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Hytrel® 7246

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® 7246 is a high modulus grade with nominal hardness of 72D. It contains non-discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

The 72 Shore D hardness is based on a legacy method and is still used for grade identification purposes.

Typical applications:
Tubing, wire and cable jackets, gears and sprockets, oil field parts.

Product information

Resin Identification	TPC-ET	ISO 1043
Part Marking Code	>TPC-ET<	ISO 11469
ISO designation	ISO 20029-TPC-ET,,GLN,70-22-075	

Rheological properties

Melt volume-flow rate	12	cm³/10min	ISO 1133
Melt mass-flow rate	13	g/10min	ISO 1133
Temperature	240	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate, Temperature	240	°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

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Typical mechanical properties

Tensile Modulus	550	MPa	ISO 527-1/-2
Yield stress	27	MPa	ISO 527-1/-2
Yield strain	23	%	ISO 527-1/-2
Stress at 5% strain	14	MPa	ISO 527-1/-2
Stress at 10% strain	23	MPa	ISO 527-1/-2
Stress at 50% strain	24	MPa	ISO 527-1/-2
Stress at break	50	MPa	ISO 527-1/-2
Nominal strain at break	530	%	ISO 527-1/-2
Strain at break	>300	%	ISO 527-1/-2
Flexural Modulus	550	MPa	ISO 178
Shear Modulus	280	MPa	ISO 6721
Tensile creep modulus, 1h	360	MPa	ISO 899-1
Tensile creep modulus, 1000h	310	MPa	ISO 899-1
Charpy notched impact strength, 23°C	36	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	8	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	7	kJ/m²	ISO 179/1eA
Tensile notched impact strength, 23°C	300	kJ/m²	ISO 8256/1
Izod notched impact strength, 23°C	38	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	7	kJ/m²	ISO 180/1A
Poisson's ratio	0.47		
Brittleness temperature	-97	°C	ISO 974
Shore D hardness, 15s	64		ISO 48-4 / ISO 868
Shore D hardness, max	68		ISO 868
Tear strength, parallel	182	kN/m	ISO 34-1
Tear strength, normal	172	kN/m	ISO 34-1
Abrasion resistance	100	mm³	ISO 4649

Thermal properties

Melting temperature, 10°C/min	218	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	25	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	50	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	100	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	140	°C	ISO 306
Vicat softening temperature, 50°C/h 10N	205	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	120	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	180	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	130	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	170	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.15	W/(m K)	ISO 22007-2
Eff. thermal diffusivity	8E-8	m²/s	
Spec. heat capacity of melt	2150	J/(kg K)	
RTI, electrical, 1.5mm	85	°C	UL 746B
RTI, impact, 1.5mm	85	°C	UL 746B

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RTI, strength, 1.5mm	75	°C	UL 746B

Flammability

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
Oxygen index	23	%	ISO 4589-1/-2
FMVSS Class	SE/B		ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	4		IEC 62631-2-1
Relative permittivity, 1MHz	3.5		IEC 62631-2-1
Dissipation factor, 100Hz	160	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	300	E-4	IEC 62631-2-1
Volume resistivity	2E10	Ohm.m	IEC 62631-3-1
Surface resistivity	>1E15	Ohm	IEC 62631-3-2
Electric strength	20	kV/mm	IEC 60243-1
Comparative tracking index	600		IEC 60112

Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.6	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.3	%	Sim. to ISO 62
Density	1260	kg/m³	ISO 1183
Density of melt	1110	kg/m³	

VDA Properties

Light stability delta l	-3		DIN 53236
Light stability delta a	-0.1		DIN 53236
Light stability delta b	15		DIN 53236
Light stability delta E	16		DIN 53236
Emission of organic compounds	300	µgC/g	VDA 277

Injection

Drying Recommended	yes	
Drying Temperature	110	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.08	%
Melt Temperature Optimum	245	°C
Min. melt temperature	240	°C
Max. melt temperature	260	°C
Mold Temperature Optimum	45	°C
Min. mould temperature	45	°C

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Max. mould temperature	55	°C
Hold pressure range	≤70	MPa

Extrusion

Drying Temperature	100 - 120	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	235	°C
Melt Temperature Range	225 - 245	°C

