



# Zytel® 73G15L NC010

## NYLON RESIN

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® 73G15L NC010 is a 15% glass fiber reinforced polyamide 6 resin for injection molding.

### Product information

Resin Identification	PA6-GF15	ISO 1043
Part Marking Code	>PA6-GF15<	ISO 11469
ISO designation	ISO 16396-PA6,GF15,M1GNR,S14-060	

### Rheological properties

	dry/cond.		
Viscosity number	139/*	cm <sup>3</sup> /g	ISO 307, 1157, 1628
Molding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Molding shrinkage, normal	0.8/-	%	ISO 294-4, 2577

### Typical mechanical properties

	dry/cond.		
Tensile Modulus	6000/3500	MPa	ISO 527-1/-2
Stress at break	140/70	MPa	ISO 527-1/-2
Strain at break	4/10	%	ISO 527-1/-2
Flexural Modulus	5100/3100 <sup>DS</sup>	MPa	ISO 178
Flexural Strength	190/90 <sup>DS</sup>	MPa	ISO 178
Charpy impact strength, 73°F	50/95	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -22°F	45/54	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 73°F	7/15	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -22°F	6/14	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -40°F	6/-	kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 73°F	6/12	kJ/m <sup>2</sup>	ISO 180/1A
Izod notched impact strength, -22°F	5/-	kJ/m <sup>2</sup>	ISO 180/1A
Izod notched impact strength, -40°F	5/-	kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 73°F	45/-	kJ/m <sup>2</sup>	ISO 180/1U
Izod impact strength, -40°F	40/-	kJ/m <sup>2</sup>	ISO 180/1U
Ball indentation hardness, H 961/30	210/123	MPa	ISO 2039-1



# Zytel® 73G15L NC010

## NYLON RESIN

Poisson's ratio 0.35/0.37 -  
 DS: Derived from similar grade

### Thermal properties

	dry/cond.		
Melting temperature, 18°F/min	221/*	°C	ISO 11357-1/-3
Temp. of deflection under load, 260 psi	200/*	°C	ISO 75-1/-2
Temp. of deflection under load, 65 psi	220/*	°C	ISO 75-1/-2
Vicat softening temperature, 90°F/h, 11 lbf	215/*	°C	ISO 306
CLTE, Parallel, -40-23°C	34/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	37/*	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 55-160°C	15/*	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	80/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	109/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal, 55-160°C	100/*	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.19	W/(m K)	
Spec. heat capacity of melt	2470	J/(kg K)	
RTI, electrical, 60mil	65	°C	UL 746B
RTI, impact, 60mil	65	°C	UL 746B
RTI, strength, 60mil	65/*	°C	UL 746B

### Flammability

	dry/cond.		
Burning Behav. at 60mil nom. thickn.	HB/*	class	IEC 60695-11-10
Thickness tested	1.5/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Burning Behav. at thickness h	HB/*	class	IEC 60695-11-10
Thickness tested	1.5/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Oxygen index	21/*	%	ISO 4589-1/-2
Glow Wire Flammability Index, 40mil	725/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 80mil	725/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 120mil	725/-	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 40mil	725/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 80mil	725/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 120mil	725/-	°C	IEC 60695-2-13
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	25 <sup>DS</sup>	mm/min	ISO 3795 (FMVSS 302)

DS: Derived from similar grade

### Other properties

	dry/cond.		
Humidity absorption, 80mil	2.5/*	%	Sim. to ISO 62
Water absorption, 80mil	7.6/*	%	Sim. to ISO 62
Density	1230/-	kg/m <sup>3</sup>	ISO 1183
Density of melt	1070	kg/m <sup>3</sup>	



# Zytel® 73G15L NC010

## NYLON RESIN

### VDA Properties

Odor test	dry/cond.		
Fogging, G-value (condensate)	4 <sup>DS</sup>	class	VDA 270
DS: Derived from similar grade	0/*	mg	ISO 6452

### Injection

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	0.2 m/s
Mold Temperature Optimum	100 °C
Min. mold temperature	70 °C
Max. mold temperature	120 °C
Hold pressure range	50 - 100 MPa
Hold pressure time	3 s/mm

