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	160[1] / *	cm³/g	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	1800 / 550	MPa	ISO 527-1/-2	
Yield stress	48 / 29	MPa	ISO 527-1/-2	
Yield strain	4 / 30	%	ISO 527-1/-2	
Nominal strain at break	>50 / >50	%	ISO 527-1/-2	
Flexural Modulus	1700 / 550	MPa	ISO 178	
Flexural Stress at 3.5%	53 / 32	MPa	ISO 178	
Tensile creep modulus, 1000h	* / 320	MPa	ISO 899-1	
Charpy impact strength			ISO 179/1eU	
73°F	N / N	kJ/m²		
-22°F	N / N	kJ/m²		
Charpy notched impact strength			ISO 179/1eA	
73°F	80 / 120	kJ/m²		
-22°F	17 / 18	kJ/m²		
-40°F	18 / 17	kJ/m²		
Izod notched impact strength			ISO 180/1A	
73°F	60 / 95	kJ/m²		
-22°F	14 / 15	kJ/m²		
-40°F	15 / 13	kJ/m²		
Ball indentation hardness, H 358/30	95 / -	MPa	ISO 2039-1	DS
DS: Derived from similar grade				
Thermal properties	**dry / cond**	**Unit**	**Test Standard**	
Melting temperature, 18°F/min	221 / *	°C	ISO 11357-1/-3	
Temp. of deflection under load			ISO 75-1/-2	
260 psi	51 / *	°C		
65 psi	95 / *	°C		

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

North America **Asia Pacific** **Europe/Middle East/Africa**

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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	mm/min	ISO 3795 (FMVSS 302)
Other properties	**dry / cond**	**Unit**	**Test Standard**
Humidity absorption, 80mil	2.7 / *	%	Sim. to ISO 62
Density	1060 / -	kg/m³	ISO 1183
Density of melt	960	kg/m³	-
Injection	**dry / cond**	**Unit**	**Test Standard**
Drying Recommended	yes	-	-
Drying Temperature	≥80	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	270	°C	-
Min. melt temperature	260	°C	-
Max. melt temperature	280	°C	-
Max. screw tangential speed	0.3 / *	m/s	-
Mold Temperature Optimum	70	°C	-
Min. mold temperature	50	°C	-
Max. mold temperature	90	°C	-
Hold pressure range	50 - 100	MPa	-
Hold pressure time	4	s/mm	-

