



# Zytel® HTNFR51G35L NC010

## HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTNFR51G35L NC010 is a 35% Glass Reinforced, Flame Retardant, PPA, High Performance Polyamide

### Product information

Resin Identification	PA6T/XT-GF35FR(17)	ISO 1043
Part Marking Code	>PA6T/XT-GF35FR(17)<	ISO 11469
ISO designation	ISO 16396-PA6T/XT,GF35 FR(17),M1F1GNR,S10-140	

### Rheological properties

	dry/cond.		
Moulding shrinkage, parallel	0.2/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6/-	%	ISO 294-4, 2577

### Typical mechanical properties

	dry/cond.		
Tensile Modulus	14000/14000	MPa	ISO 527-1/-2
Stress at break	170/130	MPa	ISO 527-1/-2
Strain at break	1.5/1.1	%	ISO 527-1/-2
Flexural Modulus	12000/12000	MPa	ISO 178
Flexural Strength	250/235	MPa	ISO 178
Compressive strength	293/-	MPa	ISO 604
Shear Strength	64/70	MPa	ASTM D 732
Charpy impact strength, 23°C	40/30	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	35/30	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	11/-	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	13/-	kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.33/0.33	-	

### Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	300/*	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	260/*	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	270/*	°C	ISO 75-1/-2
CLTE, Parallel, -40-23°C	20/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	18/*	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	46/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	50/*	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.25	W/(m K)	
Spec. heat capacity of melt	2400	J/(kg K)	
RTI, electrical, 0.75mm	150	°C	UL 746B
RTI, electrical, 1.5mm	150	°C	UL 746B
RTI, electrical, 3mm	150	°C	UL 746B
RTI, impact, 0.75mm	120	°C	UL 746B
RTI, impact, 1.5mm	125	°C	UL 746B
RTI, impact, 3mm	130	°C	UL 746B



# Zytel® HTNFR51G35L NC010

## HIGH PERFORMANCE POLYAMIDE RESIN

RTI, strength, 0.75mm	130	°C	UL 746B
RTI, strength, 1.5mm	140/*	°C	UL 746B
RTI, strength, 3mm	150	°C	UL 746B

### Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	V-0/*	class	IEC 60695-11-10
Thickness tested	1.5/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Burning Behav. at thickness h	V-0/*	class	IEC 60695-11-10
Thickness tested	0.81/*	mm	IEC 60695-11-10
UL recognition	yes/*	-	UL 94
Oxygen index	38/*	%	ISO 4589-1/-2
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

### Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	3.9/-	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.6/-	-	IEC 62631-2-1
Dissipation factor, 100Hz	80/-	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150/-	E-4	IEC 62631-2-1
Volume resistivity	>1E13/1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	*/1E13	Ohm	IEC 62631-3-2
Electric strength	34/34	kV/mm	IEC 60243-1
Comparative tracking index	500/-	-	IEC 60112
Comparative tracking index M	200/-	-	IEC 60112

### Other properties

	dry/cond.		
Density	1650/-	kg/m <sup>3</sup>	ISO 1183
Density of melt	1480	kg/m <sup>3</sup>	

### Injection

Drying Recommended	yes
Drying Temperature	100 °C
Drying Time, Dehumidified Dryer	6 - 8 h
Processing Moisture Content	≤0.1 %
Melt Temperature Optimum	325 °C
Min. melt temperature	320 °C
Max. melt temperature	330 °C
Mold Temperature Optimum	150 °C
Min. mould temperature	140 °C
Max. mould temperature	180 °C



# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

## Characteristics

Additives

Release agent, Flame retardant

## Additional Information

Injection molding

During molding, use proper protective equipment and adequate ventilation. Avoid exposure to fumes and limit the hold up time and temperature of the resin in the machine. Purge degraded resin carefully with HDPE.

