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Hytrel® HTR4275 BK316

THERMOPLASTIC POLYESTER ELASTOMER

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, we recommend, 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® HTR4275 BK316 is designed for blow molding, extrusion or processing techniques requiring high melt viscosity. It has nominal hardness of 55D, is pigmented black with fine particle size carbon black, and contains a general purpose stabilizer.

Typical applications:

Hollow thin wall parts requiring a tough polymer with excellent flexibility and temperature properties such as automotive boots.

Product information

Resin Identification	TPC-ET	ISO 1043
Part Marking Code	>TPC-ET<	ISO 11469

Rheological properties

Melt volume-flow rate	6	cm^3/10min	ISO 1133
Temperature	230	°C	
Load	10	kg	
Melt mass-flow rate	6	g/10min	ISO 1133
Melt mass-flow rate, Temperature	230	°C	
Melt mass-flow rate, Load	10	kg	
Moulding shrinkage, parallel	1.7	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.9	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	160	MPa	ISO 527-1/-2
Stress at 5% strain	6.7	MPa	ISO 527-1/-2
Stress at 10% strain	10.4	MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	17	MPa	ISO 527-1/-2
Tensile stress at 100% strain	21	MPa	ISO 527-1/-2
Tensile stress at break	37	MPa	ISO 527-1/-2
Nominal strain at break	450	%	ISO 527-1/-2
Tensile strain at break	>300	%	ISO 527-1/-2
Flexural modulus	160	MPa	ISO 178
Tensile creep modulus, 1h	140	MPa	ISO 899-1
Tensile creep modulus, 1000h	90	MPa	ISO 899-1
Charpy impact strength, 23°C	N	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	N	kJ/m^2	ISO 179/1eA

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Charpy notched impact strength, -30 °C	160[P]	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	30	kJ/m²	ISO 179/1eA
Tensile notched impact strength, 23 °C	410	kJ/m²	ISO 8256/1
Poisson's ratio	0.49		
Brittleness temperature	-100	°C	ISO 974
Shore D hardness, 15s	52		ISO 48-4 / ISO 868
Shore D hardness, max	55		ISO 868
Tear strength, parallel	140	kN/m	ISO 34-1
Tear strength, normal	130	kN/m	ISO 34-1

[P]: Partial Break

Thermal properties

Melting temperature, 10 °C/min	192	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	-30	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	41	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	57	°C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h 10N	170	°C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	181	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	185	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.15	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	5.44E-8	m²/s	ISO 22007-4
Specific heat capacity of melt	2100	J/(kg K)	ISO 22007-4
TGA curve	available		ISO 11359-1/-2

Flammability

Burning Behav. at 1.5mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	1.5	mm	IEC 60695-11-10
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	38	mm/min	ISO 3795 (FMVSS 302)

Physical/Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.5	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.5	%	Sim. to ISO 62
Density	1170	kg/m³	ISO 1183
Density of melt	1000	kg/m³	

VDA Properties

Odour	3.5	class	VDA 270

Injection

Drying Recommended	yes	
Drying Temperature	100	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.08	%

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Melt Temperature Optimum	230	°C
Min. melt temperature	220	°C
Max. melt temperature	250	°C
Mold Temperature Optimum	40	°C
Min. mould temperature	30	°C
Max. mould temperature	41	°C
Ejection temperature	100	°C

Extrusion

Drying Temperature	100	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.06	%
Melt Temperature Range	205 - 220	°C

Blow Molding

Drying Recommended	yes	
Drying Temperature	90 - 100	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.03	%
Melt Temperature Optimum	230	°C
Melt Temperature Range	220 - 240	°C
Swell ratio	2.4	
Mold Temperature Optimum	50	°C
Mold Temperature Range	30 - 70	°C

Characteristics

Processing	Injection Moulding, Extrusion, Blow Moulding, Thermoforming
Delivery form	Pellets
Special characteristics	Light stabilised or stable to light, Heat stabilised or stable to heat

Additional information

Blow molding

Molding shrinkage

Normal, 1.0mm Blow Molded = 2.2-2.7 %
Parallel 1.0mm Blow Molded = 1.5-2.0 %

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Ford	WSS-M4D1006-A1	
General Motors	Part Specific Approval, Please Contact Your CE Representative For More Details.	
Hyundai	MS220-24 Type C	
Mercedes-Benz	DBL5562.34 TPS	

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Mercedes-Benz	DBL5562.34 TPU	
Mercedes-Benz	DBL5562.34 TPV	
Mercedes-Benz	DBL5562.50 TPC	
Mercedes-Benz	DBL5562.AA39 TPC	
Mercedes-Benz	DBL5562.AA41 TPU	
Mercedes-Benz	DBL5562.AA41 TPV	
Renault-Nissan	UB02b, No Spec, Special Part Approval, See Your CE Account Manager.	
Stellantis	B62 0300 / 61/213M-215E/11/J3/M1/Q2/R4/Z9 + S62 0001 (130°C - 3000h)	CPN2703, 01994_10_00206
Stellantis - Chrysler	MS-DB-448 / CPN-2703	Black
VW Group	VW 50123 TPC-ET	