### Characteristics

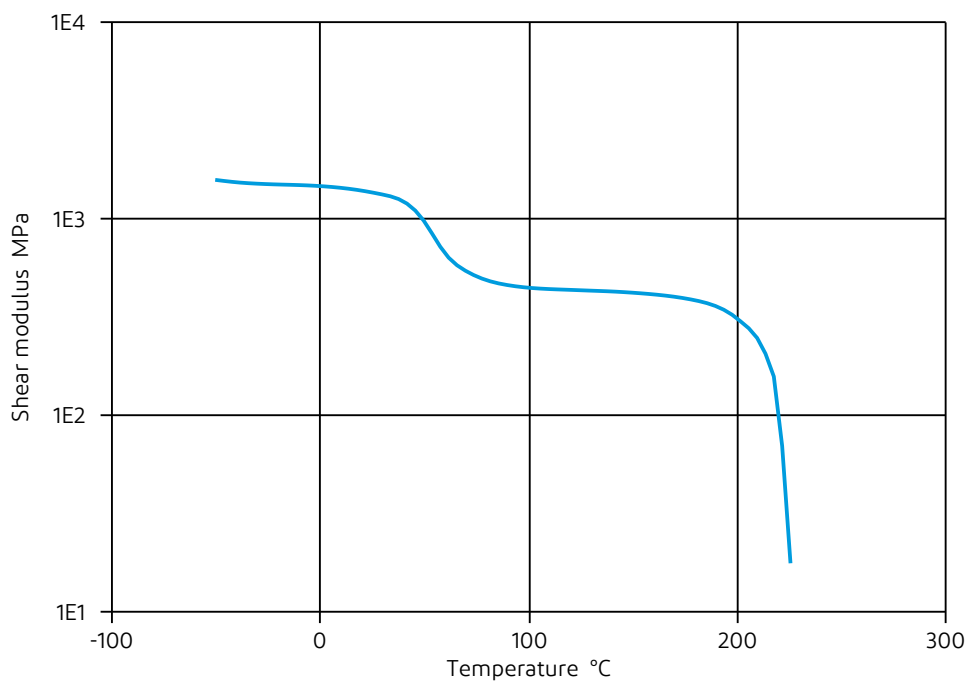
Additives	Release agent
-----------	---------------



# Zytel® 73G15L NC010

NYLON RESIN

Dynamic Shear modulus-temperature (dry)

