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Hytrel® G4074

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® G4074 is a low modulus grade with nominal hardness of 40D. It contains discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

Typical applications:
Hose and tubing, hose jackets, wire and cable jackets, film and sheeting, moulded products. Not suited for light-colored finished products.

Product information

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

Rheological properties

Melt volume-flow rate	5	cm^3/10min	ISO 1133
Temperature	190	°C	
Load	2.16	kg	
Melt mass-flow rate	5.3	g/10min	ISO 1133
Melt mass-flow rate, Temperature	190	°C	
Melt mass-flow rate, Load	2.16	kg	
Moulding shrinkage, parallel	0.8	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	55	MPa	ISO 527-1/-2
Stress at 5% strain	2.5	MPa	ISO 527-1/-2
Stress at 10% strain	4.4	MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	8	MPa	ISO 527-1/-2
Tensile stress at break	20	MPa	ISO 527-1/-2
Nominal strain at break	360	%	ISO 527-1/-2
Tensile strain at break	250	%	ISO 527-1/-2
Flexural modulus	65	MPa	ISO 178
Shear Modulus	16	MPa	ISO 6721
Tensile creep modulus, 1000h	35	MPa	ISO 899-1
Charpy impact strength, 23°C	N	kJ/m^2	ISO 179/1eU

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Charpy impact strength, -30 °C	N	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23 °C	N	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	N	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	N	kJ/m²	ISO 179/1eA
Puncture - maximum force, -30 °C	3000	N	ISO 6603-2
Puncture energy, -30 °C	37	J	ISO 6603-2
Izod notched impact strength, 23 °C	N	kJ/m²	ISO 180/1A
Izod notched impact strength, -40 °C	N	kJ/m²	ISO 180/1A
Brittleness temperature	-60	°C	ISO 974
Shore D hardness, 15s	33		ISO 48-4 / ISO 868
Shore D hardness, max	40		ISO 868
Tear strength, parallel	86	kN/m	ISO 34-1
Tear strength, normal	96	kN/m	ISO 34-1
Abrasion resistance	50	mm³	ISO 4649

Thermal properties

Melting temperature, 10 °C/min	170	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	-45	°C	ISO 11357-1/-3
Vicat softening temperature, 50 °C/h 10N	115	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23 °C	220	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	210	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23 °C	180	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	200	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.26	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	5.44E-8	m²/s	ISO 22007-4
Specific heat capacity of melt	2050	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	90	°C	UL 746B
RTI, electrical, 1.5mm	90	°C	UL 746B
RTI, electrical, 3.0mm	90	°C	UL 746B
RTI, impact, 0.75mm	50	°C	UL 746B
RTI, impact, 1.5mm	85	°C	UL 746B
RTI, impact, 3.0mm	85	°C	UL 746B
RTI, strength, 0.75mm	50	°C	UL 746B
RTI, strength, 1.5mm	85	°C	UL 746B
RTI, strength, 3.0mm	85	°C	UL 746B
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
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	20	%	ISO 4589-1/-2
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	51	mm/min	ISO 3795 (FMVSS 302)

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Electrical properties

Relative permittivity, 100Hz	5.7		IEC 62631-2-1
Relative permittivity, 1MHz	5		IEC 62631-2-1
Dissipation factor, 100Hz	550	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	530	E-4	IEC 62631-2-1
Volume resistivity	4E9	Ohm.m	IEC 62631-3-1
Surface resistivity	2E13	Ohm	IEC 62631-3-2
Electric strength	17	kV/mm	IEC 60243-1

Physical/Other properties

Density	1180	kg/m^3	ISO 1183
Density of melt	1030	kg/m^3	

Film Properties

WVTR, 23°C/85%r.h.	1900	$g/(m^2*d)$	DIS 15106-1/-2
Oxygen transmission rate, 23°C/85%r.h.	34000	$cm^3/(m^2*d*bar)$	DIS 15105-1/-2
Thickness of specimen	0.025	mm	

VDA Properties

Odour	4	class	VDA 270

Injection

Drying Recommended	yes	
Drying Temperature	100	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.08	%
Melt Temperature Optimum	200	°C
Min. melt temperature	180	°C
Max. melt temperature	220	°C
Mold Temperature Optimum	40	°C
Min. mould temperature	30	°C
Max. mould temperature	50	°C
Ejection temperature	53	°C

Extrusion

Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	195	°C
Melt Temperature Range	185 - 200	°C

Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Casting, Thermoforming
Delivery form	Pellets
Special characteristics	Heat stabilised or stable to heat

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Additional information

Profile extrusion

PREPROCESSING

Drying temperature = 80 °C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.06 %

PROCESSING

Melt temperature optimum = 195 °C
Melt temperature range = 185-200 °C

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Bosch	N28 BN34-OX035	
General Motors	GMW17187P-TPC-ET-Type 2	
Stellantis - Chrysler	MS-DB-448 / CPN-3095	Black

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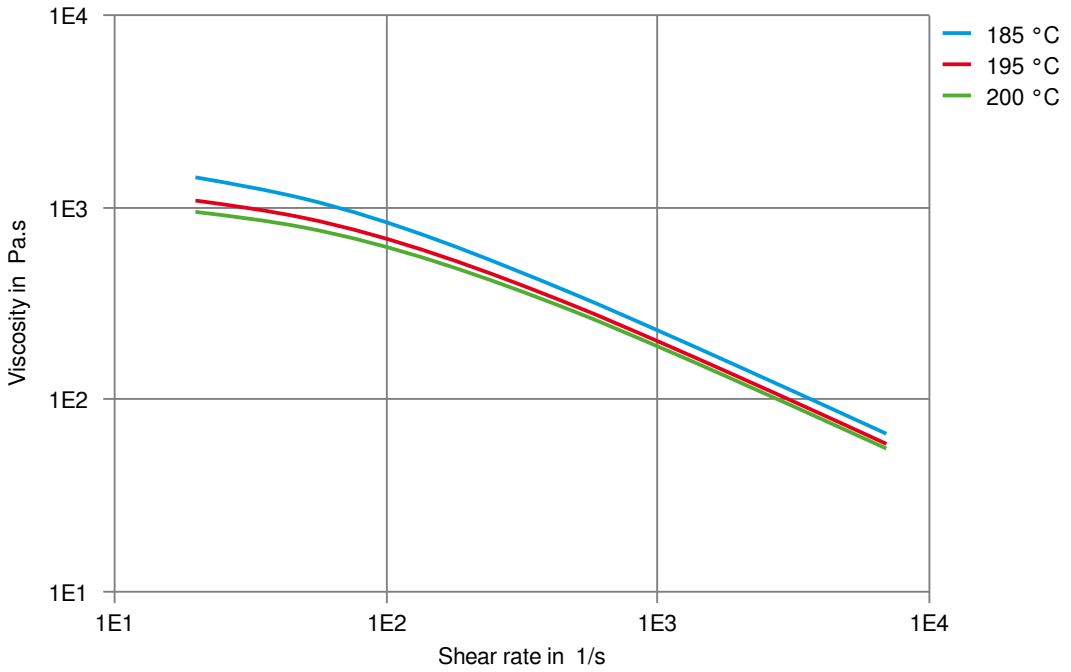
Viscosity-shear rate



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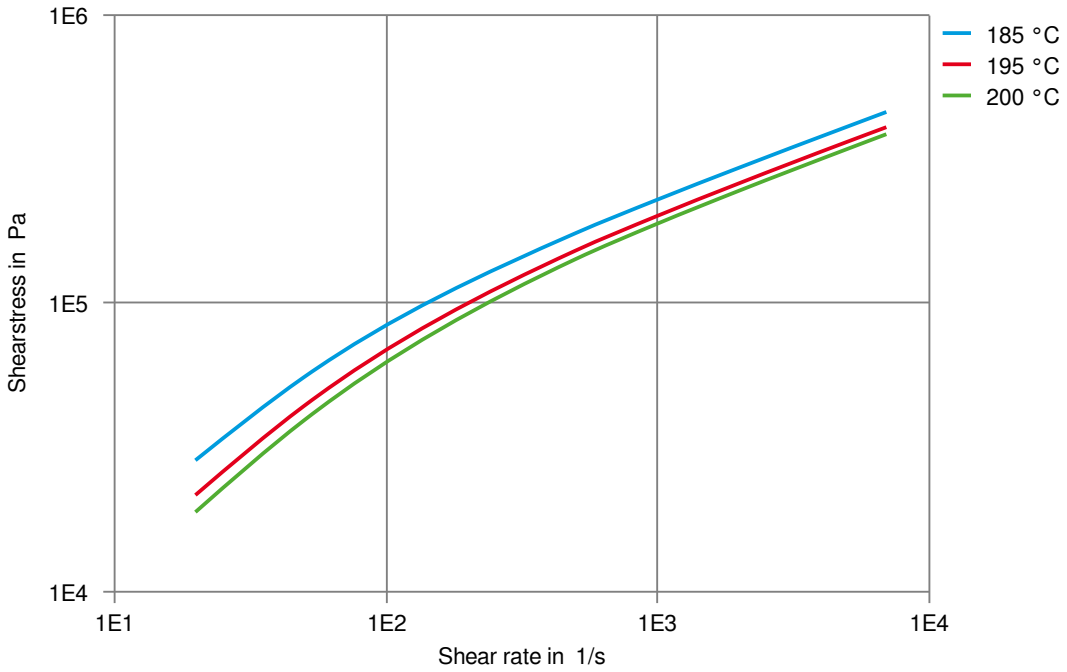
Shearstress-shear rate



