

DuPont™ Crastin® SK645FR NC010

THERMOPLASTIC POLYESTER RESIN

Product Information

Common features of Crastin® thermoplastic polyester resin include mechanical and physical properties such as stiffness and toughness, heat resistance, friction and wear resistance, excellent surface finishes and good colourability. Crastin® thermoplastic polyester resin has excellent electrical insulation characteristics and high arc-resistant grades are available. Many flame retardant grades have UL recognition (class V-0). Crastin® thermoplastic polyester resin typically has high chemical and heat ageing resistance.

The good melt stability of Crastin® thermoplastic polyester 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 (-24 kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Crastin® thermoplastic polyester resin typically is used in demanding applications in the electronics, electrical, automotive, mechanical engineering, chemical, domestic appliances and sporting goods industry.

Crastin® SK645FR is a flame retardant, 30% glass reinforced polybutylene terephthalate moulding resin. It is recognized as UL94V-0 at 0.75mm.

Product information	Value	Unit	Test Standard
Resin Identification	PBT-GF30FR(17)	-	ISO 1043
Part Marking Code	PBT-GF30FR(17)	-	ISO 11469
Rheological properties	Value	Unit	Test Standard
Melt volume-flow rate	11	cm ³ /10min	ISO 1133
Temperature	250	°C	ISO 1133
Load	5	kg	ISO 1133
Melt mass-flow rate	9	g/10min	ISO 1133
Melt mass-flow rate, Temperature	250	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	0.4	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.3	%	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	0.5	%	ISO 294-4
Moulding shrinkage, normal, annealed	1.5	%	ISO 294-4
Mechanical properties	Value	Unit	Test Standard
Tensile Modulus	11000	MPa	ISO 527-1/-2
Stress at break	120	MPa	ISO 527-1/-2
Strain at break	2.4	%	ISO 527-1/-2
Flexural Modulus	9500	MPa	ISO 178
Flexural Strength	215	MPa	ISO 178
Tensile creep modulus			ISO 899-1
1h	11000	MPa	
1000h	8000	MPa	
Charpy impact strength			ISO 179/1eU
23°C	55	kJ/m ²	
-30°C	55	kJ/m ²	
Charpy notched impact strength			ISO 179/1eA
23°C	9	kJ/m ²	
-30°C	9	kJ/m ²	
Izod notched impact strength			ISO 180/1A
23°C	9	kJ/m ²	
-30°C	8	kJ/m ²	
Izod impact strength			ISO 180/1U
23°C	40	kJ/m ²	
-30°C	40	kJ/m ²	

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Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	225	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	210	°C	
0.45 MPa	220	°C	
Vicat softening temperature, 50°C/h, 50N	212	°C	ISO 306
Coeff. of linear therm. expansion, parallel	30	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	90	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.26	W/(m K)	-
Spec. heat capacity of melt	1600	J/(kg K)	-
RTI, electrical			UL 746B
0.75mm	140	°C	
1.5mm	140	°C	
3mm	140	°C	
6mm	140	°C	
RTI, impact			UL 746B
0.75mm	125	°C	
1.5mm	125	°C	
3mm	130	°C	
6mm	130	°C	
RTI, strength			UL 746B
0.75mm	140	°C	
1.5mm	140	°C	
3mm	140	°C	
6mm	140	°C	
Flammability	Value	Unit	Test Standard
Burning Behav. at 1.5mm nom. thickn.	V-0	class	IEC 60695-11-10
Thickness tested	1.5	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Burning Behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Oxygen index	31	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	960	°C	IEC 60695-2-12
Glow Wire Temperature, No Flame, 1mm	650	°C	IEC 60335-1
FMVSS Class	DNI	-	ISO 3795 (FMVSS 302)
Electrical properties	Value	Unit	Test Standard
Relative permittivity			IEC 62631-2-1
100Hz	4.5	-	
1MHz	3.8	-	
Dissipation factor			IEC 62631-2-1
100Hz	30	E-4	
1MHz	160	E-4	
Volume resistivity	>1E13	Ohm*m	IEC 62631-3-1
Surface resistivity	1E15	Ohm	IEC 62631-3-2
Electric strength	39	kV/mm	IEC 60243-1
Comparative tracking index	250	-	IEC 60112
Electric Strength, 20s, 2mm	17	kV/mm	IEC 60243-1
Other properties	Value	Unit	Test Standard
Humidity absorption, 2mm	0.1	%	Sim. to ISO 62
Water absorption, 2mm	0.3	%	Sim. to ISO 62
Density	1710	kg/m ³	ISO 1183
Density of melt	1490	kg/m ³	-
Injection	Value	Unit	Test Standard
Drying Recommended	yes	-	-
Drying Temperature	≥120	°C	-

