

# DuPont™ Zytel® 70G50HSL 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® 70G50HSL NC010 is a 50% Glass Reinforced, Heat Stabilized, Polyamide 66**

Product information	Value	Unit	Test Standard
Resin Identification	PA66-GF50	-	ISO 1043
Part Marking Code	PA66-GF50	-	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	0.2 / -	%	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	2.47E6 / 2.03E6	psi	ISO 527-1/-2
Stress at break	34800 / 24700	psi	ISO 527-1/-2
Strain at break	2.6 / 3.5	%	ISO 527-1/-2
Flexural Modulus	2.32E6 / 1.45E6	psi	ISO 178
Flexural Strength	56600 / 40600	psi	ISO 178
Flexural Stress at 3.5%	- / 36300	psi	ISO 178
Charpy impact strength			ISO 179/1eU
73 °F	47.6 / 54.7	ftlb/in <sup>2</sup>	A
-22 °F	47.6 / 47.6	ftlb/in <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73 °F	8.09 / 9.04	ftlb/in <sup>2</sup>	
-22 °F	6.66 / 6.18	ftlb/in <sup>2</sup>	
A: Assessed			
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18 °F/min	504 / *	°F	ISO 11357-1/-3
Temp. of deflection under load, 260 psi	496 / *	°F	ISO 75-1/-2
Vicat softening temperature, 90 °F/h, 11 lbf	491 / *	°F	ISO 306
CLTE			ASTM E 831
Normal, 23-55 °C (73-130 °F)	4.06E-7 / -	in/in/°F	
Parallel, 23-55 °C (73-130 °F)	8.33E-8 / -	in/in/°F	
RTI, electrical			UL 746B
30mil	248	°F	
60mil	248	°F	
120mil	248	°F	
RTI, impact			UL 746B
30mil	239	°F	
60mil	257	°F	
120mil	266	°F	
RTI, strength			UL 746B
30mil	239	°F	
60mil	257 / *	°F	
120mil	266	°F	

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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
UL recognition	yes / *	-	UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.0327 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Glow Wire Flammability Index, 120mil	1560 / -	°F	IEC 60695-2-12
FMVSS Class	SE	-	ISO 3795 (FMVSS 302)
Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 80mil	1.2 / *	%	Sim. to ISO 62
Water absorption, 80mil	4.2 / *	%	Sim. to ISO 62
Density	1.58 / -	g/cm <sup>3</sup>	ISO 1183
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

Special characteristics

- Heat stabilized or stable to heat

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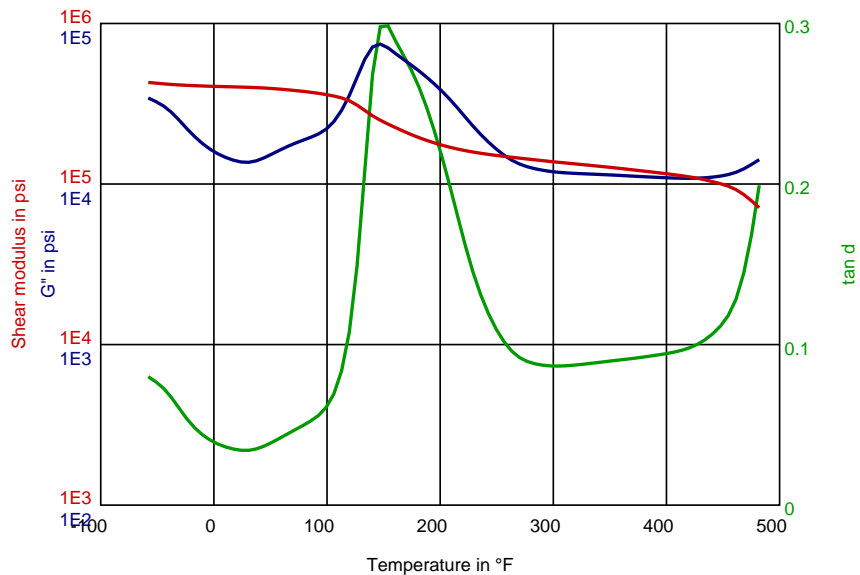