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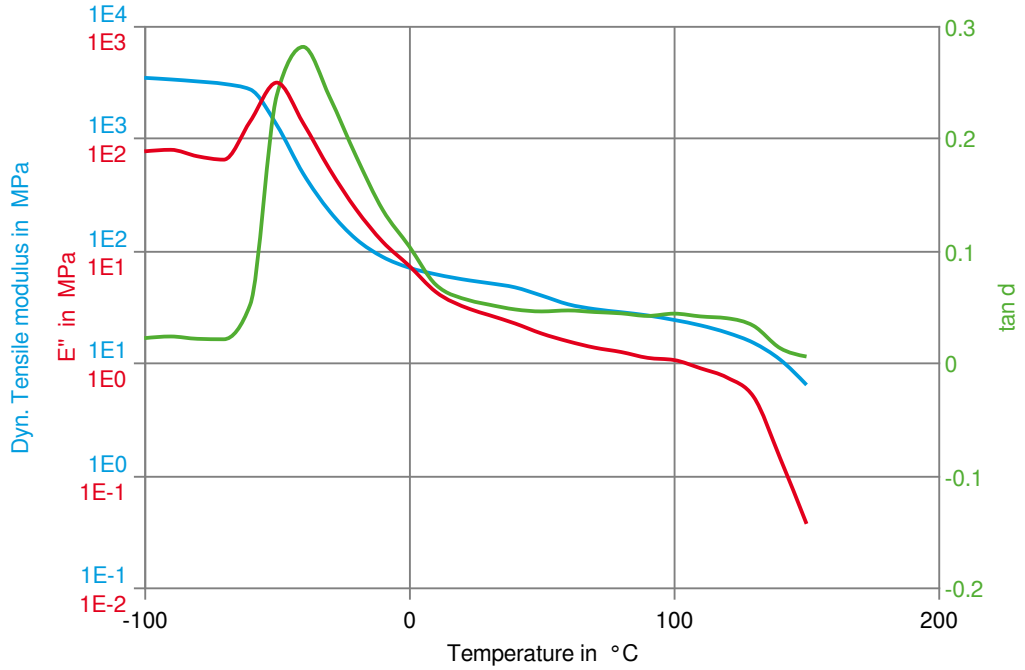
Dynamic Tensile modulus-temperature