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Drying Time, Dehumidified Dryer	2 - 4 h	-
Processing Moisture Content	≤0.04 %	-
Melt Temperature Optimum	250 °C	-
Min. melt temperature	240 °C	-
Max. melt temperature	260 °C	-
Mold Temperature Optimum	80 °C	-
Min. mould temperature	30 °C	-
Max. mould temperature	130 °C	-
Hold pressure range	≥60 MPa	-
Hold pressure time	3 s/mm	-
Back pressure	As low as possible	-
Ejection temperature	170 °C	-

Characteristics

Processing	• Injection Moulding		
Delivery form	• Pellets		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

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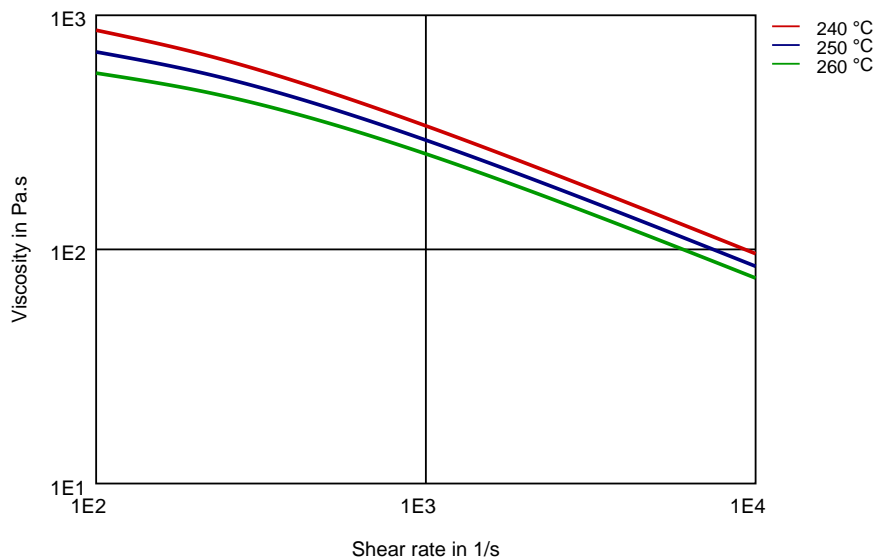


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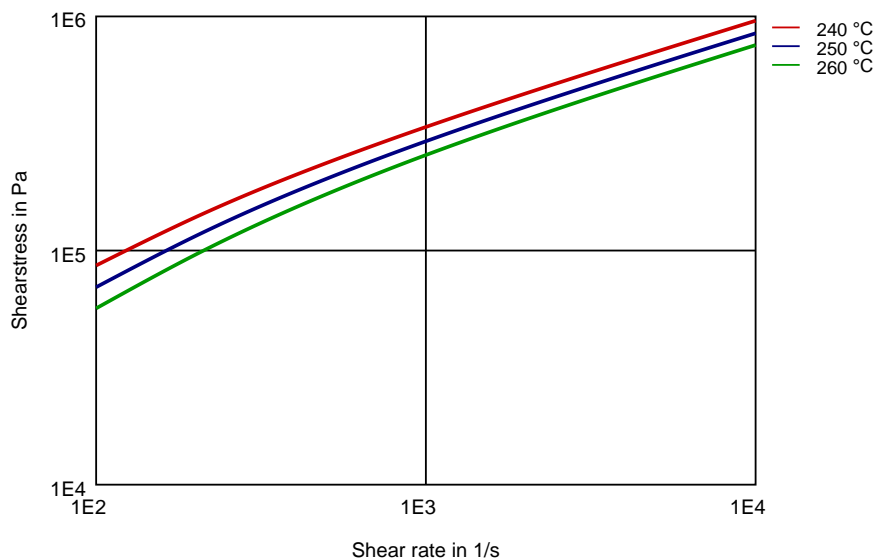
THERMOPLASTIC POLYESTER RESIN

