Celanese
The chemistry inside innovation™

Zytel® 42A 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, 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® 42A is a high viscosity polyamide 66 for injection molding and extrusion.

Product information

Resin Identification	PA66	ISO 1043
Part Marking Code	>PA66<	ISO 11469
ISO designation	ISO 16396-PA66,,M1G1NR,S32-030	

Rheological properties

	dry/cond.		
Melt mass-flow rate	2.5 / *	g/10min	ISO 1133
Melt mass-flow rate, Temperature	527 / *	°F	
Melt mass-flow rate, Load	4.76 / *	lb	
Viscosity number	8300[1] / *	in³/lb	ISO 307, 1628
Molding shrinkage, parallel	1.4 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577

[1]: formic acid 90%

Typical mechanical properties

	dry/cond.		
Tensile modulus	450000 / 189000	psi	ISO 527-1/-2
Tensile stress at yield, 50mm/min	12000 / 8000	psi	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.4 / 27	%	ISO 527-1/-2
Nominal strain at break	>50 / >50	%	ISO 527-1/-2
Flexural modulus	406000 / 155000	psi	ISO 178
Charpy impact strength, 23°C	N / N	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30°C	N / N	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, 23°C	2.85 / 9.51	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -30°C	2.85 / 1.9	ftlb/in²	ISO 179/1eA
Izod notched impact strength, 23°C	2.85 / 10.9	ftlb/in²	ISO 180/1A
Izod notched impact strength, -30°C	3.33 / 2.85	ftlb/in²	ISO 180/1A
Izod impact strength, 23°C	N / N	ftlb/in²	ISO 180/1U
Izod impact strength, -30°C	N / N	ftlb/in²	ISO 180/1U
Abrasion resistance	3.5 / *	mm³	ISO 4649

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Tribological properties

	dry/cond.		
Coefficient of sliding friction, 1h against steel	-/0.65		ASTM 1894

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	504/*	°F	ISO 11357-1/-3
Glass transition temperature, 10°C/min	158/104	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	158/*	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	392/*	°F	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	471/*	°F	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	0.56/*	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.556/*	E-4/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	7E-8	m^2/s	ISO 22007-4
Specific heat capacity of melt	2790	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	257	°F	UL 746B
RTI, electrical, 1.5mm	257	°F	UL 746B
RTI, electrical, 3.0mm	257	°F	UL 746B
RTI, electrical, 6mm	257	°F	UL 746B
RTI, impact, 0.75mm	149	°F	UL 746B
RTI, impact, 1.5mm	167	°F	UL 746B
RTI, impact, 3.0mm	167	°F	UL 746B
RTI, impact, 6mm	167	°F	UL 746B
RTI, strength, 0.75mm	149	°F	UL 746B
RTI, strength, 1.5mm	185/*	°F	UL 746B
RTI, strength, 3.0mm	185	°F	UL 746B
RTI, strength, 6mm	185	°F	UL 746B

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	V-2/*	class	IEC 60695-11-10
Thickness tested	0.1181/*	in	IEC 60695-11-10
UL recognition	yes/*		UL 94
Oxygen index	28/*	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.4mm	1760/-	°F	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	1760/-	°F	IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	1760/-	°F	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	1760/-	°F	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	1760/-	°F	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	1760/-	°F	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	1710/-	°F	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	1710/-	°F	IEC 60695-2-12
Glow Wire Ignition Temperature, 2.0mm	1470/-	°F	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	1340/-	°F	IEC 60695-2-13
Glow Wire Temperature, No Flame, 1mm	1380/-	°F	IEC 60335-1

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Glow Wire Temperature, No Flame, 2mm	1340 / -	°F	IEC 60335-1
FMVSS Class	SE		ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	4.3 / 10.3		IEC 62631-2-1
Relative permittivity, 1MHz	3.6 / 4.2		IEC 62631-2-1
Dissipation factor, 100Hz	150 / 2000	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	240 / 750	E-4	IEC 62631-2-1
Volume resistivity	1E13 / 1E11	Ohm.m	IEC 62631-3-1
Electric strength	775 / -	kV/in	IEC 60243-1