Viscosity-shear rate

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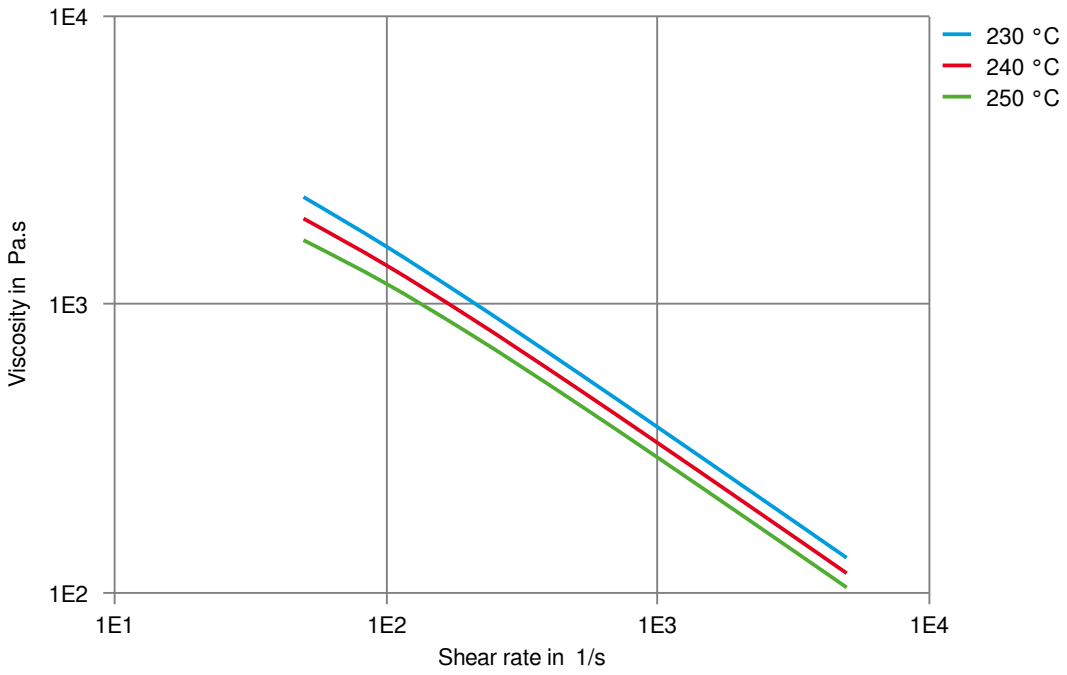
THERMOPLASTIC POLYESTER ELASTOMER



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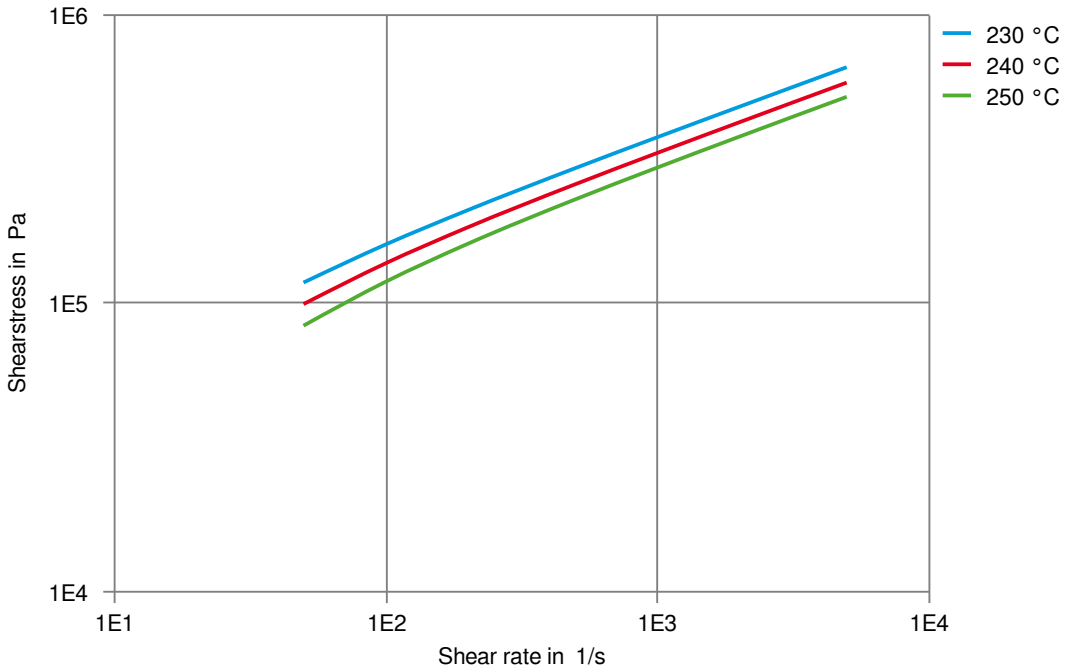
Shearstress-shear rate