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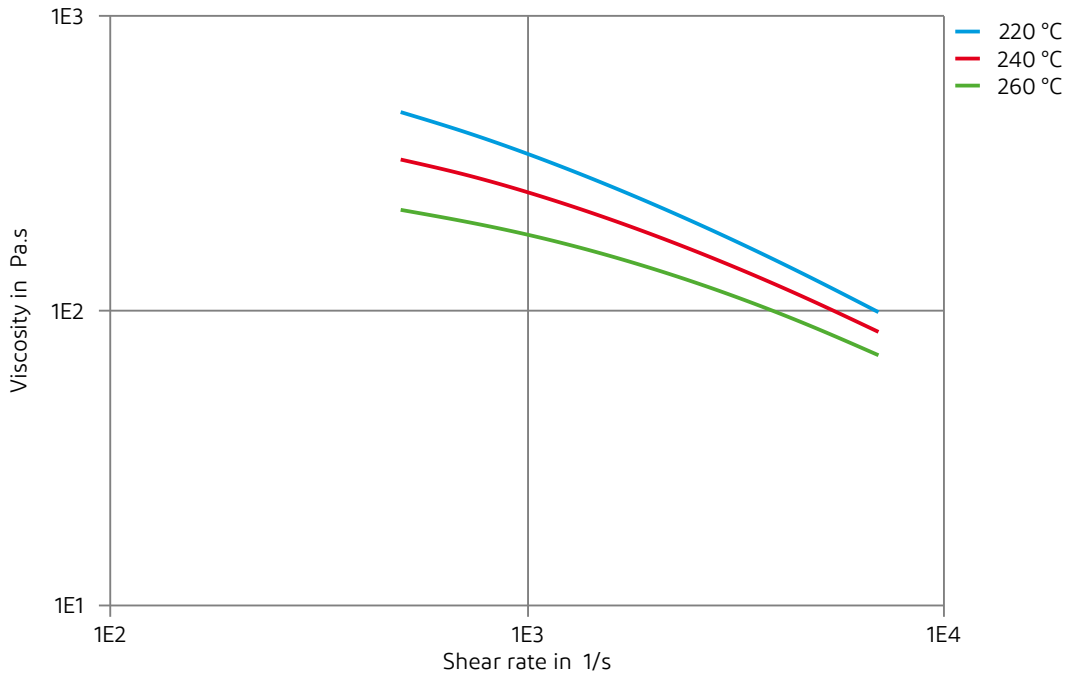
Viscosity-shear rate



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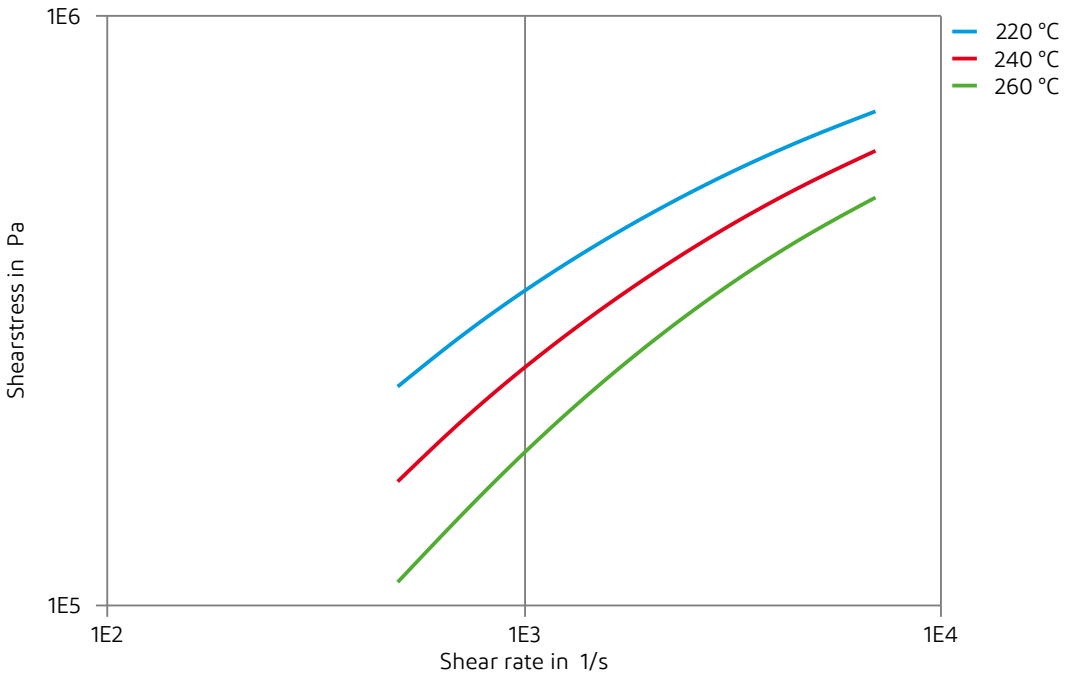
Shearstress-shear rate



