

DuPont™ Zytel® ST801AHS 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® ST801AHS NC010 is a Super Tough, high performance polyamide 66 resin. It offers outstanding molding performance in injection molding applications.

Product information	Value	Unit	Test Standard
Resin Identification	PA66-HI	-	ISO 1043
Part Marking Code	PA66-HI	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Viscosity number	3320 / *	in ³ /lb	ISO 307, 1157, 1628
Molding shrinkage, parallel	1.8 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577
Postmolding shrinkage, normal, 48h at 175 °F	0.05 / *	%	ISO 294-4
Postmolding shrinkage, parallel, 48h at 175 °F	0.05 / *	%	ISO 294-4
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	290076 / 130534	psi	ISO 527-1/-2
Yield stress	7540 / *	psi	ISO 527-1/-2
Yield strain	4 / *	%	ISO 527-1/-2
Nominal strain at break	50 / *	%	ISO 527-1/-2
Stress at 50% strain	* / 6530	psi	ISO 527-1/-2
Strain at break			ISO 527-1/-2
Strain at break	* / >50	%	
50mm/min	60 / -	%	
Flexural Modulus	276000 / 116000	psi	ISO 178
Flexural Stress at 3.5%	7980 / -	psi	ISO 178
Charpy impact strength, 73 °F	N / N	ftlb/in ²	ISO 179/1eU
Charpy notched impact strength			ISO 179/1eA
73 °F	38.1 / 52.3	ftlb/in ²	
-22 °F	9.51 / 8.09	ftlb/in ²	
Izod notched impact strength			ISO 180/1A
73 °F	38.1 / 45.2	ftlb/in ²	
-22 °F	9.04 / 9.04	ftlb/in ²	
-40 °F	9.04 / 7.61	ftlb/in ²	
Ball indentation hardness, H 358/30	15100 / -	psi	ISO 2039-1
Hardness, Rockwell, R-scale	107 / 69	-	ISO 2039-2
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 / -	°F	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	144 / *	°F	
65 psi	315 / *	°F	
Coeff. of linear therm. expansion, parallel	5.0E-5 / *	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	6.67E-5 / *	in/in/°F	ISO 11359-1/-2

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RTI, electrical			UL 746B
30mil	266	°F	
60mil	266	°F	
120mil	266	°F	
RTI, impact			UL 746B
30mil	149	°F	
60mil	221	°F	
120mil	221	°F	
RTI, strength			UL 746B
30mil	203	°F	
60mil	221 / *	°F	
120mil	230	°F	
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	0.0295 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Glow Wire Flammability Index			IEC 60695-2-12
15mil	1380 / -	°F	
30mil	1380 / -	°F	
40mil	1380 / -	°F	
60mil	1380 / -	°F	
80mil	1380 / -	°F	
120mil	1380 / -	°F	
Glow Wire Ignition Temperature			
15mil	1340 / -	°F	IEC 60695-2-12
30mil	1340 / -	°F	IEC 60695-2-13
40mil	1340 / -	°F	IEC 60695-2-13
60mil	1340 / -	°F	IEC 60695-2-13
80mil	1340 / -	°F	IEC 60695-2-13
120mil	1340 / -	°F	IEC 60695-2-13
Glow Wire Temperature, No Flame			IEC 60335-1
30mil	1290 / -	°F	
40mil	1290 / -	°F	
60mil	1290 / -	°F	
80mil	1290 / -	°F	
120mil	1290 / -	°F	
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	0.945	in/min	ISO 3795 (FMVSS 302)
Electrical properties	dry / cond	Unit	Test Standard
Relative permittivity			IEC 62631-2-1
100Hz	3.5 / 6.2	-	
1MHz	3.3 / 3.6	-	
Dissipation factor			IEC 62631-2-1
100Hz	50 / 1770	E-4	
1MHz	110 / 400	E-4	
Volume resistivity	>1E13 / 2.7E10	Ohm*m	IEC 62631-3-1
Surface resistivity	* / 5E12	Ohm	IEC 62631-3-2
Electric strength	610 / 610	kV/in	IEC 60243-1
Comparative tracking index	600 / -	-	IEC 60112
Electric Strength, Short Time, 2mm	610 / 610	V/mil	IEC 60243-1
Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 80mil	2 / *	%	Sim. to ISO 62
Water absorption, 80mil	6.5 / *	%	Sim. to ISO 62

