

# DuPont™ Zytel® 7335F 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® 7335F NC010 is a nucleated, lubricated polyamide 6 resin for injection molding.**

General information	Value	Unit	Test Standard
Resin Identification	PA6	-	ISO 1043
Part Marking Code	PA6	-	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	0.6 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577
1: Sulfuric acid 96%			
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	522137 / 203053	psi	ISO 527-1/-2
Yield stress	13300 / 7980	psi	ISO 527-1/-2
Yield strain	3.8 / 24	%	ISO 527-1/-2
Nominal strain at break	9 / >50	%	ISO 527-1/-2
Strain at Break, 23°C, 50mm/min	15 / >50	%	ISO 527-1/-2
Charpy impact strength			ISO 179/1eU
73°F	33.3 / 57.1	ftlb/in <sup>2</sup>	
-22°F	52.3 / 28.5	ftlb/in <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	2.14 / 8.56	ftlb/in <sup>2</sup>	
-22°F	1.19 / 1.43	ftlb/in <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
73°F	1.66 / -	ftlb/in <sup>2</sup>	A
-22°F	0.951 / -	ftlb/in <sup>2</sup>	A
-40°F	0.951 / -	ftlb/in <sup>2</sup>	A
A: Assessed			
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	430 / *	°F	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
260 psi	149 / *	°F	
65 psi	347 / *	°F	
Vicat softening temperature, 90°F/h, 11 lbf	392 / *	°F	ISO 306
Coeff. of linear therm. expansion, parallel	4.22E-5 / *	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	5.11E-5 / *	in/in/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K)	-
Spec. heat capacity of melt	2700	J/(kg K)	-
Temperature index, tensile strength, 20 000h	158 / *	°F	IEC 60216-1
Temperature index, tensile strength, 5000h	185 / *	°F	IEC 60216-1
Flammability	dry / cond	Unit	Test Standard
Burning Behav. at 60mil nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	0.0591 / *	in	IEC 60695-11-10

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UL recognition	yes / *	-	UL 94
FMVSS Class	SE	-	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity, 100Hz	4.2 / -	-	IEC 60250
Dissipation factor, 100Hz	300 / -	E-4	IEC 60250
Volume resistivity	>1E13 / 1E9	Ohm*m	IEC 60093
Surface resistivity	* / 1E11	Ohm	IEC 60093
Electric strength	762 / -	kV/in	IEC 60243-1
Comparative tracking index	600 / -	-	IEC 60112
<b>Other properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 80mil	3 / *	%	Sim. to ISO 62
Water absorption, 80mil	9 / *	%	Sim. to ISO 62
Density	1.13 / -	g/cm <sup>3</sup>	ISO 1183
Density of melt	60.6	lb/ft <sup>3</sup>	-
<b>Film Properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Strain at yield, parallel	4 / *	%	ISO 527-3
<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	518	°F	-
Min. melt temperature	500	°F	-
Max. melt temperature	536	°F	-
Max. screw tangential speed	0.2 / *	m/s	-
Mold Temperature Optimum	158	°F	-
Min. mold temperature	122	°F	-
Max. mold temperature	194	°F	-
Hold pressure range	7250 - 14500	psi	-
Hold pressure time	0.102	s/mil	-

### Characteristics

Processing	• Injection Molding
Delivery form	• Pellets
Additives	• Lubricants
Regional Availability	• North America
	• Release agent
	• South and Central America

