Zytel® 70G35HSLR BK416LM

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, we recommend, 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® 70G35HSLR BK416LM is a 35% Glass Reinforced, Heat Stabilized, Hydrolysis Resistant,Laser Markable,Polyamide 66

Product information

Resin Identification	PA66-GF35	ISO 1043
Part Marking Code	>PA66-GF35<	ISO 11469
ISO designation	ISO 16396-PA66,GF35,M1CGHO2RW,S14-110	

Rheological properties

	dry/cond.		
Viscosity number	3820[1]/*	in³/lb	ISO 307, 1628
Molding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.0 / -	%	ISO 294-4, 2577
Melt viscosity , @ 1000 sec-1, 280 °C	2200 / *	P	ISO 11443

[1]: formic acid

Typical mechanical properties

	dry/cond.		
Tensile modulus	1.67E6 / 1.09E6	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	31200 / 20300	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2 / 5	%	ISO 527-1/-2
Flexural modulus	1.45E6 / 943000	psi	ISO 178
Flexural strength	43500 / 30500	psi	ISO 178
Tensile creep modulus, 1h	* / 1.09E6	psi	ISO 899-1
Tensile creep modulus, 1000h	* / 725000	psi	ISO 899-1
Charpy impact strength, 23 °C	40.4 / 42.8	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30 °C	33.3 / 38.1	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, 23 °C	6.18 / 7.61	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -30 °C	4.76 / 4.76	ftlb/in²	ISO 179/1eA
Puncture energy, 23 °C	6 / -[DS]	J	ISO 6603-2

[DS]: Derived from similar grade

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	502 / *	°F	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	158 / 68[DS]	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	482 / *	°F	ISO 75-1/-2

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Coefficient of linear thermal expansion (CLTE), parallel	0.12 / *[DS]	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, -40-23°C	0.133 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, 55-160°C	0.117 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.472 / *[DS]	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, -40-23°C	0.383 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, 55-160°C	0.783 / *	E-4/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.22[DS]	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2300[DS]	J/(kg K)	ISO 22007-4

[DS]: Derived from similar grade

Flammability

	dry/cond.		
Oxygen index	21 / *[DS]	%	ISO 4589-1/-2
FMVSS Class	B[DS]		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80[DS]	in/min	ISO 3795 (FMVSS 302)

[DS]: Derived from similar grade

Electrical properties

	dry/cond.		
Comparative tracking index	400 / -		IEC 60112

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.7 / *[DS]	%	Sim. to ISO 62
Water absorption, 2mm	5.5 / *[DS]	%	Sim. to ISO 62
Density	0.0513 / -	lb/in³	ISO 1183
Density of melt	79.3[DS]	lb/ft³	

[DS]: Derived from similar grade

Injection

Drying Recommended	yes	
Drying Temperature	176	°F
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	563	°F
Min. melt temperature	545	°F
Max. melt temperature	581	°F
Max. screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	212	°F
Min. mold temperature	158	°F
Max. mold temperature	248	°F
Hold pressure range	7250 - 14500	psi
Hold pressure time	0.0762	s/mil
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h²+2	s

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Ejection temperature	410 °F

Automotive

OEM	STANDARD
Mercedes-Benz	DBL5405.05 PAGG GF35
Mercedes-Benz	DBL5409.25 PA66 GF35

