Zytel® HTNFE350064 BK544

HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTN high performance polyamide resins feature high retention of properties upon exposure to elevated temperature, to high moisture, and to harsh chemical environments. Polymer families and grades of Zytel® HTN are tailored to optimize performance as well as processability.

Typical applications with Zytel® HTN include demanding applications in the automotive, electrical and electronics, domestic appliances, and construction industries.

Zytel® HTNFE350064 BK544 is a carbon fiber reinforced, toughened, heat stabilized, conductive high performance polyamide resin developed for static dissipative applications. It is also a PPA resin.

Product information

Resin Identification	PA-I-CF15	ISO 1043
Part Marking Code	>PA-I-CF15<	ISO 11469
Part Marking Code	>PPA-I-CF<	SAE J1344
ISO designation	ISO 16396-PA-I,CF,M1CGHRSZ,S10-100	
Infrared spectrum	available	
TGA curve	available	ISO 11358-1

Rheological properties

	dry/cond.		
Melt mass-flow rate	40 / *	g/10min	ISO 1133
Melt mass-flow rate, Temperature	617 / *	°F	
Melt mass-flow rate, Load	11 / *	lb	
Viscosity number	2910 / *	in³/lb	ISO 307, 1628
Molding shrinkage, parallel	0.2 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.5 / -	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile modulus	1.51E6 / 1.6E6	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	24400 / 23500	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.4 / 2.3	%	ISO 527-1/-2
Flexural modulus	1.26E6 / -	psi	ISO 178
Flexural strength	34800 / -	psi	ISO 178
Charpy impact strength, 23°C	22.8 / -	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, 23°C	2.85 / -	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -40°C	1.43 / -	ftlb/in²	ISO 179/1eA

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	581 / *	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	496 / *	°F	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	0.08 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, -40-23°C	0.0944 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, 55-160°C	0.0833 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.461 / *	E-4/°F	ISO 11359-1/-2

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Coefficient of linear thermal expansion (CLTE), normal, -40-23 °C	0.444 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, 55-160 °C	0.472 / *	E-4/°F	ISO 11359-1/-2
Thermal conductivity, flow	0.46	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2600	J/(kg K)	ISO 22007-4
Specific heat capacity solid	1120	J/(kg K)	ISO 22007-4

Flammability

FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	in/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Volume resistivity	1000 / -	Ohm.m	IEC 62631-3-1
Comparative tracking index	- / 175		IEC 60112
Volume resistivity, conductive plastics	1000 / -	Ohm.m	ASTM D 4496

Physical/Other properties

	dry/cond.		
Density	0.0433 / -	lb/in³	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	212	°F
Drying Time, Dehumidified Dryer	6 - 8	h
Processing Moisture Content	≤0.1	%
Melt Temperature Optimum	617	°F
Min. melt temperature	608	°F
Max. melt temperature	626	°F
Mold Temperature Optimum	203	°F
Min. mold temperature	185	°F
Max. mold temperature	221	°F
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h^2+2	s
Ejection temperature	505	°F

Automotive

OEM	STANDARD
Ford	WSS-M98P14-A3

Characteristics

Processing	Injection Molding
Additives	Release agent
Special characteristics	Increased electrical conductivity, Anti-static, Static dissipative, High impact or impact modified, Heat stabilized or stable to heat