### Processing Texts

### Injection molding

#### POSTPROCESSING

Annealing : 30min at 170°C

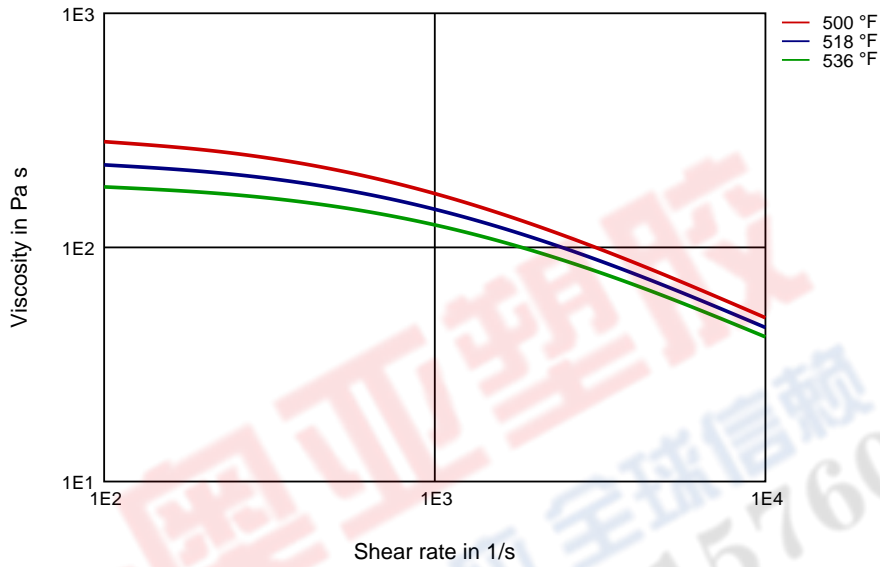


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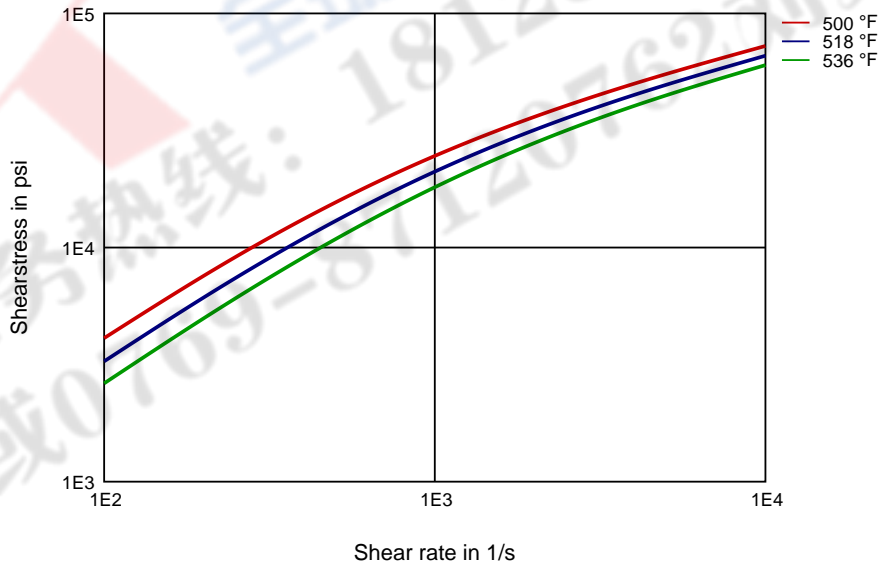
## NYLON RESIN

Diagrams

Viscosity-shear rate



Shearstress-shear rate



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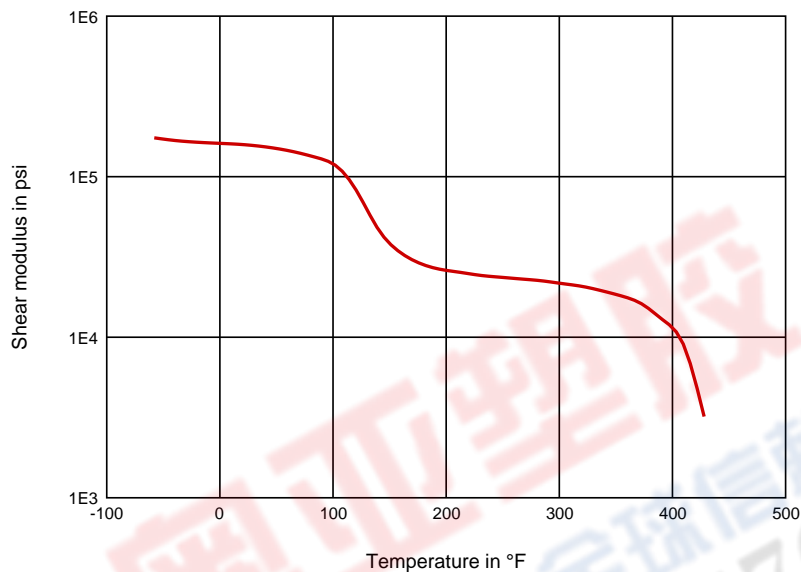
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## NYLON RESIN