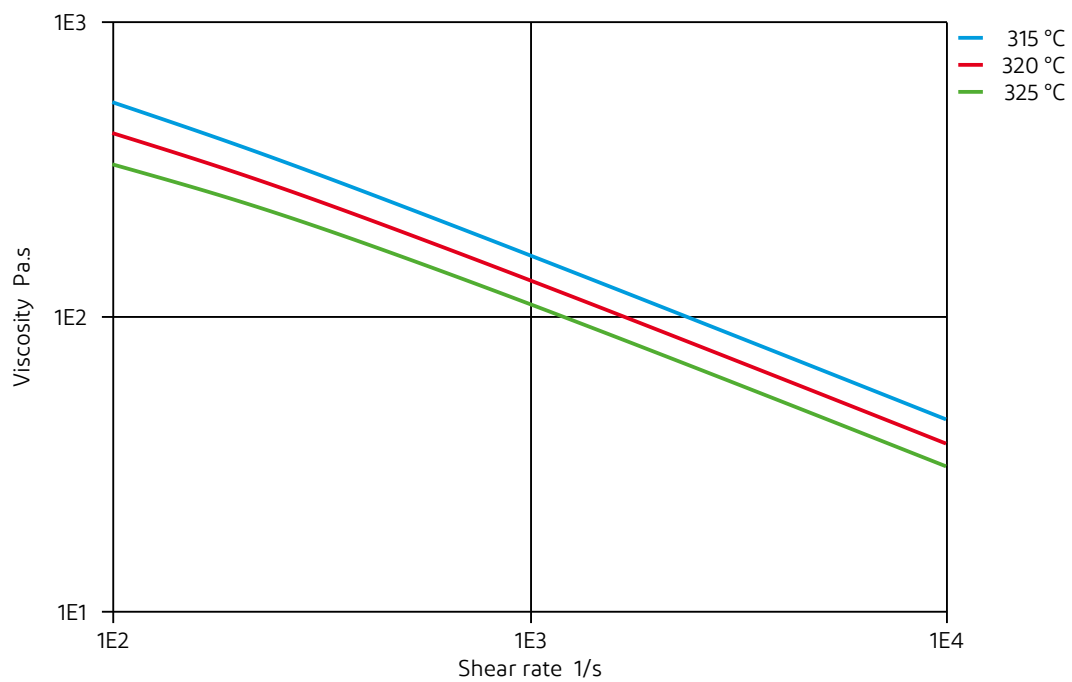
When lower mold temperatures are used, the initial warpage and shrinkage may be lower, but the surface appearance and chemical resistance may be reduced, and the dimensional change may be greater when parts are subsequently heated.



# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Viscosity-shear rate

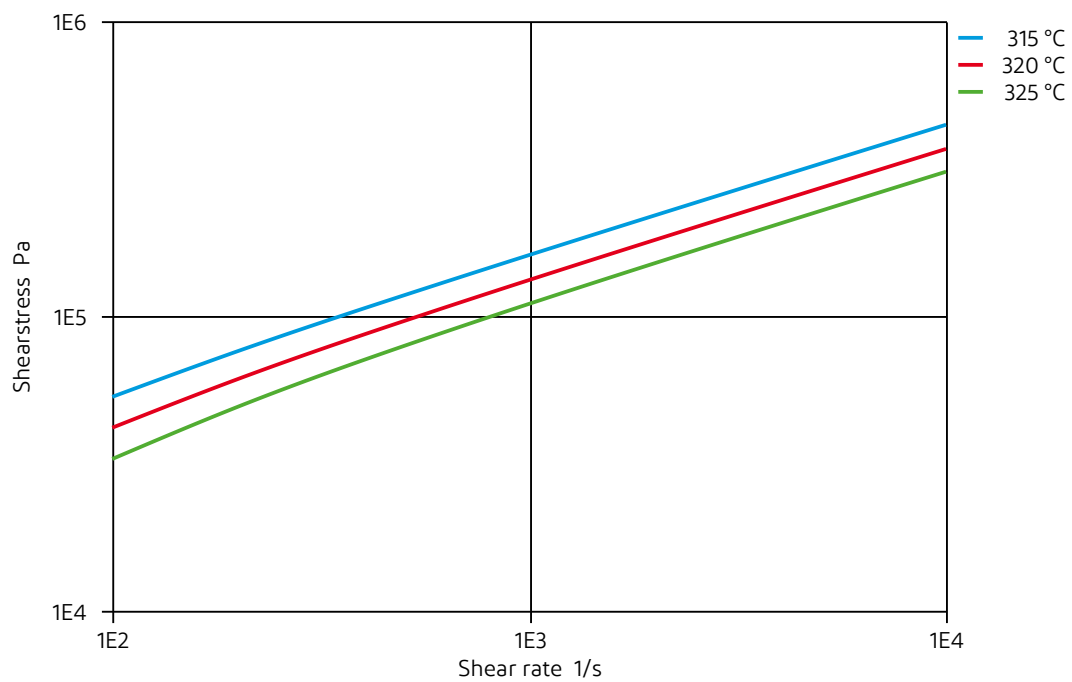




# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Shearstress-shear rate

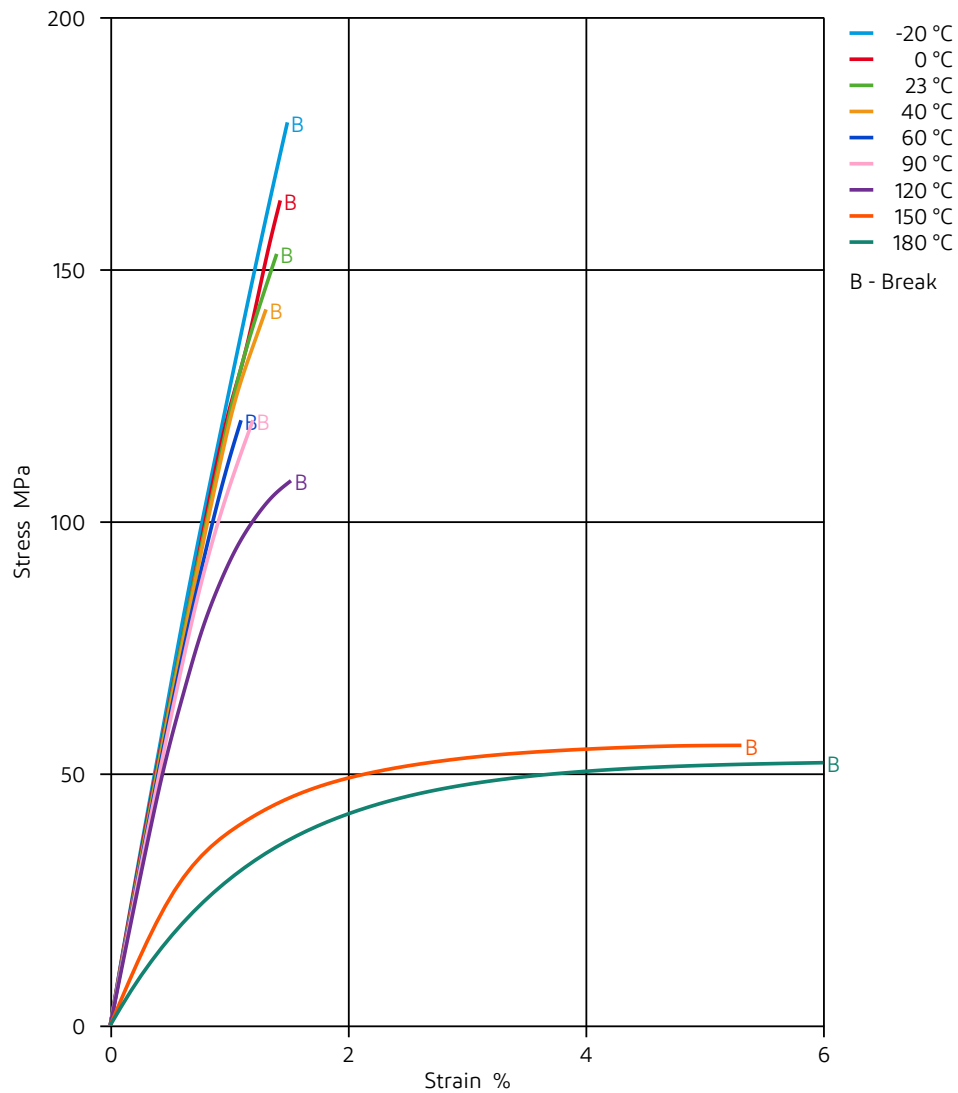




# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Stress-strain (dry)