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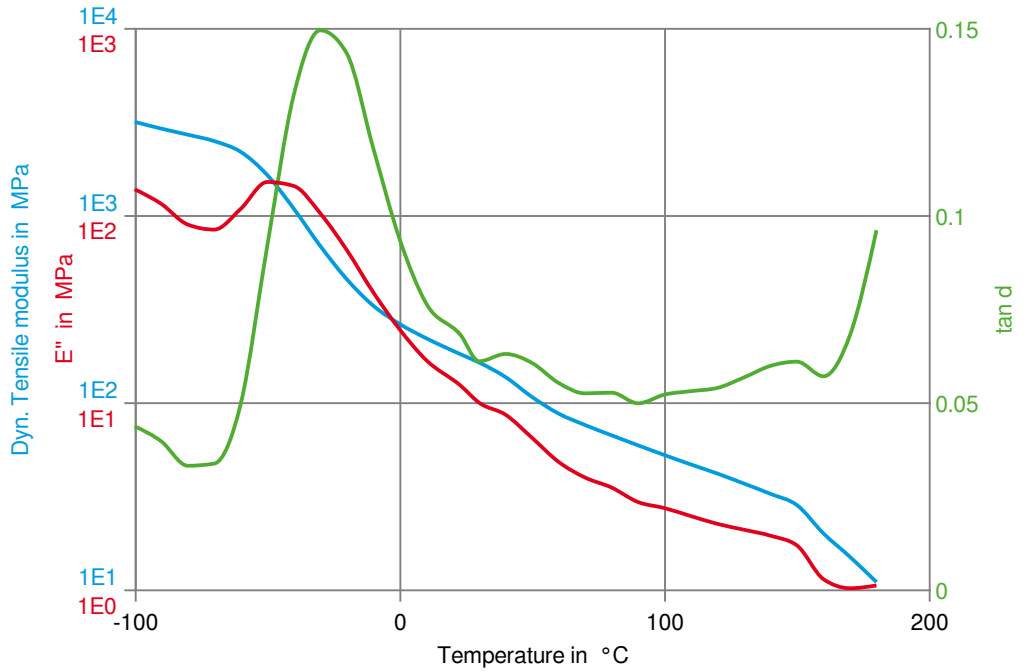
Dynamic Tensile modulus-temperature



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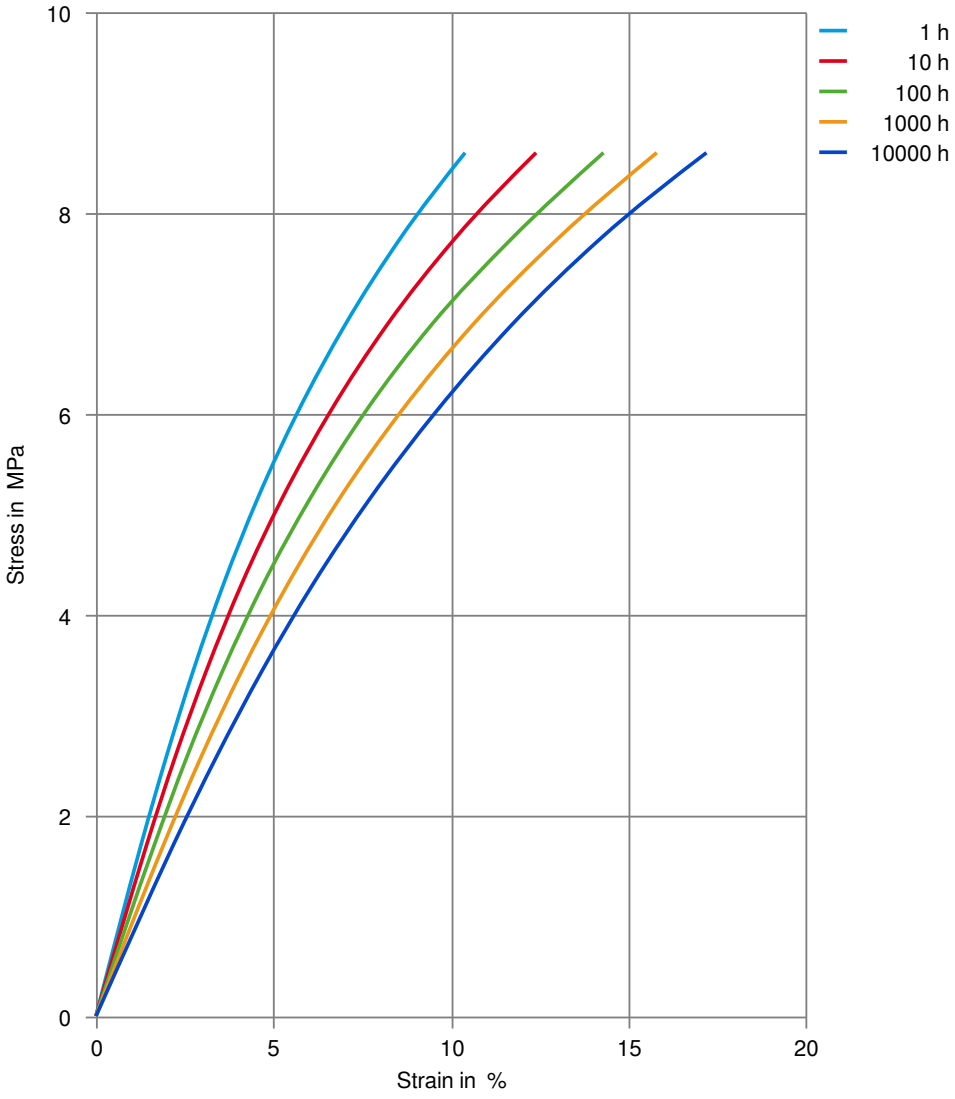
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 23 °C