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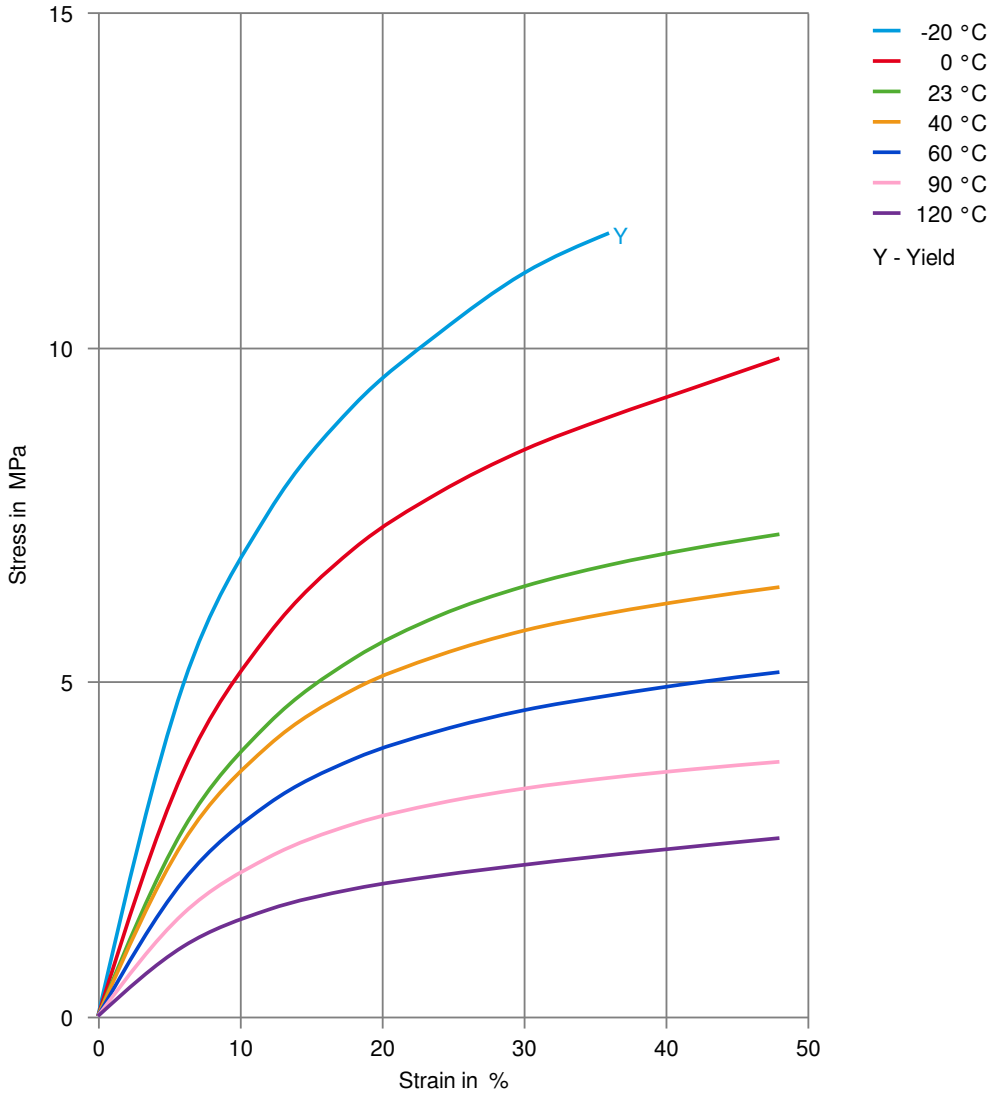
Stress-strain



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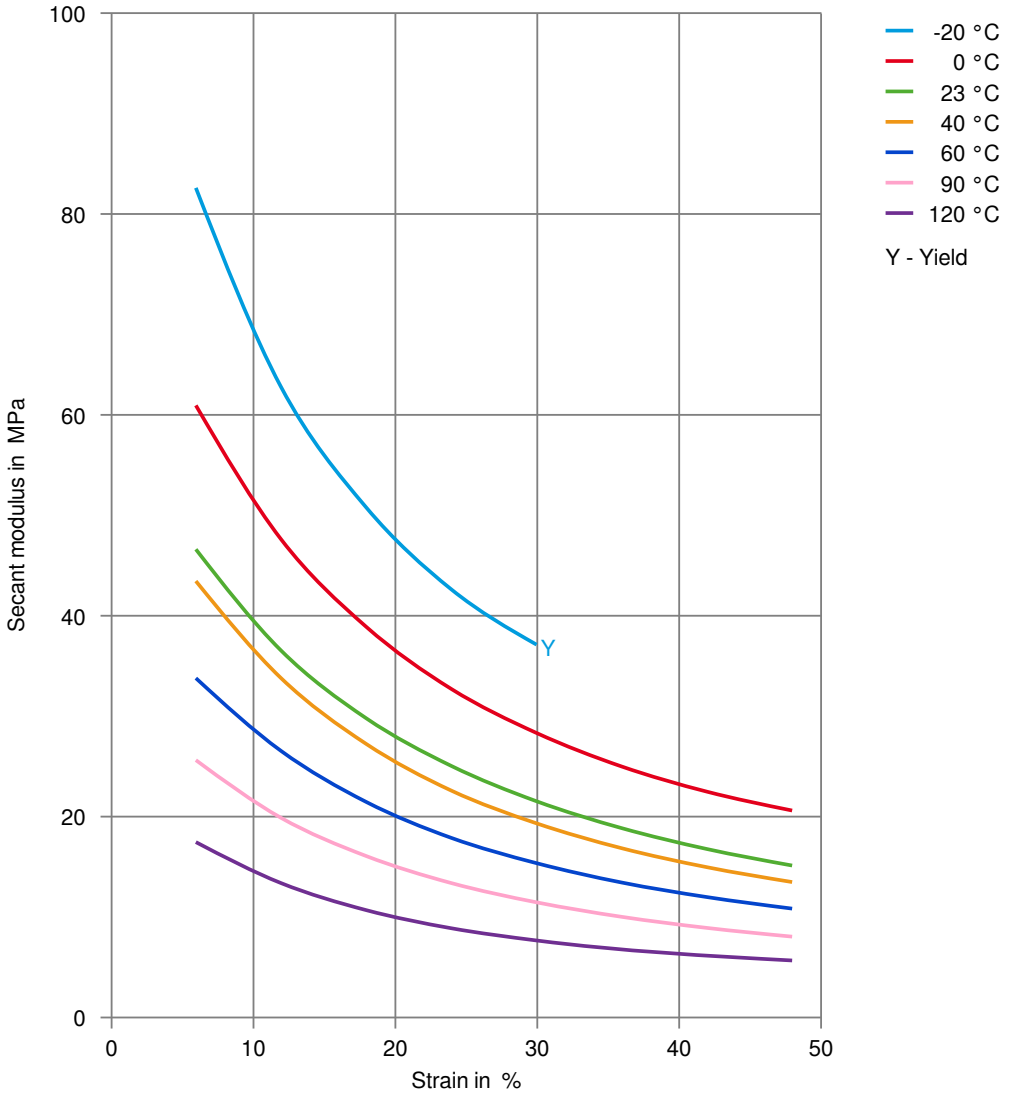
Secant modulus-strain