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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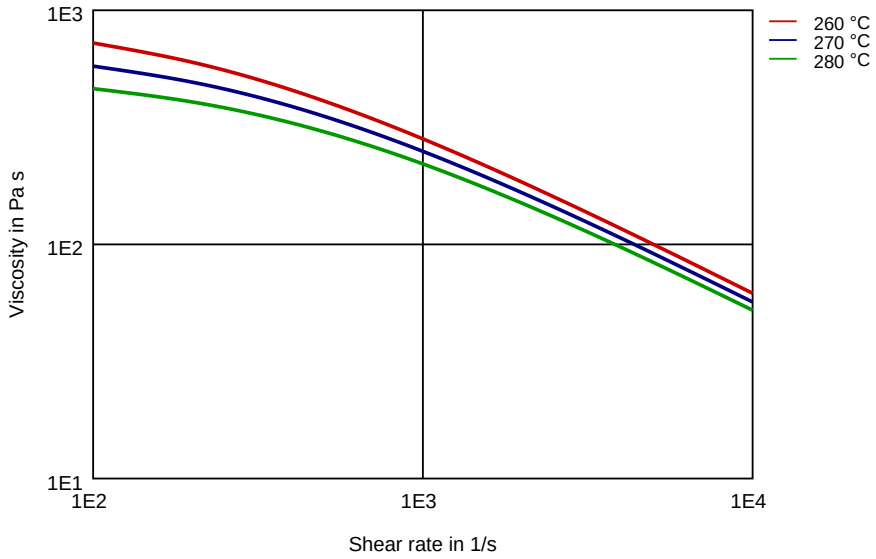
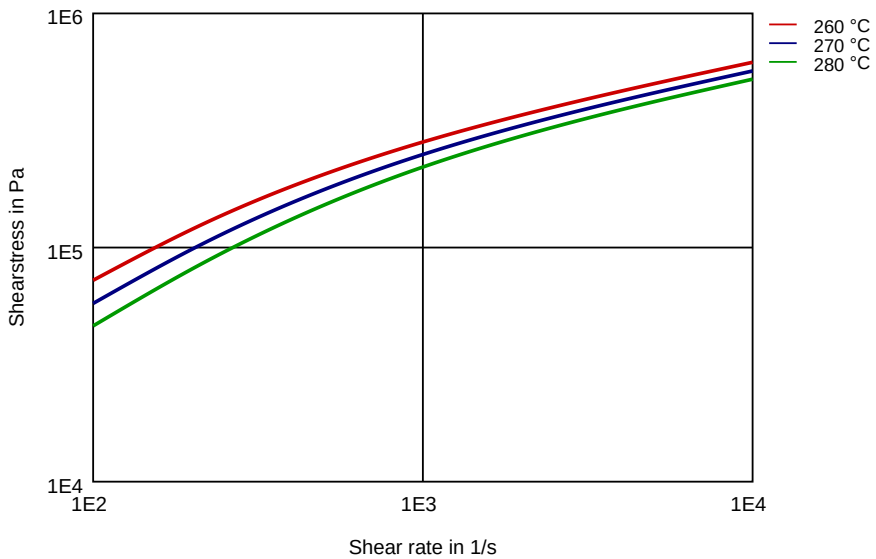
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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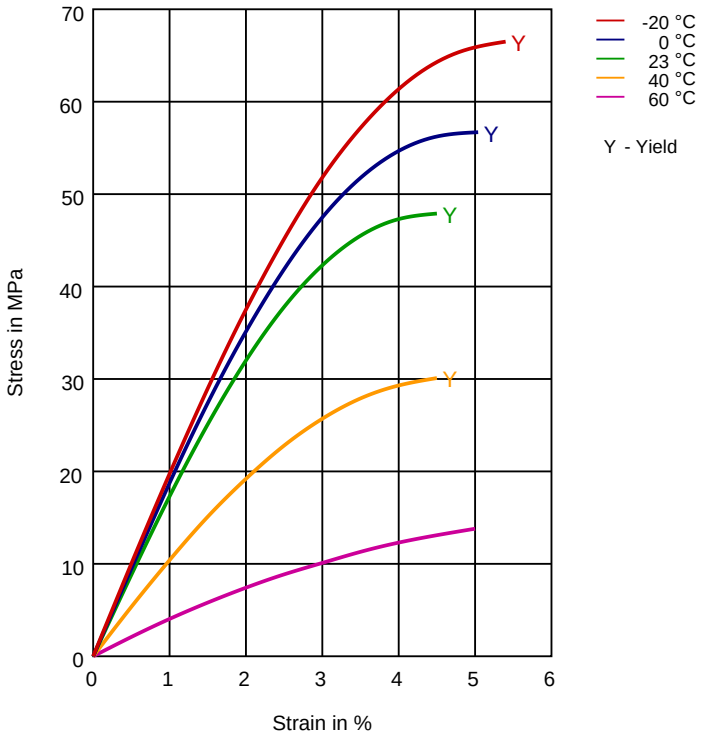
Stress-strain (dry)



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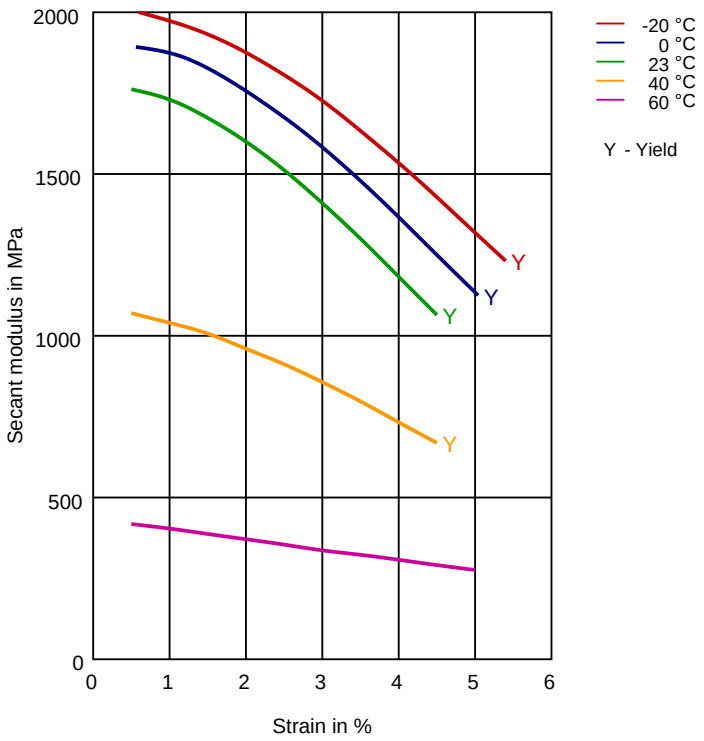
Secant modulus-strain (dry)