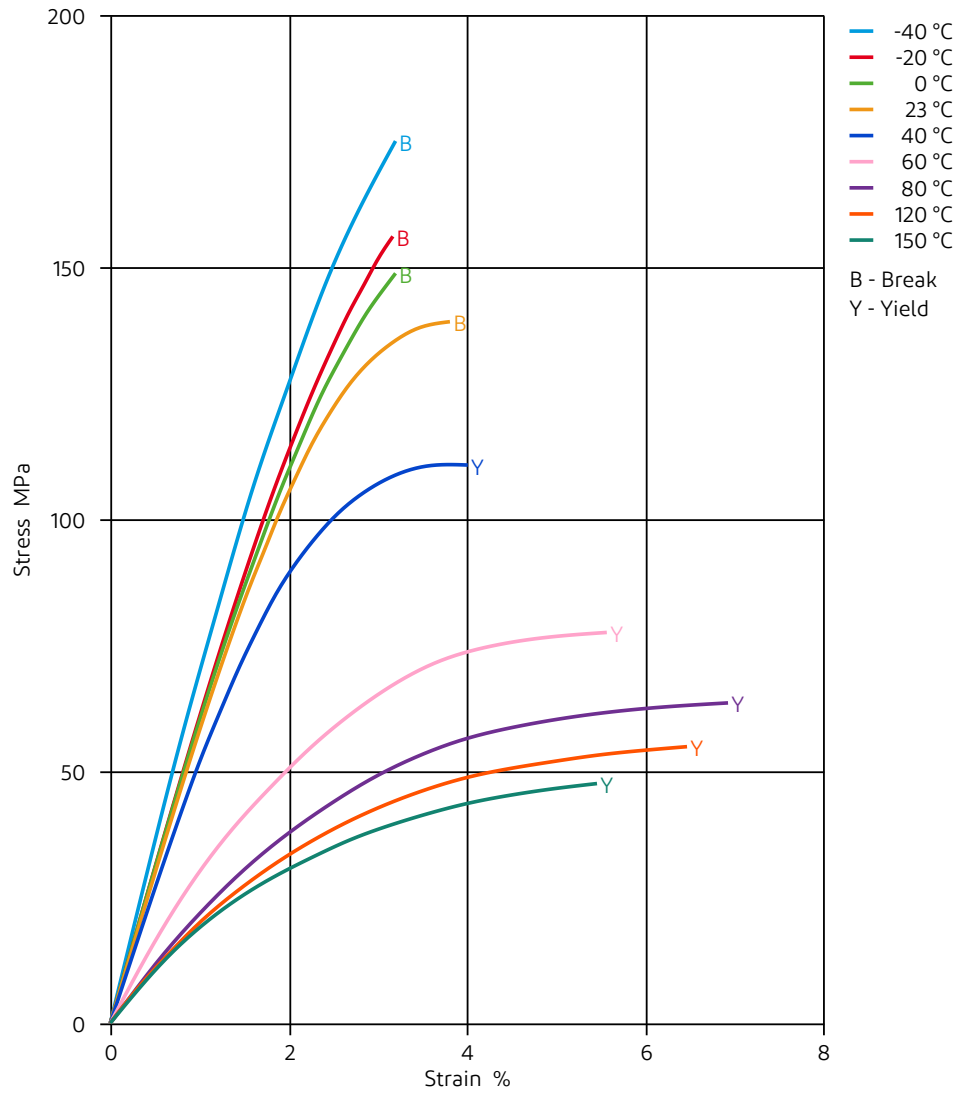




# Zytel® 73G15L NC010

NYLON RESIN

Stress-strain (dry)

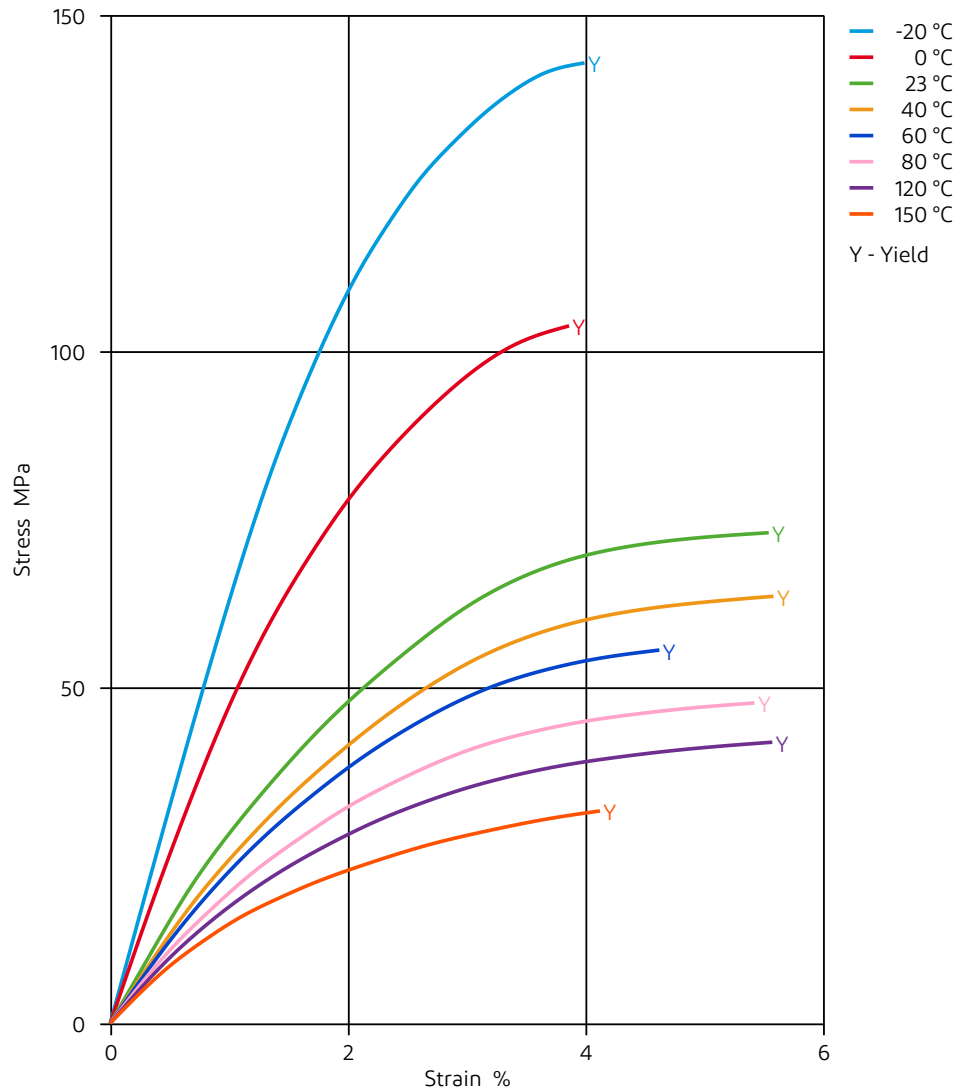




# Zytel® 73G15L NC010

NYLON RESIN

Stress-strain (cond.)