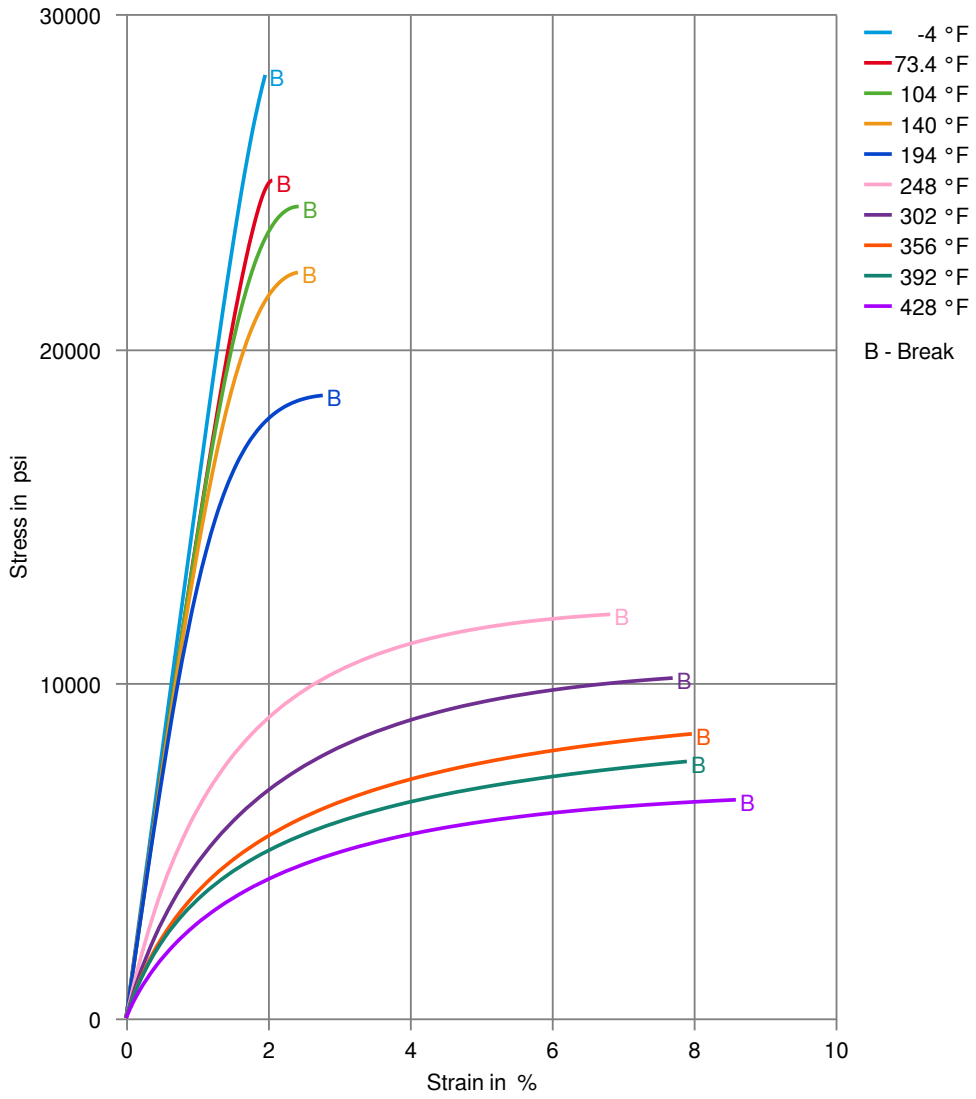
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Additional information

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.

Stress-strain (dry)

