

# DuPont™ Zytel® 151 NC010

## NYLON RESIN

### Product Information

DuPont™ Zytel® LCPA long chain polyamide resins provide an innovative and growing portfolio of flexible polymers with excellent thermal, chemical, and hydrolysis resistance. The diverse selection of Zytel® LCPA grades is targeted for a range of performance characteristics, balancing temperature resistance, flexibility and low permeation.

Zytel® 151 NC010 is a low viscosity polyamide 612 resin.

General information	Value	Unit	Test Standard
Resin Identification	PA612	-	ISO 1043
Part Marking Code	PA612	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Melt mass-flow rate	35 / *	g/10min	ISO 1133
Melt mass-flow rate, Temperature	230 / *	°C	ISO 1133
Melt mass-flow rate, Load	1 / *	kg	ISO 1133
Viscosity number	95 / *	cm <sup>3</sup> /g	ISO 307, 1157, 1628
Molding shrinkage, parallel	1.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577
Mold Shrinkage, Flow, 3.2mm (0.125in)	1.1 / *	%	-
Mold Shrinkage, Transverse, 3.2mm (0.125in)	1.1 / *	%	-
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	2400 / 1700	MPa	ISO 527-1/-2
Yield stress	62 / 54	MPa	ISO 527-1/-2
Yield strain	4.5 / 18	%	ISO 527-1/-2
Nominal strain at break	17 / >50	%	ISO 527-1/-2
Flexural Modulus	2100 / 1440	MPa	ISO 178
Charpy impact strength			ISO 179/1eU
73°F	N / N	kJ/m <sup>2</sup>	
-22°F	N / 40	kJ/m <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	3.5 / 4	kJ/m <sup>2</sup>	
-22°F	3.5 / 3	kJ/m <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
73°F	4 / 4.5	kJ/m <sup>2</sup>	
-22°F	4.5 / 3	kJ/m <sup>2</sup>	
Hardness, Rockwell, R-scale	114 / 108	-	ISO 2039-2
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	218 / *	°C	ISO 11357-1/-3
Glass transition temperature, 18°F/min	65 / 50	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	62 / *	°C	
65 psi	135 / *	°C	
Vicat softening temperature, 90°F/h, 11 lbf	181 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	110 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	120 / *	E-6/K	
Normal, -40-23°C	90 / *	E-6/K	
Normal, 55-160°C	180 / *	E-6/K	
Parallel, -40-23°C	90 / *	E-6/K	
Parallel, 55-160°C	160 / *	E-6/K	
Thermal conductivity of melt	0.18	W/(m K)	-
Spec. heat capacity of melt	2750	J/(kg K)	-
Eff. thermal diffusivity	7.5E-8	m <sup>2</sup> /s	-

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

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RTI, electrical			UL 746B
30mil	105 / *	°C	
60mil	105 / *	°C	
120mil	105	°C	
RTI, impact			UL 746B
30mil	65	°C	
60mil	65 / *	°C	
120mil	65	°C	
RTI, strength			UL 746B
30mil	65	°C	
60mil	65 / *	°C	
120mil	65	°C	
<b>Flammability</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Burning Behav. at 60mil nom. thickn.	V-2 / *	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Burning Behav. at thickness h	V-2 / *	class	IEC 60695-11-10
Thickness tested	0.85 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Oxygen index	27 / *	%	ISO 4589-1/-2
Flammability, 3.0mm	V-2 / *	-	IEC 60695-11-10
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<100	mm/min	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Volume resistivity	>1E13 / 1E11	Ohm*m	IEC 60093
Electric strength	30 / 30	kV/mm	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	1.3 / *	%	Sim. to ISO 62
Water absorption, 80mil	3 / *	%	Sim. to ISO 62
Density	1060 / -	kg/m <sup>3</sup>	ISO 1183
Density of melt	900	kg/m <sup>3</sup>	-
Water Absorption, Immersion 24h	0.4 / *	%	Sim. to ISO 62
<b>VDA Properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Emission of organic compounds	3.9	µgC/g	VDA 277
<b>Injection</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Drying Recommended	yes	-	-
Drying Temperature	80	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.15	%	-
Min. melt temperature	230	°C	-
Max. melt temperature	290	°C	-
Min. mold temperature	50	°C	-
Max. mold temperature	90	°C	-
<b>Extrusion</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Drying Temperature	75 - 80	°C	-
Drying Time, Dehumidified Dryer	3 - 4	h	-
Processing Moisture Content	≤0.06	%	-
Melt Temperature Optimum	240	°C	-
Melt Temperature Range	235 - 250	°C	-
<b>Characteristics</b>			
Processing	• Injection Molding	• Profile Extrusion	• Other Extrusion
Delivery form	• Pellets		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