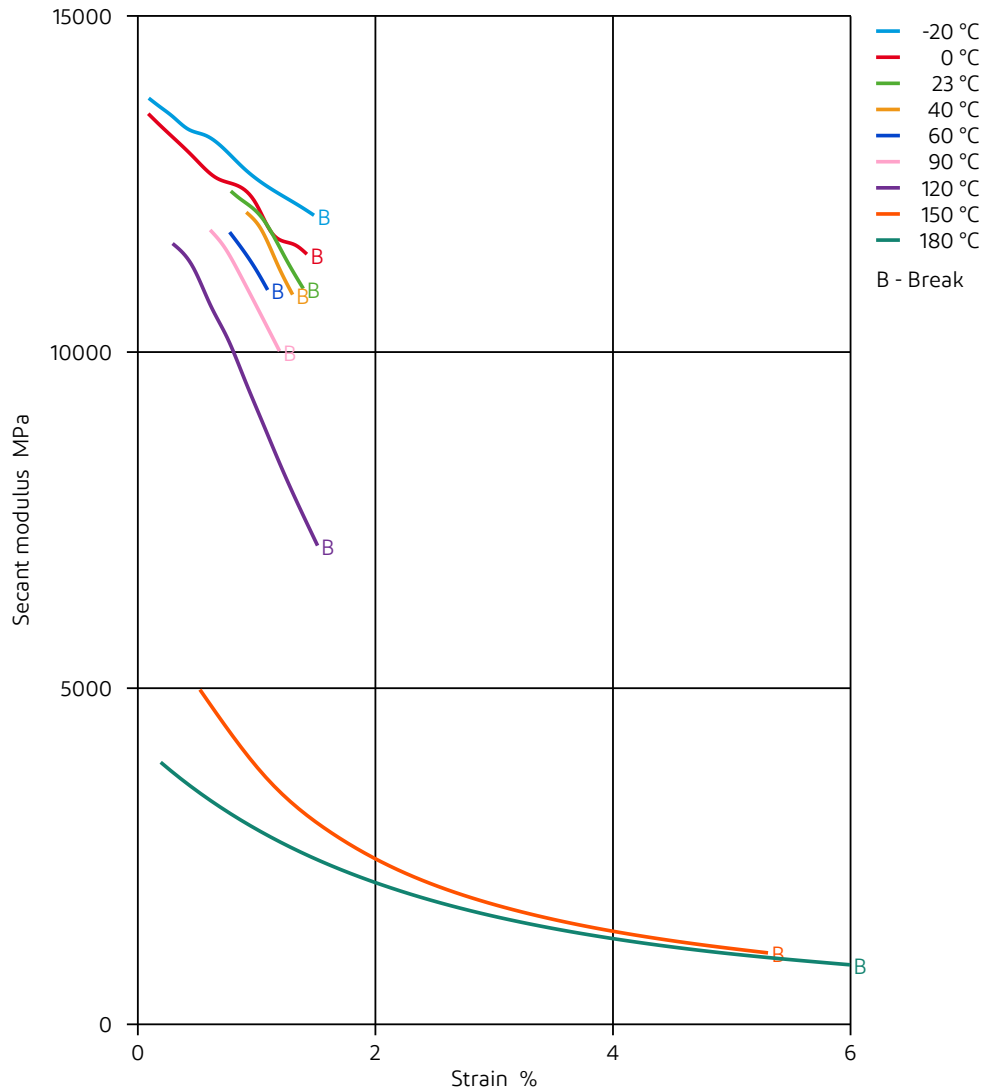




# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Secant modulus-strain (dry)

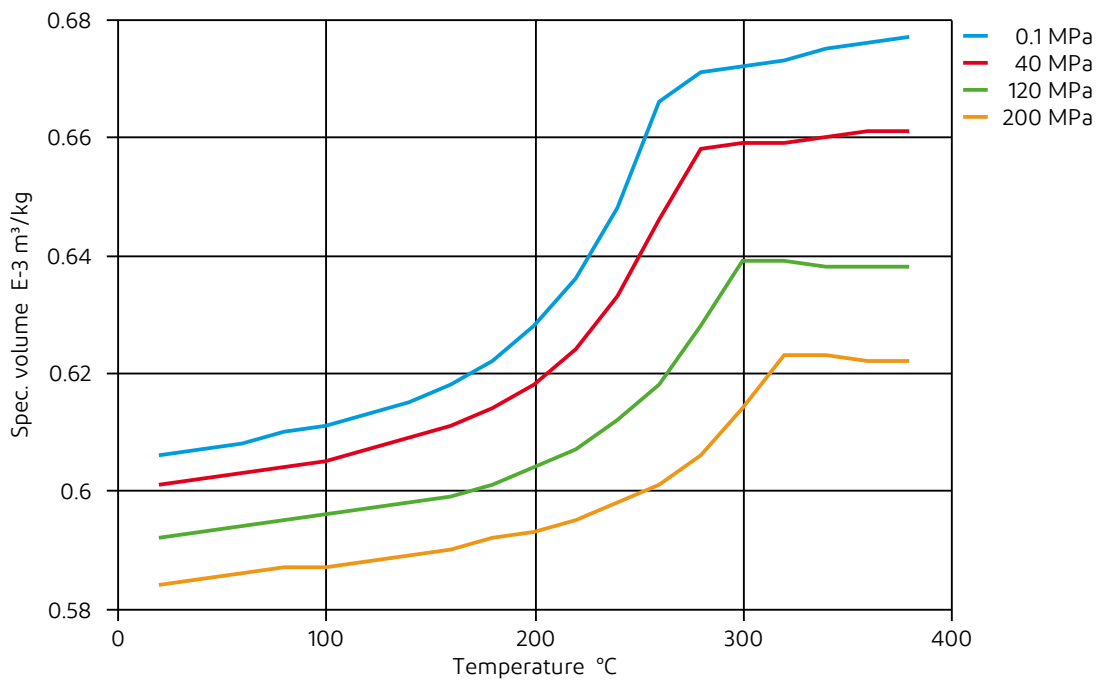




# Zytel® HTNFR51G35L NC010

HIGH PERFORMANCE POLYAMIDE RESIN

Specific volume-temperature (pvT)







# Zytel® HTNFR51G35L NC010

## HIGH PERFORMANCE POLYAMIDE RESIN

### Chemical Media Resistance

#### Other

- ✓ Ethylene Glycol (50% by mass) in water, 108°C
- ✓ Water, 23°C
- ✓ Water, 90°C
- ✓ Coolant Glysantin G48, 1:1 in water, 125°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.