DuPont™ Zytel® ST7301 NC010

NYLON RESIN

Product Information

ISO 1043: PA6-HI

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® ST7301 NC010 is a Super Tough, heat stabilized, lubricated polyamide 6 resin for injection molding and extrusion. It offers outstanding impact resistance over a wide temperature and humidity range and high productivity.

General information	Value	Unit	Test Standard	
Resin Identification	PA6-HI	-	ISO 1043	
Part Marking Code	PA6-HI	-	ISO 11469	
Rheological properties	**dry / cond**	**Unit**	**Test Standard**	
Viscosity number	4430[1] / *	in³/lb	ISO 307, 1157, 1628	
Molding shrinkage, parallel	1.0 / -	%	ISO 294-4, 2577	
Molding shrinkage, normal	1.0 / -	%	ISO 294-4, 2577	
Postmolding shrinkage, normal, 48h at 175°F	0.1 / *	%	ISO 294-4	
Postmolding shrinkage, parallel, 48h at 175°F	0.1 / *	%	ISO 294-4	
1: Sulfuric acid 96%				
Mechanical properties	**dry / cond**	**Unit**	**Test Standard**	
Tensile Modulus	261068 / 79770.9	psi	ISO 527-1/-2	
Yield stress	6960 / 4210	psi	ISO 527-1/-2	
Yield strain	4 / 30	%	ISO 527-1/-2	
Nominal strain at break	>50 / >50	%	ISO 527-1/-2	
Flexural Modulus	247000 / 79800	psi	ISO 178	
Flexural Stress at 3.5%	7690 / 4640	psi	ISO 178	
Tensile creep modulus, 1000h	* / 46400	psi	ISO 899-1	
Charpy impact strength			ISO 179/1eU	
73°F	N / N	ftlb/in²		
-22°F	N / N	ftlb/in²		
Charpy notched impact strength			ISO 179/1eA	
73°F	38.1 / 57.1	ftlb/in²		
-22°F	8.09 / 8.56	ftlb/in²		
-40°F	8.56 / 8.09	ftlb/in²		
Izod notched impact strength			ISO 180/1A	
73°F	28.5 / 45.2	ftlb/in²		
-22°F	6.66 / 7.14	ftlb/in²		
-40°F	7.14 / 6.18	ftlb/in²		
Ball indentation hardness, H 358/30	13800 / -	psi	ISO 2039-1	DS
DS: Derived from similar grade				
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	124 / *	°F		
65 psi	203 / *	°F		

To find out more, visit DuPont Performance Polymers or contact nearest DuPont location.