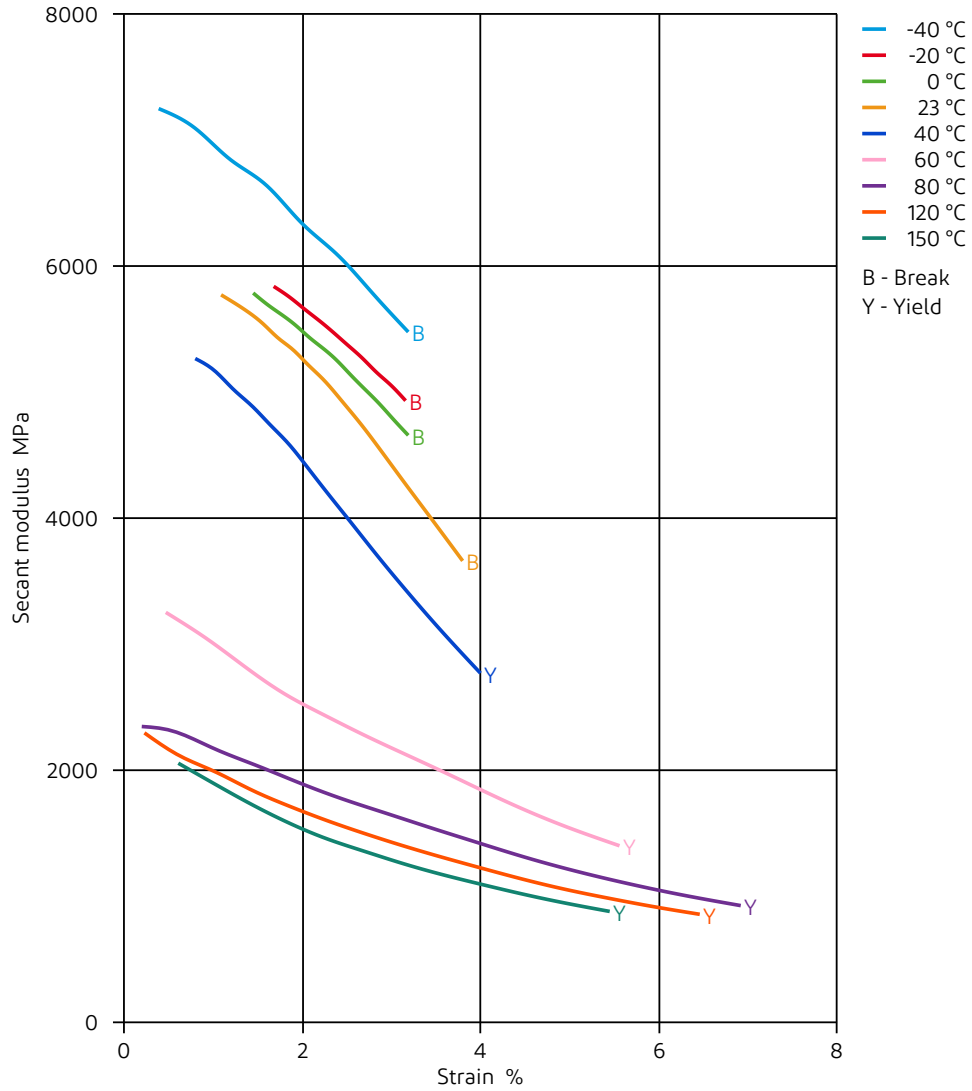




# Zytel® 73G15L NC010

NYLON RESIN

Secant modulus-strain (dry)

