Zytel® HTN51G35HSL BK083

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® HTN51G35HSL BK083 is a 35% glass reinforced, heat stabilized, lubricated, hydrolysis resistant high performance polyamide resin. It is also a PPA resin.

Product information

Resin Identification	PA6T/XT-GF35	ISO 1043
Part Marking Code	>PA6T/XT-GF35<	ISO 11469
Part Marking Code	>PPA-GF35<	SAE J1344
ISO designation	ISO 16396-PA6T/XT,GF35,M1CGHR,S10-120	

Rheological properties

	dry/cond.		
Viscosity number	2770 / *	in³/lb	ISO 307, 1628
Molding shrinkage, parallel	0.2 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.6 / -	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile modulus	1.74E6 / 1.67E6	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	33400 / 30500	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.4 / 2.3	%	ISO 527-1/-2
Flexural modulus	1.83E6 / -	psi	ISO 178
Flexural strength	46800 / -	psi	ISO 178
Charpy impact strength, 23°C	28.5 / 19	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30°C	28.5 / 19	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, 23°C	4.76 / 4.76	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -30°C	4.76 / 4.28	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -40°C	4.28 / -	ftlb/in²	ISO 179/1eA
Izod notched impact strength, 23°C	4.76 / -	ftlb/in²	ISO 180/1A
Izod notched impact strength, -30°C	3.81 / -	ftlb/in²	ISO 180/1A
Izod impact strength, 23°C	30.9 / -	ftlb/in²	ISO 180/1U
Izod impact strength, -30°C	31.9 / -	ftlb/in²	ISO 180/1U

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	572 / *	°F	ISO 11357-1/-3
Melting temperature, first heat	572 / *	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	507 / *	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	543 / *	°F	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	0.11 / *	E-4/°F	ISO 11359-1/-2

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Coefficient of linear thermal expansion (CLTE), parallel, -40-23°C	0.1 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, 55-160°C	0.1 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.333 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, -40-23°C	0.283 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, 55-160°C	0.417 / *	E-4/°F	ISO 11359-1/-2
Specific heat capacity of melt	1820	J/(kg K)	ISO 22007-4
Specific heat capacity solid	610[DS]	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	302	°F	UL 746B
RTI, electrical, 1.5mm	302	°F	UL 746B
RTI, electrical, 3.0mm	302	°F	UL 746B
RTI, impact, 0.75mm	257	°F	UL 746B
RTI, impact, 1.5mm	257	°F	UL 746B
RTI, impact, 3.0mm	266	°F	UL 746B
RTI, strength, 0.75mm	266	°F	UL 746B
RTI, strength, 1.5mm	284 / *	°F	UL 746B
RTI, strength, 3.0mm	302	°F	UL 746B

[DS]: Derived from similar grade

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	0.0591 / *	in	IEC 60695-11-10
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.0335 / *	in	IEC 60695-11-10
UL recognition	yes / *		UL 94
Oxygen index	26 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 1.5mm	1380 / -	°F	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	1760 / -	°F	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.5mm	1430 / -	°F	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	1470 / -	°F	IEC 60695-2-13
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	0.827	in/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4 / -		IEC 62631-2-1
Relative permittivity, 1MHz	3.8 / -		IEC 62631-2-1
Dissipation factor, 100Hz	90 / -	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	170 / -	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / -	Ohm.m	IEC 62631-3-1
Electric strength	914 / 914	kV/in	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112

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Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.4 / *	%	Sim. to ISO 62
Water absorption, 2mm	4 / *	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.5[1] / *	%	Sim. to ISO 62
Density	0.0531 / -	lb/in³	ISO 1183

[1]: 2mm thickness

Emissions

Odor test	4	class	VDA 270

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	302	°F
Min. mold temperature	284[2]	°F
Max. mold temperature	356	°F
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h^2+2	s

[2]: Higher temperature needed for thinner sections.