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Thermal conductivity of melt	0.15	W/(m K)	-
Spec. heat capacity of melt	2600	J/(kg K)	-
Flammability	**Value**	**Unit**	**Test Standard**
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<100	in/min	ISO 3795 (FMVSS 302)
Other properties	**dry / cond**	**Unit**	**Test Standard**
Humidity absorption, 80mil	2.7 / *	%	Sim. to ISO 62
Density	1.06 / -	g/cm³	ISO 1183
Density of melt	59.9	lb/ft³	-
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	518	°F	-
Min. melt temperature	500	°F	-
Max. melt temperature	536	°F	-
Max. screw tangential speed	0.3 / *	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 • Film Extrusion • Profile Extrusion	• Sheet Extrusion • Other Extrusion • Coating	• Casting
Delivery form	• Pellets		
Additives	• Lubricants	• 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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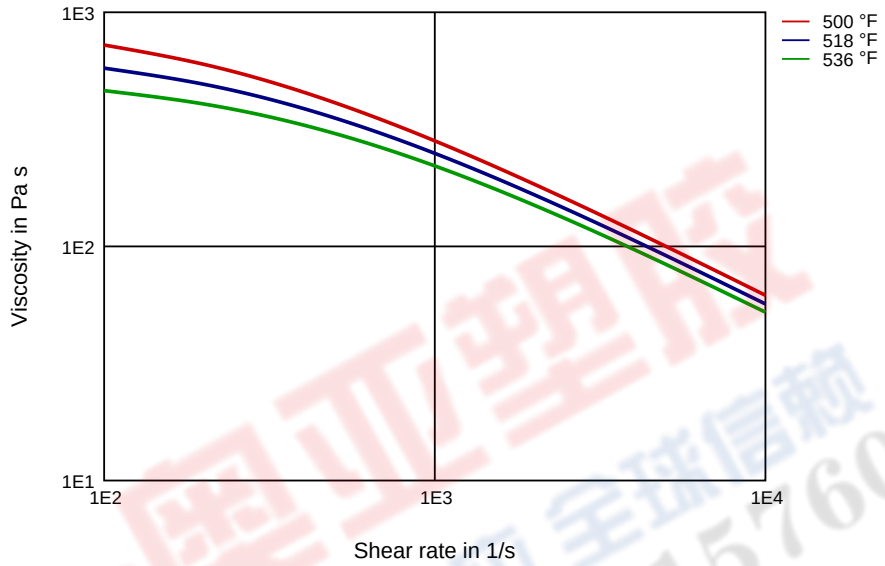
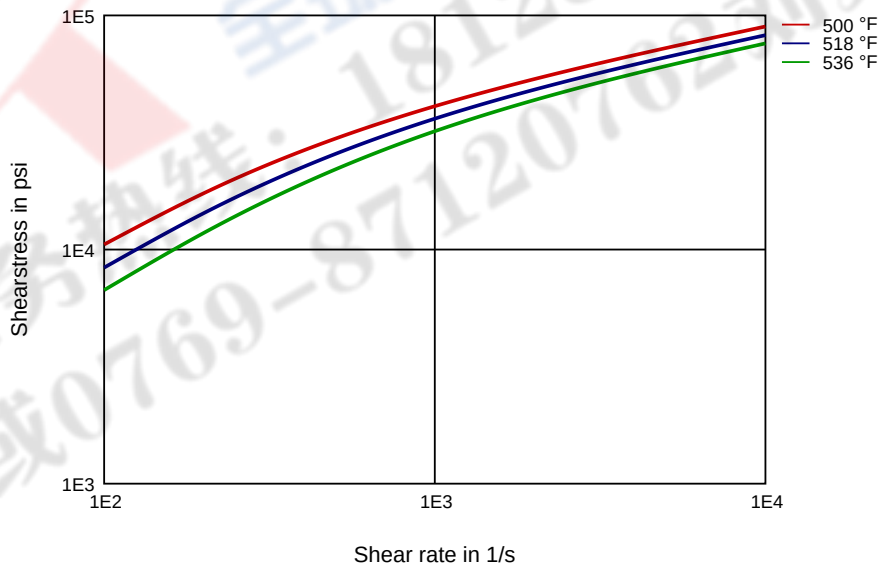
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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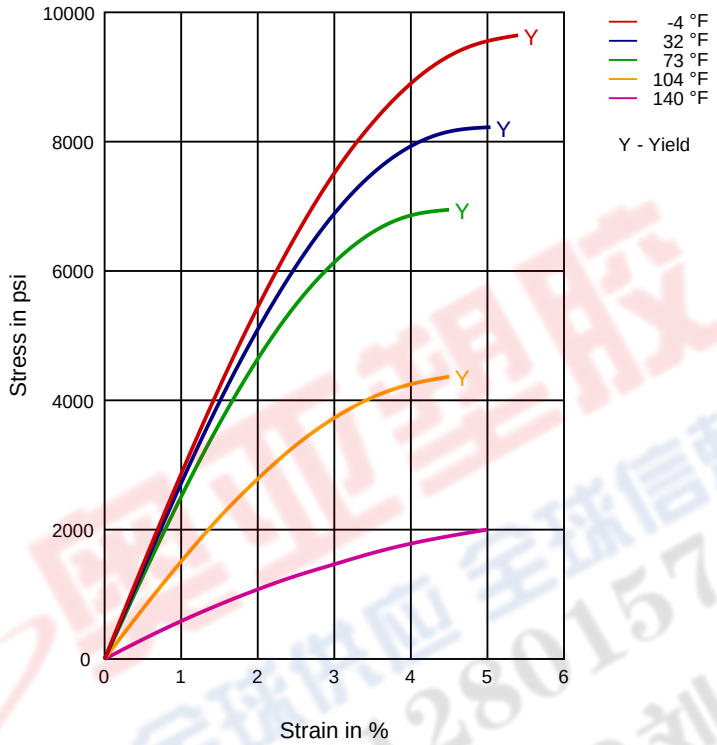
Stress-strain (dry)



