

DuPont™ Zytel® 79G13L NC010

NYLON RESIN

Product Information

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, DuPont recommends, 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® 79G13L NC010 is a 13% glass fiber reinforced, toughened polyamide 66 resin for injection molding.

General information	Value	Unit	Test Standard
Resin Identification	PA66-IGF13	-	ISO 1043
Part Marking Code	PA66-IGF13	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	0.4 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	5100 / 3700	MPa	ISO 527-1/-2
Stress at break	118 / 67	MPa	ISO 527-1/-2
Strain at break	4 / 10	%	ISO 527-1/-2
Tensile creep modulus			ISO 899-1
1h	* / 4030	MPa	
1000h	* / 3180	MPa	
Charpy impact strength			ISO 179/1eU
73°F	67 / 59	kJ/m ²	
-22°F	59 / 54	kJ/m ²	
Charpy notched impact strength			ISO 179/1eA
73°F	8 / 14	kJ/m ²	
-22°F	6 / 6	kJ/m ²	
Izod notched impact strength			ISO 180/1A
73°F	8 / 9	kJ/m ²	
-22°F	6 / 4	kJ/m ²	
Hardness, Rockwell, M-scale	90 / 74	-	ISO 2039-2
Hardness, Rockwell, R-scale	120 / 110	-	ISO 2039-2
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	263 / *	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
260 psi	242 / *	°C	
65 psi	260 / *	°C	
Vicat softening temperature, 90°F/h, 11 lbf	240 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	50 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	130 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.18	W/(m K)	-
Spec. heat capacity of melt	2140	J/(kg K)	-
Eff. thermal diffusivity	7E-8	m ² /s	-
RTI, electrical			UL 746B
60mil	90 / *	°C	
120mil	90	°C	
RTI, impact			UL 746B
60mil	65 / *	°C	
120mil	65	°C	

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RTI, strength				UL 746B
60mil	90 / *	°C		
120mil	90	°C		
Flammability		dry / cond	Unit	Test Standard
Burning Behav. at 60mil nom. thickn.		HB / *	class	IEC 60695-11-10
Thickness tested		1.5 / *	mm	IEC 60695-11-10
UL recognition		yes / *	-	UL 94
Burning Behav. at thickness h		HB / *	class	IEC 60695-11-10
Thickness tested		0.75 / *	mm	IEC 60695-11-10
UL recognition		yes / *	-	UL 94
Flammability, 3.0mm		HB / *	-	IEC 60695-11-10
FMVSS Class		B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm		19	mm/min	ISO 3795 (FMVSS 302)
Electrical properties		dry / cond	Unit	Test Standard
Relative permittivity				IEC 62631-2-1
100Hz		3.9 / 9.8	-	
1MHz		3.7 / 4.5	-	
Dissipation factor				IEC 62631-2-1
100Hz		65 / 2500	E-4	
1MHz		130 / 660	E-4	
Volume resistivity		- / 1E12	Ohm*m	IEC 62631-3-1
Surface resistivity		* / 1E14	Ohm	IEC 62631-3-2
Electric strength		37 / 35	kV/mm	IEC 60243-1
Comparative tracking index		475 / -	-	IEC 60112
Other properties		dry / cond	Unit	Test Standard
Humidity absorption, 80mil		2.2 / *	%	Sim. to ISO 62
Water absorption, 80mil		6.5 / *	%	Sim. to ISO 62
Density		1210 / -	kg/m ³	ISO 1183
Density of melt		1030	kg/m ³	-
VDA Properties		dry / cond	Unit	Test Standard
Emission of organic compounds		13	µgC/g	VDA 277
Odor test		4	class	VDA 270
Fogging, G-value (condensate)		0.3 / *	mg	ISO 6452
Injection		dry / cond	Unit	Test Standard
Drying Recommended		yes	-	-
Drying Temperature		≥80	°C	-
Drying Time, Dehumidified Dryer		2 - 4	h	-
Processing Moisture Content		≤0.2	%	-
Melt Temperature Optimum		295	°C	-
Min. melt temperature		285	°C	-
Max. melt temperature		305	°C	-
Max. screw tangential speed		0.2 / *	m/s	-
Mold Temperature Optimum		80	°C	-
Min. mold temperature		50	°C	-
Max. mold temperature		100	°C	-
Hold pressure range		50 - 100	MPa	-
Hold pressure time		3	s/mm	-
Ejection temperature		210	°C	-