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	2.6 / *	%	Sim. to ISO 62
Water absorption, 2mm	8.5 / *	%	Sim. to ISO 62
Density	0.0412 / -	lb/in^3	ISO 1183
Density of melt	63.1	lb/ft^3	

Injection

Drying Recommended	yes	
Drying Temperature	176	°F
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.05	%
Melt Temperature Optimum	554	°F
Min. melt temperature	536	°F
Max. melt temperature	572	°F
Max. screw tangential speed	≤0.3	m/s
Mold Temperature Optimum	158	°F
Min. mold temperature	122	°F
Max. mold temperature	194	°F
Hold pressure range	7250 - 14500	psi
Hold pressure time	0.102	s/mil
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h^2+2	s
Ejection temperature	374	°F

Extrusion

Drying Temperature	176	°F
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.06	%
Melt Temperature Range	527 - 554	°F

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Stellantis - Chrysler	MS.50017 / CPN-1618	Natural

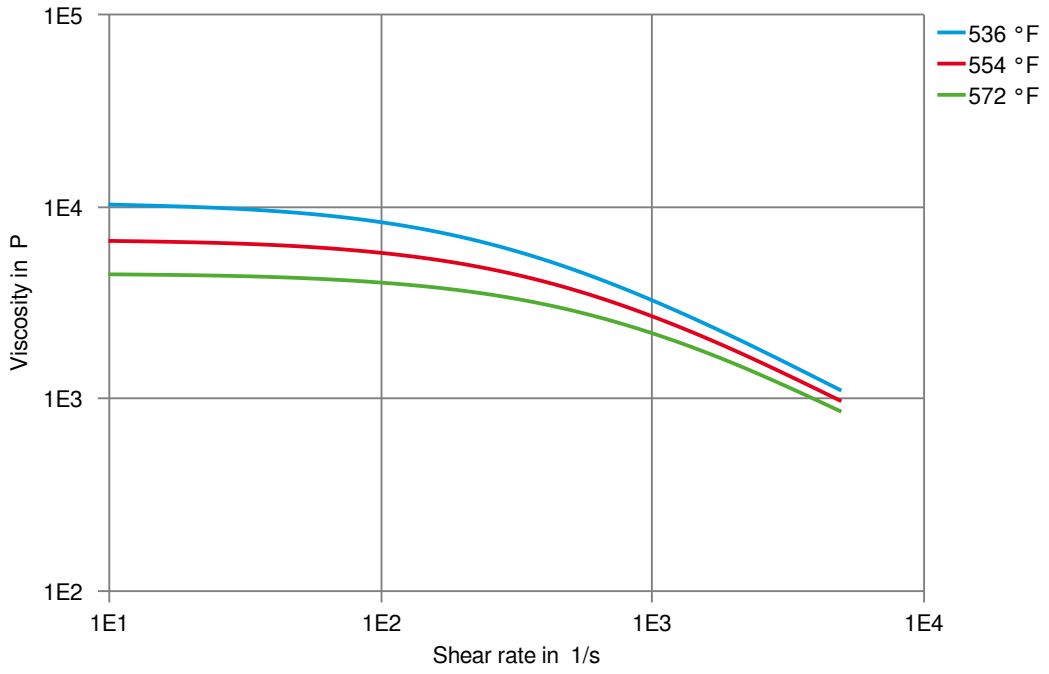
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Characteristics

Processing	Injection Molding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coating, Casting
Additives	Release agent