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## NYLON RESIN

Diagrams

Dynamic Shear modulus-temperature (dry)



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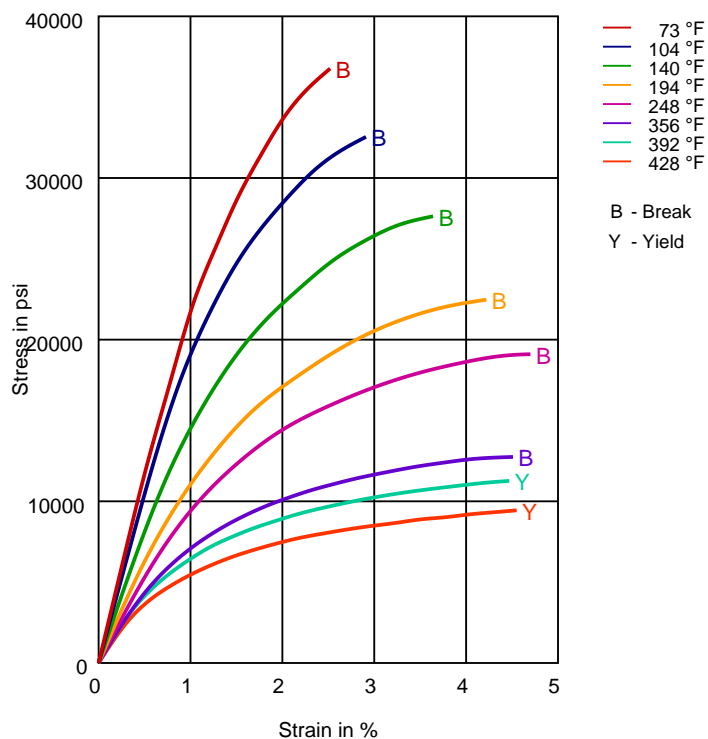
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# DuPont™ Zytel® 70G50HSL NC010

## NYLON RESIN

Stress-strain (dry)



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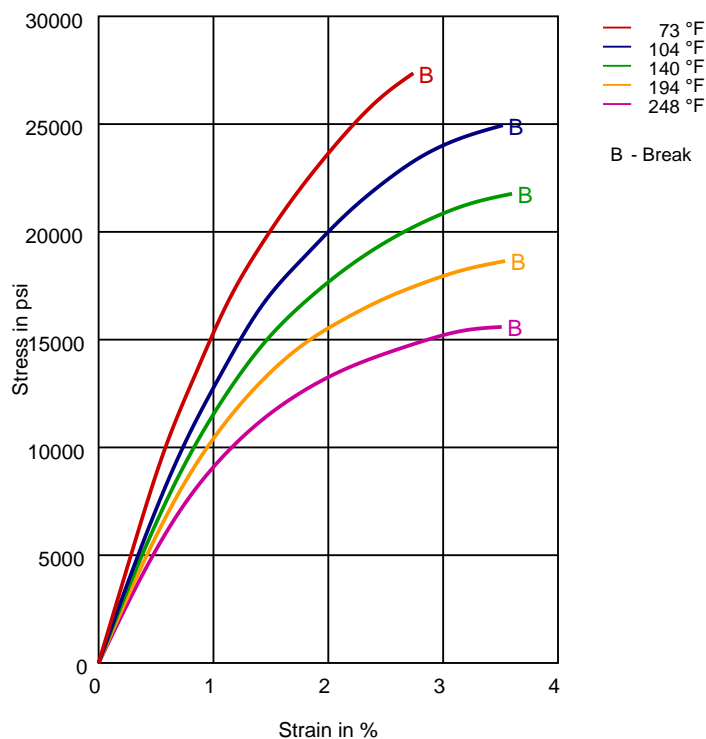
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# DuPont™ Zytel® 70G50HSL NC010

## NYLON RESIN

Stress-strain (cond.)