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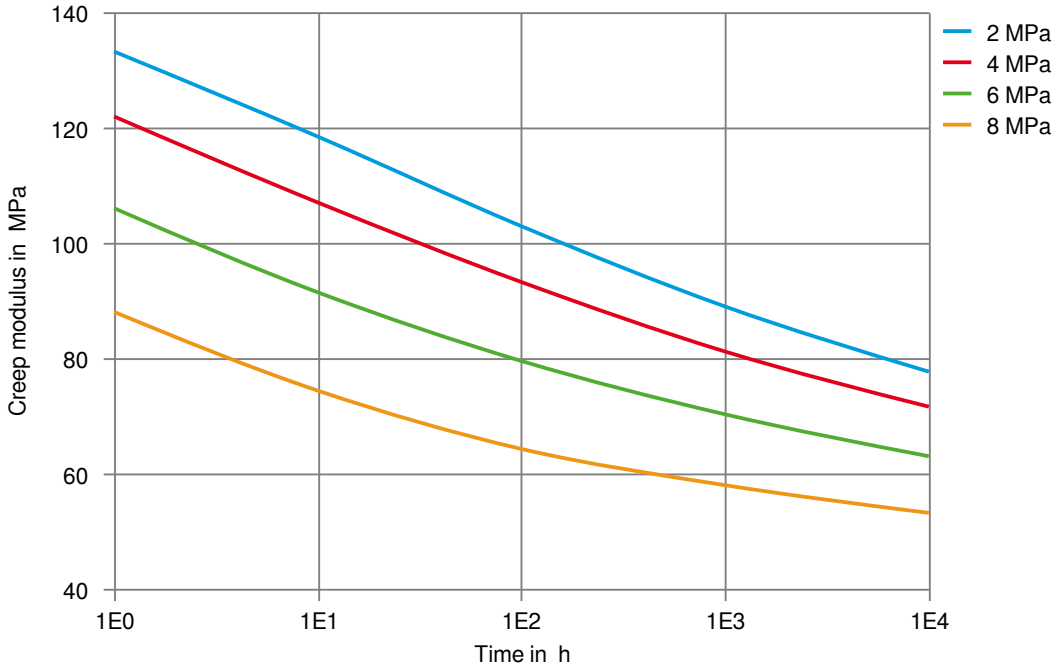
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 23 °C