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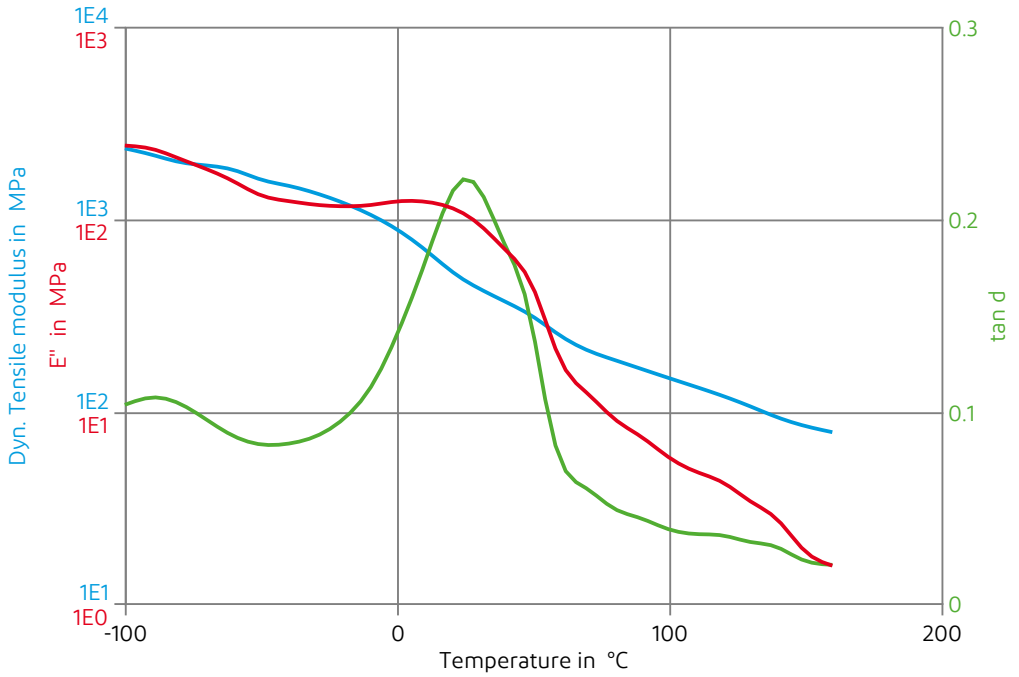
Dynamic Tensile modulus-temperature



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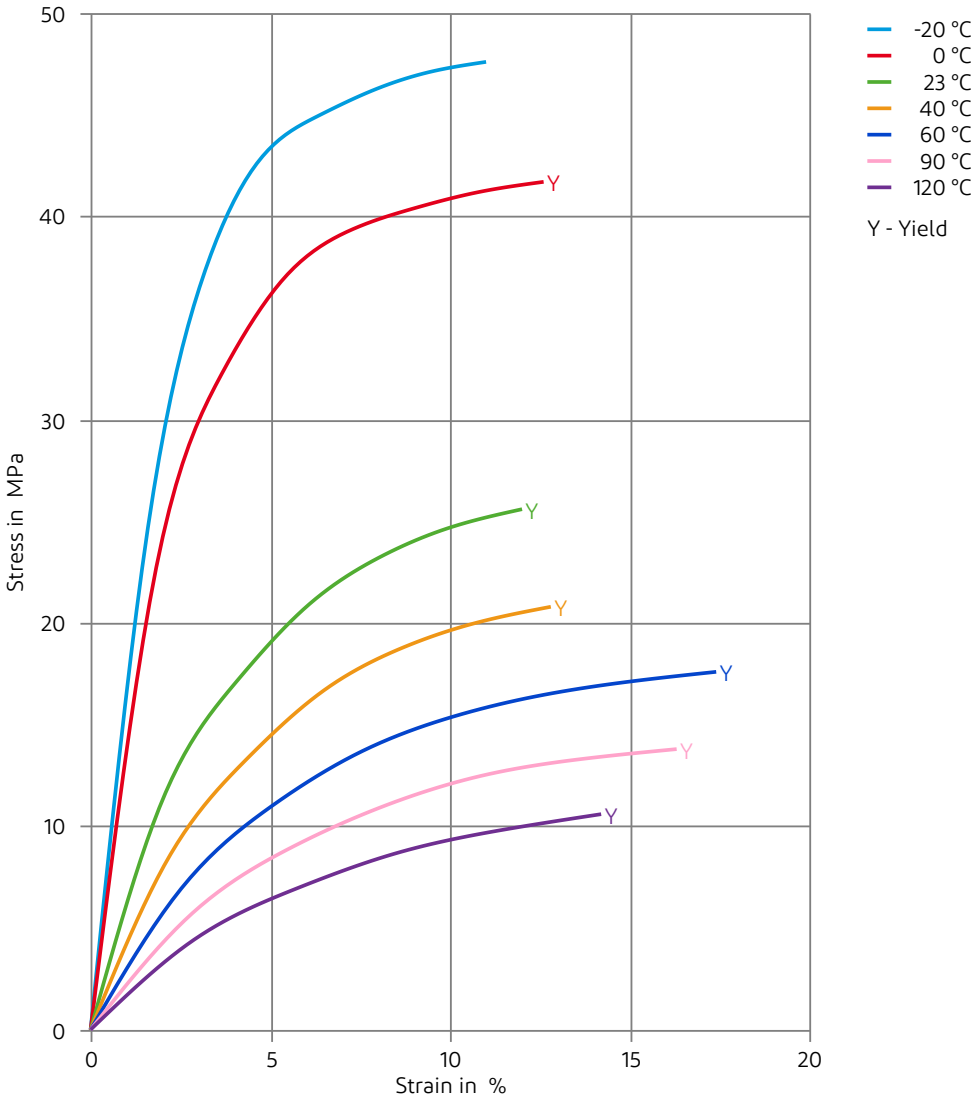
Stress-strain



