

DuPont™ Hytrel® G5544

THERMOPLASTIC POLYESTER ELASTOMER

Product Information

Common features of Hytrel® thermoplastic polyester elastomer include mechanical and physical properties such as exceptional toughness and resilience, high resistance to creep, impact and flex fatigue, flexibility at low temperatures and good retention of properties at elevated temperatures. In addition, it resists many industrial chemicals, oils and solvents. Special grades include heat stabilised, flame retardant, food contact compliant, blow molding and extrusion grades. Concentrates offered include black pigments, UV protection additives, heat stabilisers, and flame retardants.

Hytrel® thermoplastic polyester elastomer is plasticiser free.

The good melt stability of Hytrel® thermoplastic polyester elastomer 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.

Hytrel® thermoplastic polyester elastomer typically is used in demanding applications in the automotive, fluid power, electrical/electronic, consumer goods, appliance and power tool, sporting goods, furniture, industrial and off-road transportation/equipment industry.

Hytrel® G5544 is a medium modulus grade with nominal hardness of 55D. It contains discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

Typical applications:

Hose and tubing, profiles, moulded and extruded consumer products. Not suited for light-colored finished products.

General information	Value	Unit	Test Standard
Resin Identification	TPC-ET	-	ISO 1043
Part Marking Code	TPC-ET	-	ISO 11469
Rheological properties	Value	Unit	Test Standard
Melt volume-flow rate	10	cm ³ /10min	ISO 1133
Temperature	230	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	10	g/10min	ISO 1133
Melt mass-flow rate, Temperature	230	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	1.6	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.6	%	ISO 294-4, 2577
Mechanical properties (TPE)	Value	Unit	Test Standard
Tensile Modulus	200	MPa	ISO 527-1/-2
Stress at 5% strain	8.1	MPa	ISO 527-1/-2
Stress at 10% strain	11.7	MPa	ISO 527-1/-2
Stress at 50% strain	9	MPa	ISO 527-1/-2
Stress at break	33	MPa	ISO 527-1/-2
Strain at break	>300	%	ISO 527-1/-2
Nominal strain at break	290	%	ISO 527-1/-2
Tear strength, parallel	123	kN/m	ISO 34-1
Tear strength, normal	112	kN/m	ISO 34-1
Shore D hardness, max	56	-	ISO 7619-1
Shore D hardness, 15s	51	-	ISO 7619-1
Mechanical properties	Value	Unit	Test Standard
Flexural Modulus	190	MPa	ISO 178
Shear Modulus	65	MPa	ISO 6721
Poisson's ratio	0.4	-	ISO 527-1/-2
Tensile creep modulus			ISO 899-1
1h	110	MPa	
1000h	85	MPa	
Charpy impact strength, 23°C	N	kJ/m ²	ISO 179/1eU

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Charpy notched impact strength			ISO 179/1eA
23°C	90 ^[P]	kJ/m ²	
-30°C	45	kJ/m ²	
-40°C	14	kJ/m ²	
Tensile notched impact strength, 23°C	285	kJ/m ²	ISO 8256/1
Brittleness temperature	-61	°C	ISO 974
Izod notched impact strength			ISO 180/1A
23°C	64	kJ/m ²	
-40°C	27	kJ/m ²	

P: Partial Break

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	214	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-35	°C	ISO 11357-1/-2
Temp. of deflection under load, 0.45 MPa	77	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 10N	190	°C	ISO 306
Coeff. of linear therm. expansion, parallel	210	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	180	E-6/K	
Normal, -40-23°C	160	E-6/K	
Parallel, -40-23°C	190	E-6/K	
Thermal conductivity of melt	0.15	W/(m K)	-
Spec. heat capacity of melt	2110	J/(kg K)	-
Eff. thermal diffusivity	5.44E-8	m ² /s	-
RTI, electrical			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°C	
RTI, impact			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°C	
RTI, strength			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°C	
Flammability	Value	Unit	Test Standard
Burning Behav. at 1.5mm 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	3	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Oxygen index	19	%	ISO 4589-1/-2
Flammability, 3.0mm	HB	-	IEC 60695-11-10
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	25	mm/min	ISO 3795 (FMVSS 302)
Electrical properties	Value	Unit	Test Standard
Relative permittivity			IEC 60250
100Hz	5	-	
1MHz	4.5	-	
Dissipation factor			IEC 60250
100Hz	200	E-4	
1MHz	400	E-4	
Volume resistivity	3E10	Ohm*m	IEC 60093
Surface resistivity	1E14	Ohm	IEC 60093
Electric strength	19	kV/mm	IEC 60243-1