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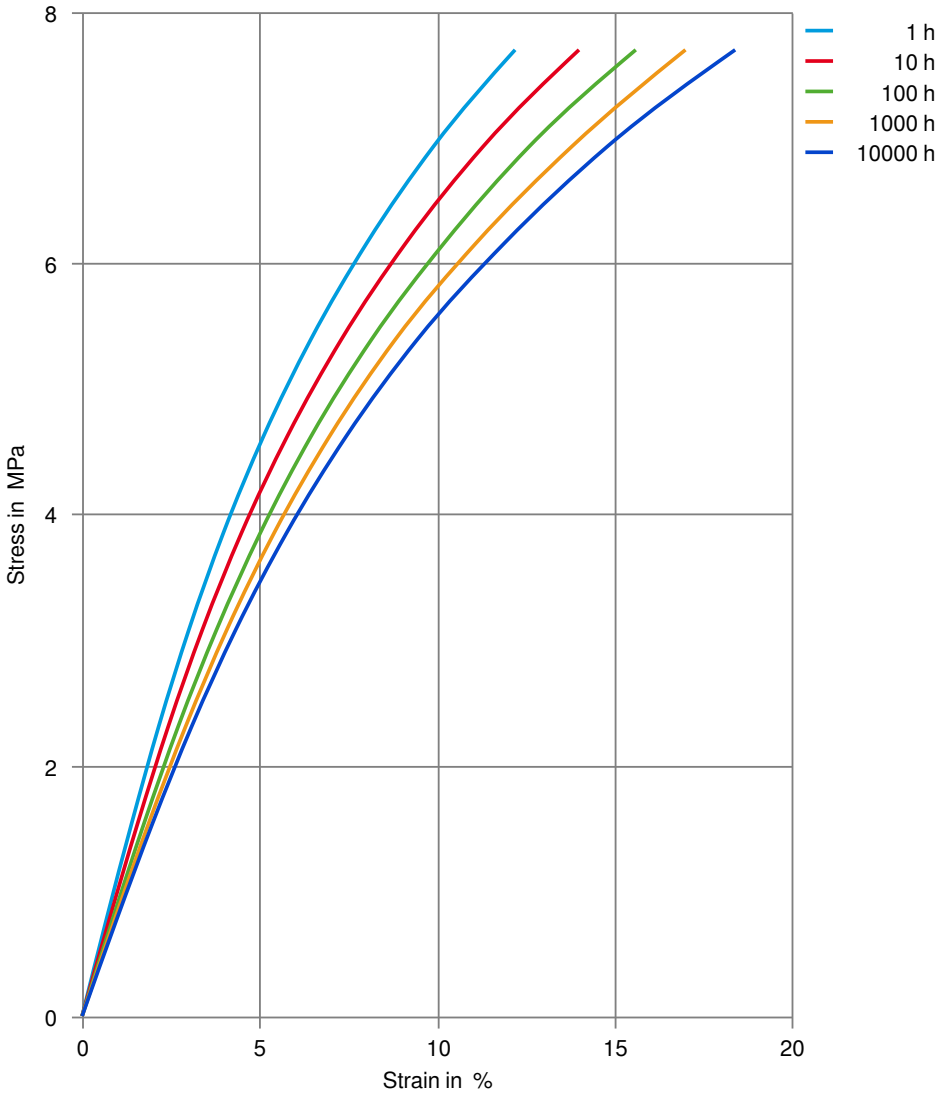
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 40 °C



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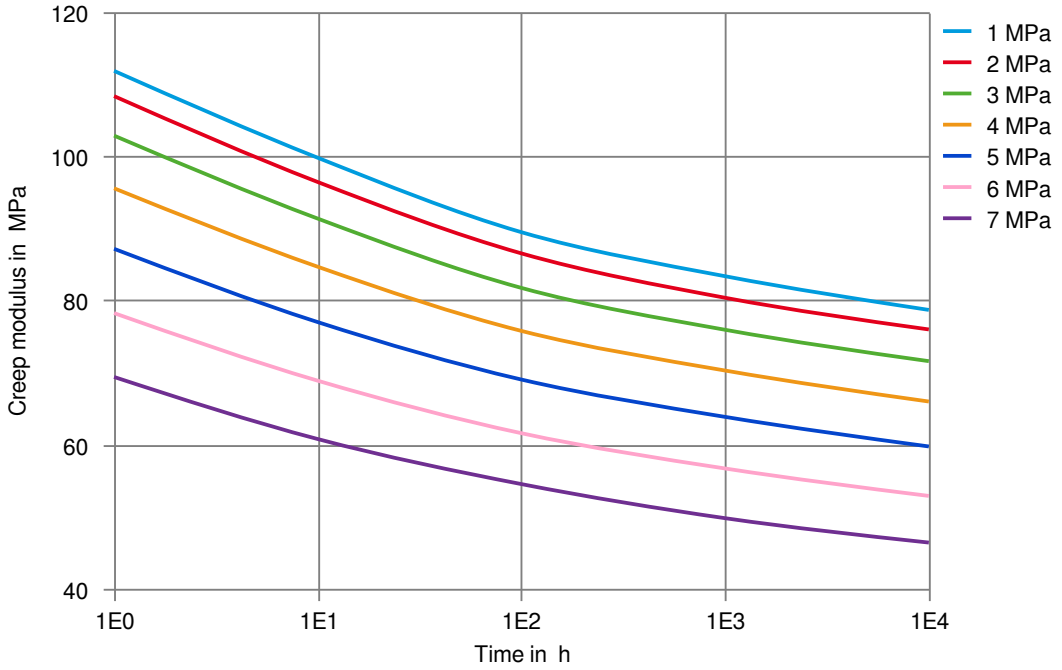
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 40 °C