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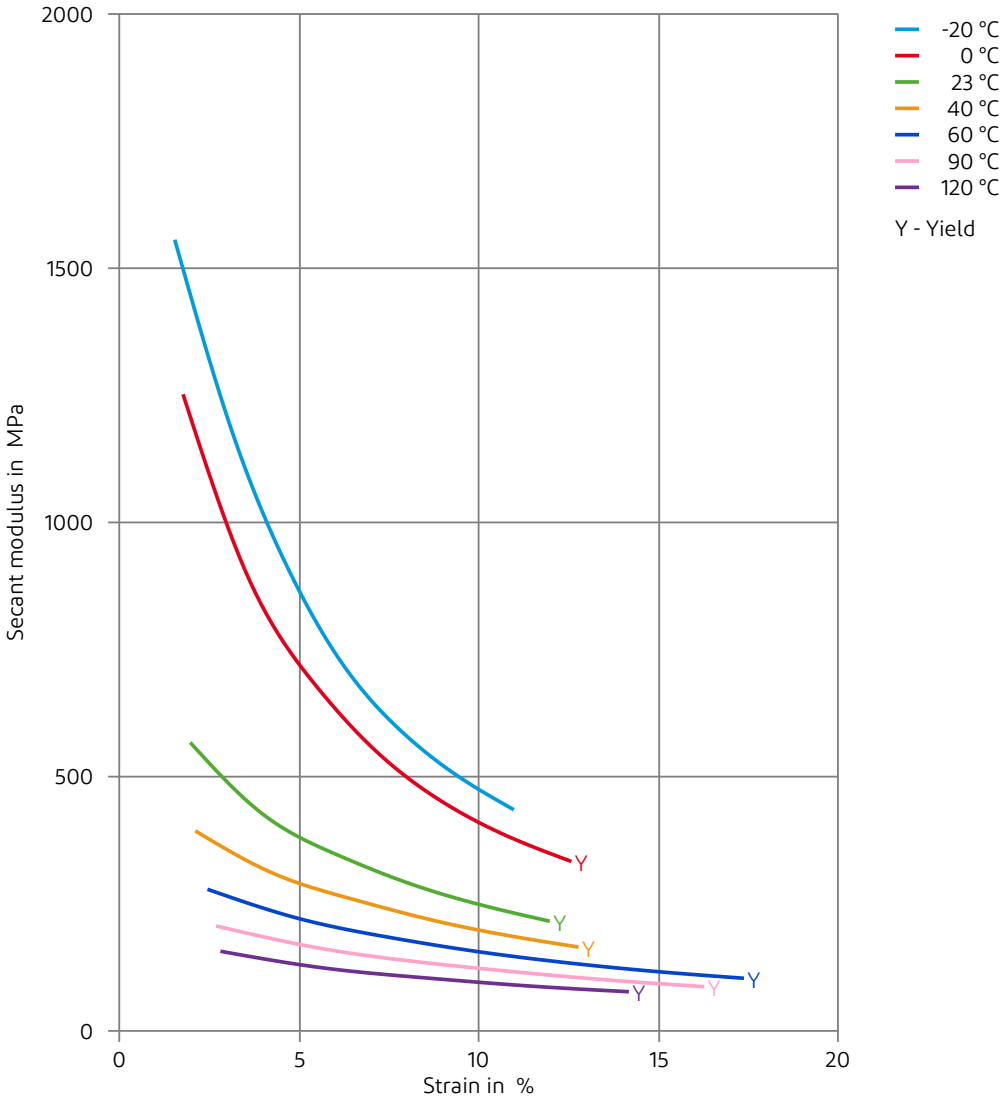
Secant modulus-strain