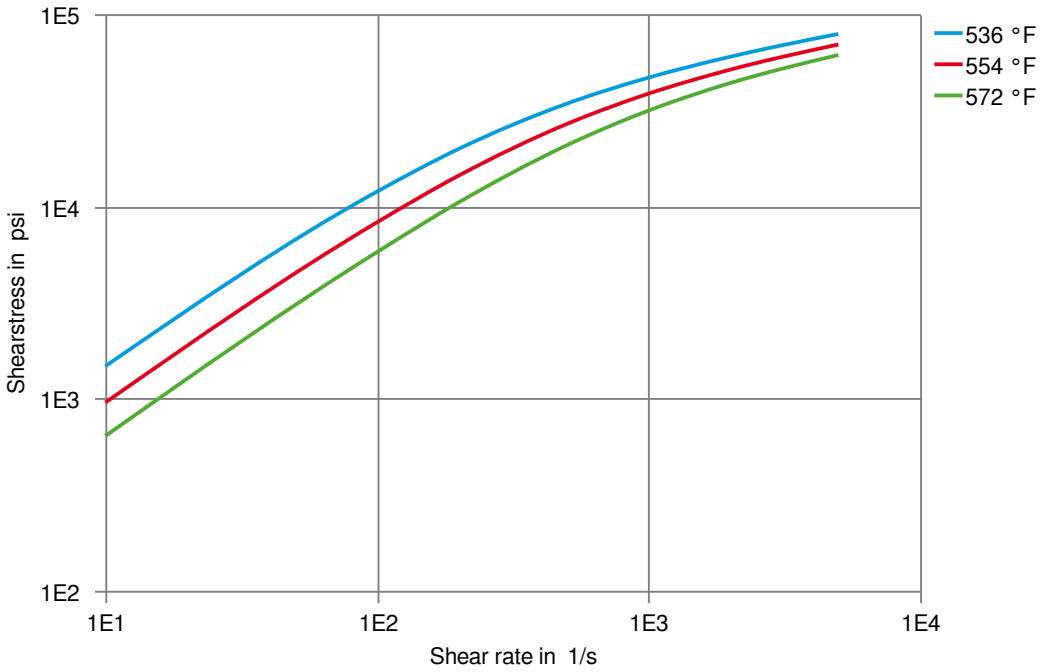
Viscosity-shear rate



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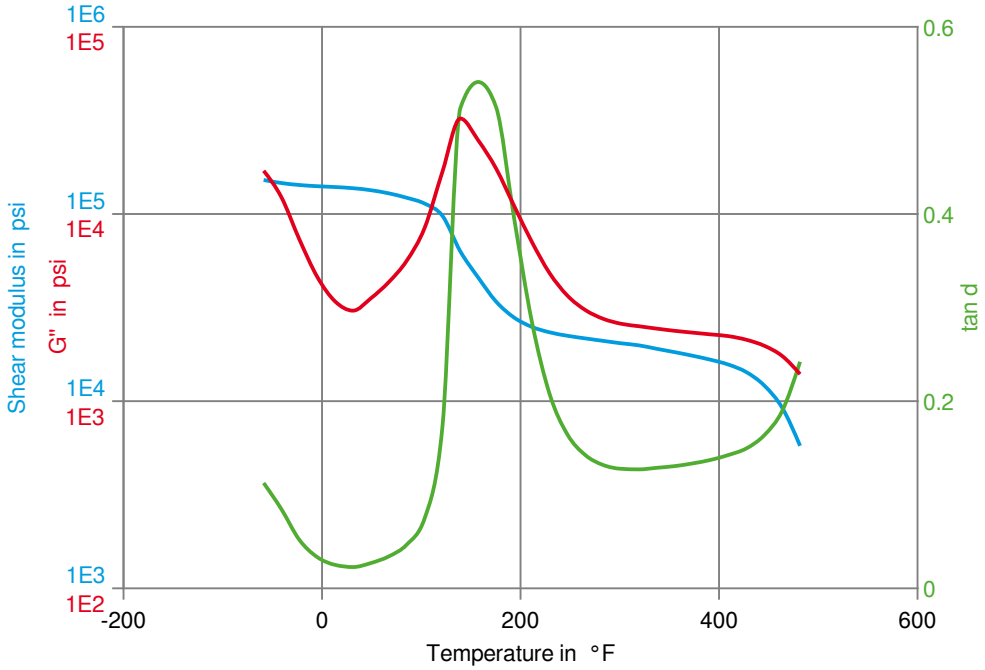
Shearstress-shear rate



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Dynamic Shear modulus-temperature (dry)