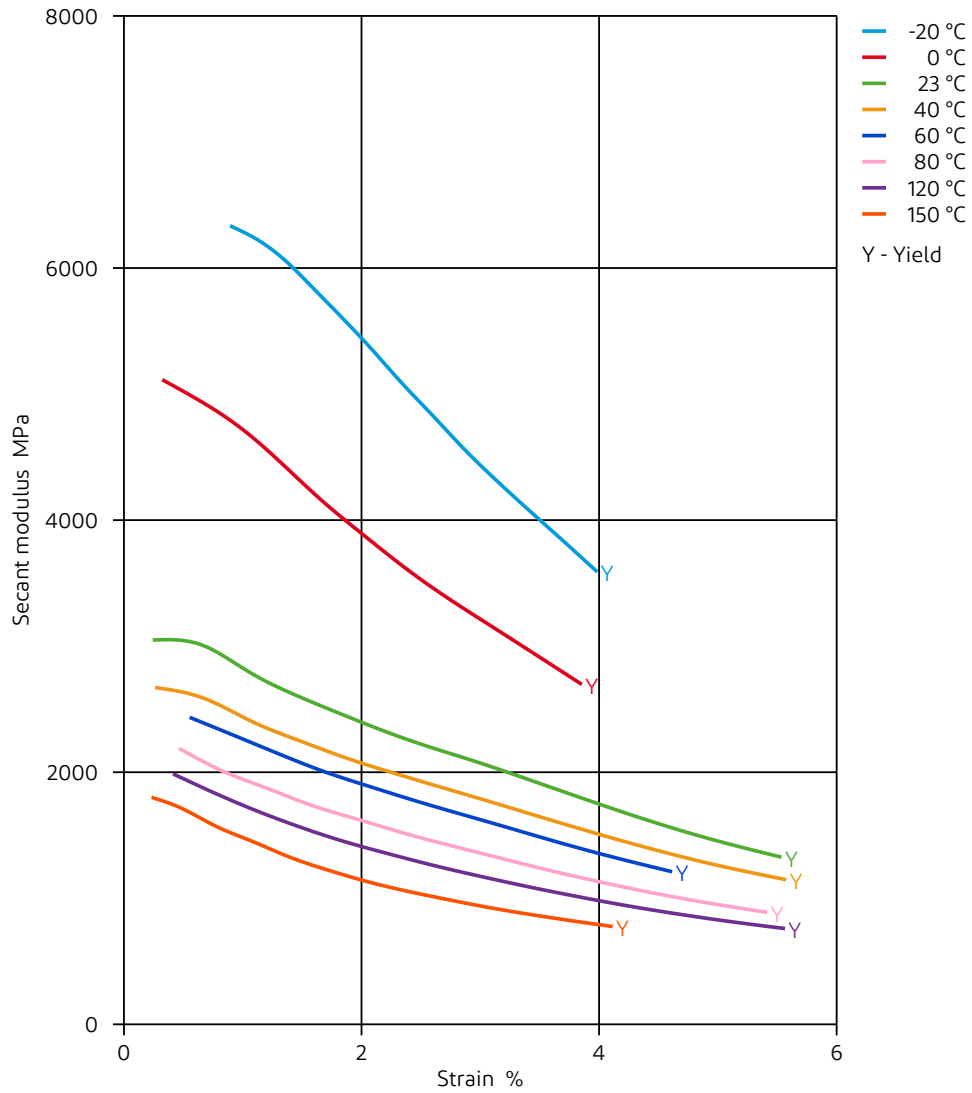




# Zytel® 73G15L NC010

NYLON RESIN

Secant modulus-strain (cond.)