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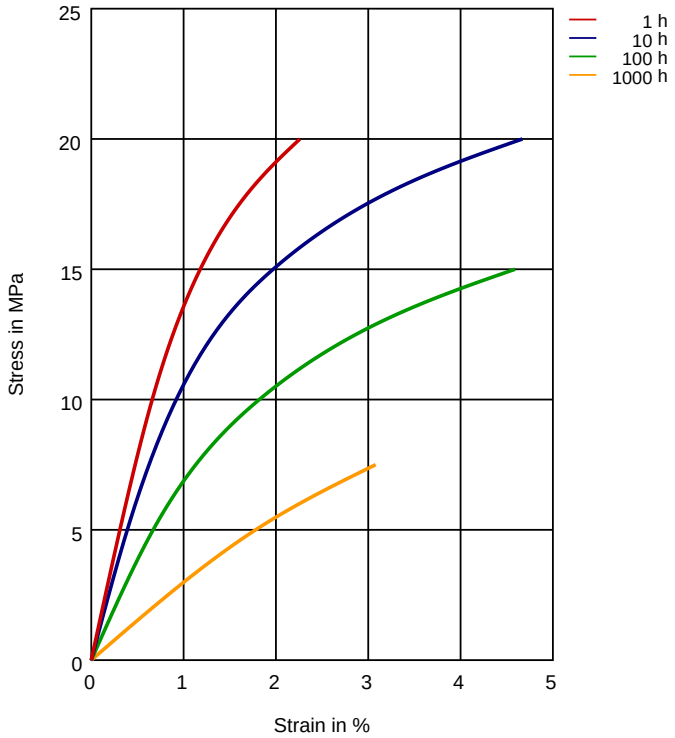
Stress-strain (isochronous) 23°C(cond.)



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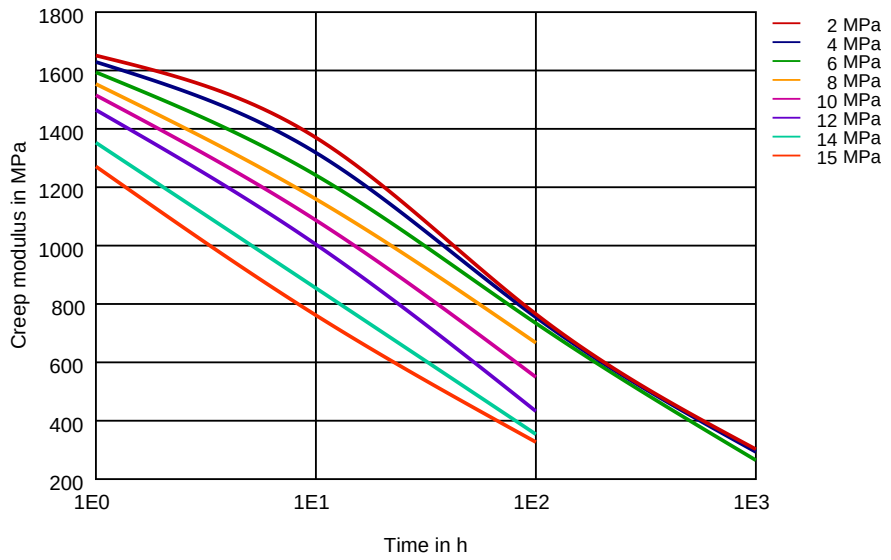
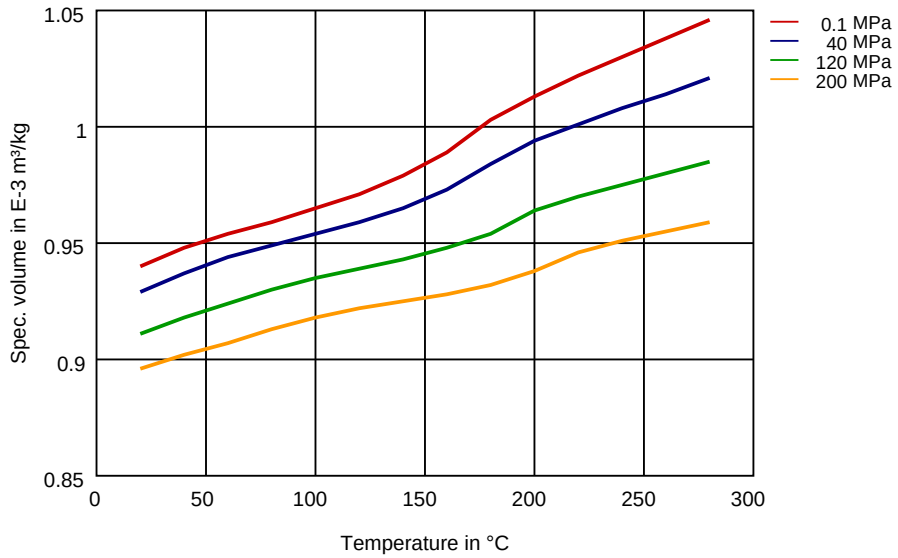
Creep modulus-time 23°C(cond.)



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.

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