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Page: 2 of 7

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### Processing Texts

#### Other extrusion

##### Melt Viscosity

@235°C, 1000s-1 = 70 Pa.s

#### Profile extrusion

##### Melt Viscosity

@235°C, 1000s-1 = 70 Pa.s

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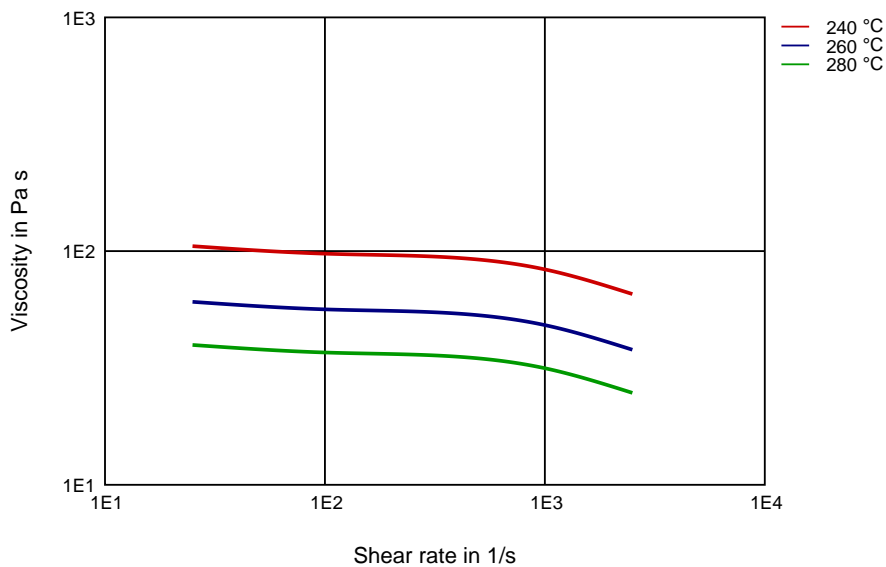