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Density	1.08 / -	g/cm ³	ISO 1183
Water Absorption, Immersion 24h 1: 3mm wall thickness	1.1 ^[1] / *	%	Sim. to ISO 62
Film Properties	dry / cond	Unit	Test Standard
Strain at yield, parallel	4.4 / *	%	ISO 527-3
VDA Properties	dry / cond	Unit	Test Standard
Emission of organic compounds	13	µgC/g	VDA 277
Odor test	5	class	VDA 270
Fogging, G-value (condensate)	0.1 / *	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	554	°F	-
Min. melt temperature	536	°F	-
Max. melt temperature	572	°F	-
Max. screw tangential speed	0.3 / *	m/s	-
Mold Temperature Optimum	176	°F	-
Min. mold temperature	122	°F	-
Max. mold temperature	212	°F	-
Hold pressure range	7250 - 14500	psi	-
Hold pressure time	0.102	s/mil	-
Ejection temperature	374	°F	-
Characteristics			
Processing	• Injection Molding		
Delivery form	• Pellets		
Additives	• 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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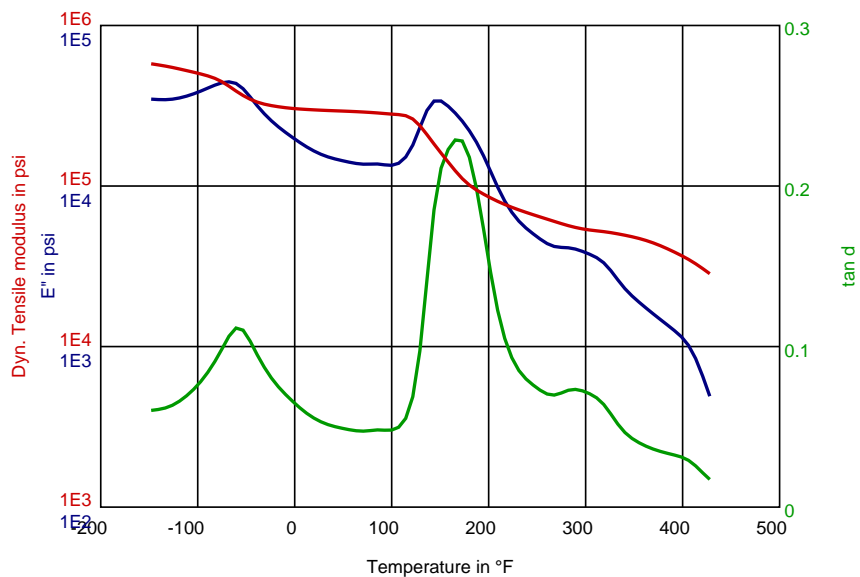


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Diagrams

Dynamic Tensile modulus-temperature (dry)



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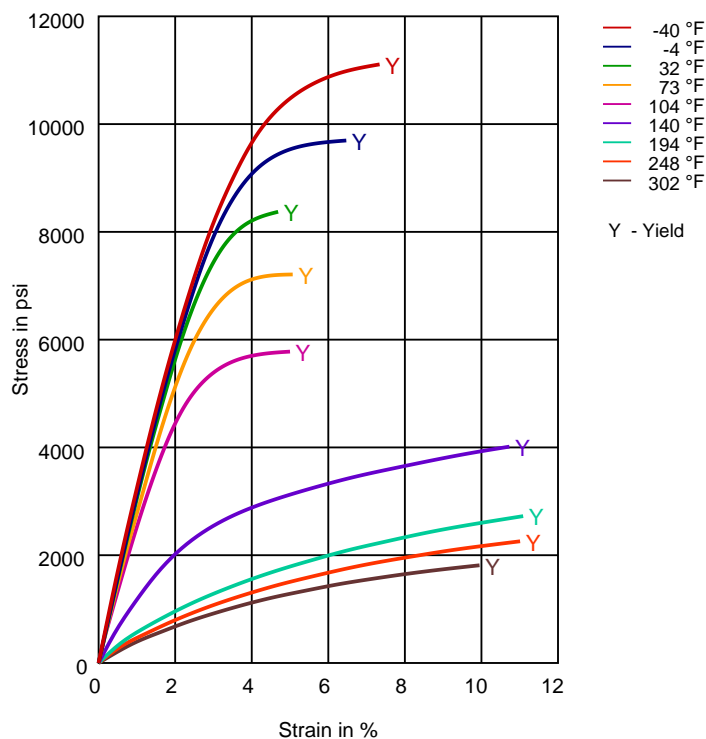


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Stress-strain (dry)