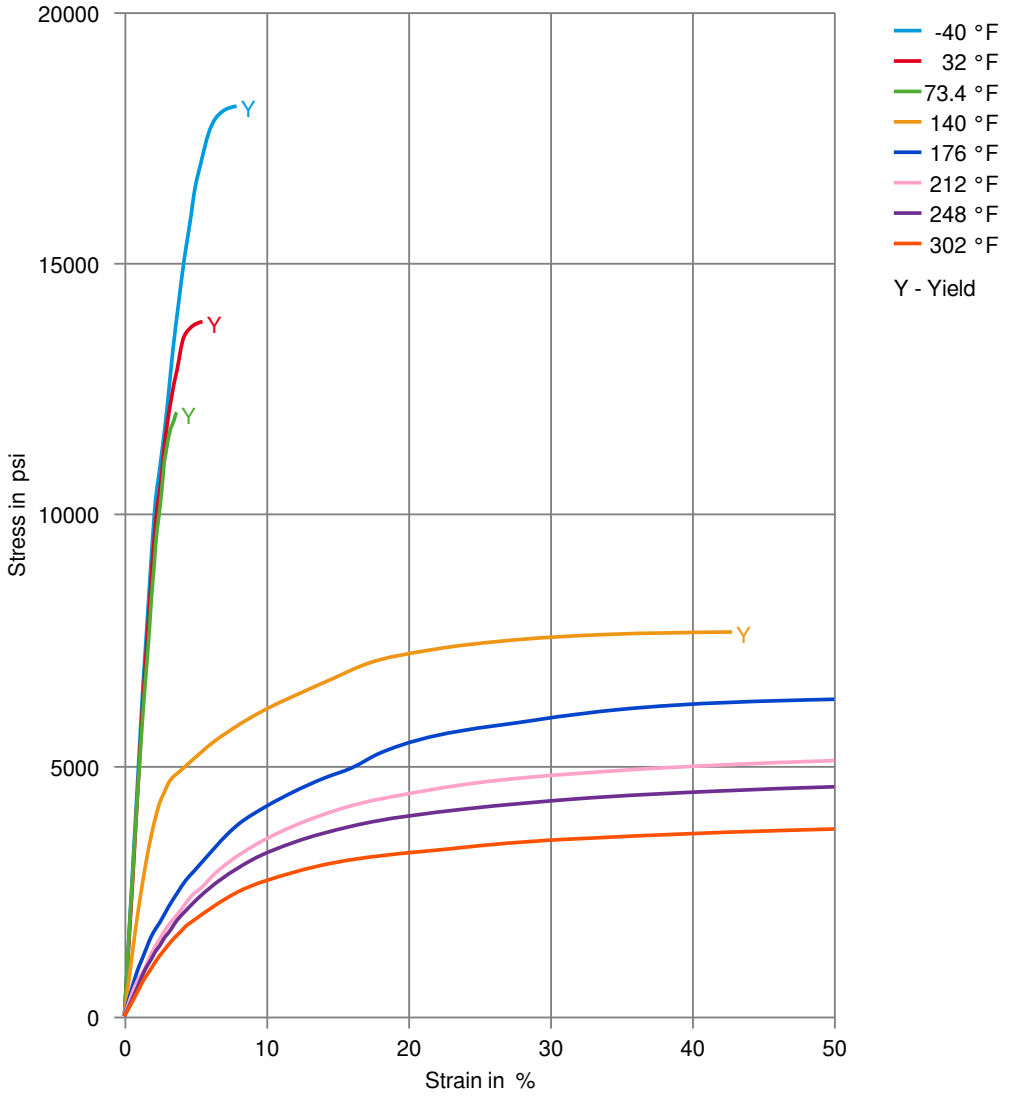


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