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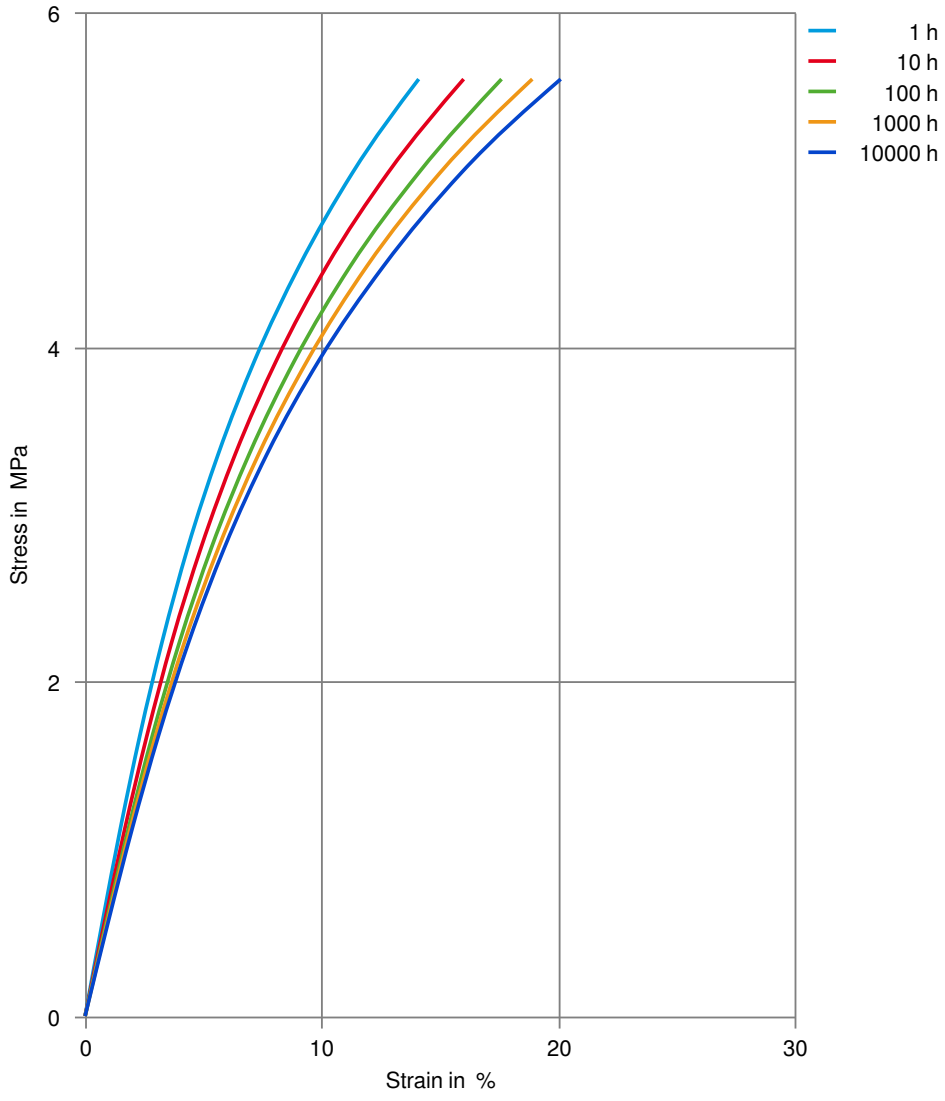
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 80 °C