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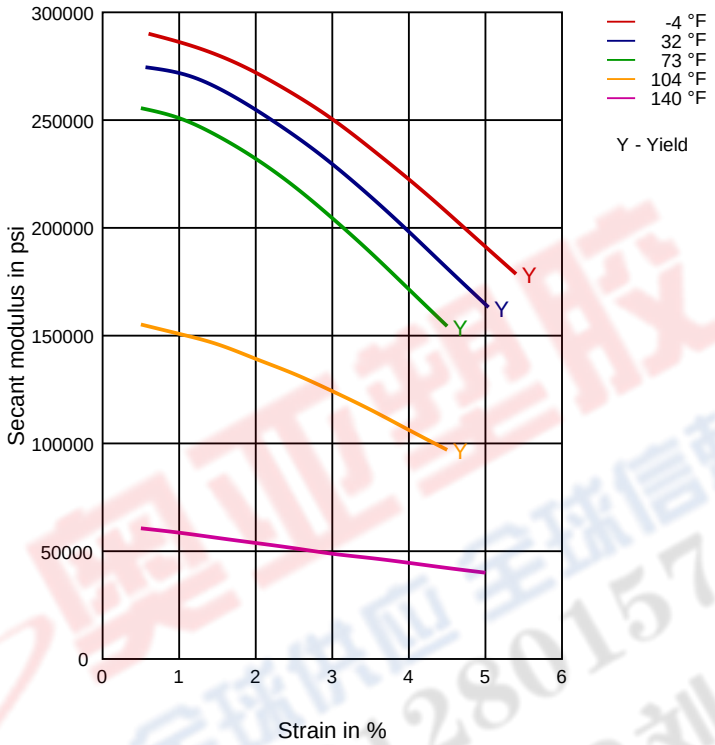
Secant modulus-strain (dry)



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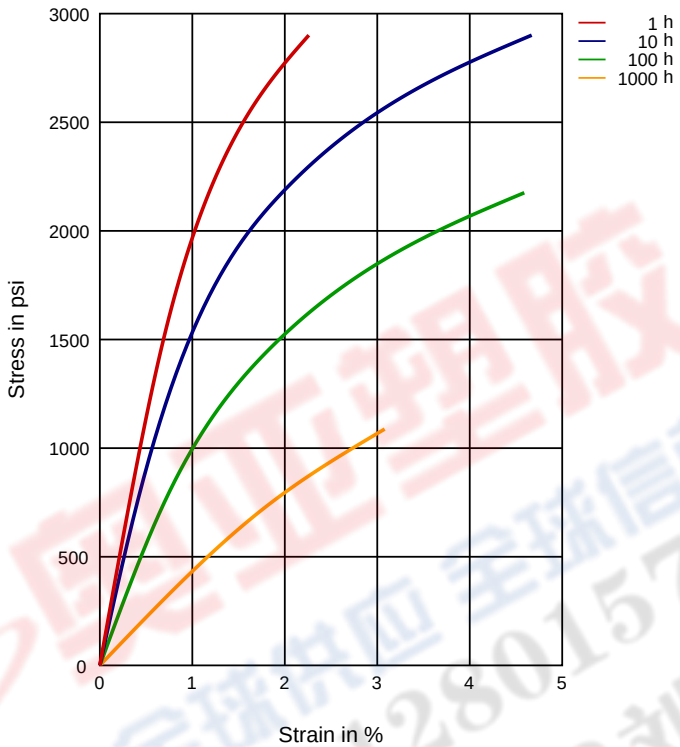
Stress-strain (isochronous) 73°F(cond.)