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Chery	Q/SQR S1-208-2022	
Ford	WSS-M98P14-A3	
General Motors	GMW16356P-PPA-GF35	Black
Hyundai	MS941-03 Type N-4	
Renault-Nissan	UB09a, No Spec, Special Part Approval, See Your CE Account Manager.	
Stellantis	B62 0300 / 61/213M+/215E+/H113/H115(168h)13/C1B	Technical Black
Stellantis	MS.50156 / PPA.GF30-35.100001.7C.HS	CPN4189, 01994_10_00119
Stellantis - Chrysler	MS.50103 / CPN-4189	Black

Characteristics

Processing	Injection Molding
Special characteristics	Heat stabilized or stable to heat, Hydrolysis resistant, Laser Markable

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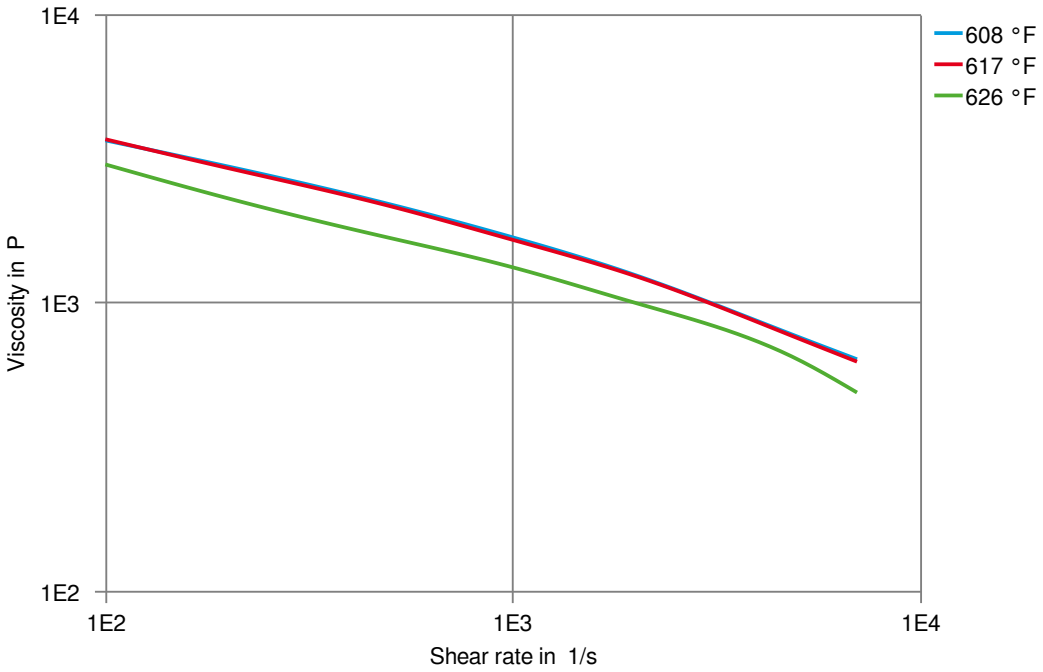
Additional information

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. 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.

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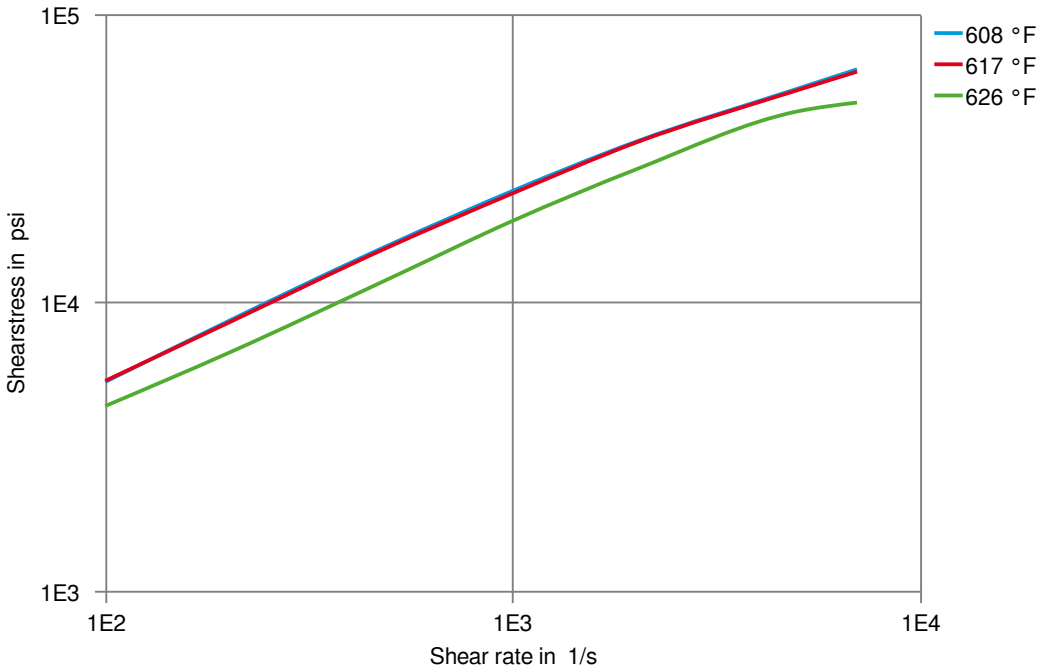
Viscosity-shear rate