Characteristics

Processing	• Injection Molding
Delivery form	• Pellets
Additives	• Lubricants
Regional Availability	• Europe
	• Release agent
	• Near East/Africa

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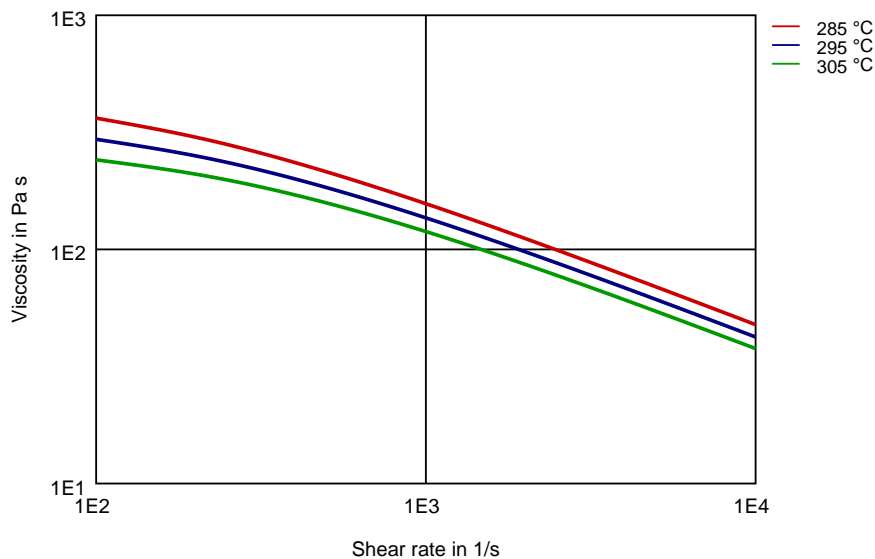


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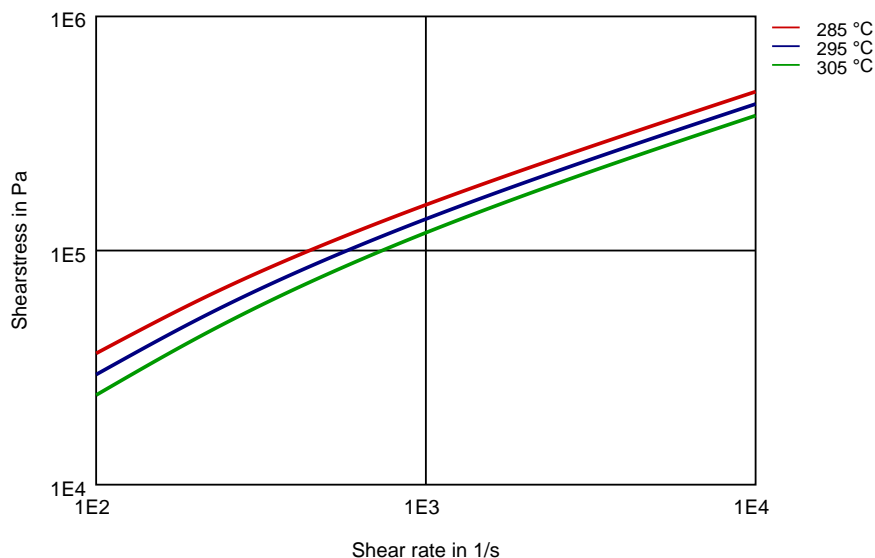
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Diagrams