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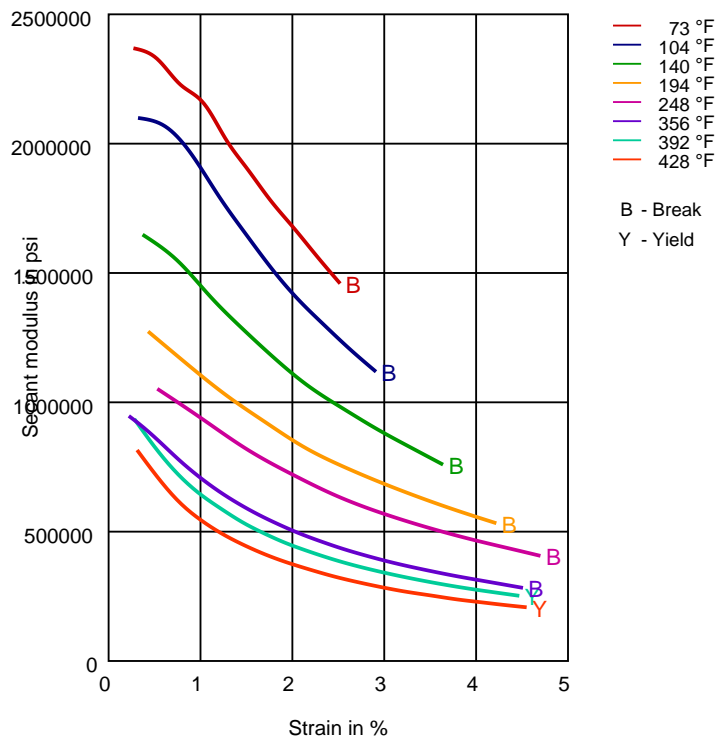


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## NYLON RESIN

Secant modulus-strain (dry)



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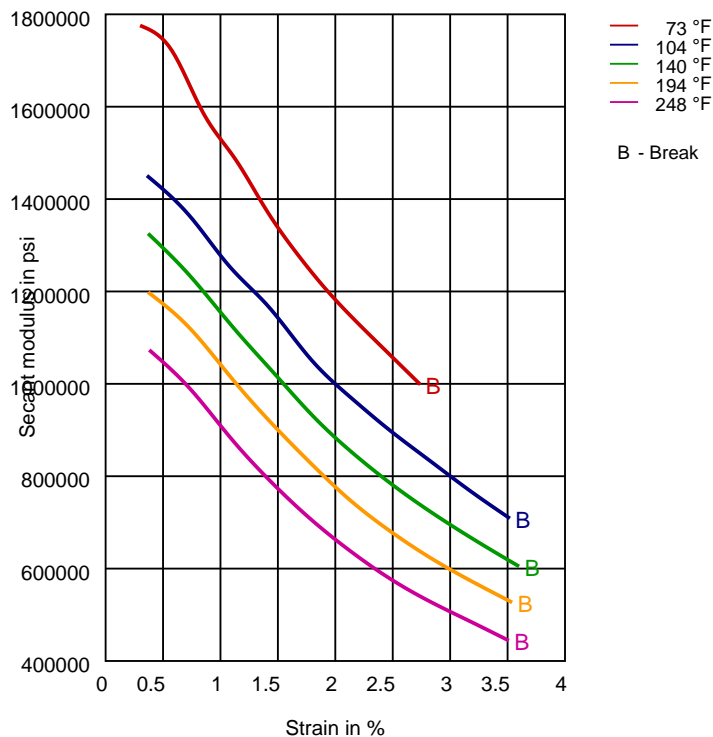
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## NYLON RESIN

Secant modulus-strain (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)

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- ✓ 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)
- ✓ 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 (Hytel® 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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the human body. For other medical applications, discuss with your DuPont customer representative and read Medical Caution H-50103-5.

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