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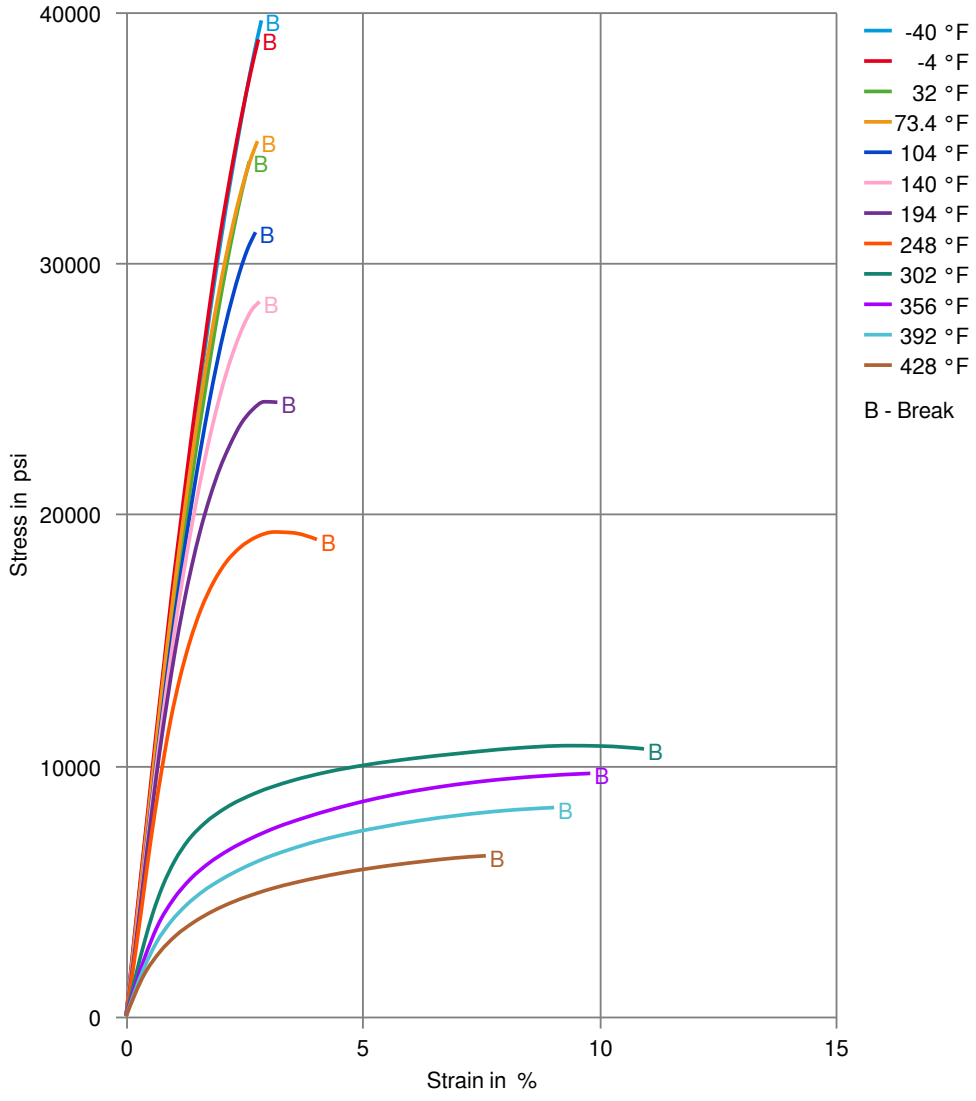
Shearstress-shear rate