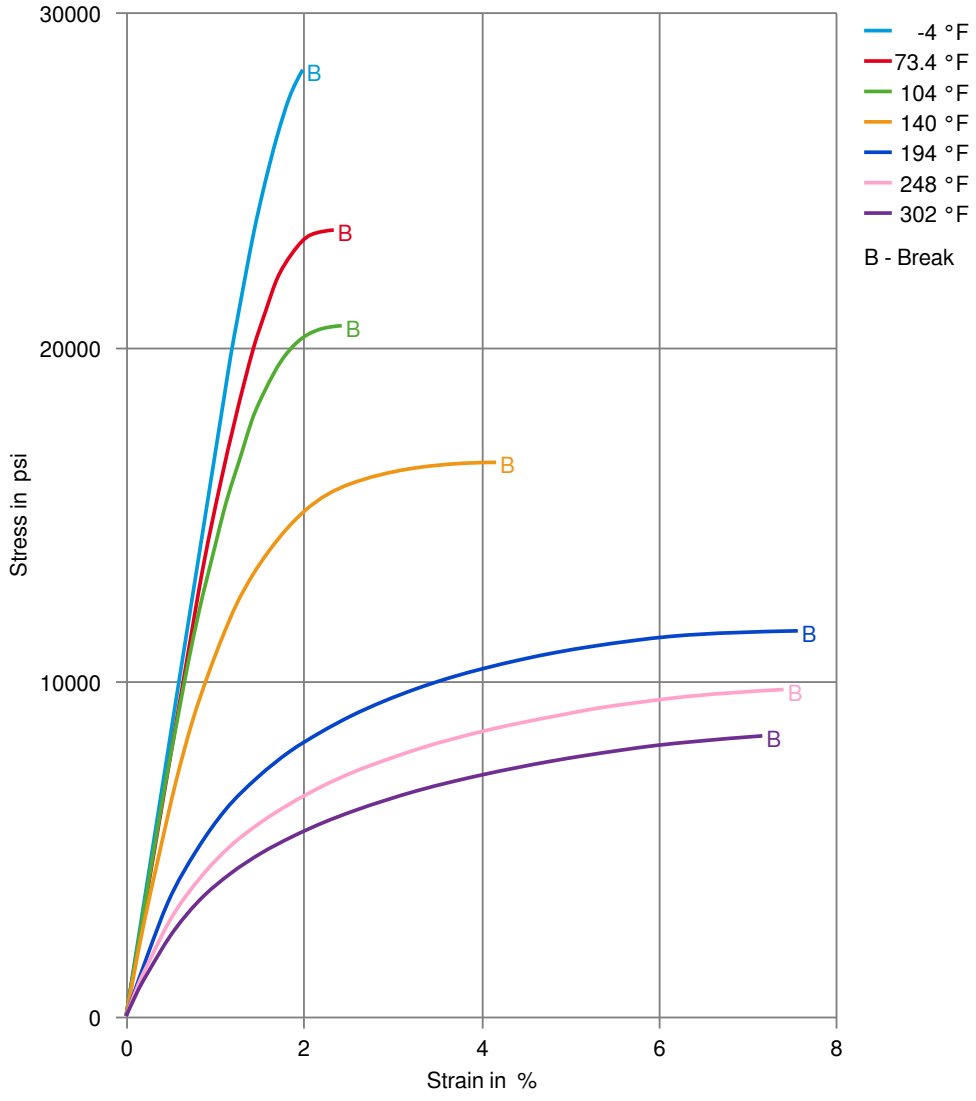


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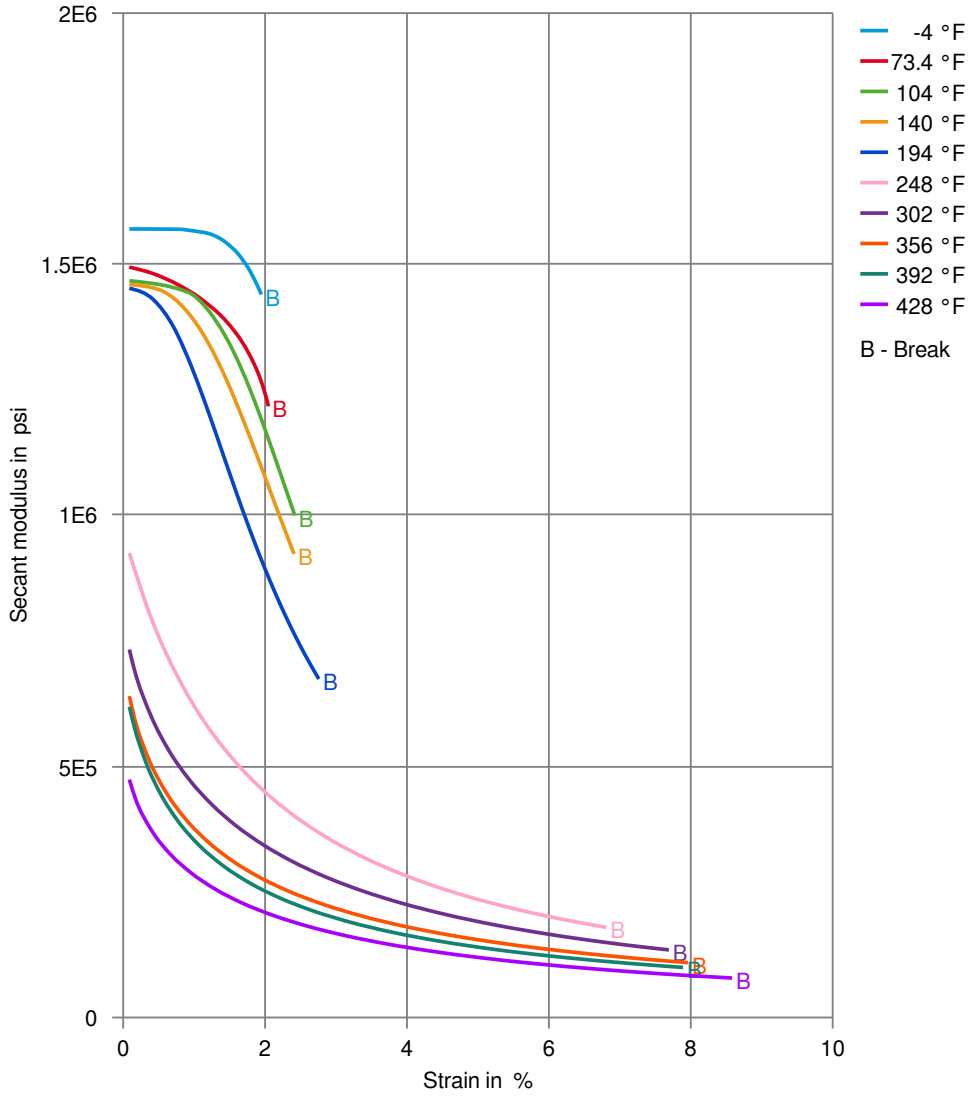