Viscosity-shear rate



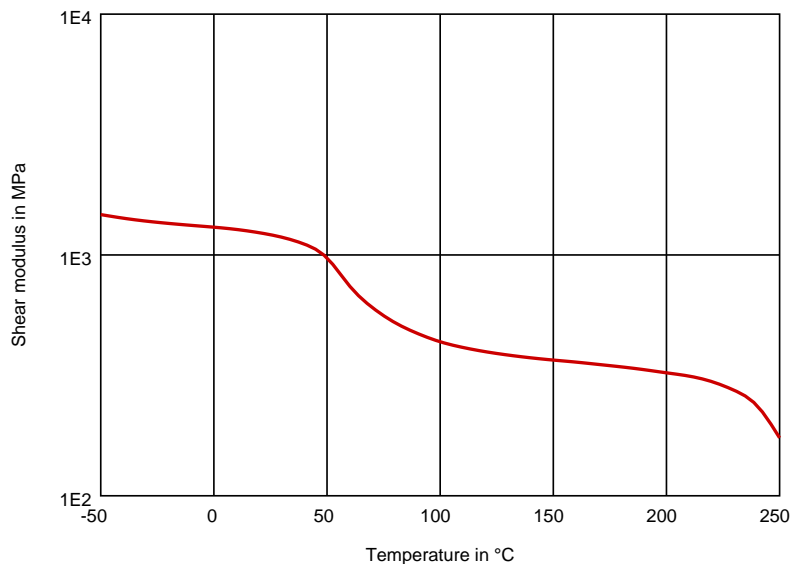
Shearstress-shear rate



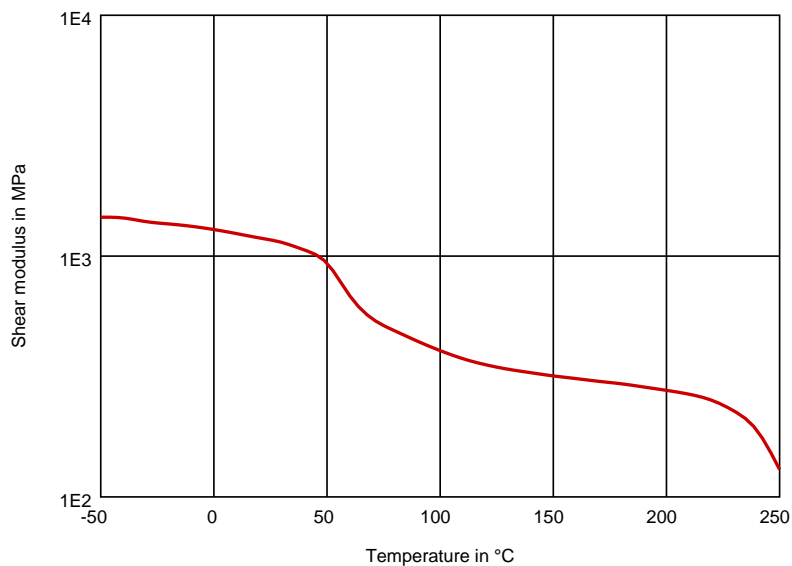
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Dynamic Shear modulus-temperature (dry)



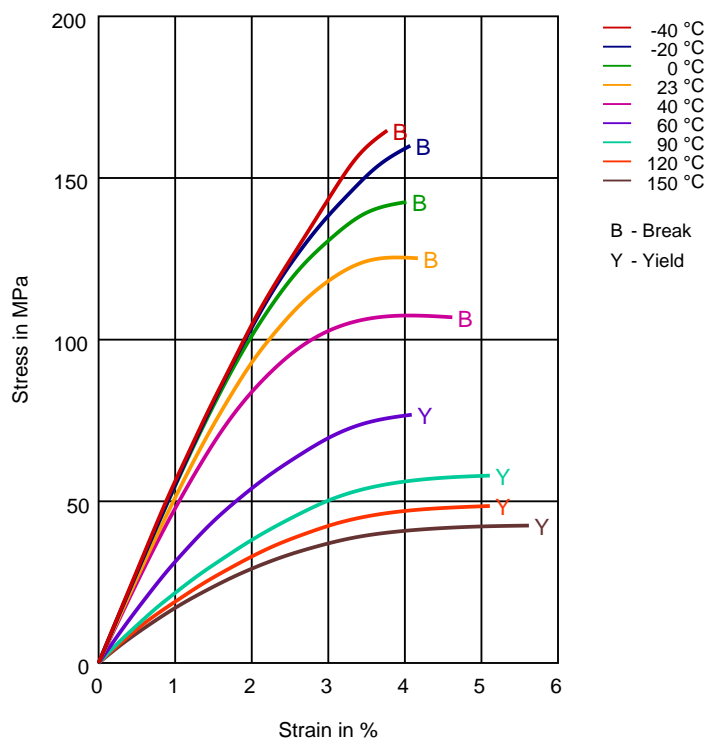
Dynamic Shear modulus-temperature (cond.)