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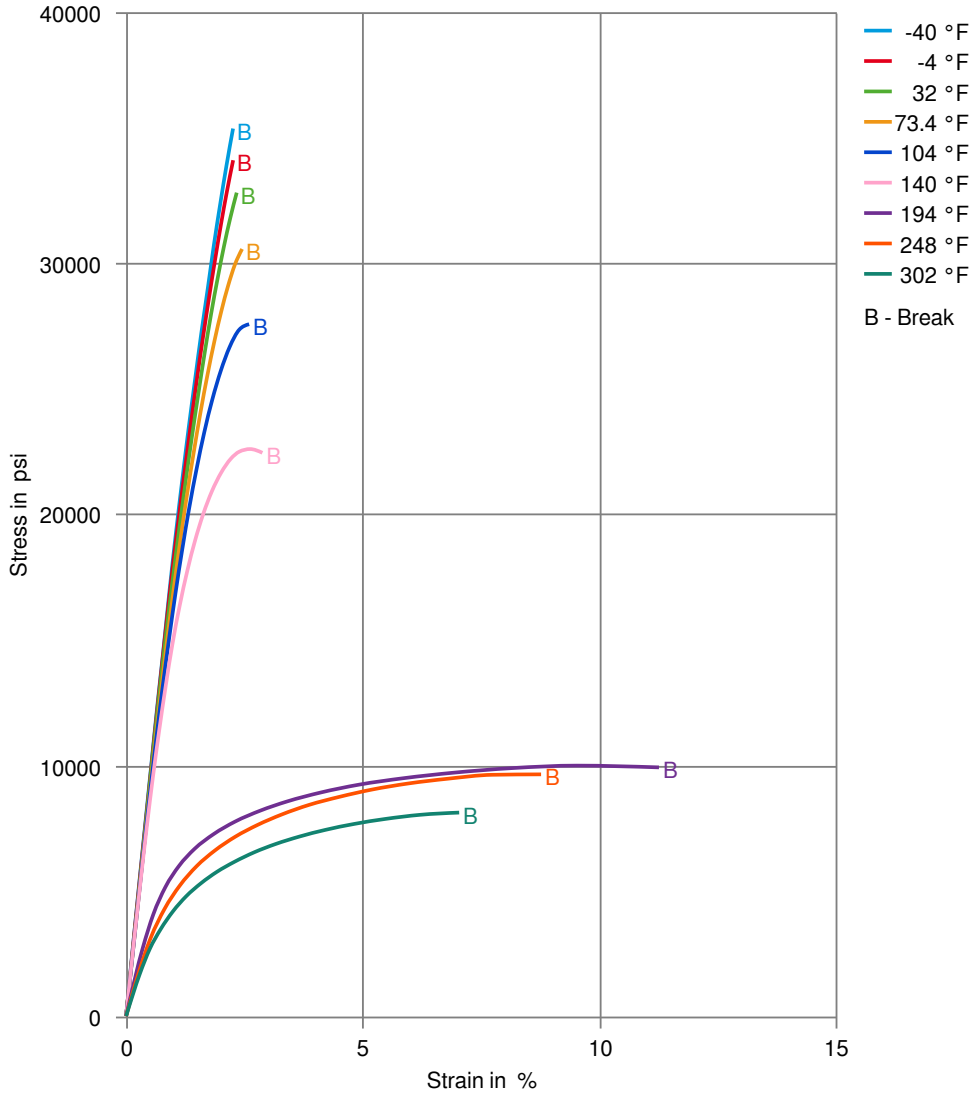
Stress-strain (dry)