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CTI, 23°C, 3.0mm			
	600	PLC	UL 746A
Other properties			
	Value	Unit	Test Standard
Humidity absorption, 2mm	0.4	%	Sim. to ISO 62
Water absorption, 2mm	2.2	%	Sim. to ISO 62
Density	1220	kg/m ³	ISO 1183
Density of melt	1050	kg/m ³	-
Water Absorption, Immersion 24h	1.6	%	Sim. to ISO 62
VDA Properties			
	Value	Unit	Test Standard
Emission of organic compounds	26	µgC/g	VDA 277
Odour	3	class	VDA 270
Fogging, G-value (condensate)	0.1	mg	ISO 6452
Injection			
	Value	Unit	Test Standard
Drying Recommended	yes	-	-
Drying Temperature	100	°C	-
Drying Time, Dehumidified Dryer	2 - 3	h	-
Processing Moisture Content	≤0.08	%	-
Melt Temperature Optimum	240	°C	-
Min. melt temperature	235	°C	-
Max. melt temperature	260	°C	-
Mold Temperature Optimum	45	°C	-
Min. mould temperature	45	°C	-
Max. mould temperature	55	°C	-
Extrusion			
	Value	Unit	Test Standard
Processing Moisture Content	≤0.06	%	-
Melt Temperature Optimum	230	°C	-

Characteristics			
Processing	<ul style="list-style-type: none"> • Injection Moulding • Film Extrusion • Profile Extrusion 	<ul style="list-style-type: none"> • Sheet Extrusion • Other Extrusion • Blow Moulding 	<ul style="list-style-type: none"> • Casting • Thermoforming
Delivery form	<ul style="list-style-type: none"> • Pellets 		
Special characteristics	<ul style="list-style-type: none"> • Heat stabilised or stable to heat 		
Regional Availability	<ul style="list-style-type: none"> • North America • Europe 	<ul style="list-style-type: none"> • Asia Pacific • South and Central America 	<ul style="list-style-type: none"> • Near East/Africa • Global

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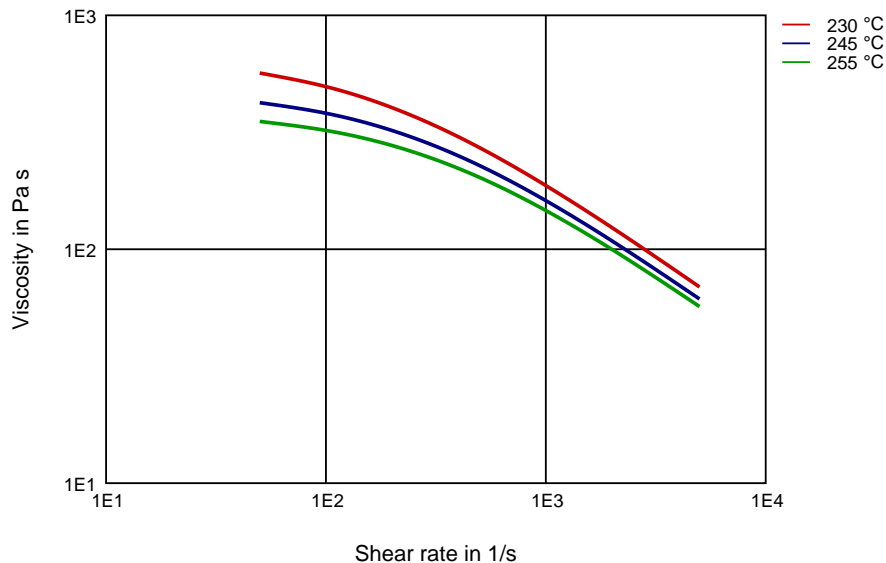