Dynamic Shear modulus-temperature (dry)



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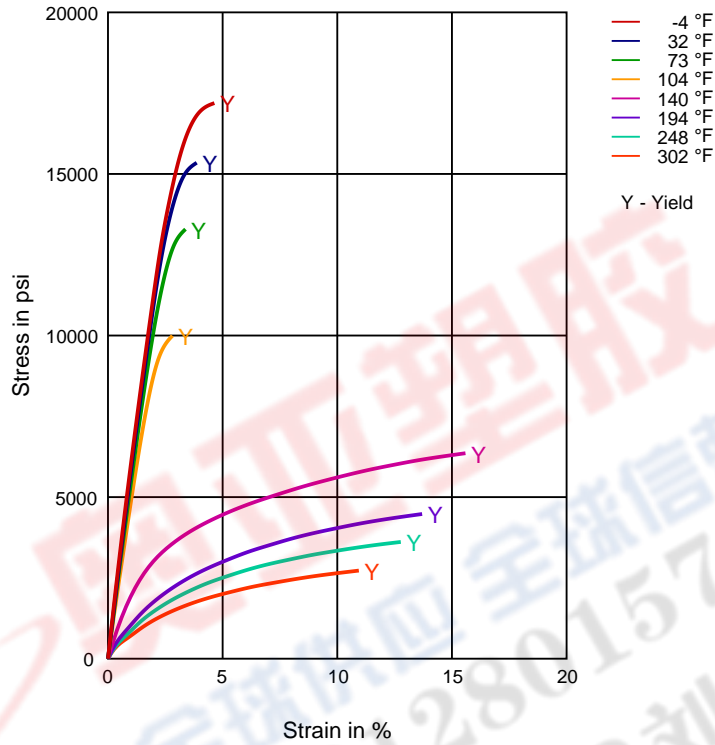
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## NYLON RESIN

Stress-strain (dry)



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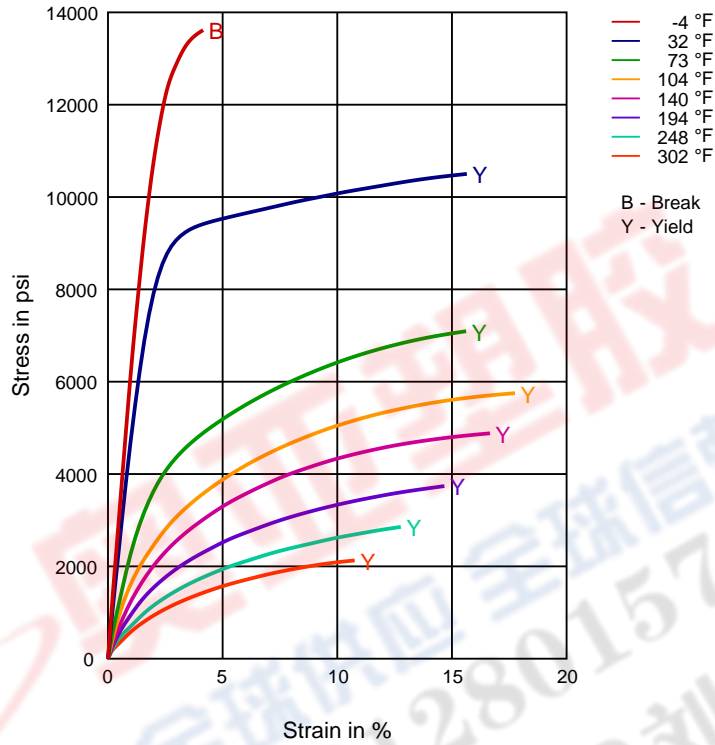
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## NYLON RESIN

