

DuPont™ Zytel® 103FHS 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® 103FHS NC010 is a heat stabilised, internally lubricated polyamide 66 resin for injection moulding. It was developed for fast cycles and high productivity.

General information	Value	Unit	Test Standard
Resin Identification	PA66	-	-
Part Marking Code	>PA66<	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Viscosity number	145 / *	cm ³ /g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	1.4 / *	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.3 / *	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	3100 / 1400	MPa	ISO 527-1/-2
Yield stress	85 / 55	MPa	ISO 527-1/-2
Yield strain	4.5 / 25	%	ISO 527-1/-2
Nominal strain at break	20 / >50	%	ISO 527-1/-2
Flexural Modulus	2800 / 1300	MPa	ISO 178
Charpy impact strength			ISO 179/1eU
23 °C	N / N	kJ/m ²	
-30 °C	350 / N	kJ/m ²	
Charpy notched impact strength			ISO 179/1eA
23 °C	5.5 / 11	kJ/m ²	
-30 °C	4.5 / 3	kJ/m ²	
Izod notched impact strength			ISO 180/1A
23 °C	5.5 / 11	kJ/m ²	
-30 °C	6 / 5	kJ/m ²	
-40 °C	5.5 / -	kJ/m ²	
Izod impact strength			ISO 180/1U
23 °C	300 / N	kJ/m ²	
-30 °C	300 / N	kJ/m ²	
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 10 °C/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	60 / -	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	70 / *	°C	
0.45 MPa	200 / *	°C	
Coeff. of linear therm. expansion, parallel	100 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	110 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K)	-
Spec. heat capacity of melt	2790	J/(kg K)	-
Eff. thermal diffusivity	5E-8	m ² /s	-
RTI, electrical			UL 746B
0.75 mm	140 / *	°C	
1.5mm	140 / *	°C	

Revised: 2014-08-12

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RTI, impact			UL 746B
0.75 mm	95	°C	
1.5mm	110 / *	°C	
RTI, strength			UL 746B
0.75 mm	115	°C	
1.5mm	125 / *	°C	
Flammability	dry / cond	Unit	Test Standard
Burning Behav. at 1.5mm nom. thckn.	V-2 / *	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	IEC 60695-11-10
UL recognition	UL / *	-	-
Burning Behav. at thickness h	V-2 / *	class	IEC 60695-11-10
Thickness tested	0.71 / *	mm	IEC 60695-11-10
Oxygen index	28 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index			IEC 60695-2-1/2
0.75mm	850 / -	°C	
1.5mm	960 / -	°C	
3mm	960 / -	°C	
Glow Wire Ignition Temperature			IEC 60695-2-1/3
0.75mm	725 / -	°C	
1.5mm	725 / -	°C	
3mm	725 / -	°C	
Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity	1E12 / 1E9	Ohm*m	IEC 60093
Comparative tracking index			
Comparative tracking index	600 / -	-	IEC 60112
3.0mm	0 / -	PLC	UL 746A
Dielectric Constant			ASTM D 150
1 MHz	3.2 / -	-	
100 Hz	3.4 / -	-	
1000 Hz	3.4 / -	-	
Dissipation Factor			ASTM D 150
1 MHz	0.02 / -	E-4	
100 Hz	0.01 / -	E-4	
1000 Hz	0.01 / -	E-4	
Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 2mm	2.6 / *	%	Sim. to ISO 62
Water absorption, 2mm	8.5 / *	%	Sim. to ISO 62
Density	1140 / -	kg/m ³	ISO 1183
Density of melt	1010	kg/m ³	-
Film Properties	dry / cond	Unit	Test Standard
Strain at yield, parallel	4.5 / *	%	ISO 527-3

Characteristics

Processing	• Injection Moulding
Delivery form	• Pellets
Additives	• Lubricants • Release agent
Special characteristics	• Heat stabilised or stable to heat
Regional Availability	• North America • Asia Pacific • Near East/Africa • Europe • South and Central America • Global

Processing Texts

Injection molding

PREPROCESSING

Drying recommended = Yes, if moisture content of resin exceeds recommended level

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Drying temperature = 80°C

Drying time, dehumidified dryer = 2-4 h

Processing moisture content = <0.2 %

PROCESSING

Melt temperature optimum = 290°C

Melt temperature range = 280-300°C

Mould temperature optimum = 70°C

Mould temperature range = 50-90°C

Maximum Screw tangential Speed : 0.4 m/s

Flow front speed : 300 mm/s

Hold pressure optimum : 85 MPa

Hold pressure range : 50-100 MPa

Back pressure : low

Hold pressure time : 4 s/mm

Maximum hold-up time : 15 min

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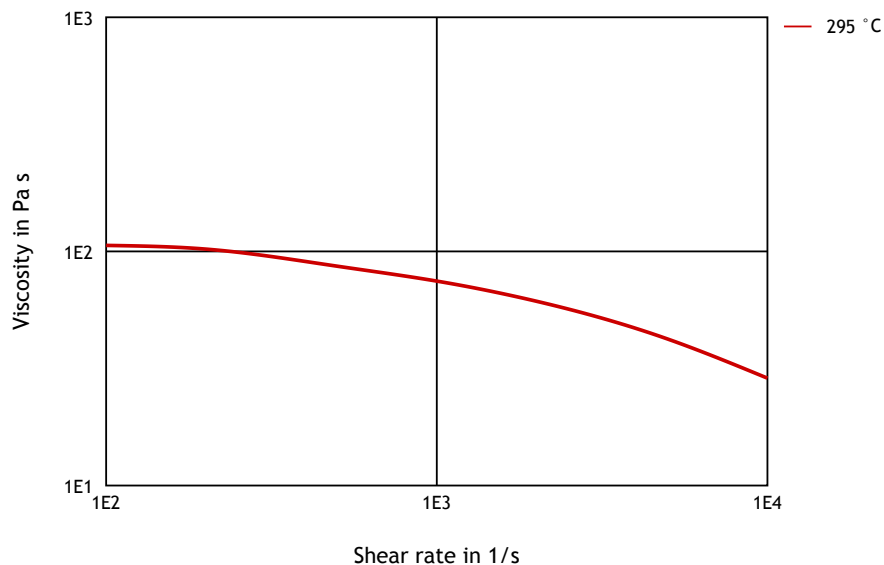