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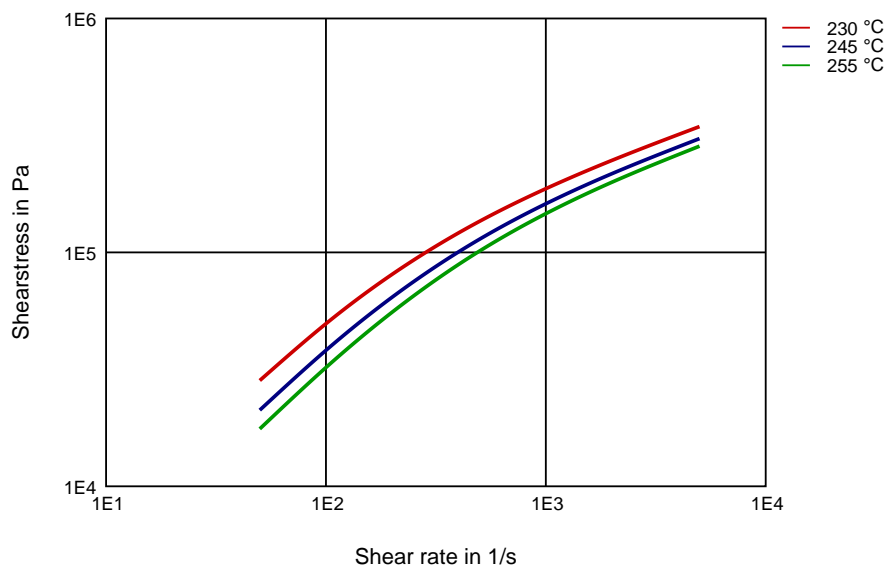
THERMOPLASTIC POLYESTER ELASTOMER

Diagrams

Viscosity-shear rate



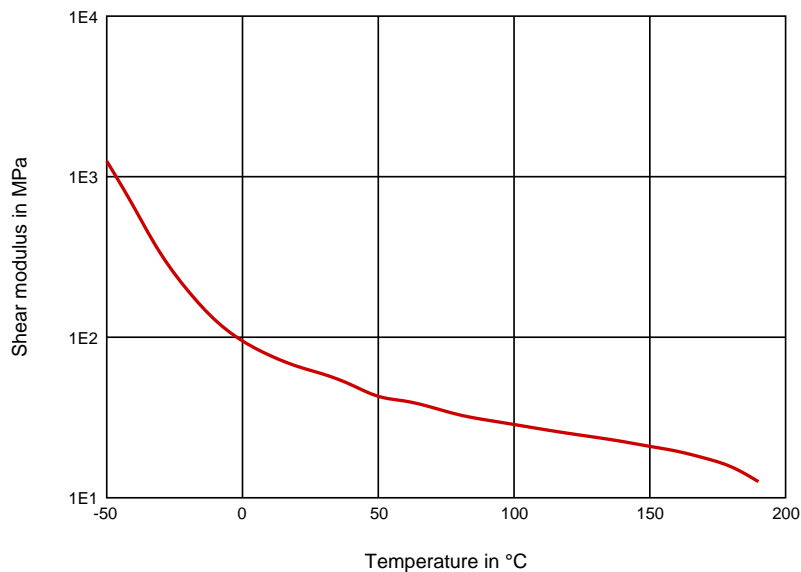
Shearstress-shear rate



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Dynamic Shear modulus-temperature



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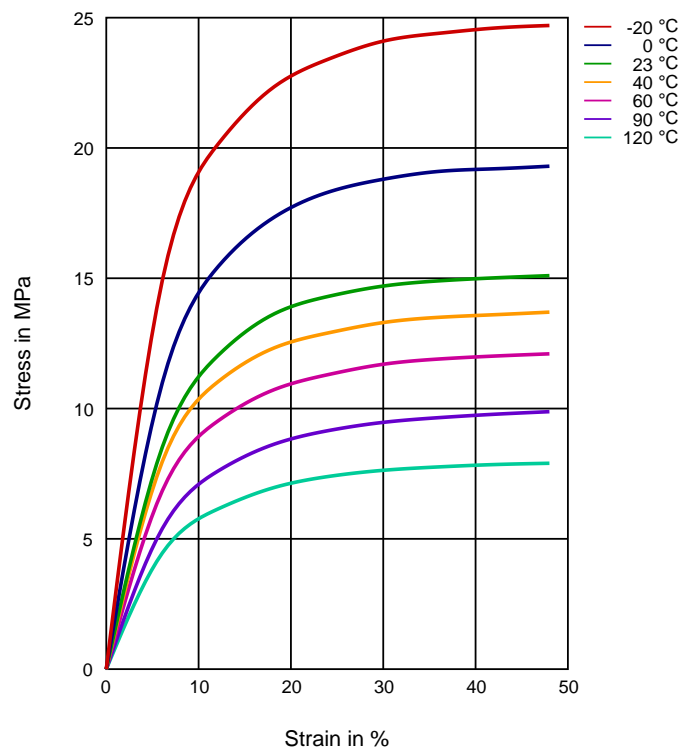
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Stress-strain