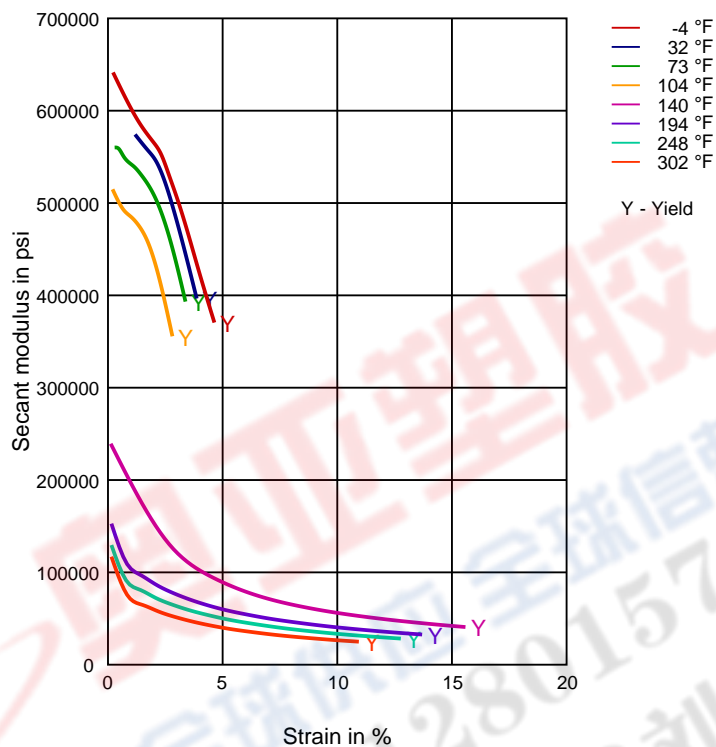
Stress-strain (cond.)



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## NYLON RESIN

Secant modulus-strain (dry)



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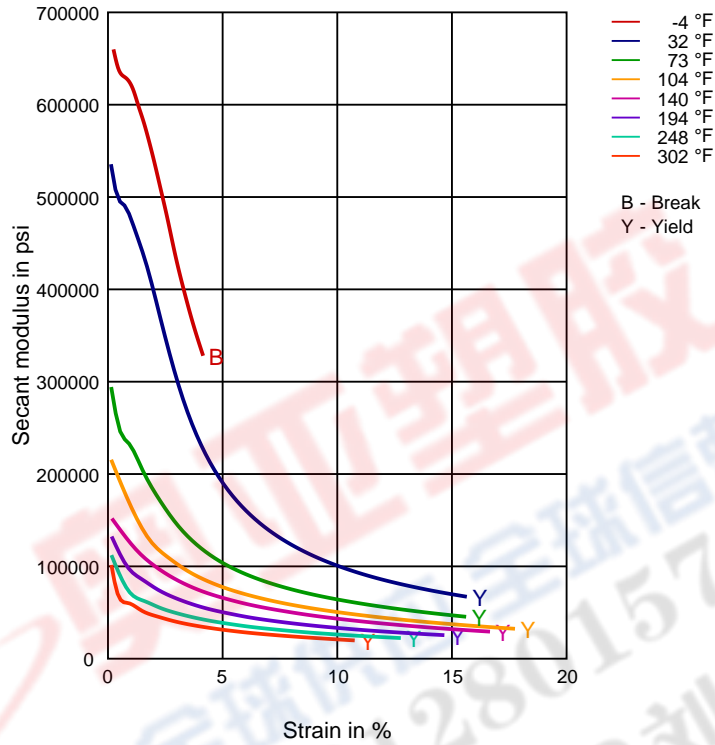
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# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

Secant modulus-strain (cond.)