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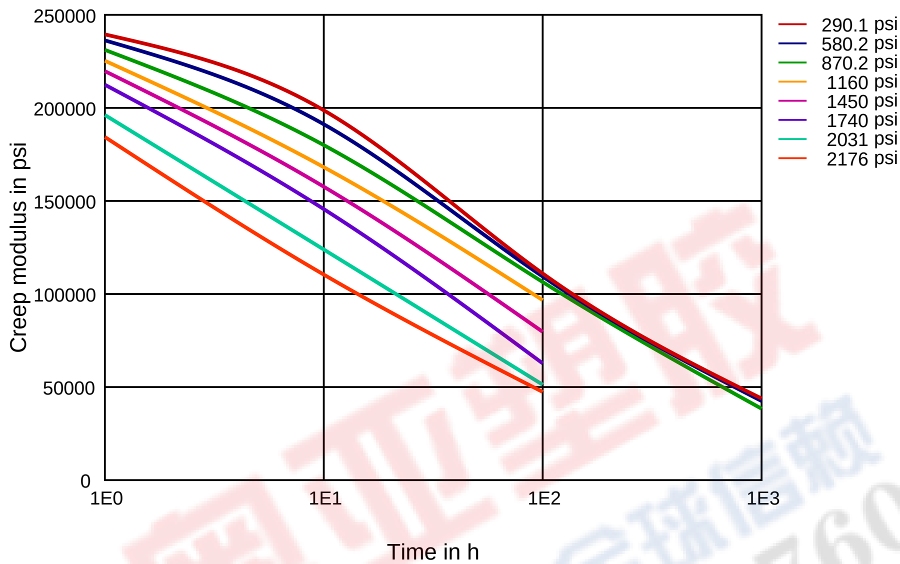
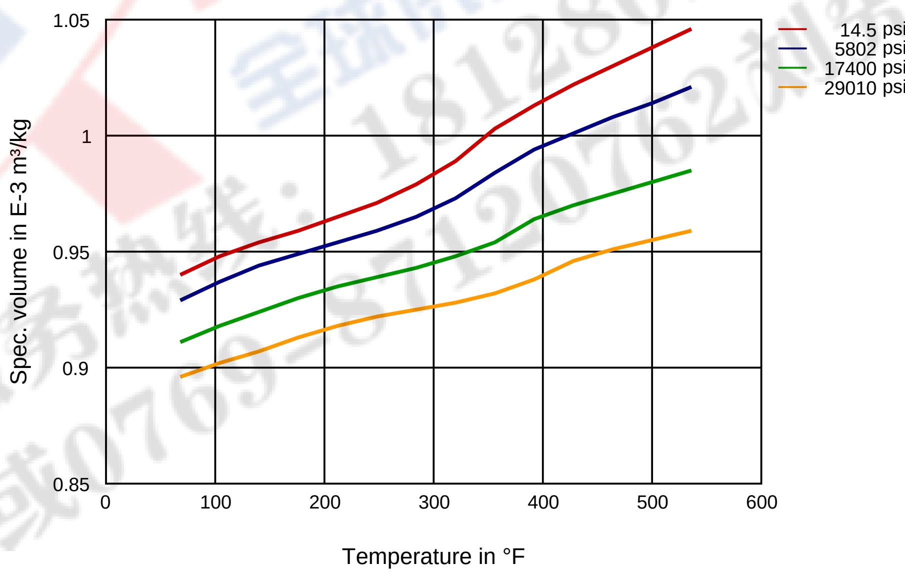
Creep modulus-time 73°F(cond.)



Specific volume-temperature (pvT)



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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.

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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