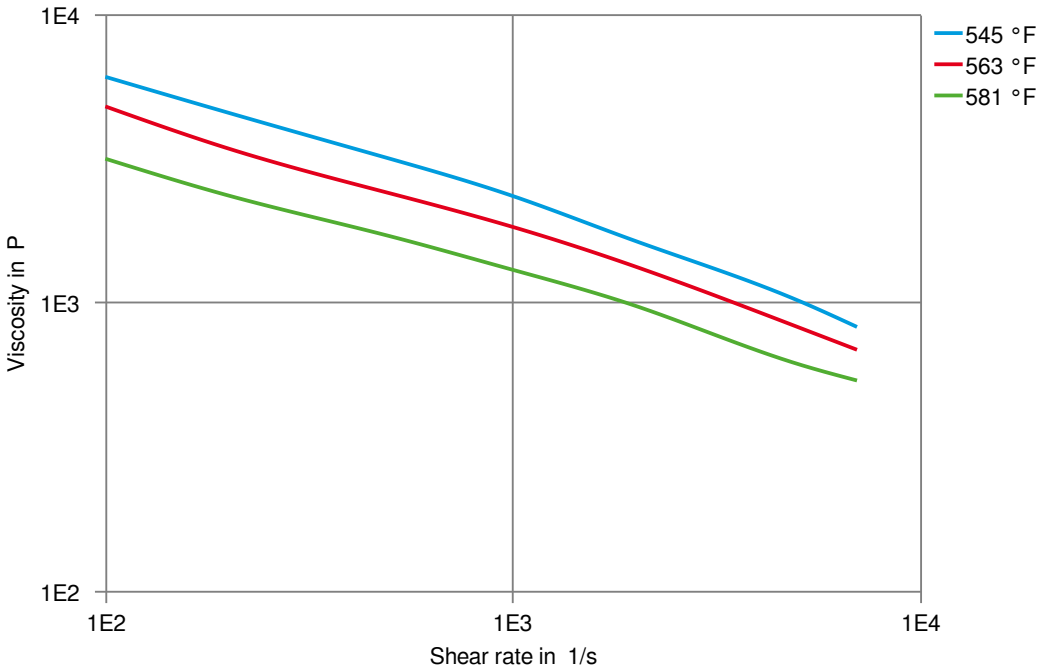
Characteristics

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

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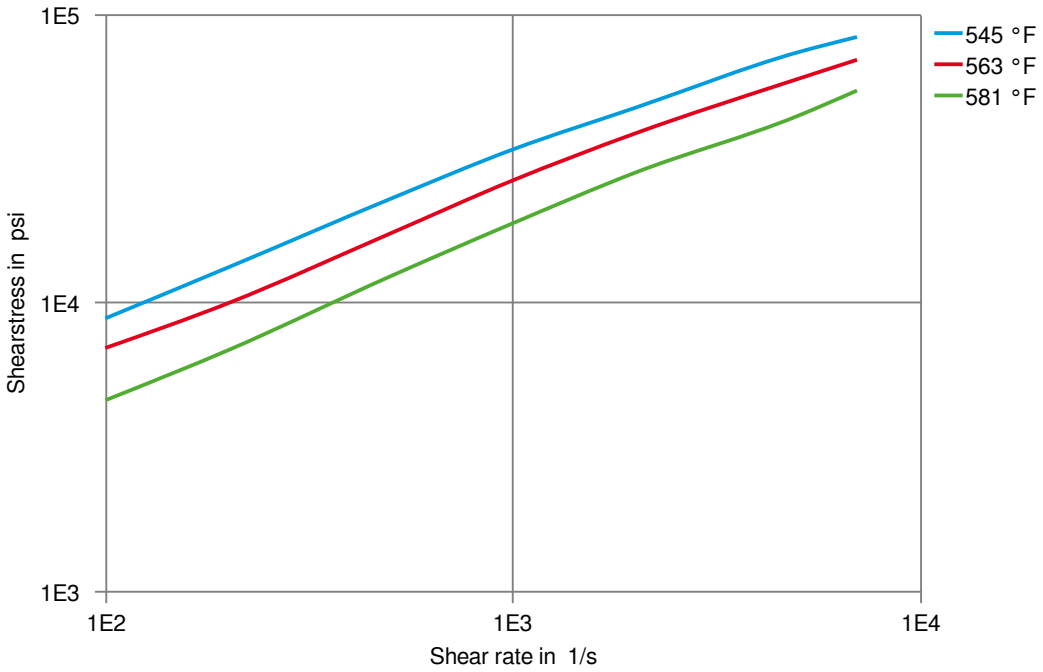
Viscosity-shear rate