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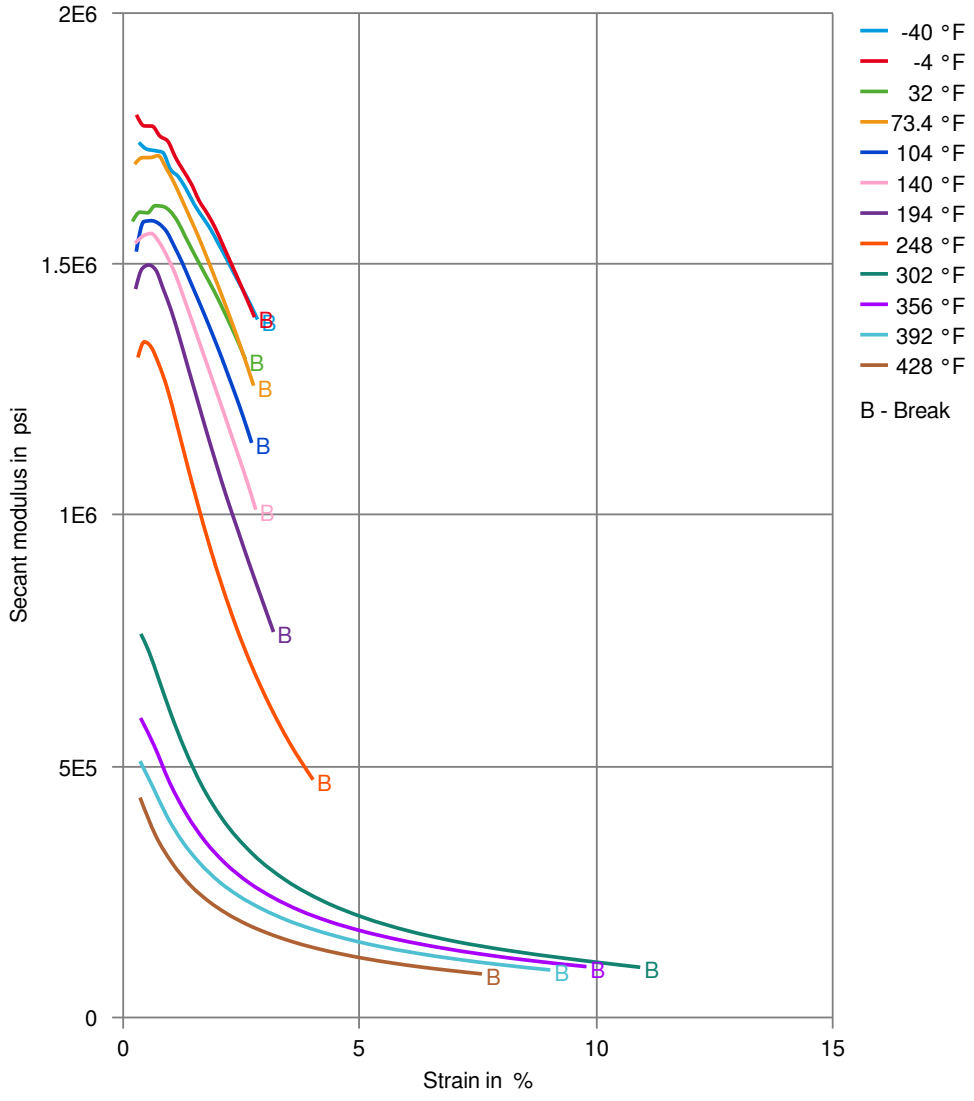
Stress-strain (cond.)