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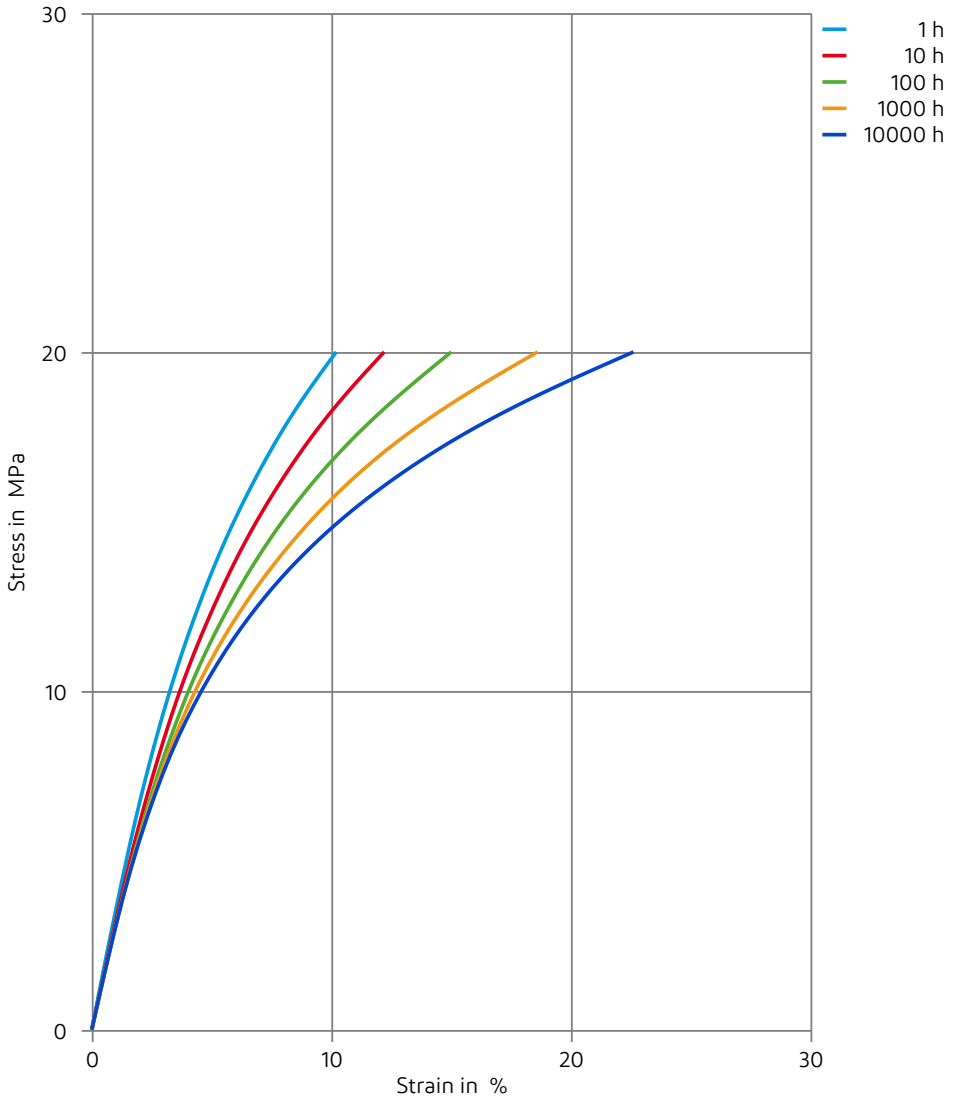
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 23°C



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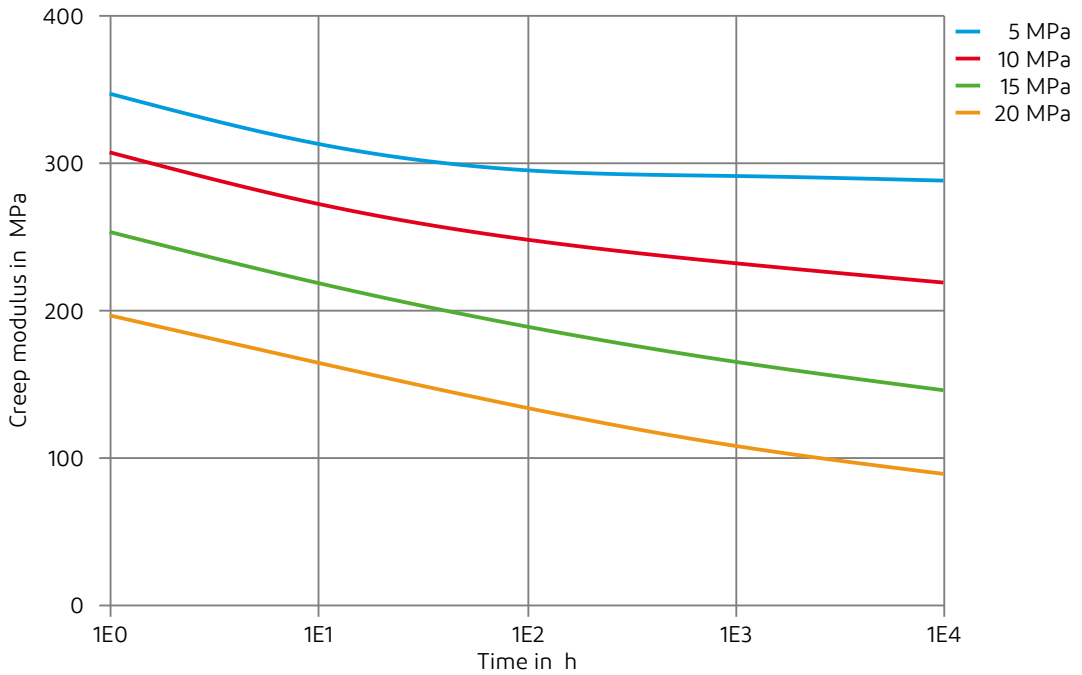
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 23°C