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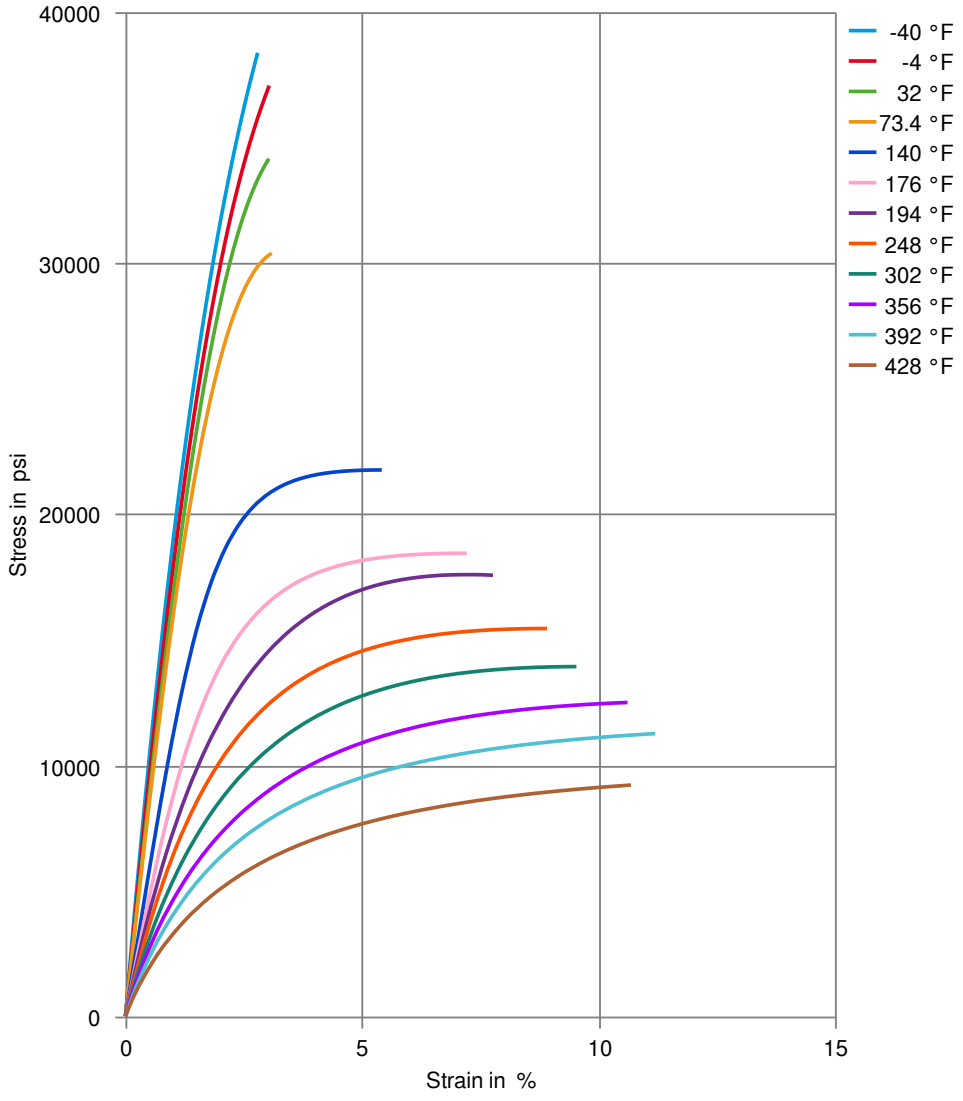
Shearstress-shear rate



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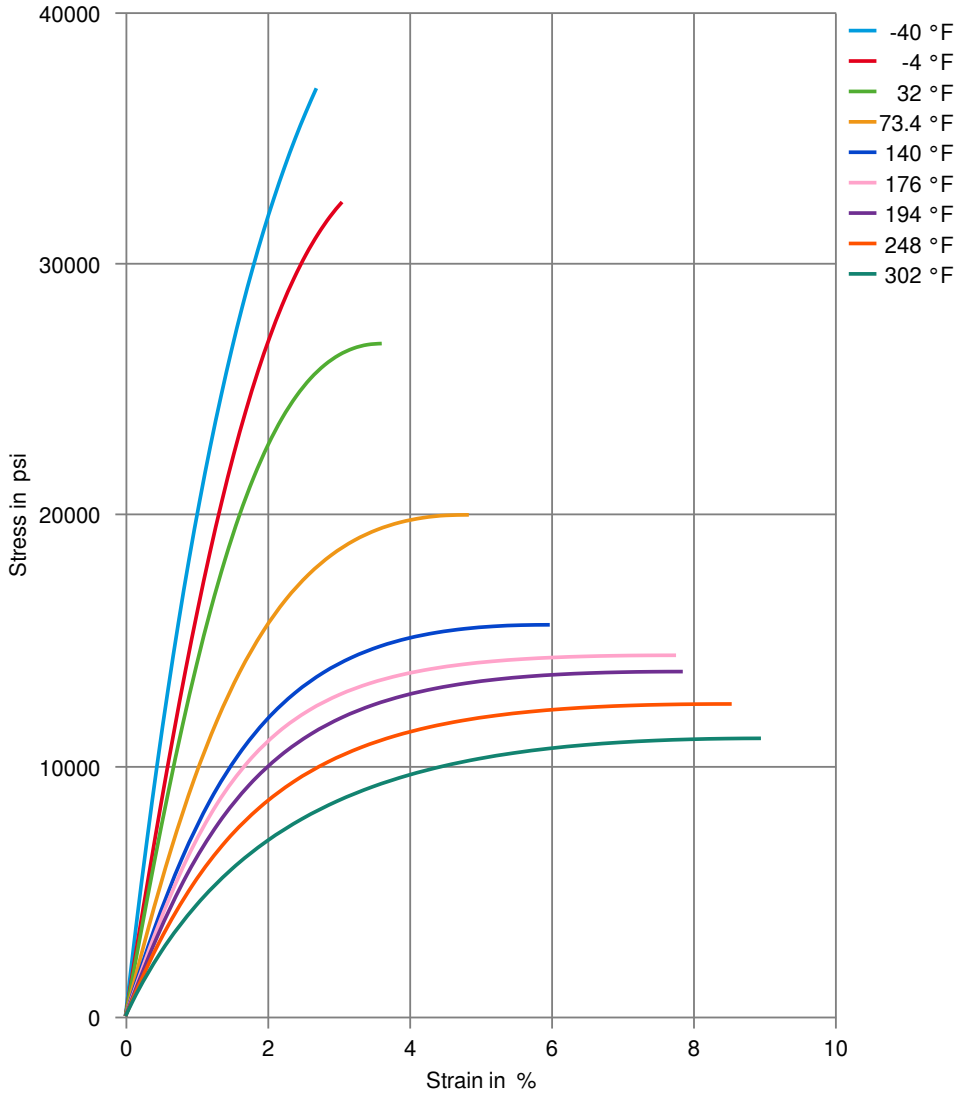
Stress-strain (dry)