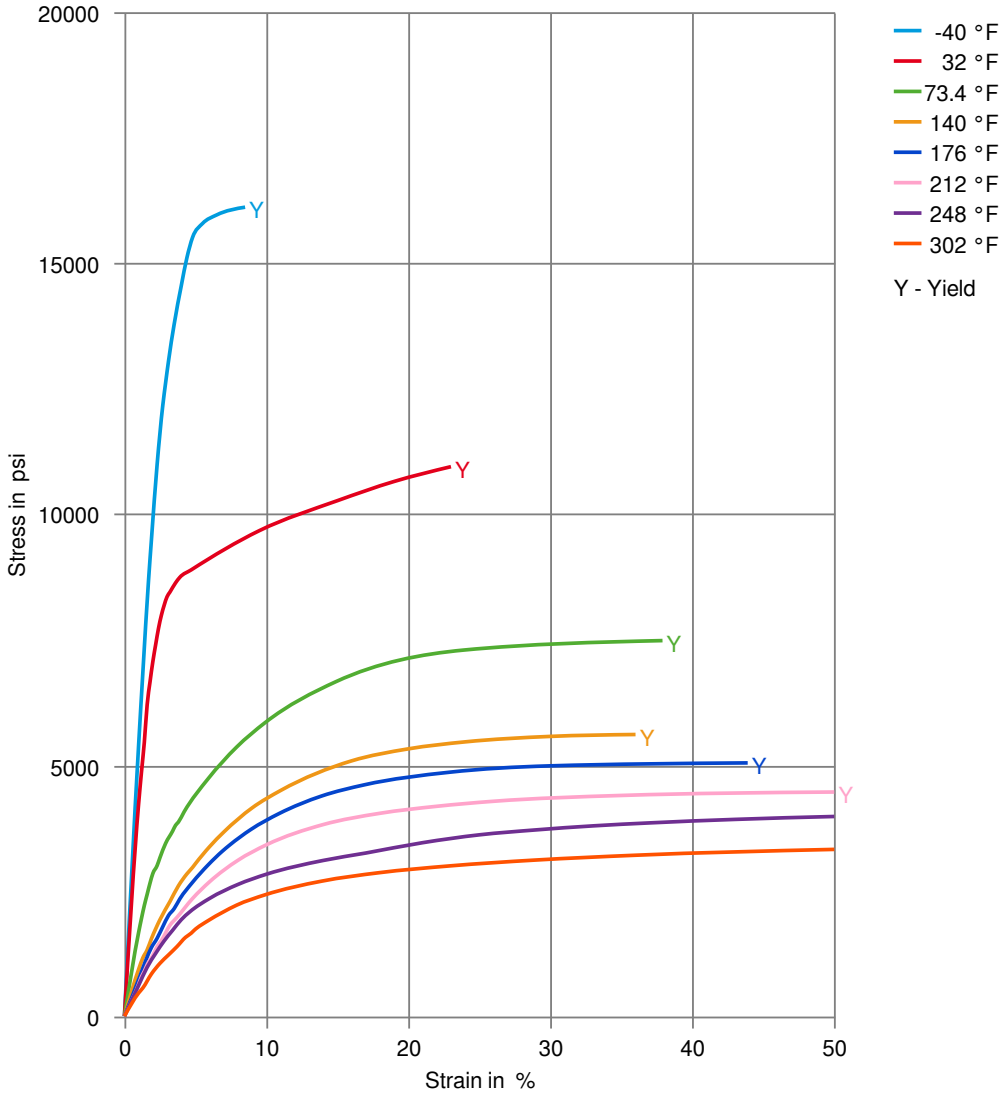
Stress-strain (dry)