Diagrams

Viscosity-shear rate



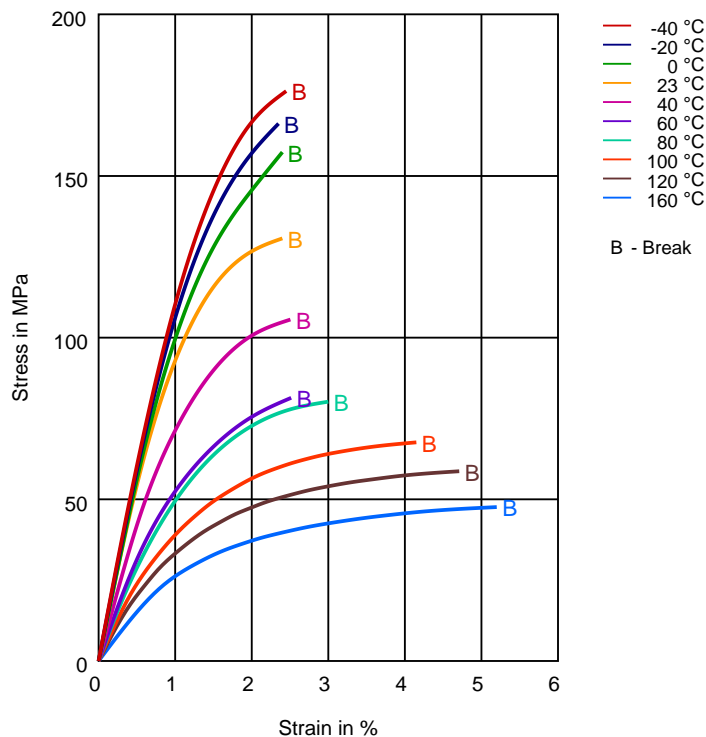
Shearstress-shear rate



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Stress-strain



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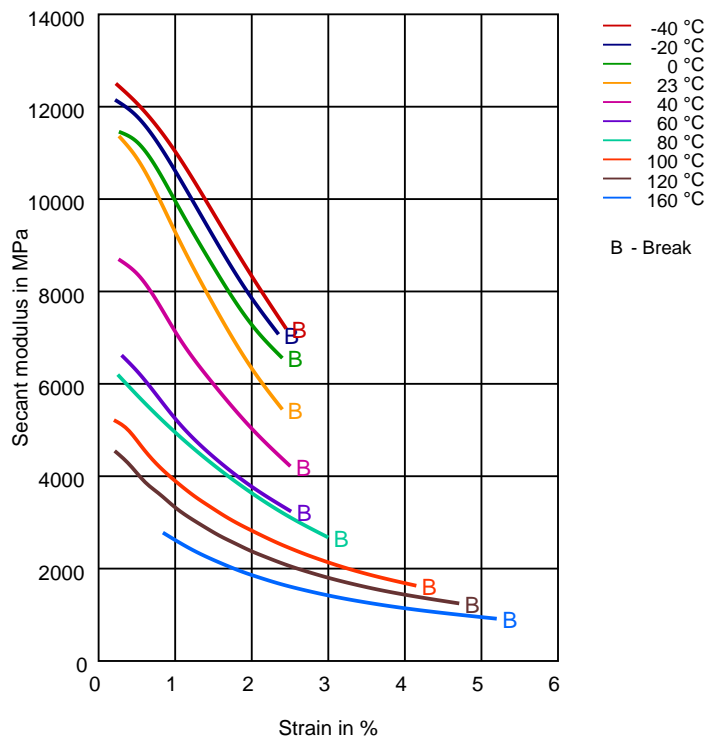
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Secant modulus-strain