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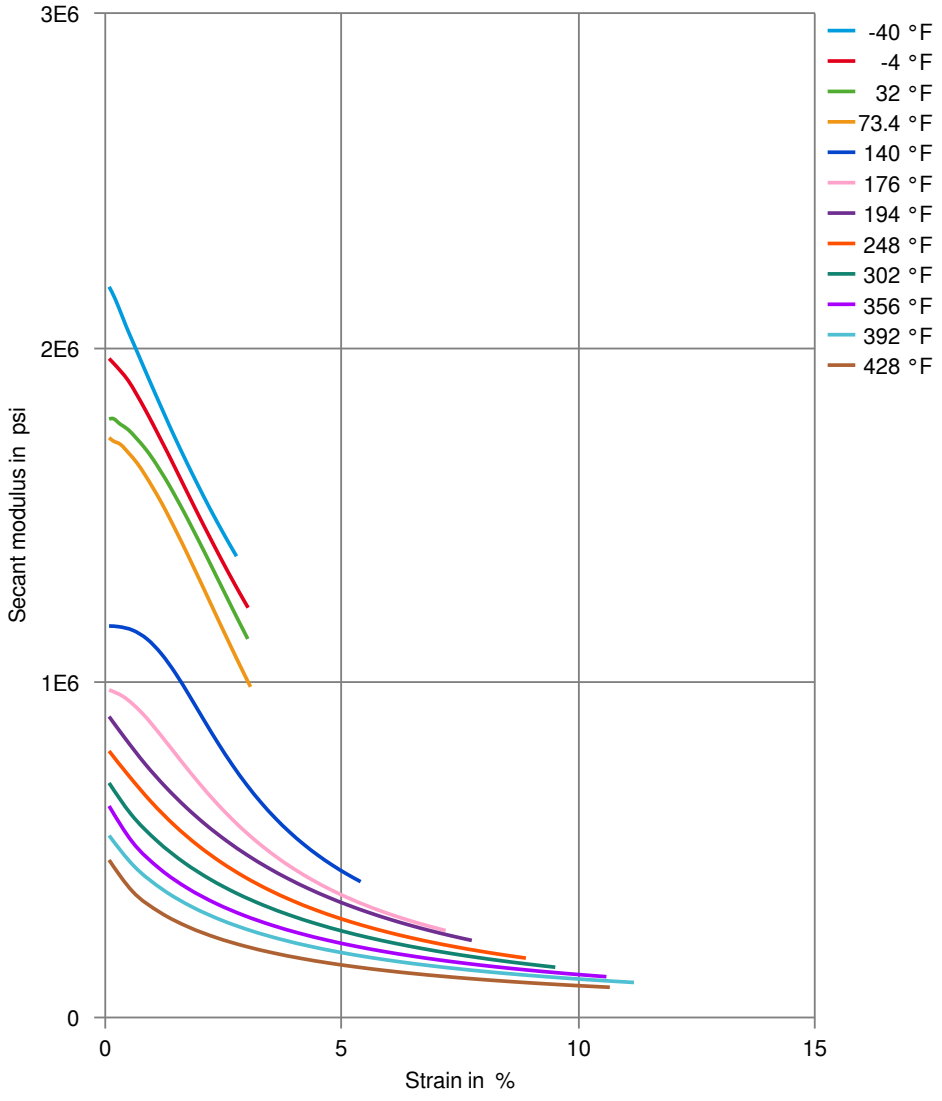
Stress-strain (cond.)