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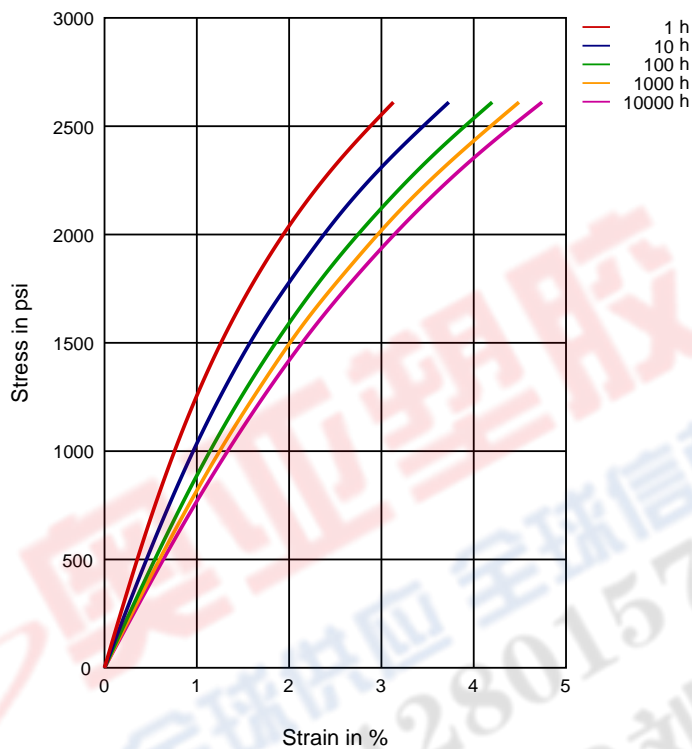




# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

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



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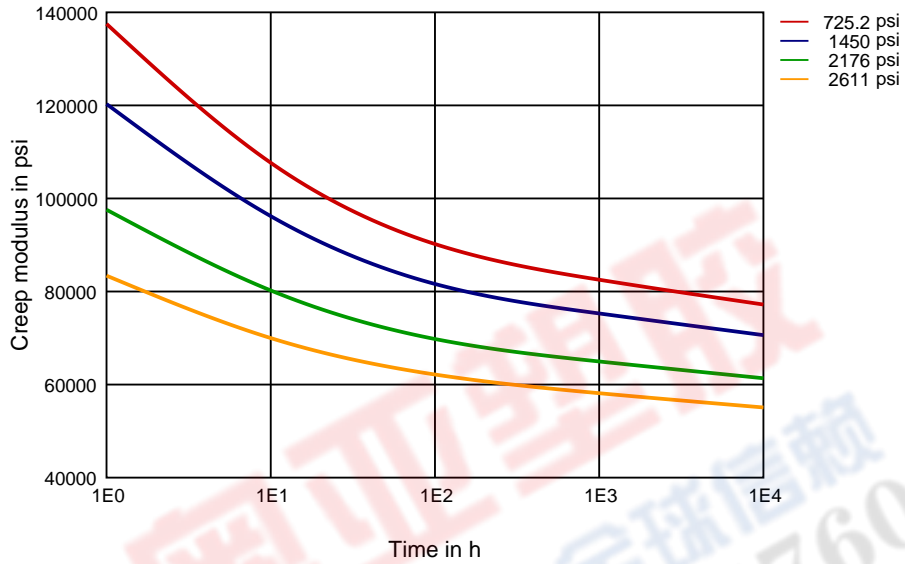
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# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

Creep modulus-time 73 °F (cond.)