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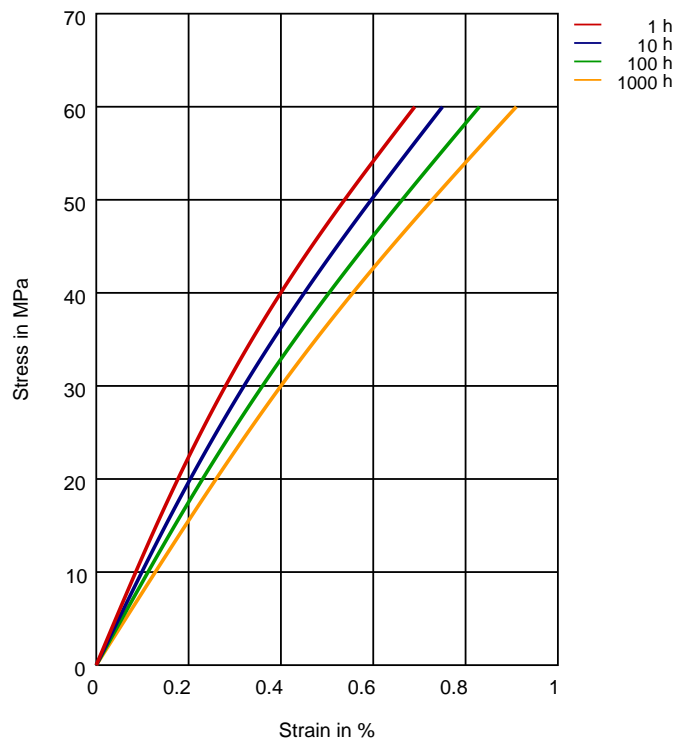
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THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 23°C



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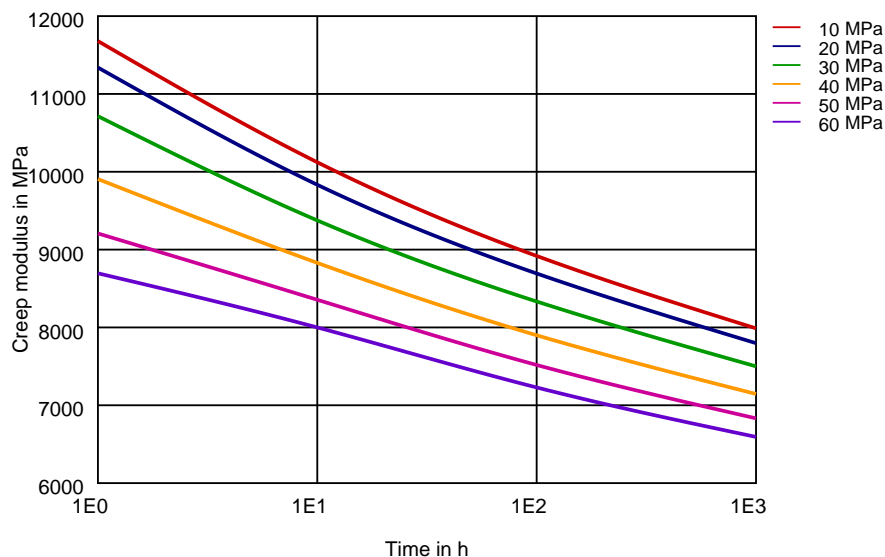
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THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 23 °C