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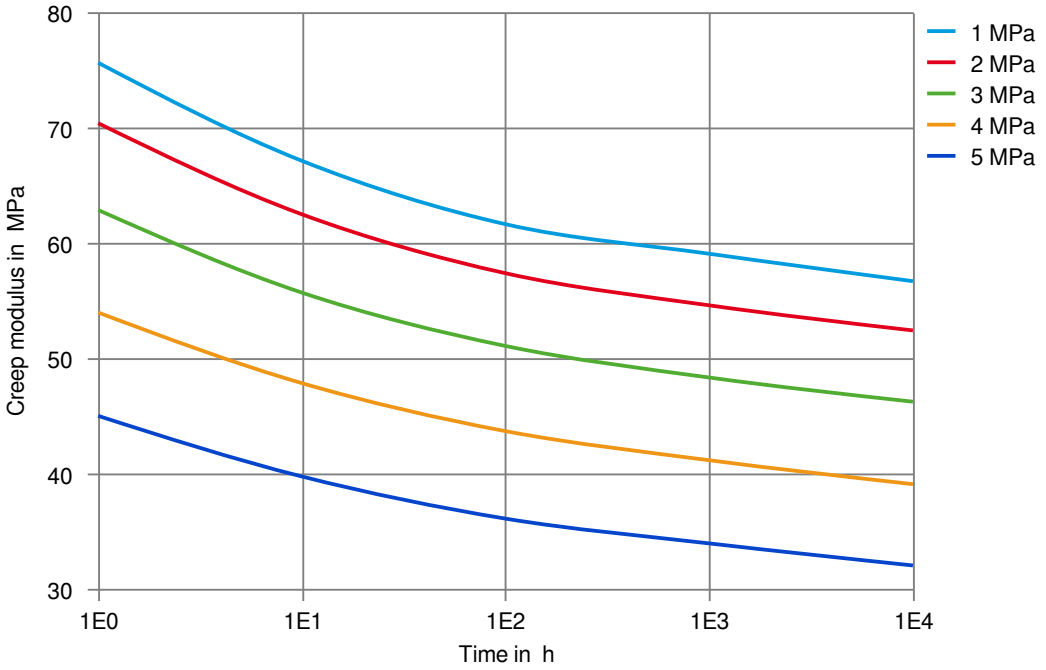
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 80 °C



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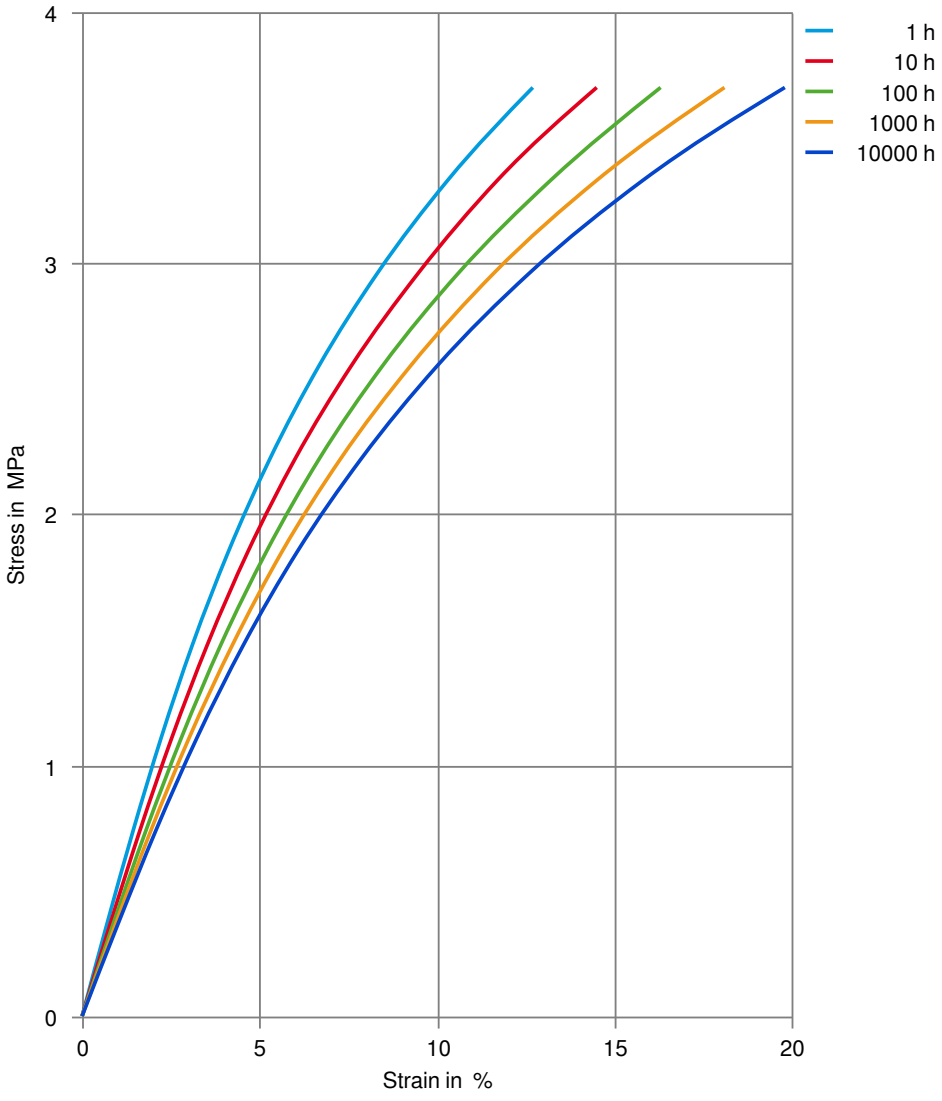
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 100 °C