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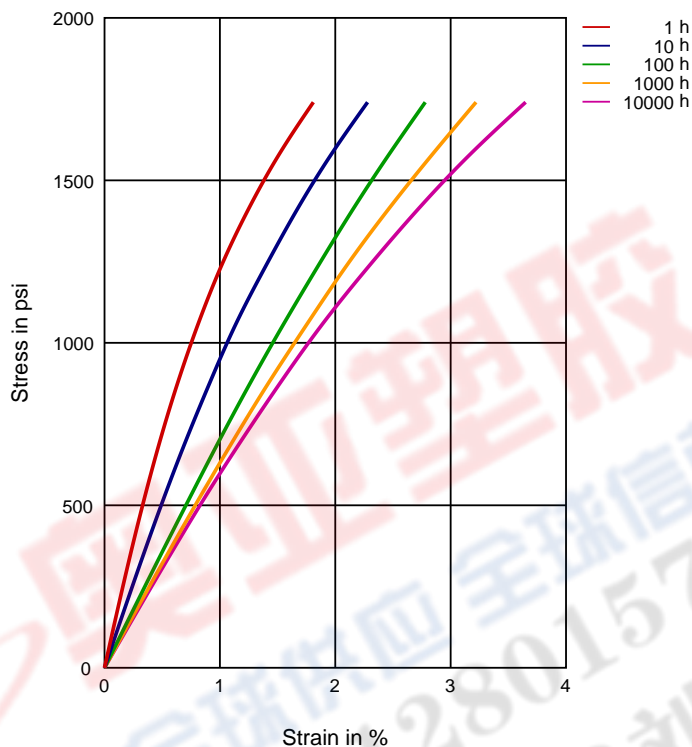
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# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

Stress-strain (isochronous) 140°F (cond.)



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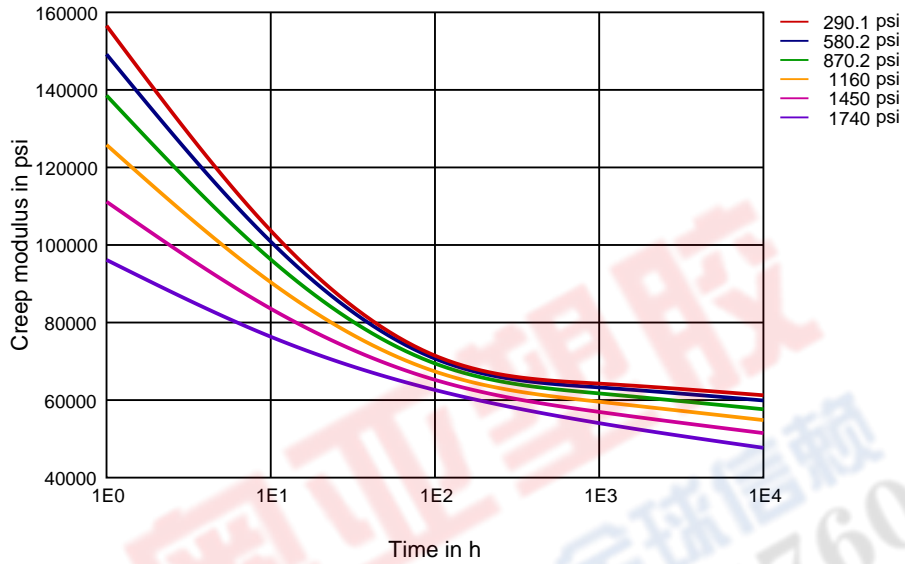
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# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

Creep modulus-time 140°F (cond.)