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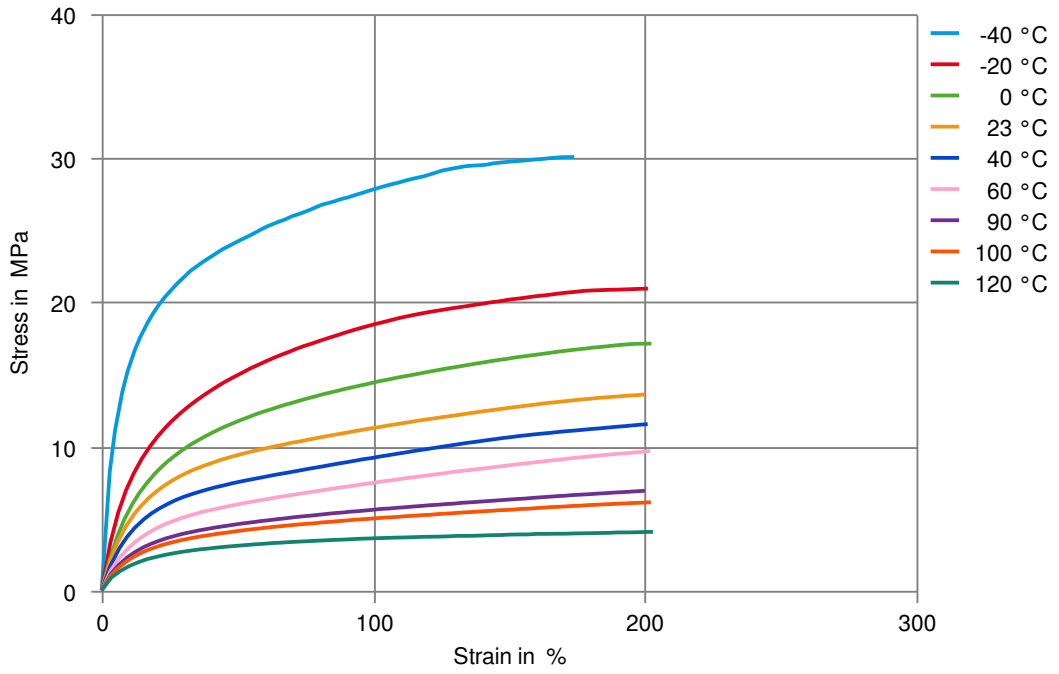
Stress-Strain (Flexible Materials)



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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

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

Salt solutions

- ✔ Sodium Chloride solution (10% by mass), 23°C
- ✘ Sodium Hypochlorite solution (10% by mass), 23°C

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- ✔ 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).