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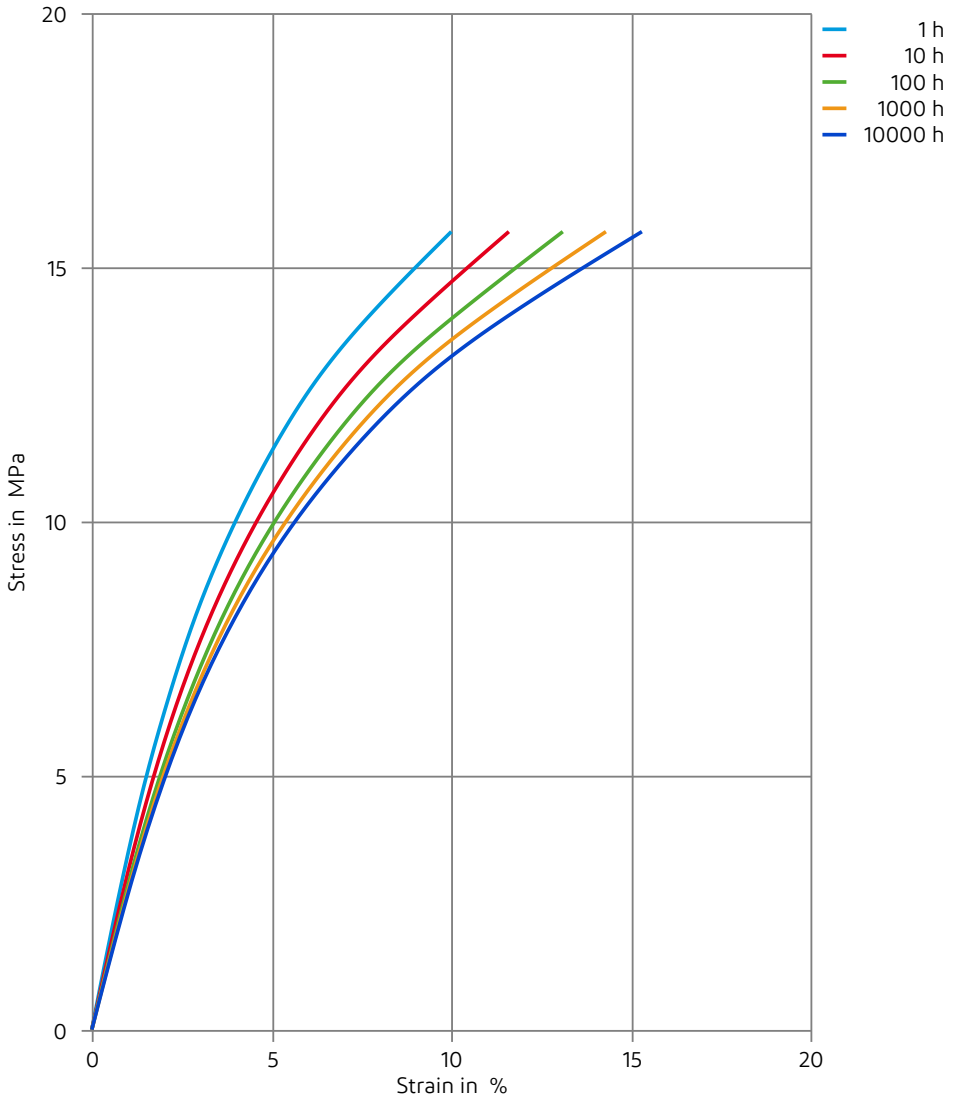
THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 40°C