Stress-strain (cond.)



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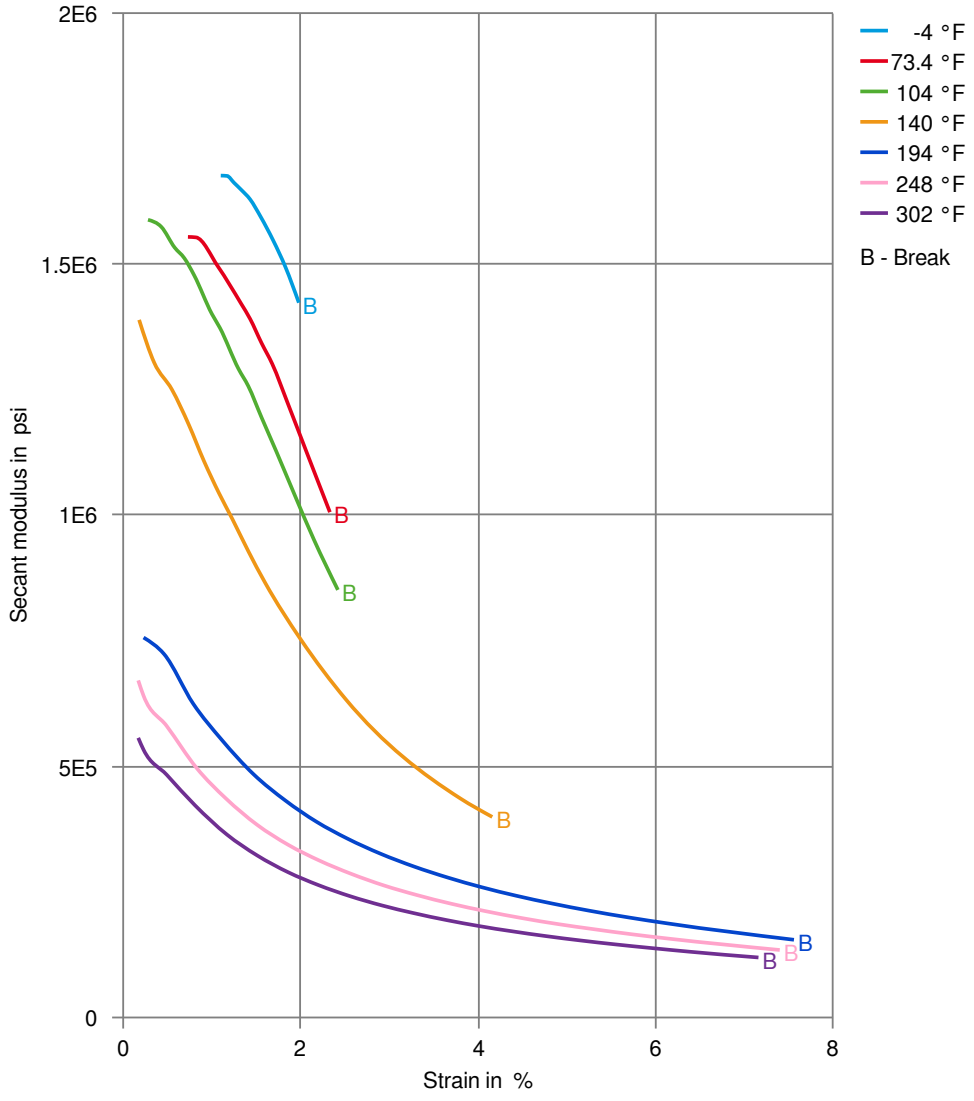
Secant modulus-strain (dry)