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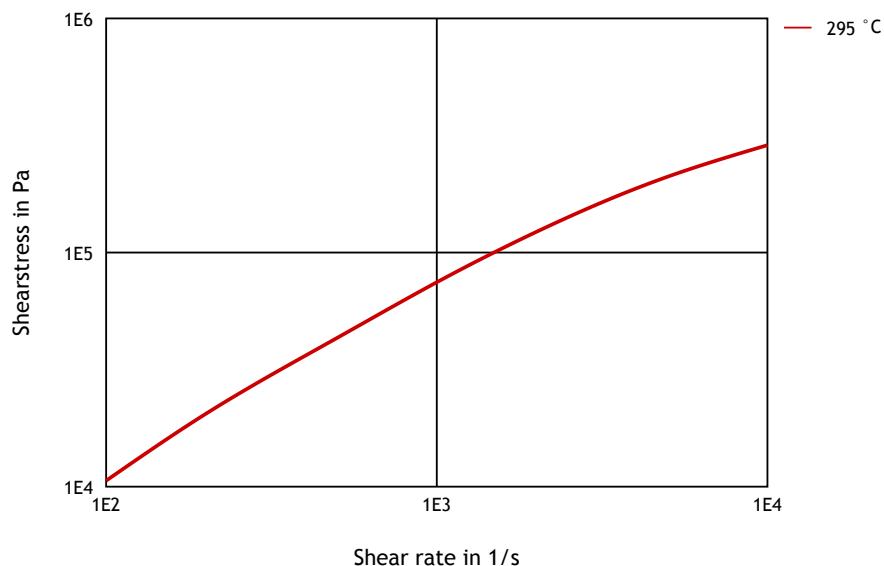
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Diagrams

Viscosity-shear rate



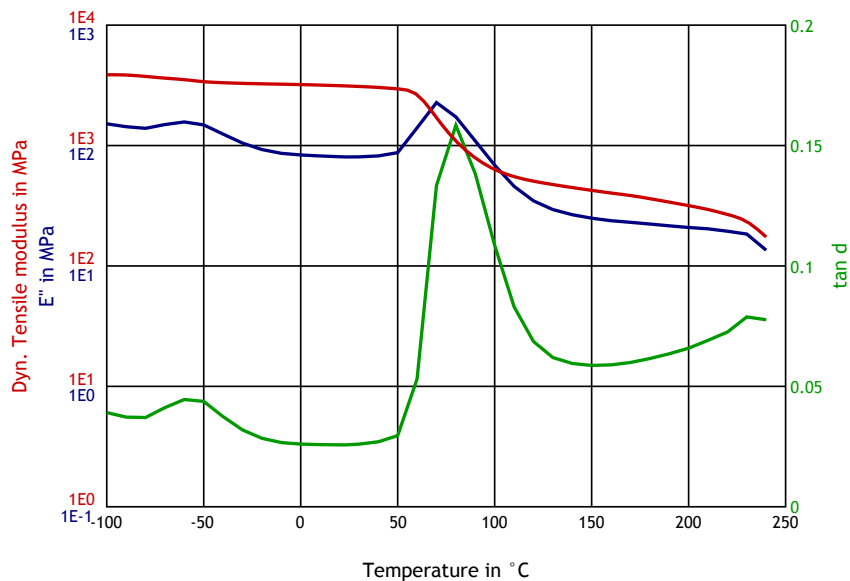
Shearstress-shear rate



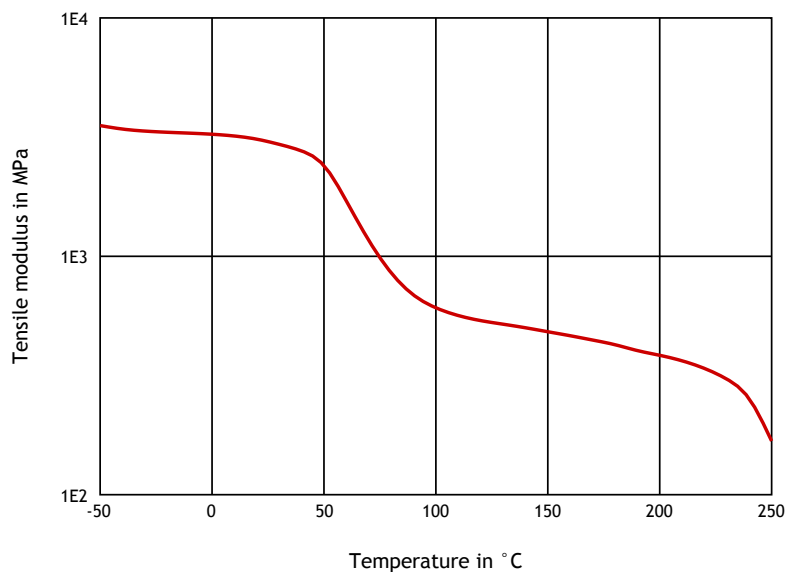
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Dynamic Tensile modulus-temperature (dry)



Tensile modulus-temperature (dry)



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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 4.0mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2.0mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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