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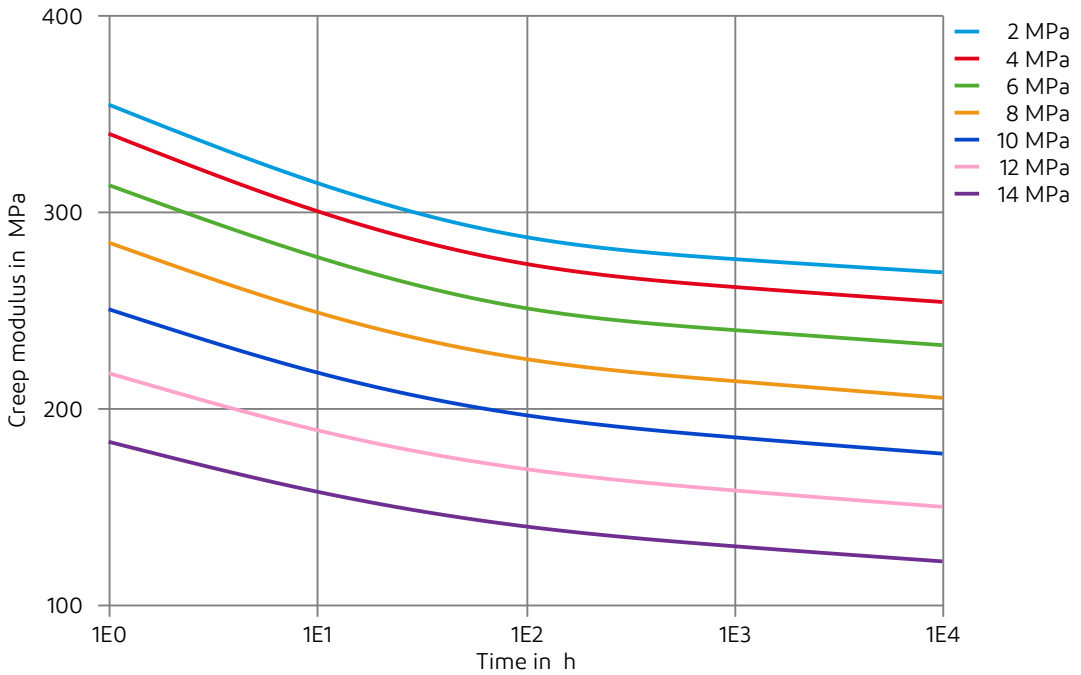
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 40°C



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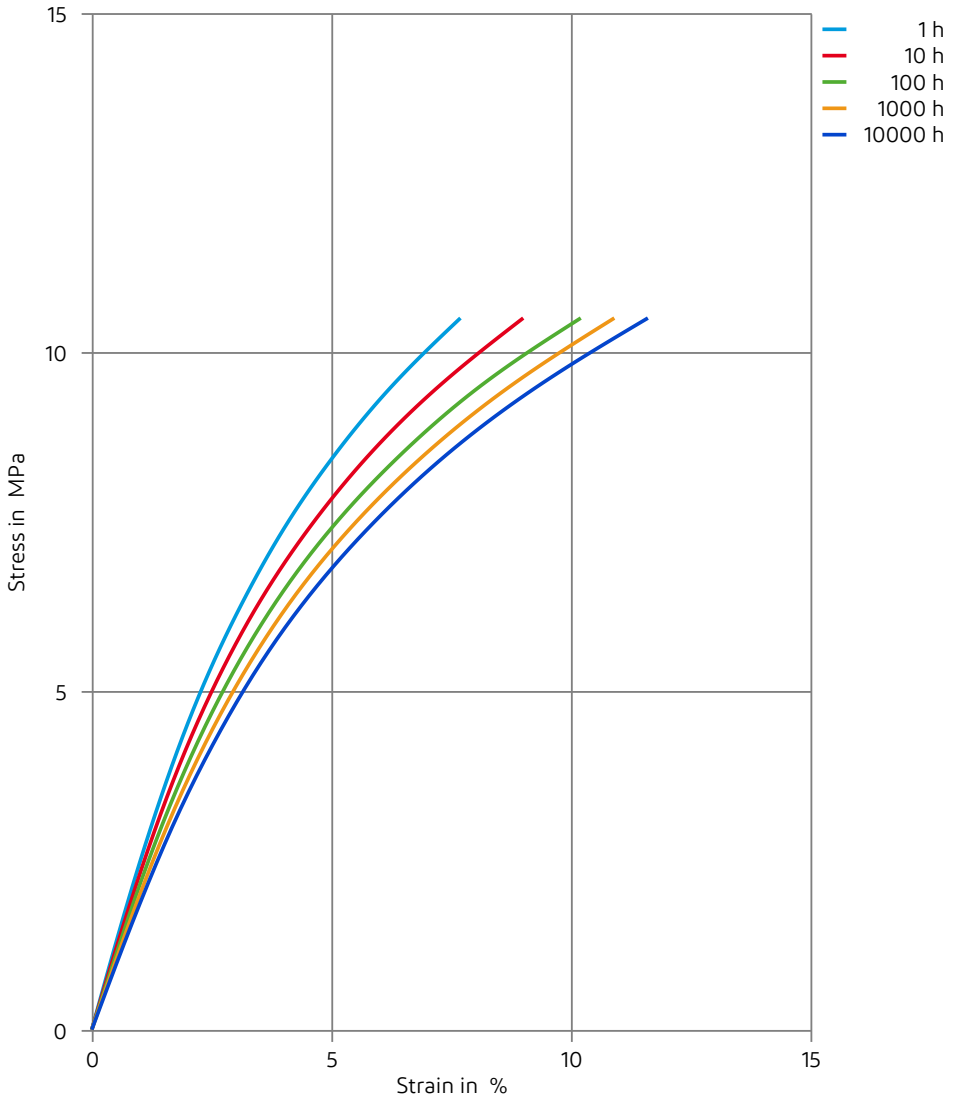
Stress-strain (isochronous) 80°C