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Stress-strain (dry)



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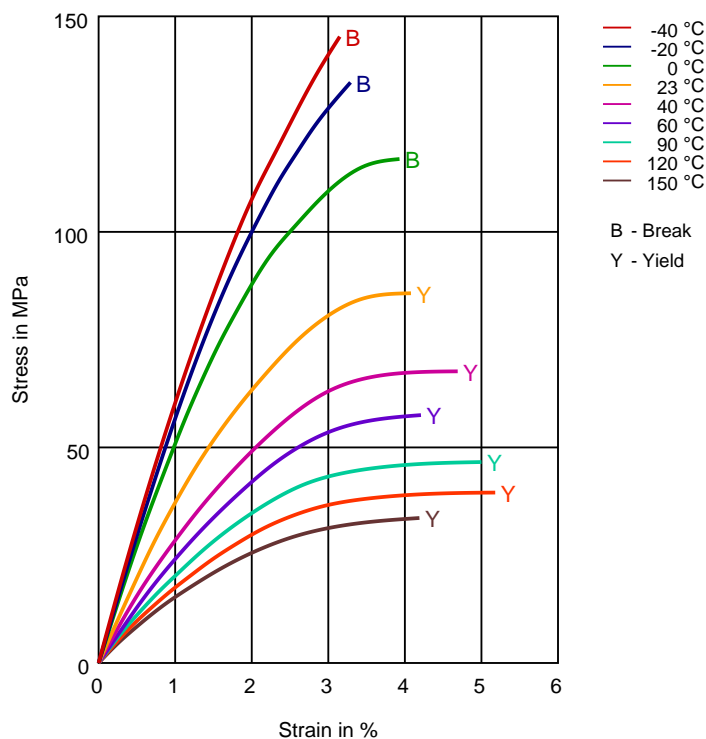
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Stress-strain (cond.)



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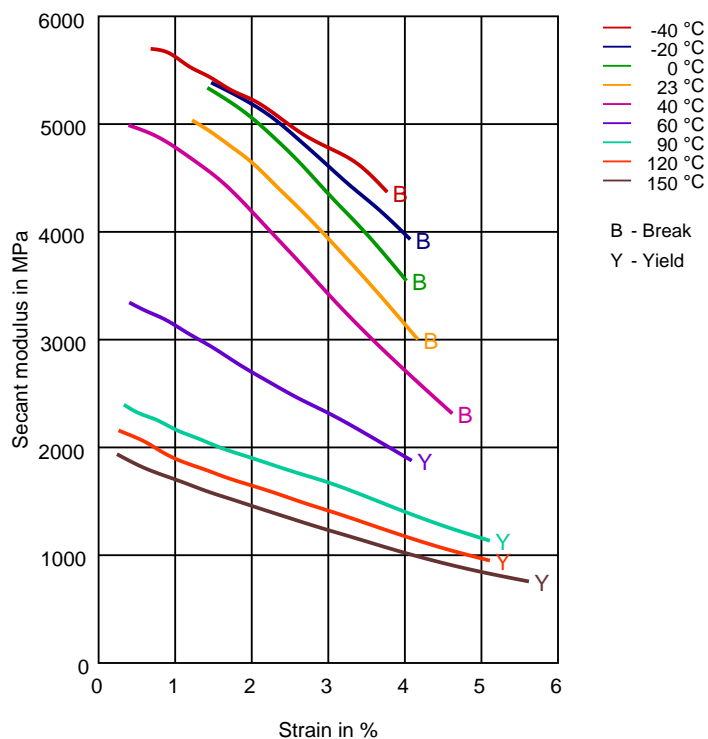
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Secant modulus-strain (dry)