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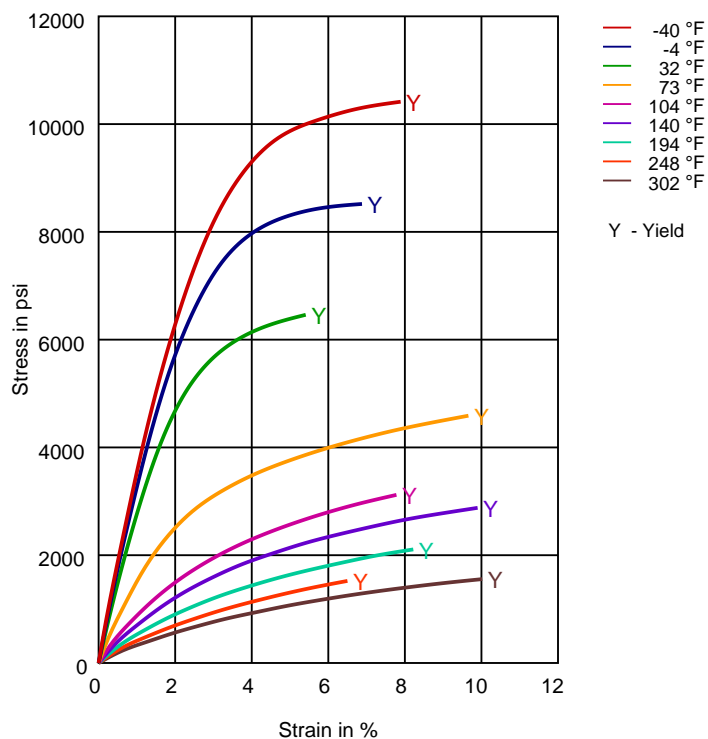
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Stress-strain (cond.)



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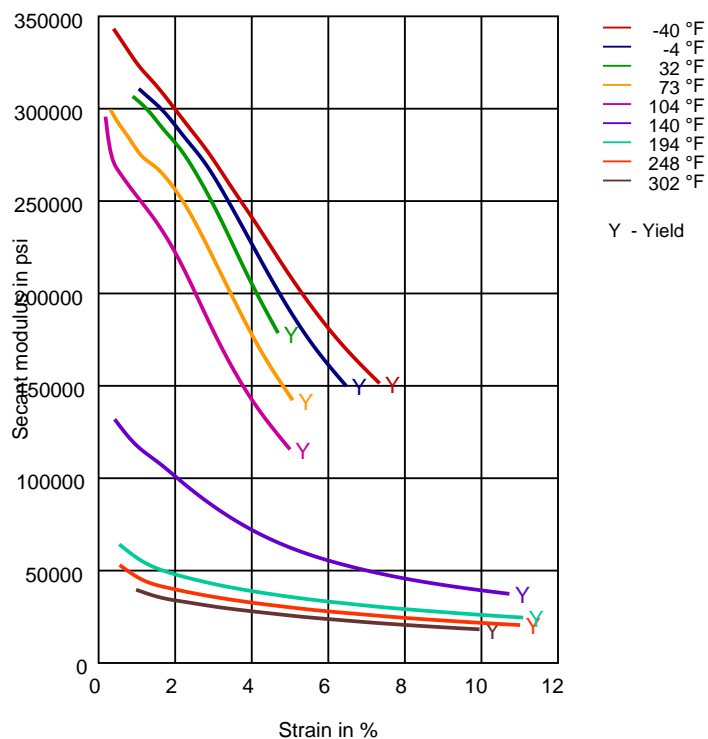
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Secant modulus-strain (dry)



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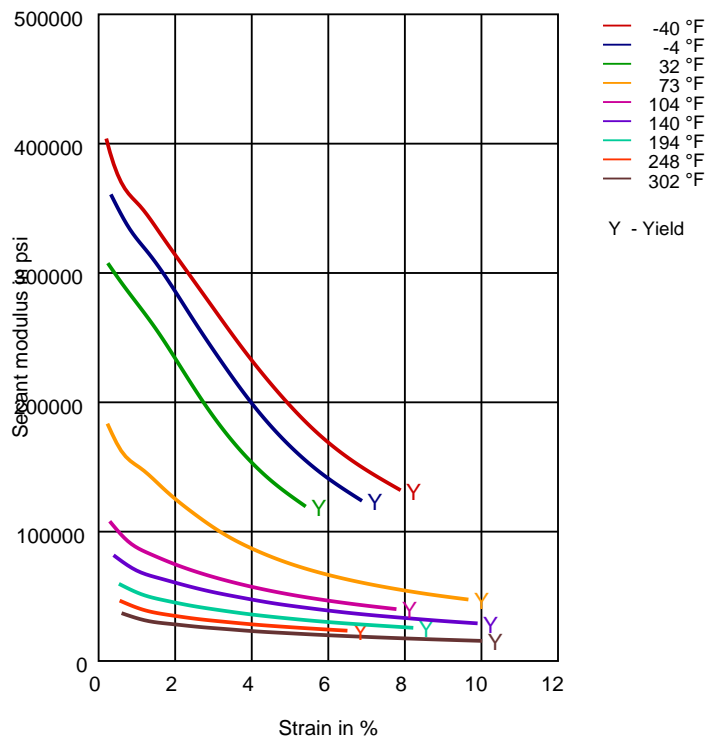
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Secant modulus-strain (cond.)



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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)
- ✓ 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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- ✓ 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)
- ✗ 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 (Hytrek® 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.

The information set forth herein is furnished free of charge and is based on technical data that DuPont believes to be reliable and falls within the normal range of properties. It is intended for use by persons having technical skill, at their own discretion and risk. This data should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents. Caution: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, discuss with your DuPont customer representative and read Medical Caution H-50103-5.

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