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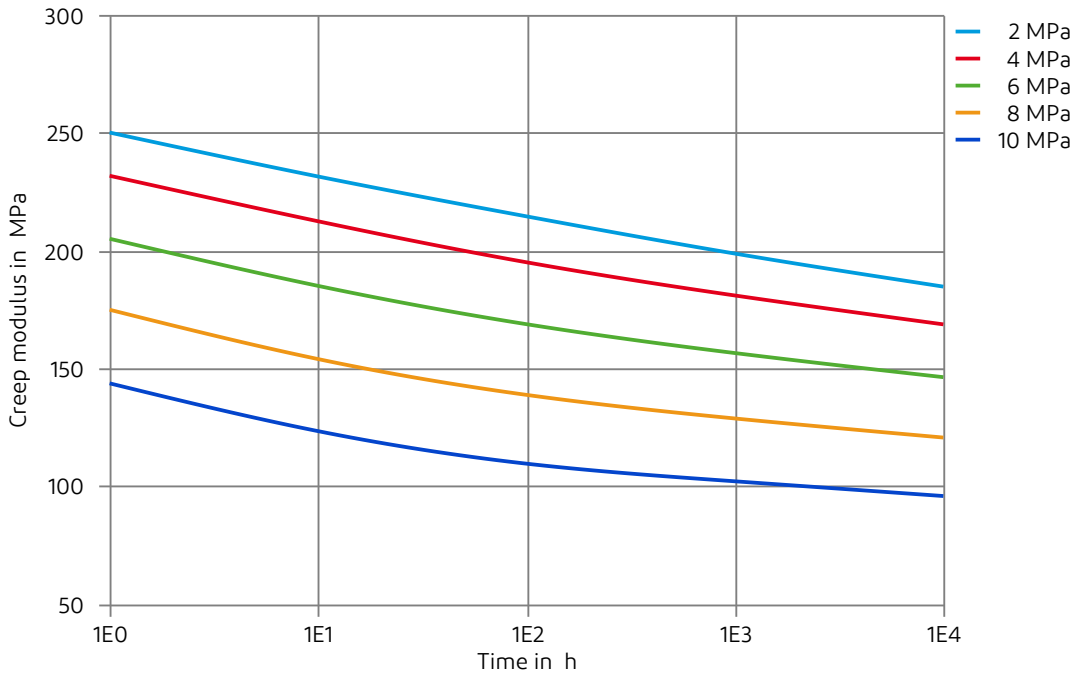
THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 80°C



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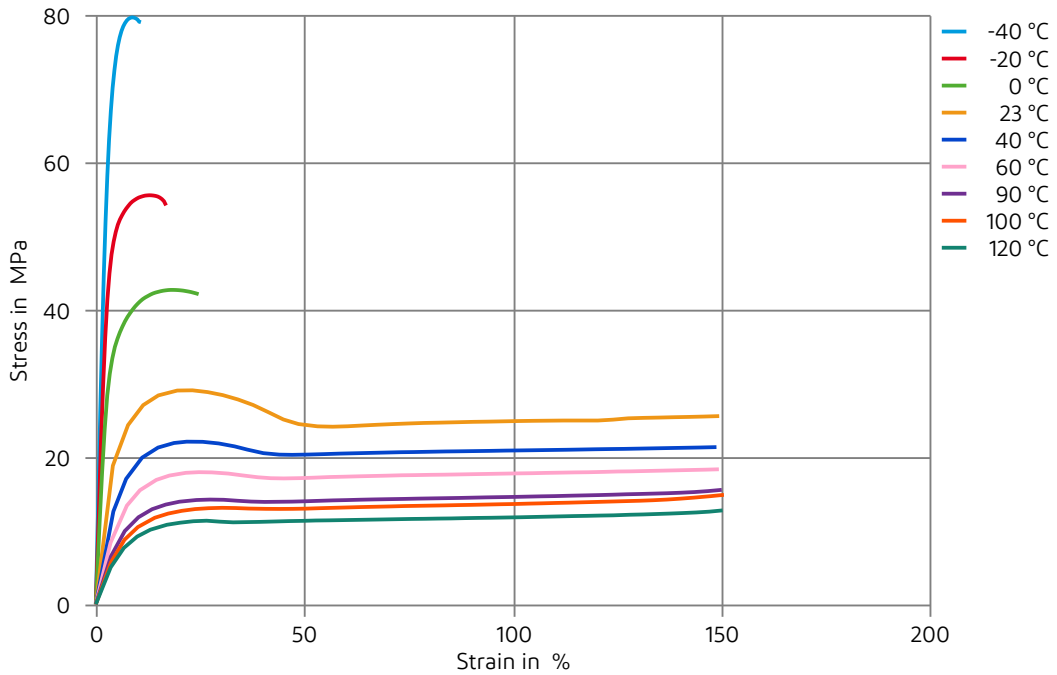
Stress-Strain (Flexible Materials)



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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

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

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- ✔ 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
- ✘ DOT No. 4 Brake fluid, 120°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).

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