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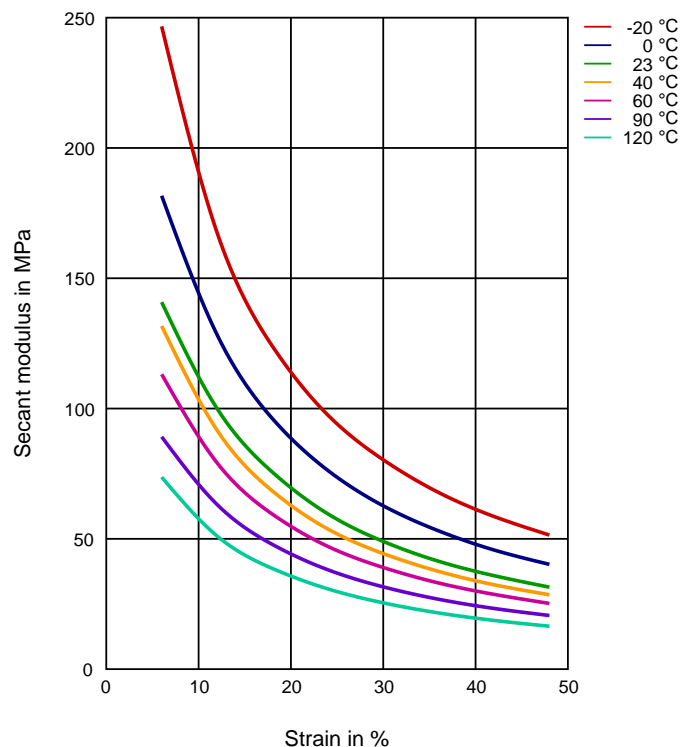


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THERMOPLASTIC POLYESTER ELASTOMER

Secant modulus-strain



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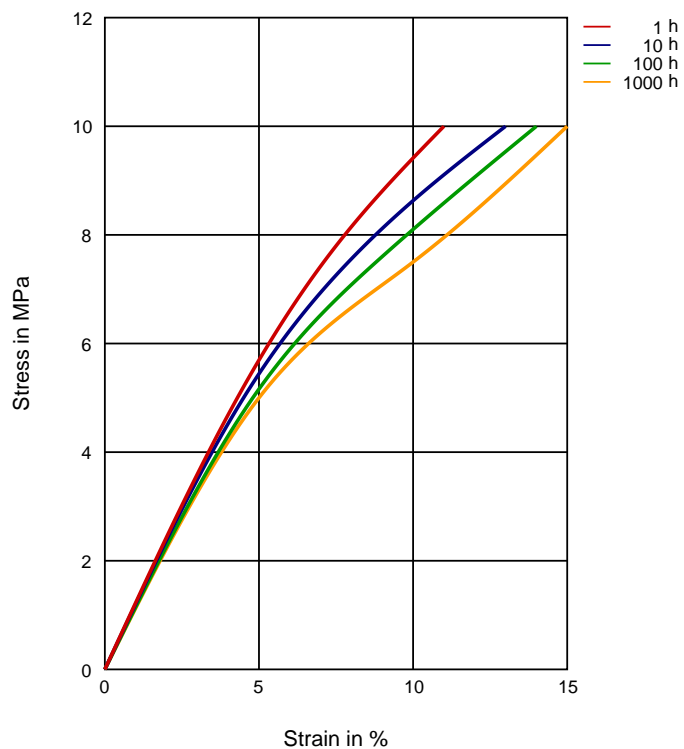
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THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 23 °C