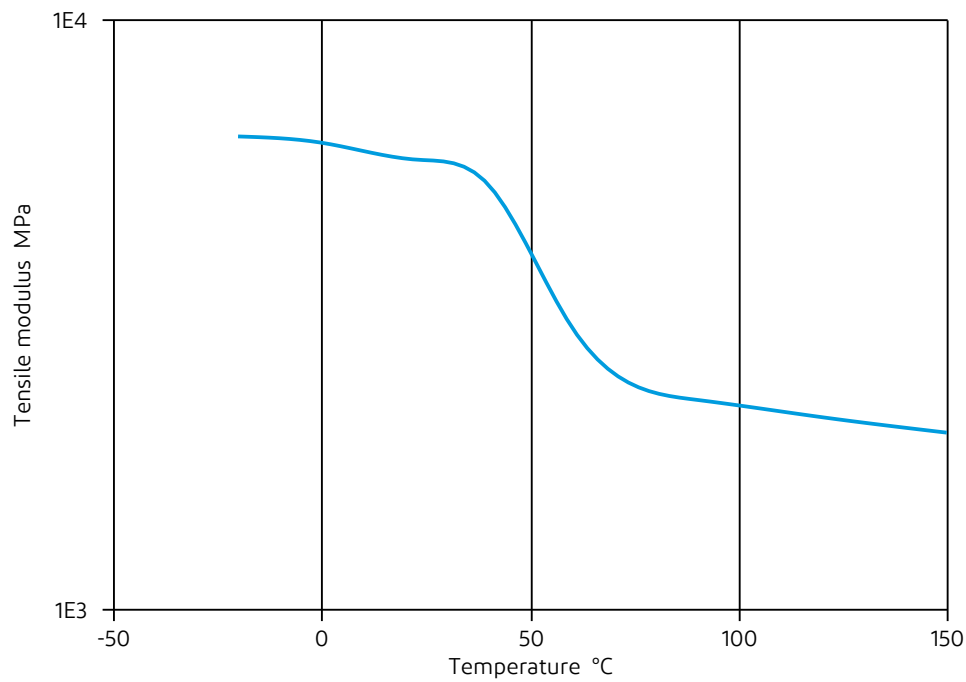




# Zytel® 73G15L NC010

NYLON RESIN

Tensile modulus-temperature (dry)

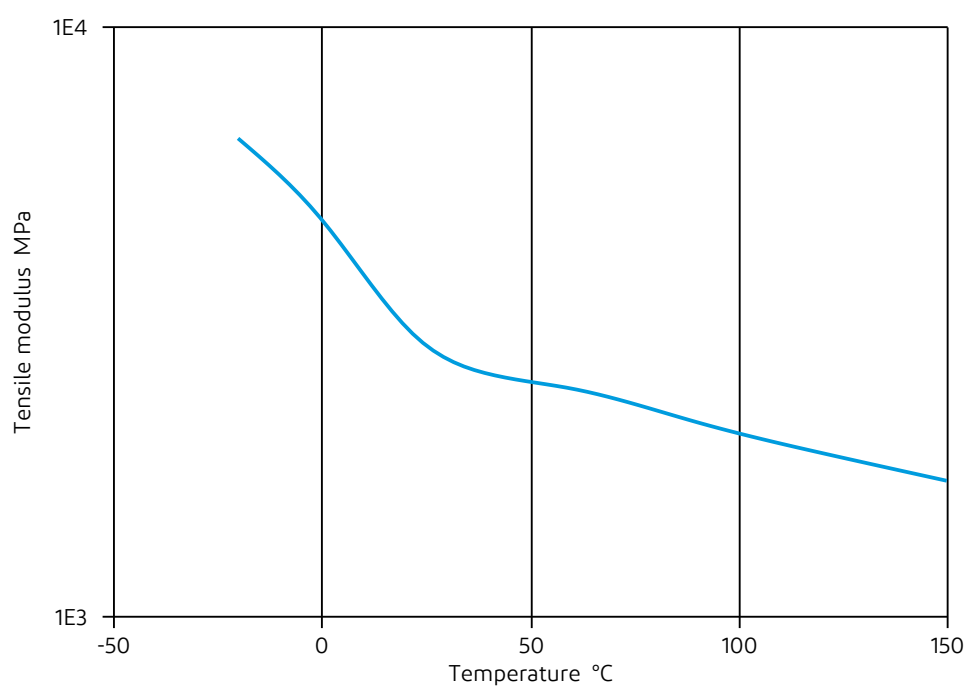




# Zytel® 73G15L NC010

NYLON RESIN

Tensile modulus-temperature (cond.)



# Zytel® 73G15L NC010

## NYLON RESIN

### 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
- ✓ 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



# Zytel® 73G15L NC010

## NYLON RESIN

### 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).

The information set forth herein is furnished free of charge, is based on technical data that DuPont believes to be reliable, and represents typical values that fall within the normal range of properties. This information relates only to the specific material designated and may not be valid for such material used in combination with other materials or in other processes. It is intended for use by persons having technical skill, at their own discretion and risk. This information 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 and comply with applicable law. 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 DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract or other acknowledgement that is consistent with the DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative.

DuPont's sole warranty is that our products will meet our standard sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DUPONT SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR NON-INFRINGEMENT. DUPONT DISCLAIMS LIABILITY FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.