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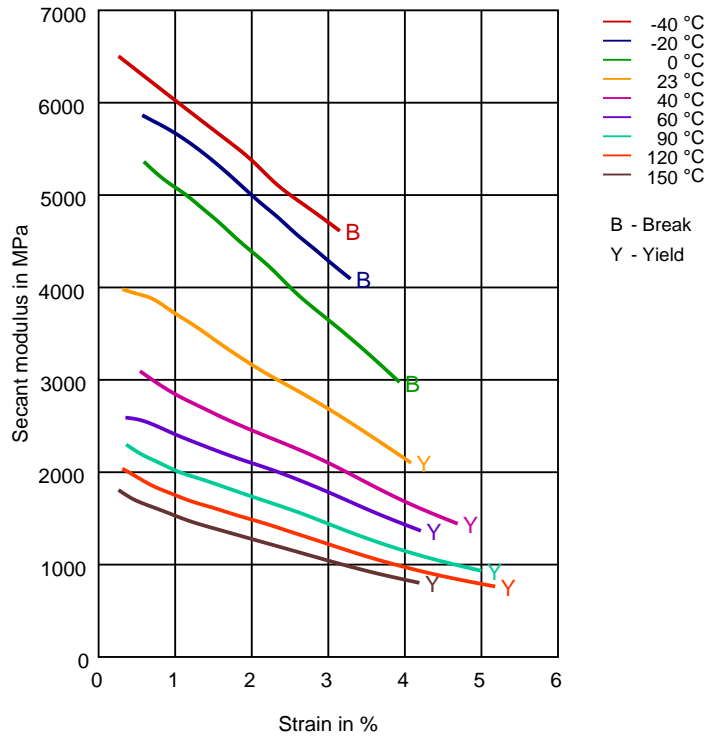
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Secant modulus-strain (cond.)



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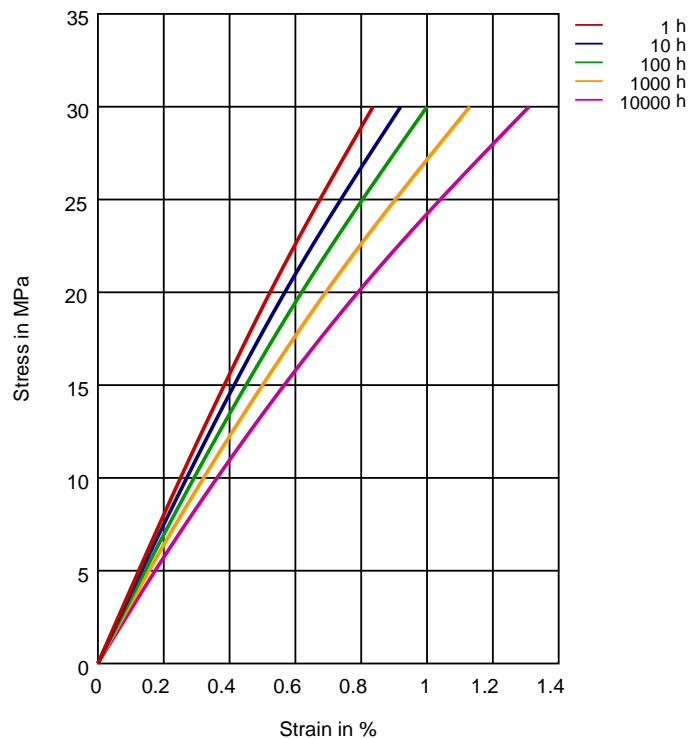
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Stress-strain (isochronous) 23°C(cond.)



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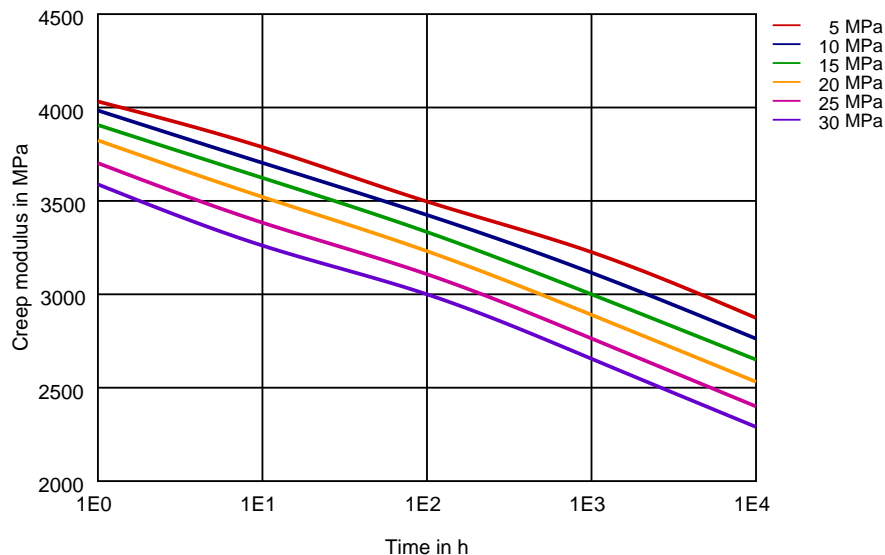
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Creep modulus-time 23 °C (cond.)