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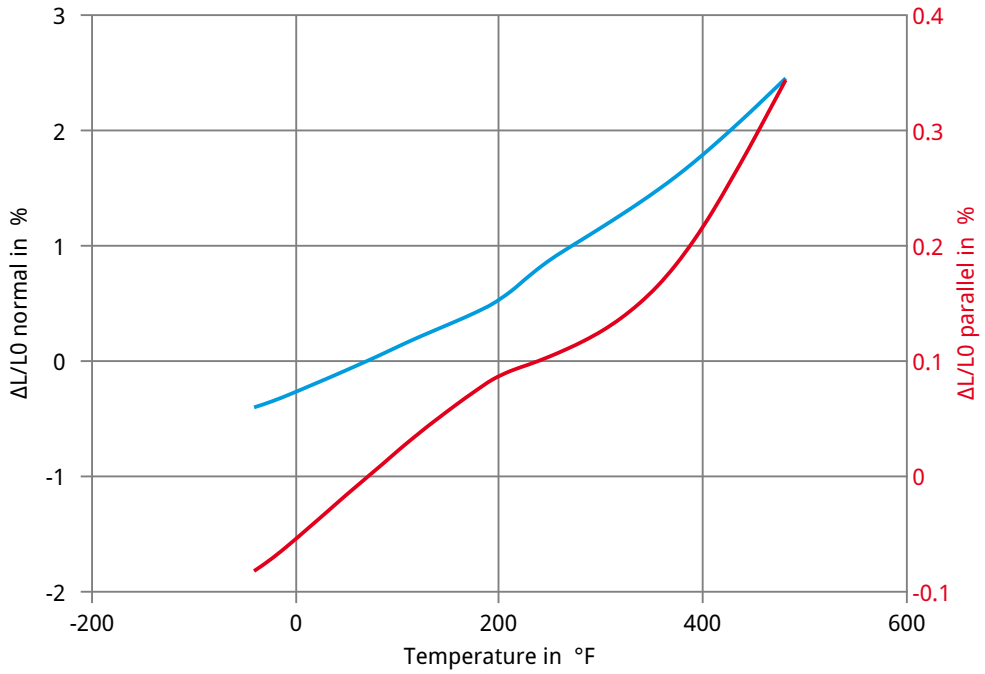
Secant modulus-strain (cond.)



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Thermal expansion



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Mineral oils

Mineral oils

- ✔ SAE 10W40 multigrade motor oil, 130 °C

Standard Fuels

- ✔ 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
- ✔ Diesel EN 590, 100 °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).

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NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values. Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.
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