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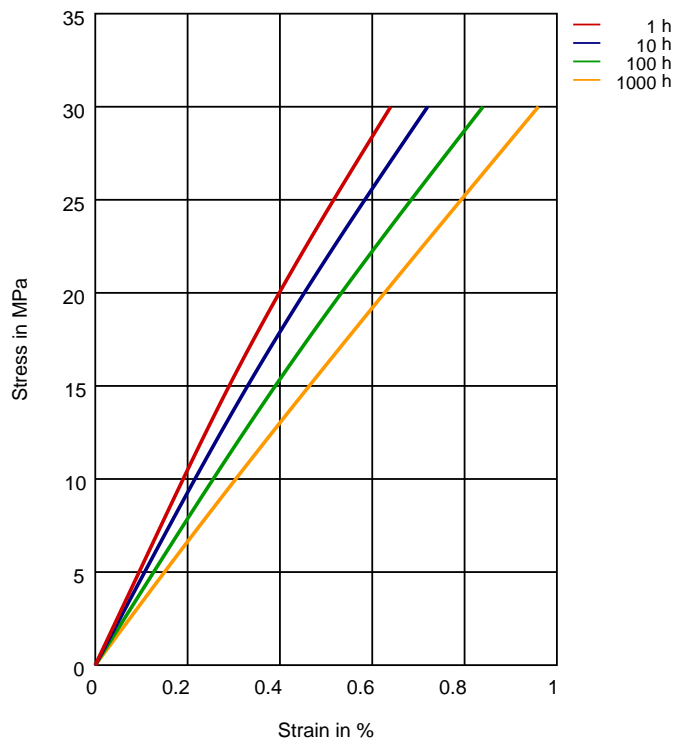
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THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 100 °C



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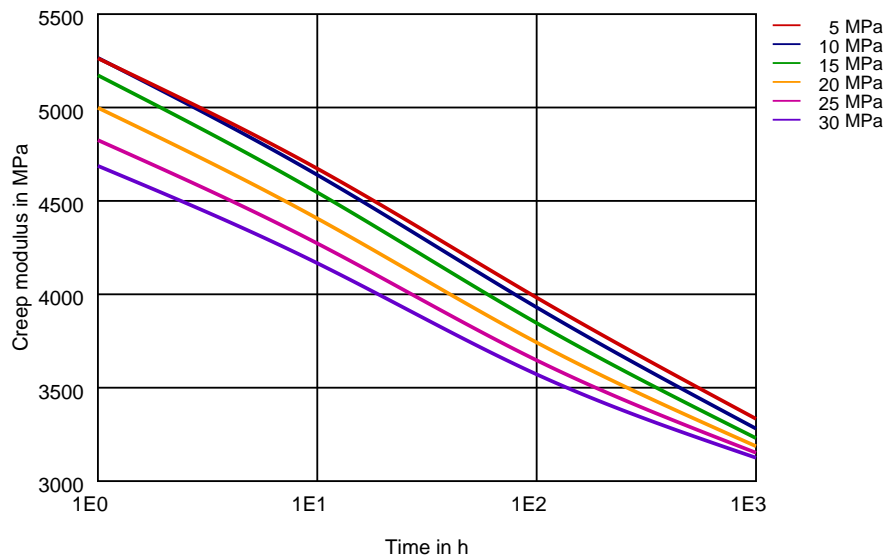
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THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 100°C



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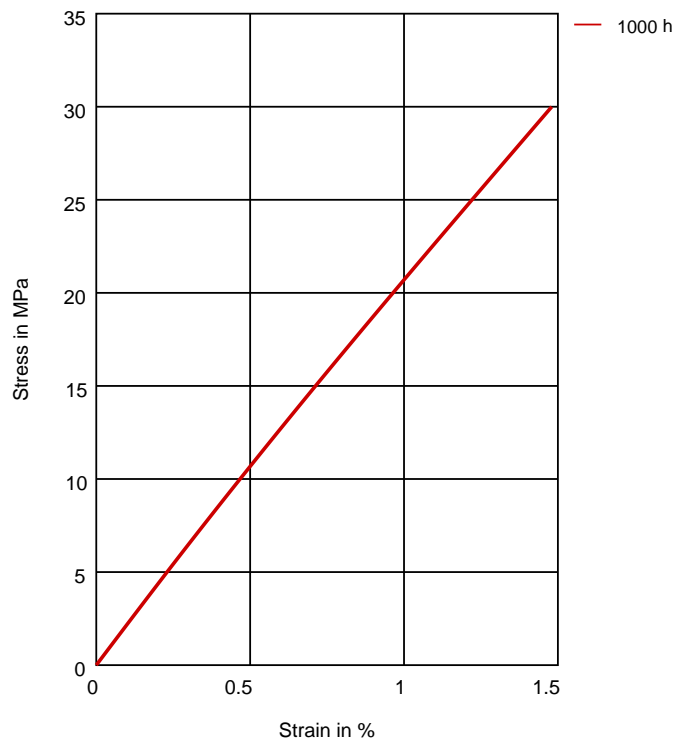
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Stress-strain (isochronous) 120°C