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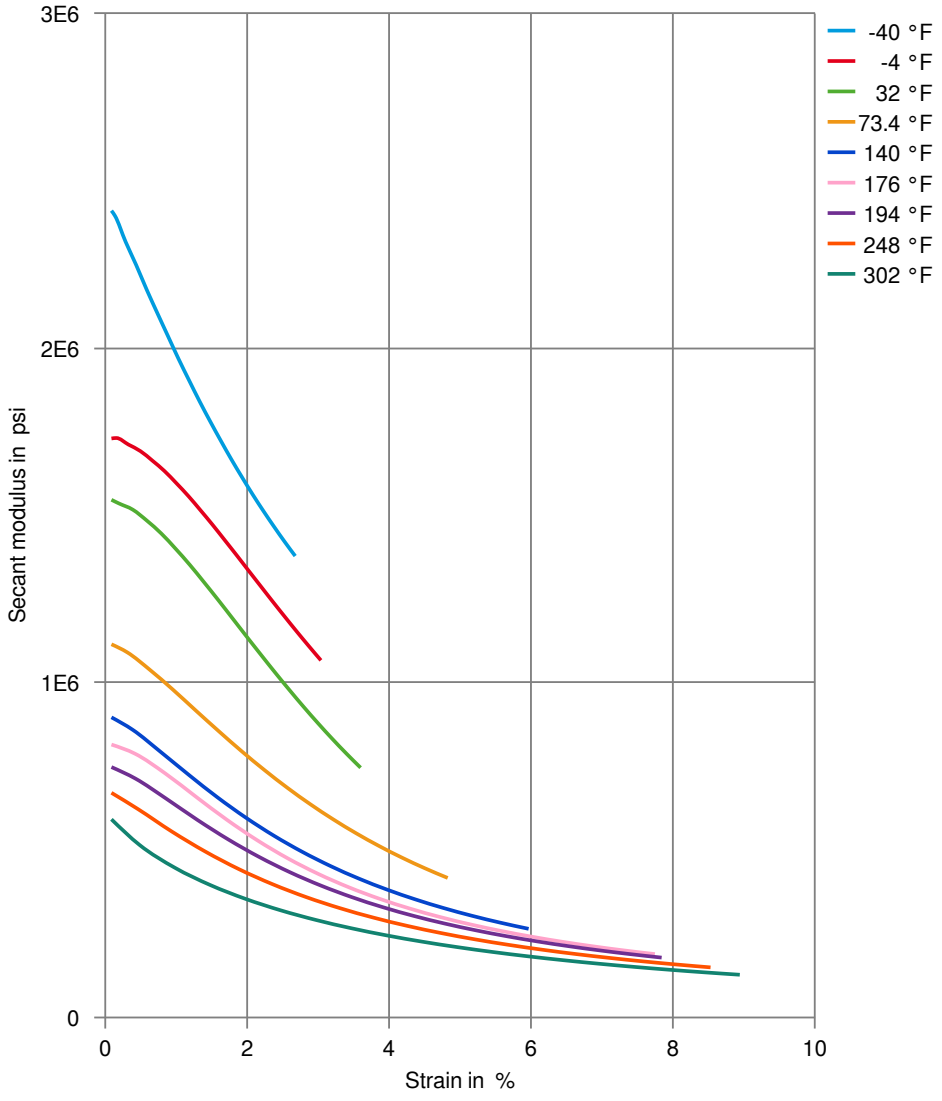
Secant modulus-strain (dry)