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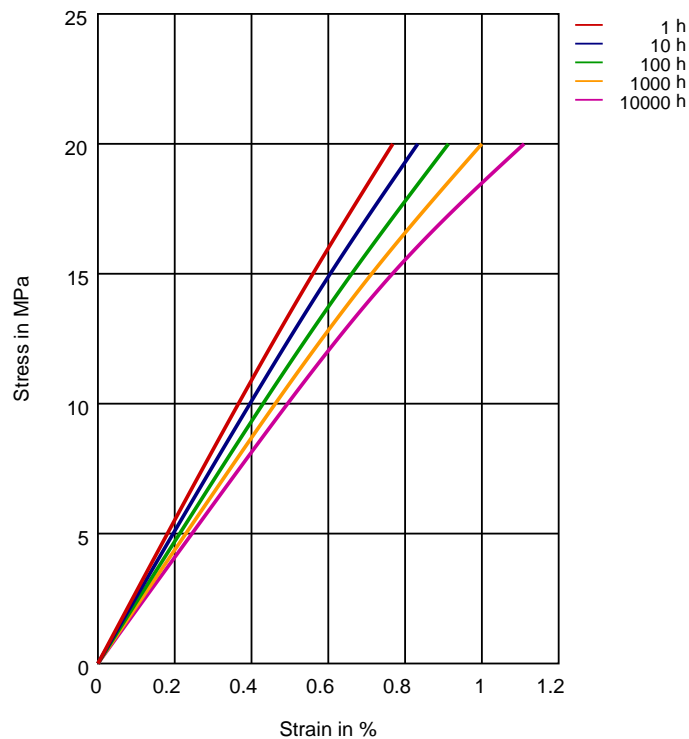
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Stress-strain (isochronous) 80°C (cond.)



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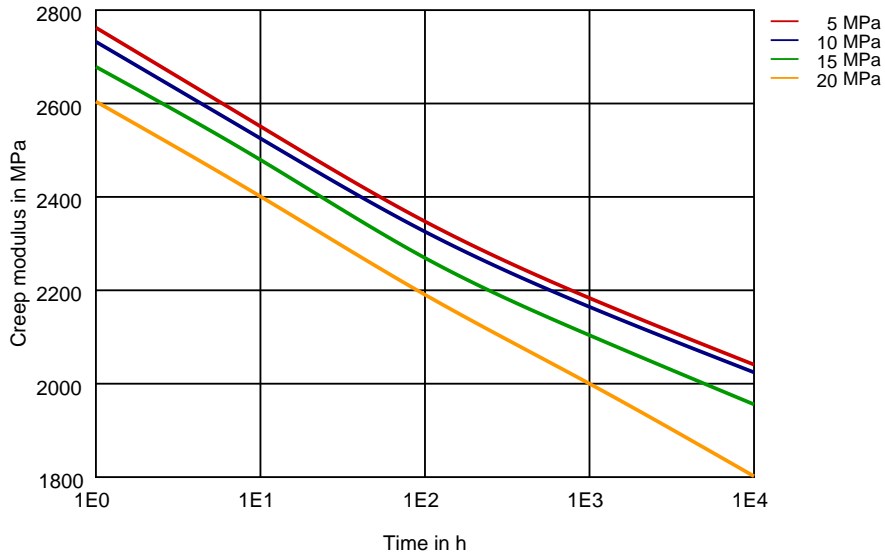
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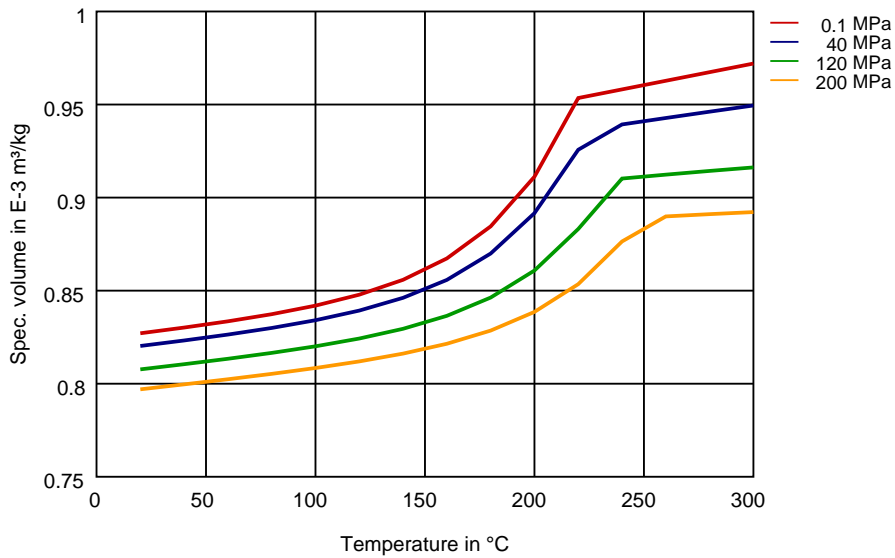
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Creep modulus-time 80 °C (cond.)