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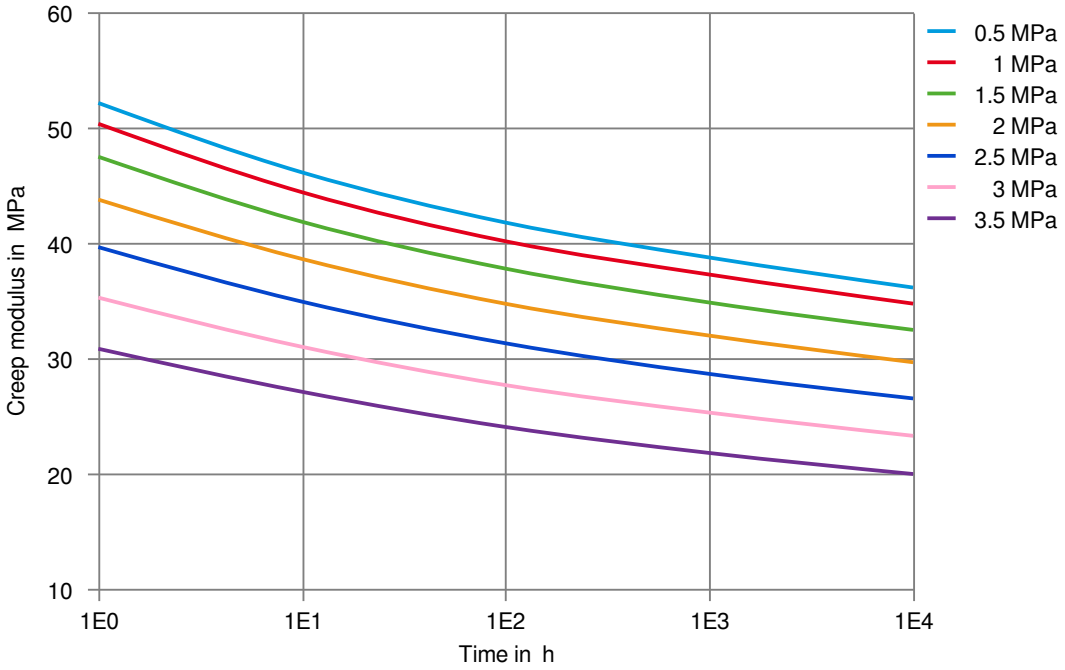
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 100 °C



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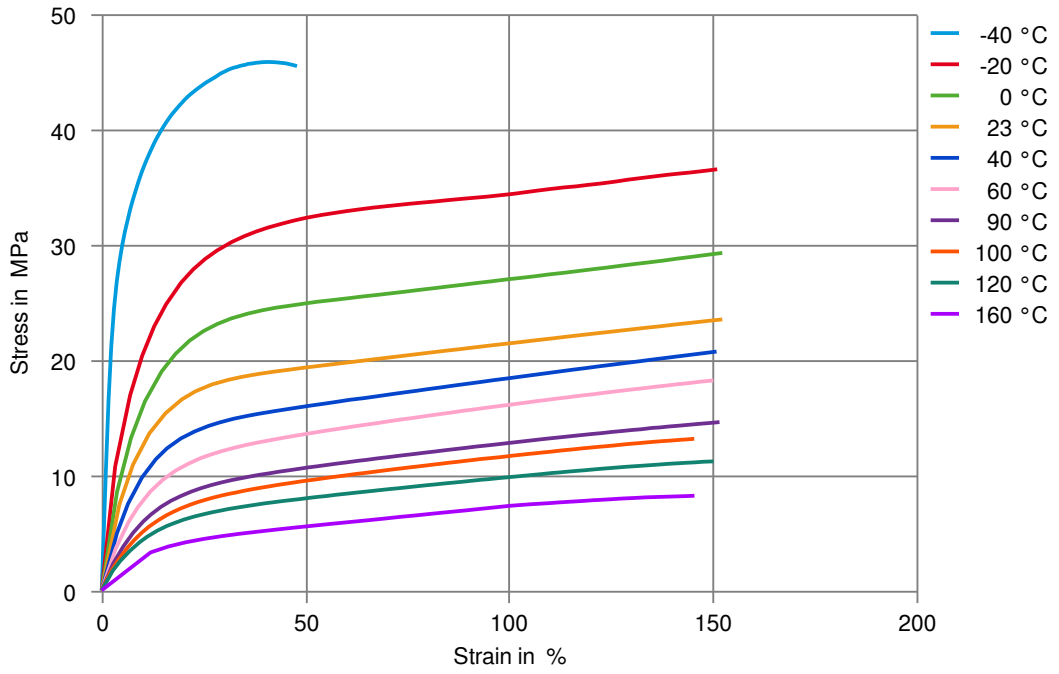
THERMOPLASTIC POLYESTER ELASTOMER

Stress-Strain (Flexible Materials)



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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
- ✘ 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).