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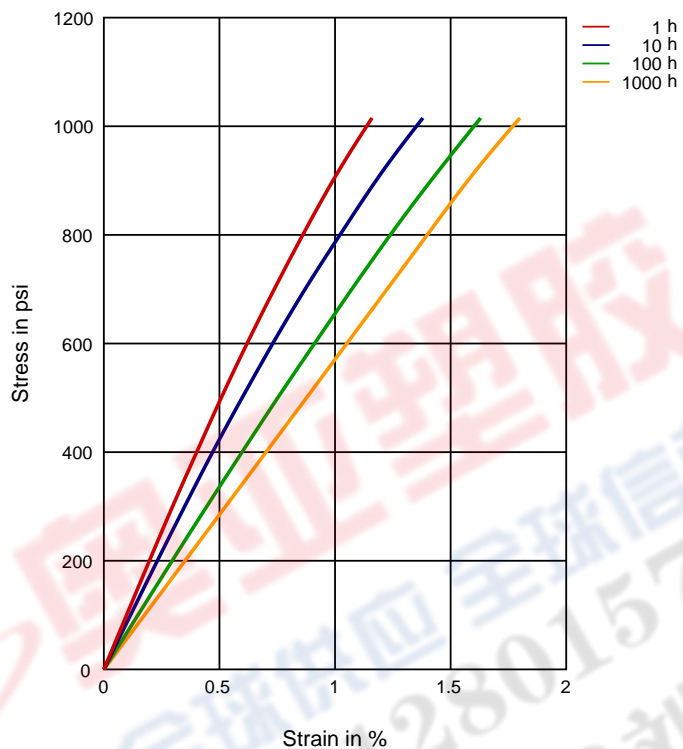
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# DuPont™ Zytel® 7335F NC010

## NYLON RESIN

Stress-strain (isochronous) 194°F (cond.)



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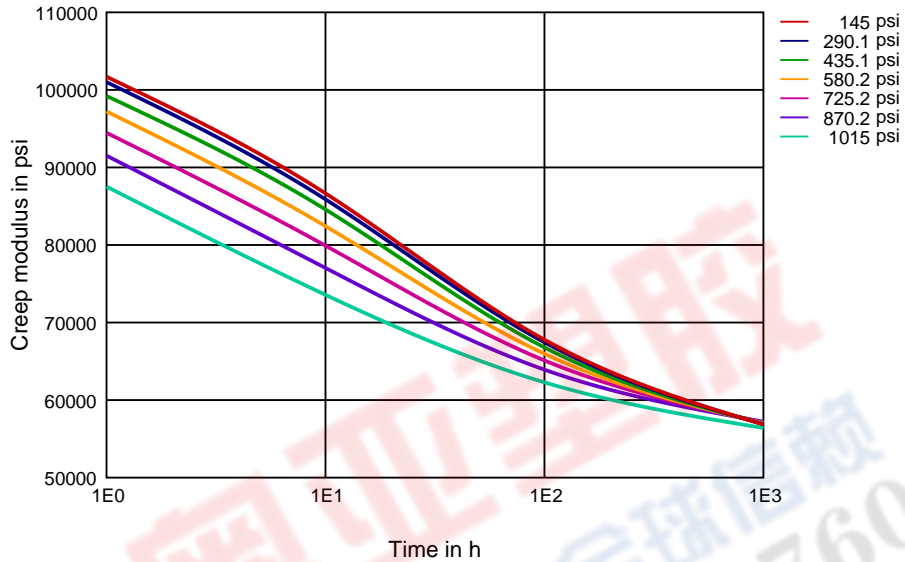
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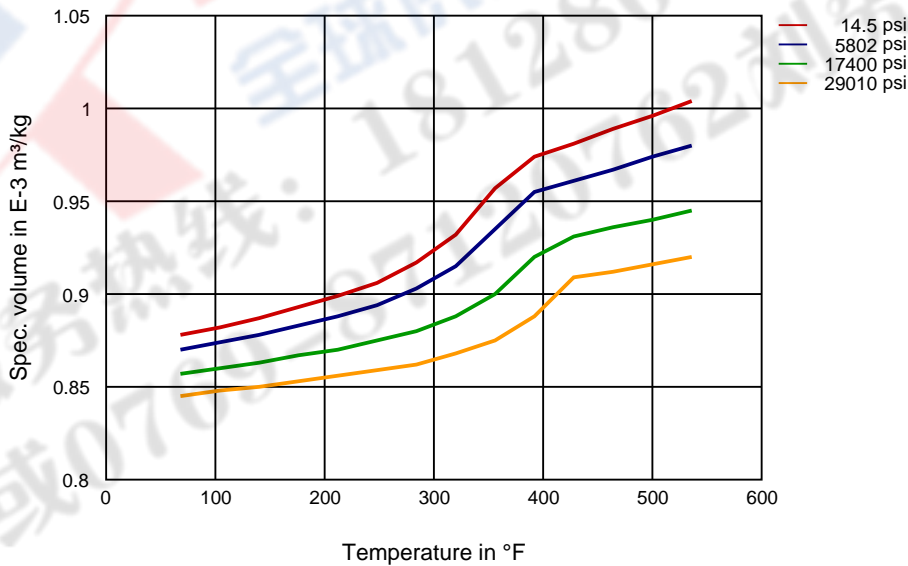
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## NYLON RESIN