Specific volume-temperature (pvT)



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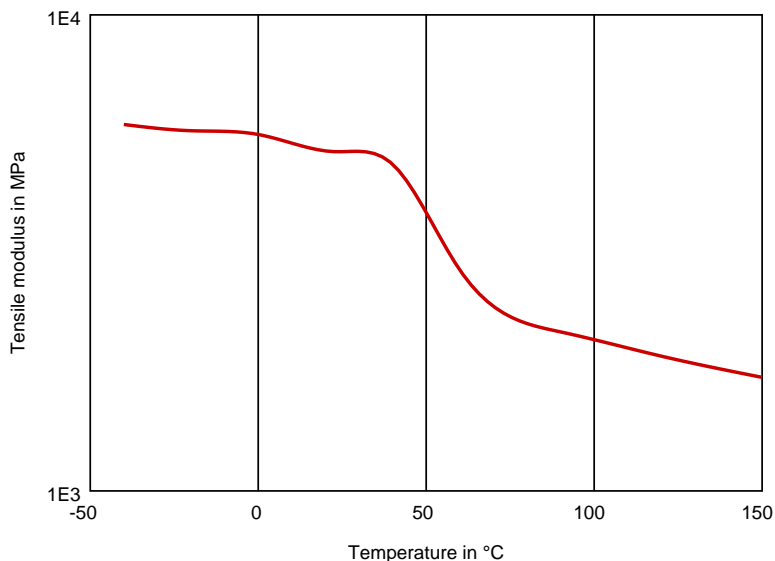
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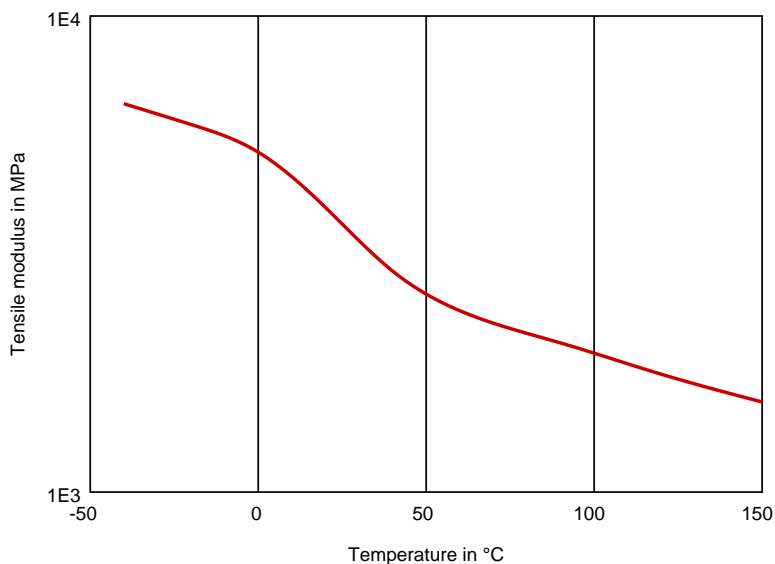
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Tensile modulus-temperature (dry)



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)

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)

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- ✓ 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)
- ✓ 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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