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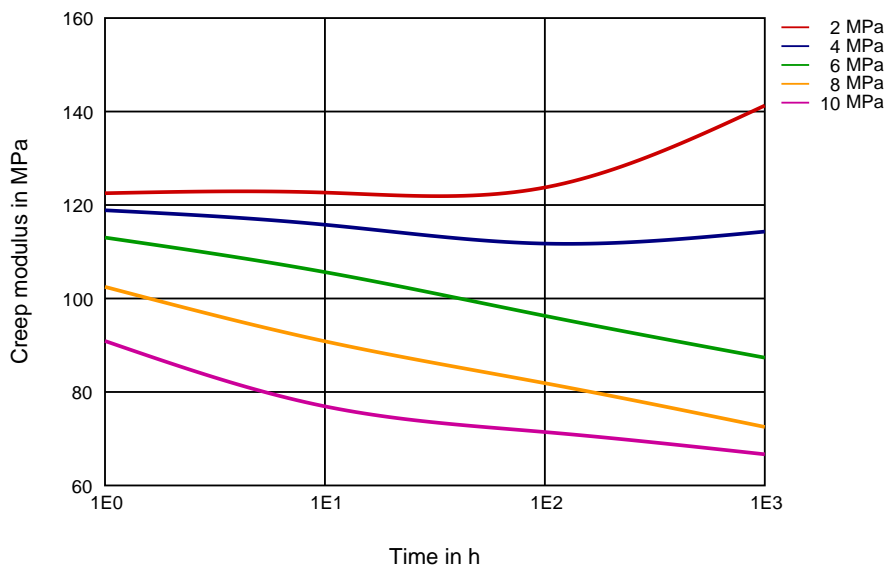


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Creep modulus-time 23 °C



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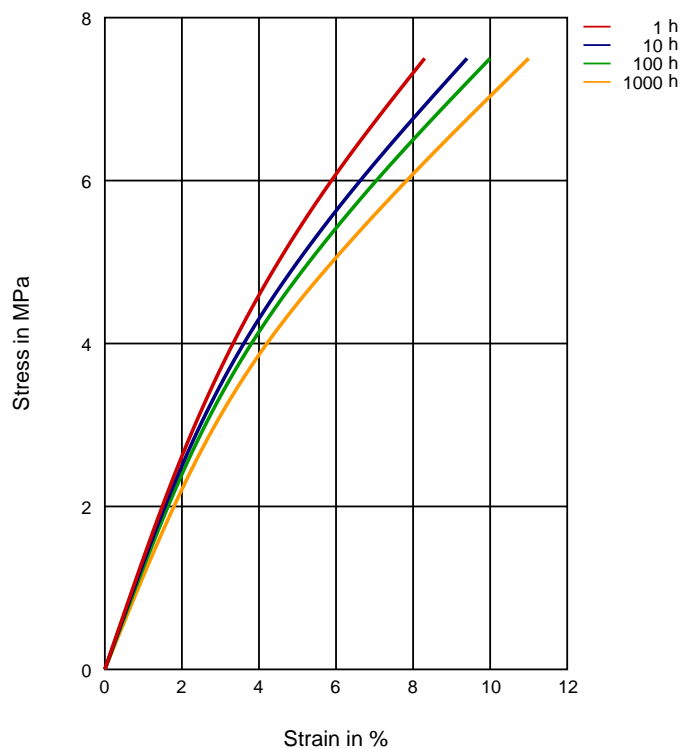
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THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 40 °C



