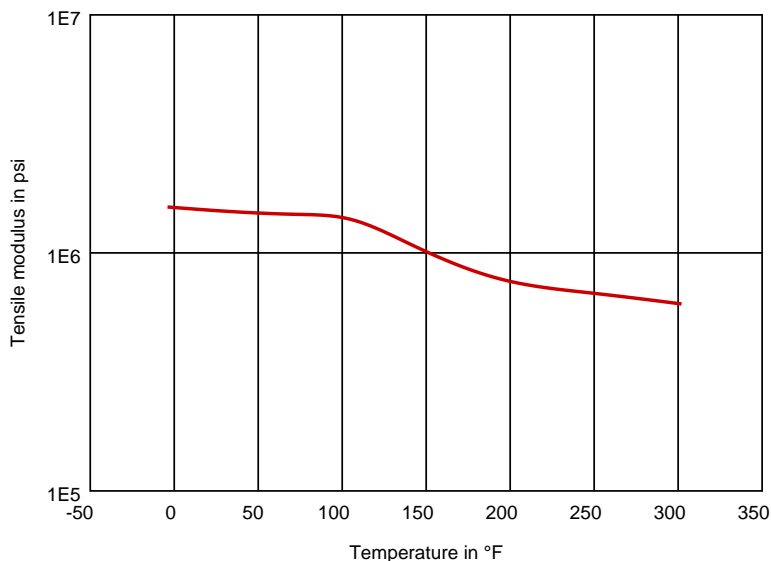
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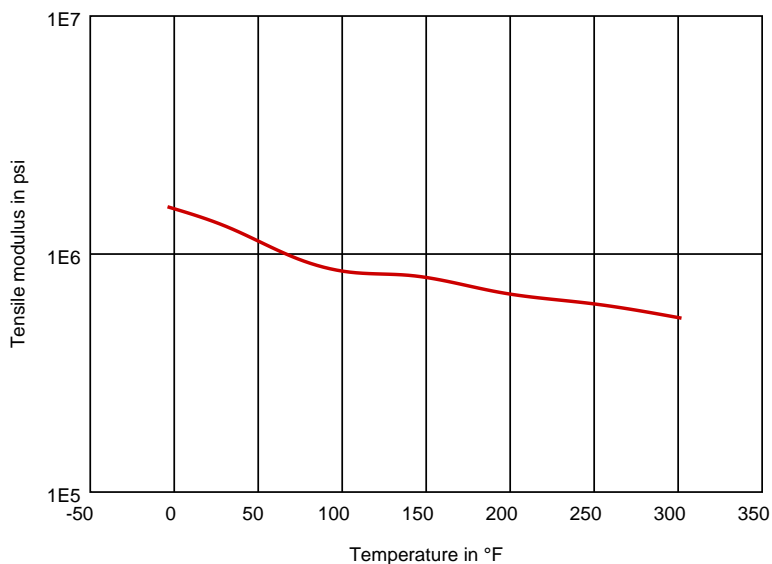
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## NYLON RESIN

### Tensile modulus-temperature (dry)



### Tensile modulus-temperature (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)
- ✓ 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)



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- ✓ 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)
- ✗ 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).

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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