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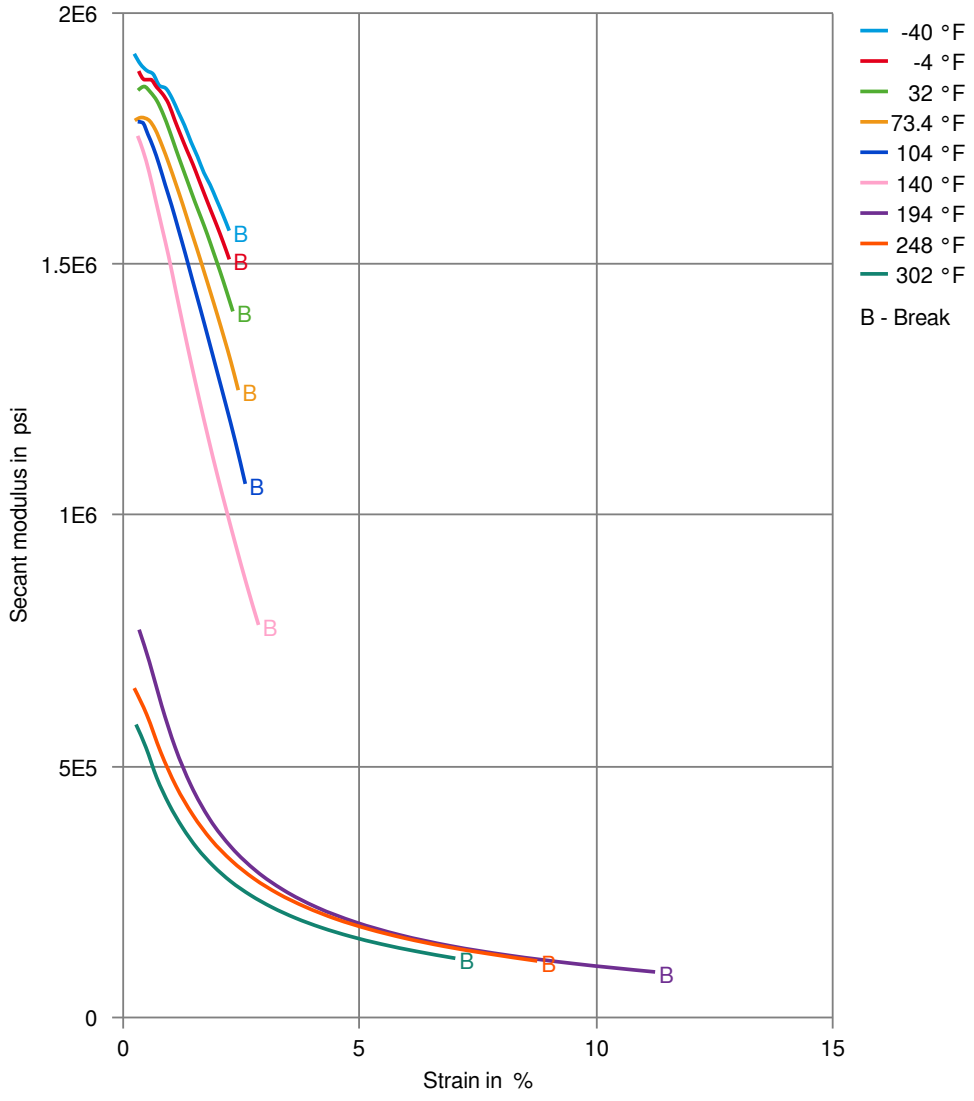
Secant modulus-strain (dry)



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Secant modulus-strain (cond.)

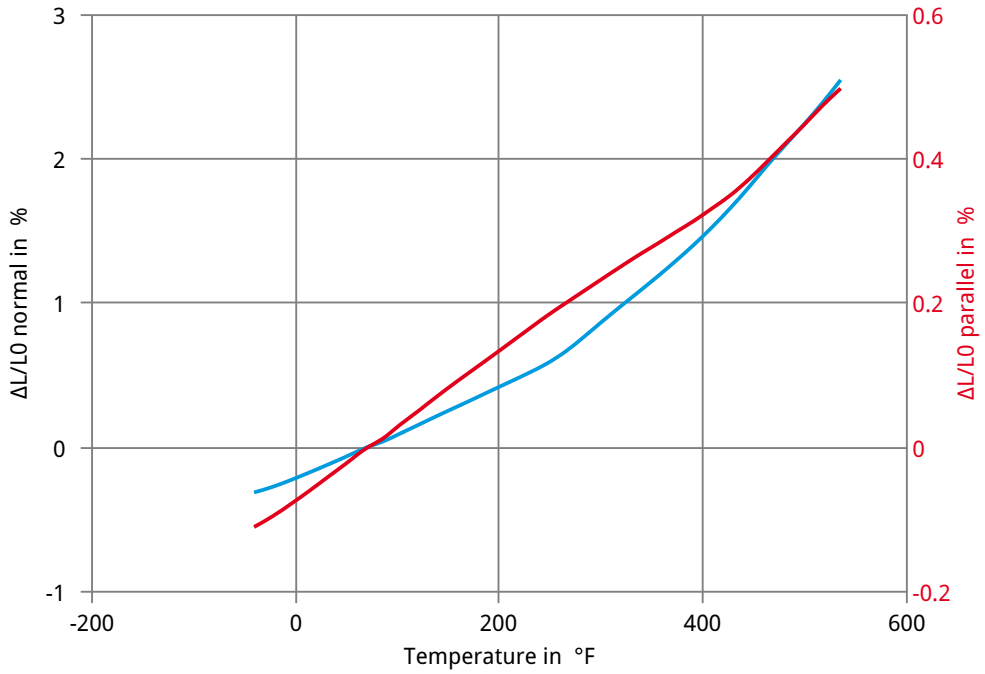


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Thermal expansion



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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

Mineral oils

- ✔ SAE 10W40 multigrade motor oil, 23°C
- ✔ Insulating Oil, 23°C

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).

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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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