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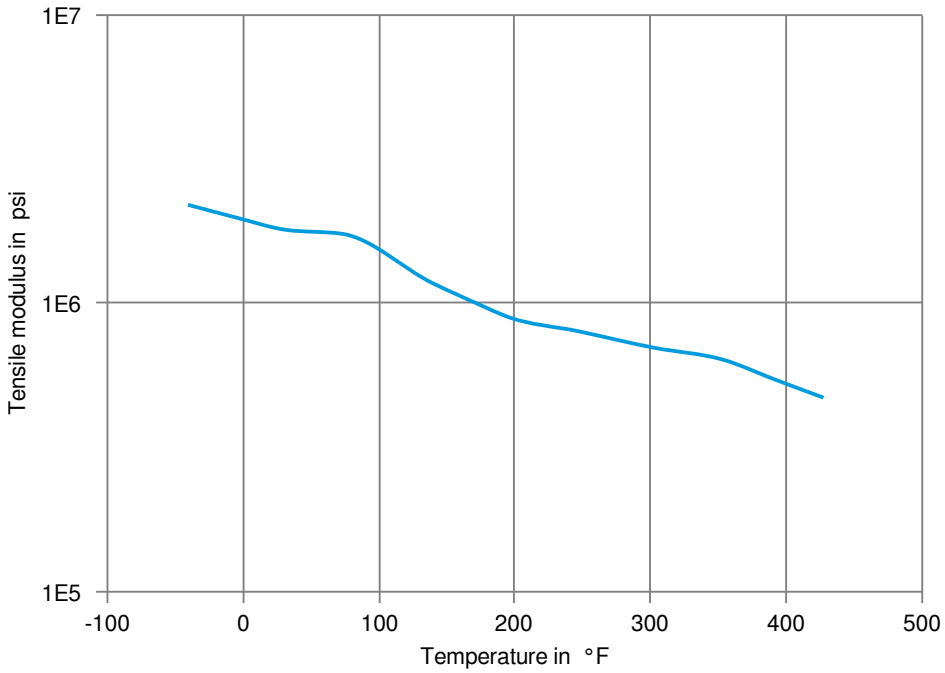
Secant modulus-strain (cond.)



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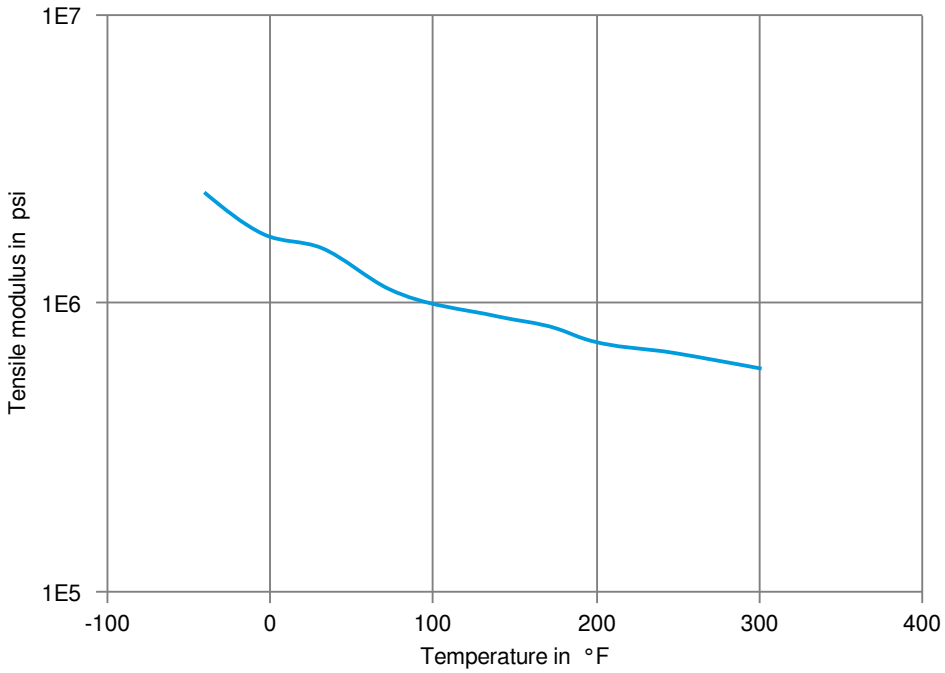
Tensile modulus-temperature (dry)



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Tensile modulus-temperature (cond.)



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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
- ✔ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ✔ Automatic hypoid-gear oil Shell Donax TX, 135°C
- ✔ Hydraulic oil Pentosin CHF 202, 125°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

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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
- ✔ DOT No. 4 Brake fluid, 120°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
- ✔ 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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