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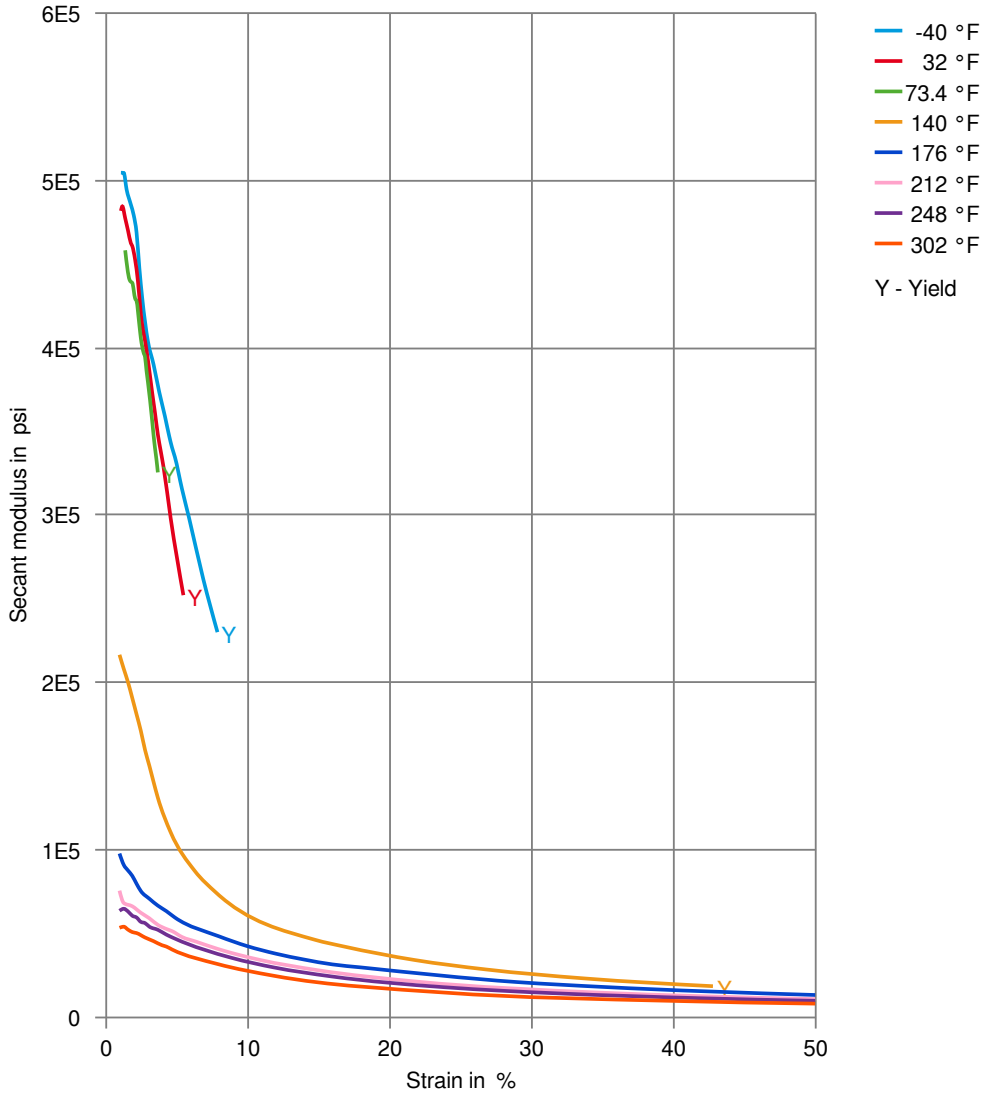
Stress-strain (cond.)



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Secant modulus-strain (dry)