Creep modulus-time 194°F (cond.)



Specific volume-temperature (pVT)



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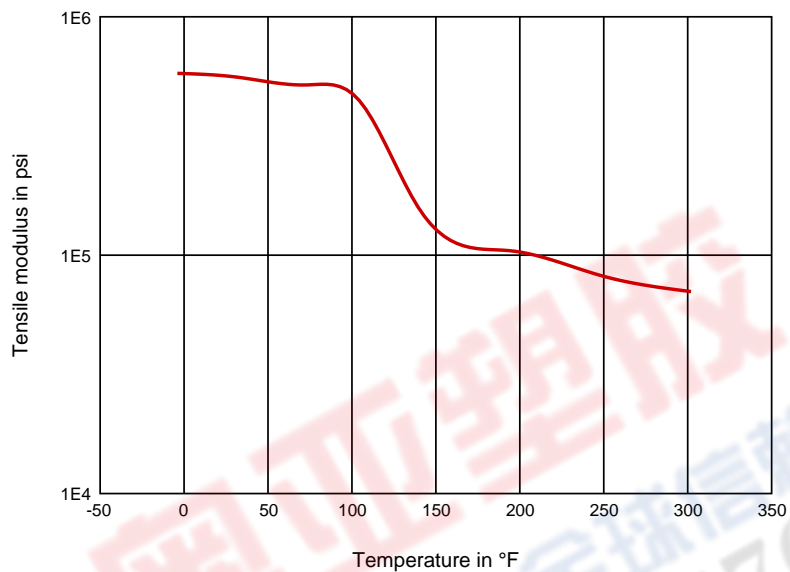
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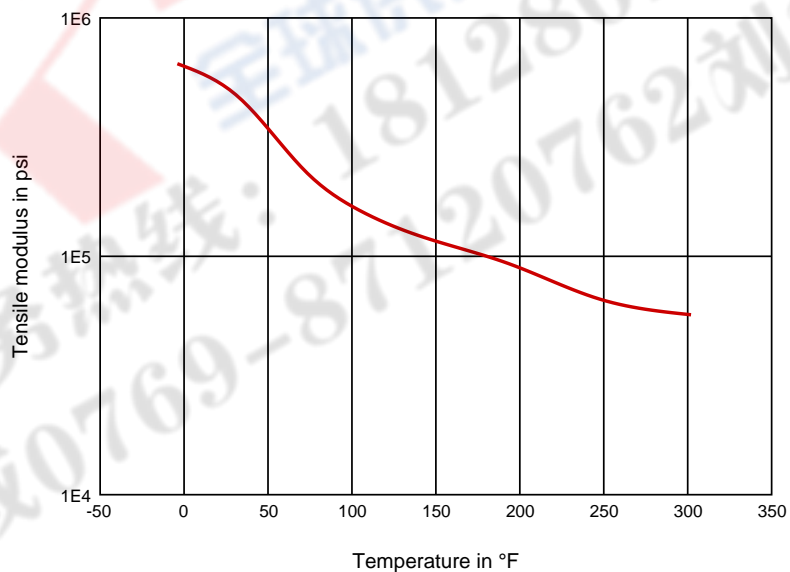
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## NYLON RESIN

### 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)

#### 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)

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- ✓ 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)
- ✗ 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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