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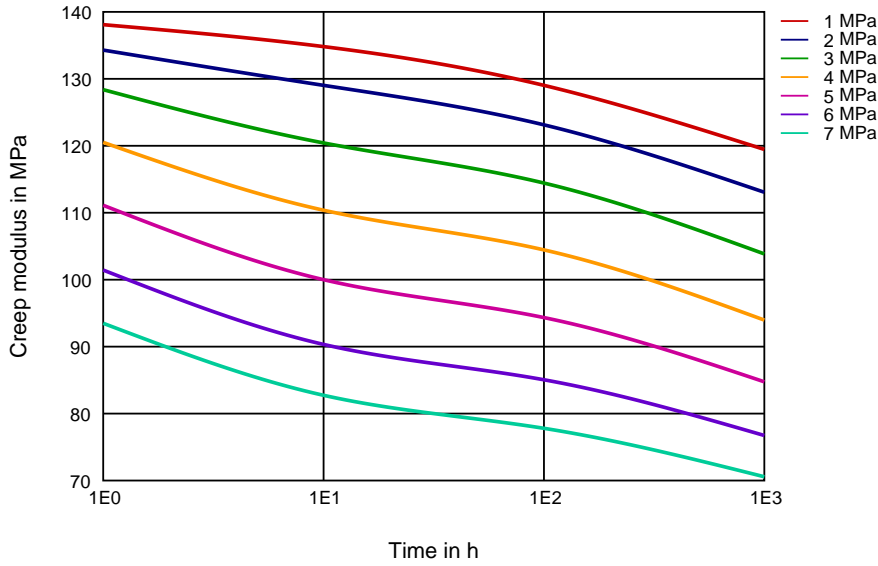
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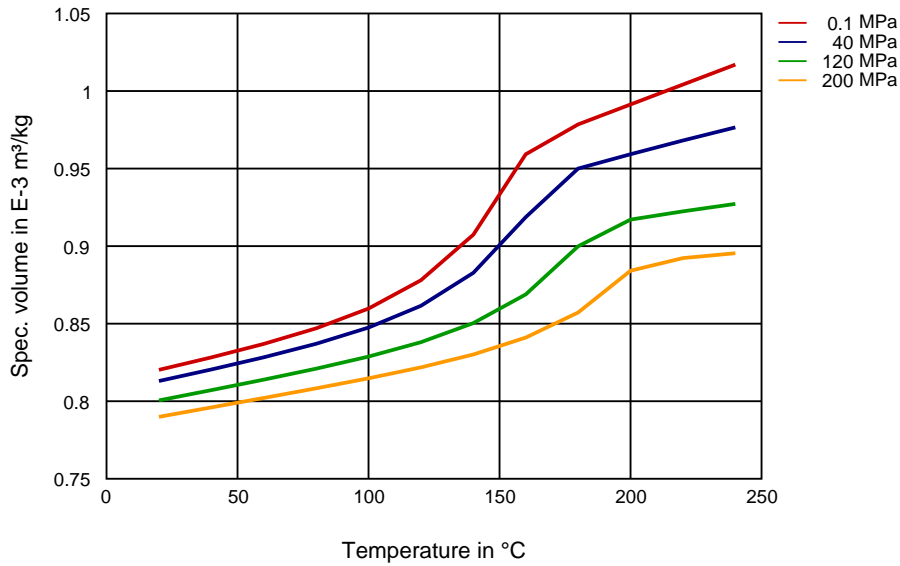
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THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 40 °C



Specific volume-temperature (pvT)



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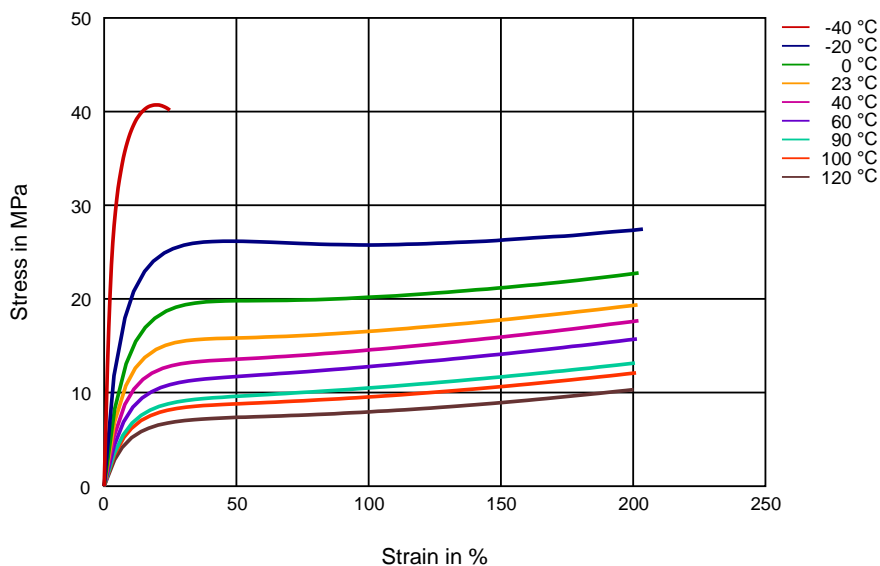
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Stress-Strain (TPE)



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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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