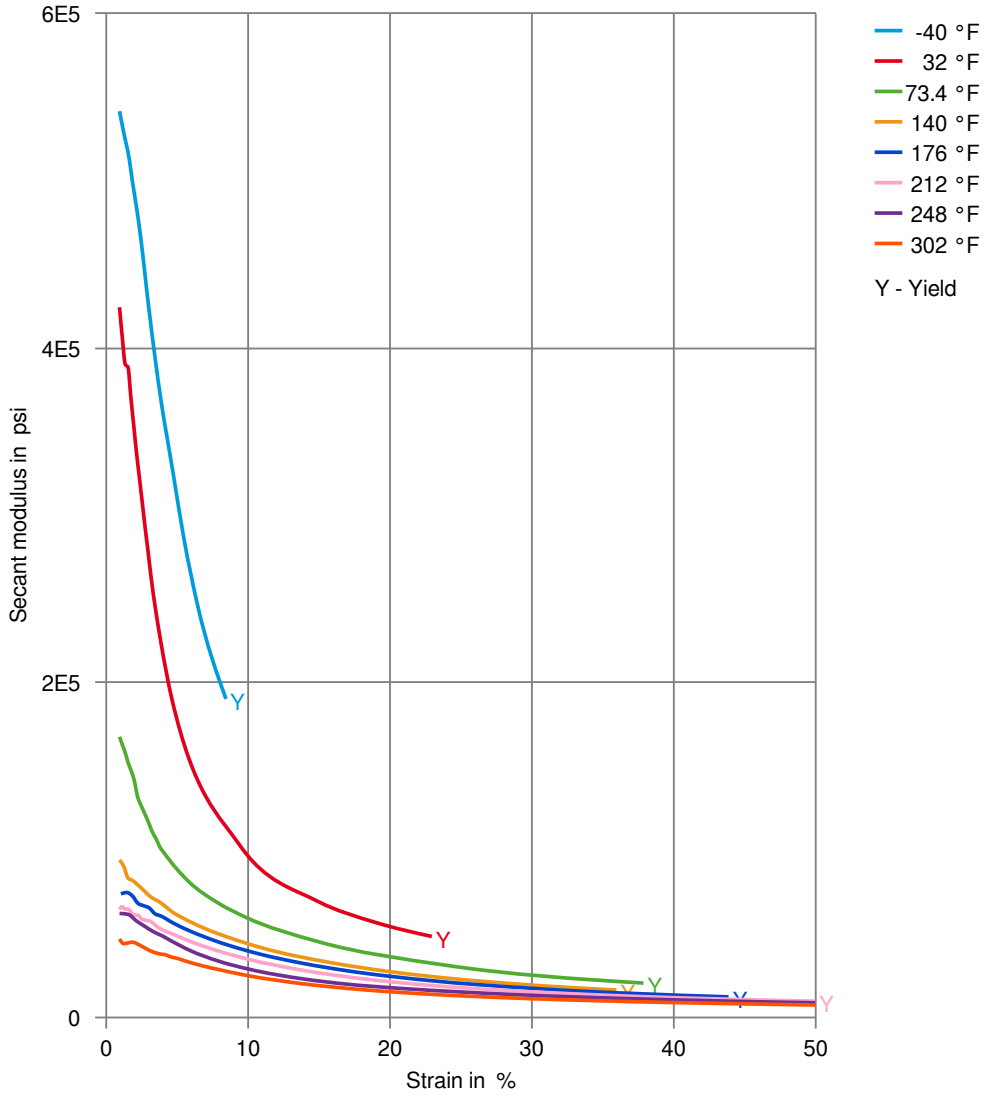


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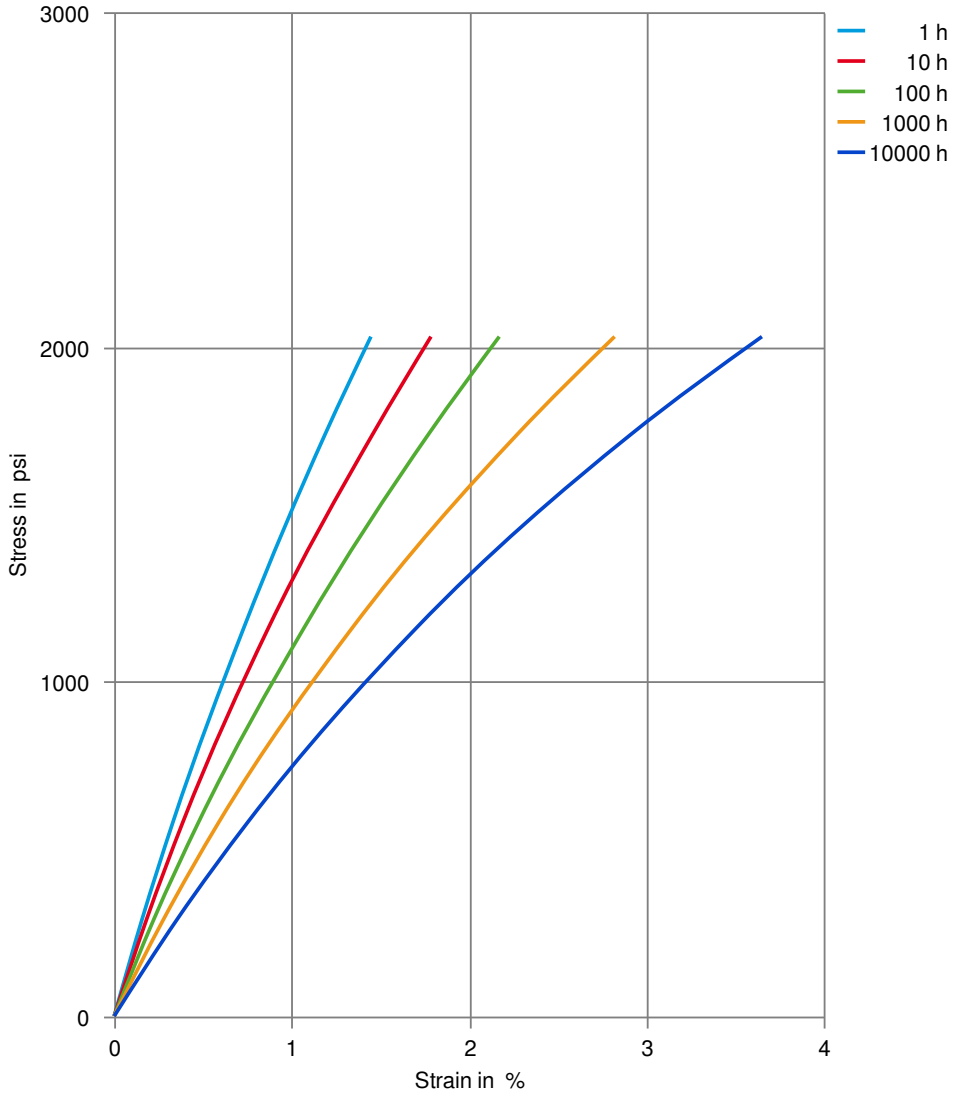
Secant modulus-strain (cond.)



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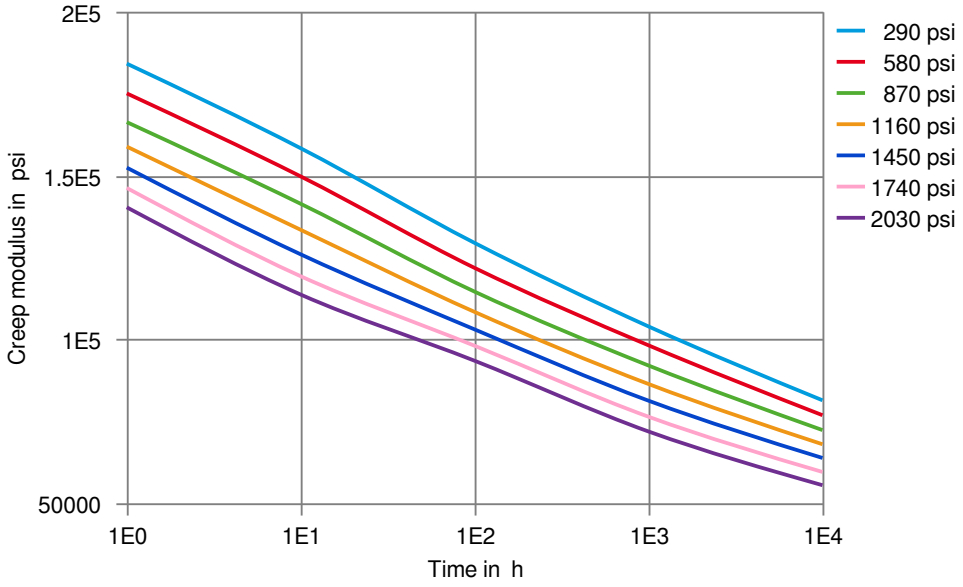
Stress-strain (isochronous) 73.4 °F (cond.)



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Creep modulus-time 73.4 °F (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

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

Salt solutions

- ✔ Sodium Chloride solution (10% by mass), 23°C
- ✘ Sodium Hypochlorite solution (10% by mass), 23°C

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- ✔ 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).

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