# DuPont™ Zytel® 151 NC010

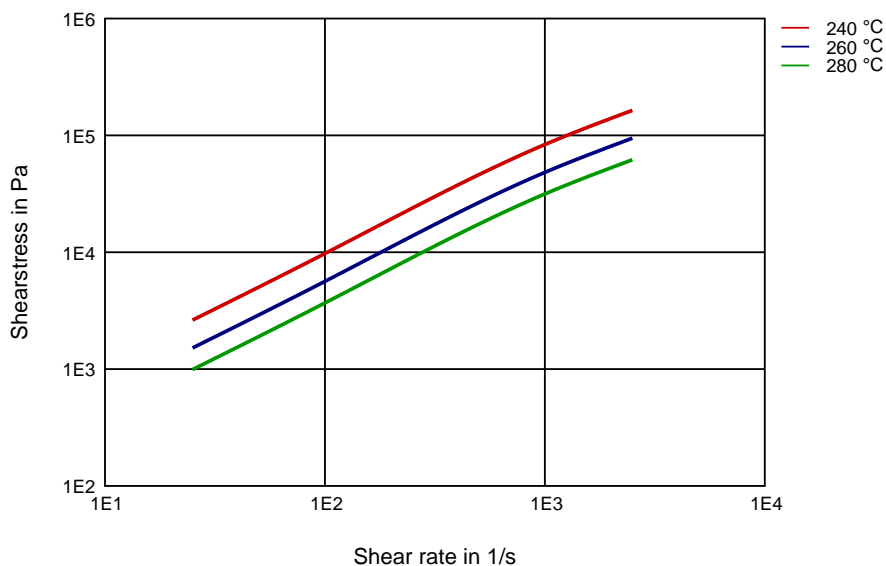
## NYLON RESIN

### Diagrams

#### Viscosity-shear rate



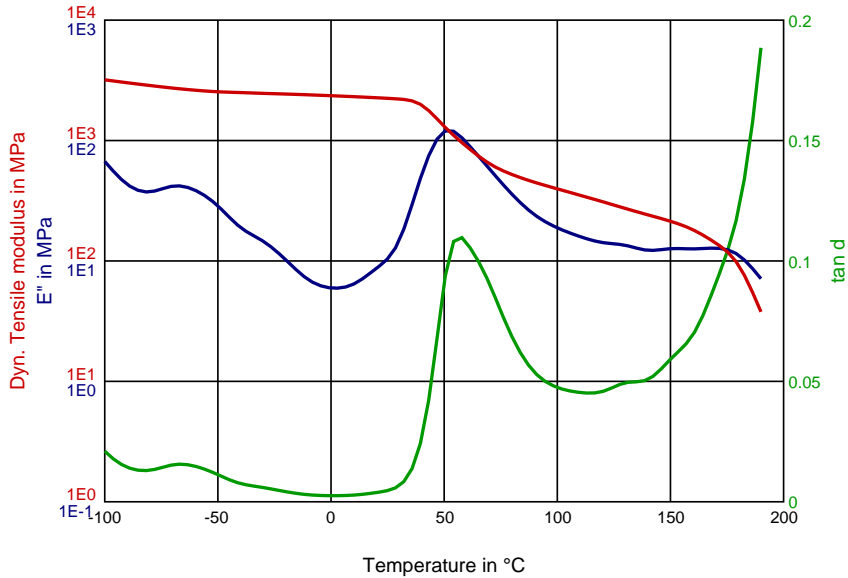
#### Shearstress-shear rate



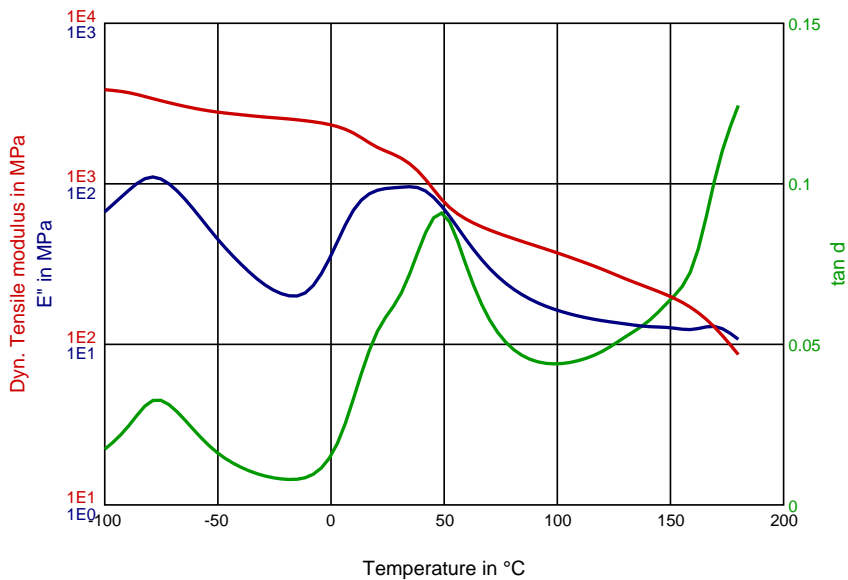
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Dynamic Tensile modulus-temperature (dry)



Dynamic 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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