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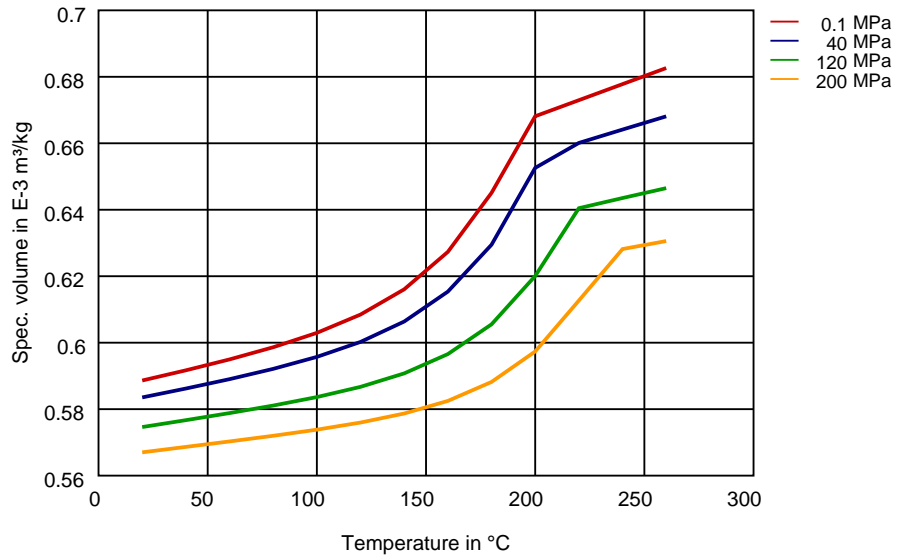
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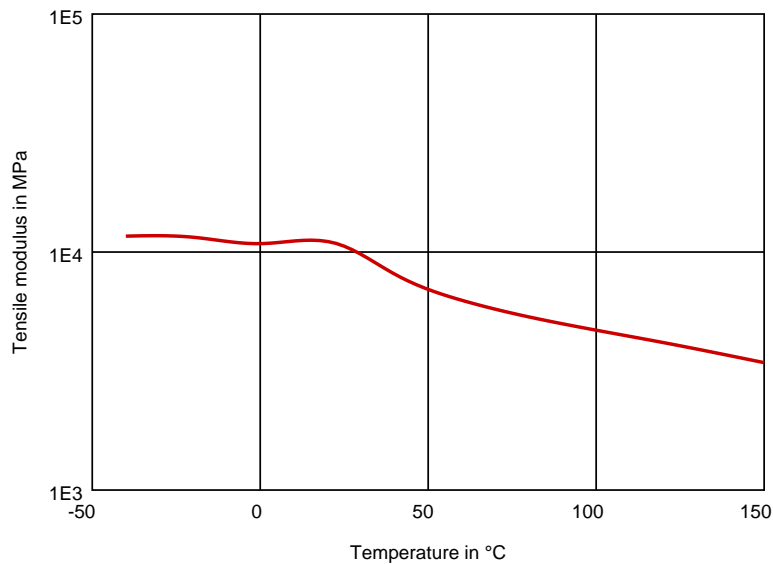
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Specific volume-temperature (pvT)



Tensile modulus-temperature



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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 4mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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