

Hytrel® 5555HS

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® 5555HS is a medium modulus Hytrel® grade, with nominal durometer hardness of 55D. It is a specially stabilized version of Hytrel® 5556 for superior heat and oil resistance properties.

Typical applications:

Parts with increased heat-ageing stability and oil and grease resistance such as tubing and hose, wire and cable jackets, film and sheeting, belting.

Precautions:

Contains a discoloring antioxidant. Not suited for light-colored finished products.

Product information

Resin Identification
Part Marking Code

TPC-ET
>TPC-ET<

ISO 1043
ISO 11469

Rheological properties

Melt volume-flow rate	8.5 cm ³ /10min	ISO 1133
Melt mass-flow rate	8.5 g/10min	ISO 1133
Temperature	220 °C	
Load	2.16 kg	
Melt mass-flow rate, Temperature	220 °C	
Melt mass-flow rate, Load	2.16 kg	
Moulding shrinkage, parallel	1.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.4 %	ISO 294-4, 2577



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Typical mechanical properties

Tensile Modulus	190 MPa	ISO 527-1/-2
Yield stress	15 MPa	ISO 527-1/-2
Yield strain	36 %	ISO 527-1/-2
Stress at 5% strain	6.9 MPa	ISO 527-1/-2
Stress at 10% strain	11.1 MPa	ISO 527-1/-2
Stress at 50% strain	14.7 MPa	ISO 527-1/-2
Stress at 100% strain	16 MPa	ISO 527-1/-2
Stress at break	35 MPa	ISO 527-1/-2
Nominal strain at break	640 %	ISO 527-1/-2
Strain at break	>300 %	ISO 527-1/-2
Flexural Modulus	200 MPa	ISO 178
Shear Modulus	65 MPa	ISO 6721
Tensile creep modulus, 1h	140 MPa	ISO 899-1
Tensile creep modulus, 1000h	100 MPa	ISO 899-1
Charpy impact strength, 23°C	N kJ/m ²	ISO 179/1eU
Charpy notched impact strength, -30°C	30 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -40°C	14 kJ/m ²	ISO 179/1eA
Tensile notched impact strength, 23°C	300 kJ/m ²	ISO 8256/1
Izod notched impact strength, -40°C	110 ^[P] kJ/m ²	ISO 180/1A
Poisson's ratio	0.48	
Brittleness temperature	-80 °C	ISO 974
Shore D hardness, 15s	52	ISO 48-4 / ISO 868
Shore D hardness, max	55	ISO 868
Compression set at 70°C, 24h	60 %	ISO 815
Tear strength, parallel	170 kN/m	ISO 34-1
Tear strength, normal	170 kN/m	ISO 34-1
Abrasion resistance	120 mm ³	ISO 4649

[P]: Partial Break

Thermal properties

Melting temperature, 10°C/min	201 °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	51 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	78 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	75 °C	ISO 306
Vicat softening temperature, 50°C/h, 10N	180 °C	ISO 306
Coeff. of linear therm. expansion, parallel	180 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	180 E-6/K	ISO 11359-1/-2
Eff. thermal diffusivity	5.44E-8 m ² /s	Internal
RTI, electrical, 0.75mm	90 °C	UL 746B
RTI, electrical, 1.5mm	90 °C	UL 746B
RTI, electrical, 3mm	90 °C	UL 746B
RTI, impact, 0.75mm	50 °C	UL 746B



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RTI, impact, 1.5mm	85 °C	UL 746B
RTI, impact, 3mm	85 °C	UL 746B
RTI, strength, 0.75mm	50 °C	UL 746B
RTI, strength, 1.5mm	85 °C	UL 746B
RTI, strength, 3mm	85 °C	UL 746B
TGA curve	available	ISO 11359-1/-2

Flammability

Burning Behav. at 1.5mm nom. thickn.	HB class	UL 94
Thickness tested	1.5 mm	UL 94
UL recognition	yes	UL 94
Burning Behav. at thickness h	HB class	UL 94
Thickness tested	3 mm	UL 94
UL recognition	yes	UL 94
Oxygen index	20 %	ISO 4589-1/-2
FMVSS Class	SE	ISO 3795 (FMVSS 302)

Electrical properties

Comparative tracking index	600	IEC 60112
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Other properties

Humidity absorption, 2mm	0.2 %	Sim. to ISO 62
Water absorption, 2mm	0.6 %	Sim. to ISO 62
Water absorption, Immersion 24h	0.7 %	Sim. to ISO 62
Density	1190 kg/m³	ISO 1183

VDA Properties

Fogging, G-value (condensate)	0.1 ^[DS] mg	ISO 6452
[DS]: Derived from similar grade		

Injection

Drying Recommended	yes	
Drying Temperature	100 °C	
Drying Time, Dehumidified Dryer	2 - 3 h	
Processing Moisture Content	≤0.08 %	
Melt Temperature Optimum	230 °C	Internal
Min. melt temperature	220 °C	
Max. melt temperature	250 °C	
Mold Temperature Optimum	45 °C	
Min. mould temperature	45 °C	
Max. mould temperature	55 °C	



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Extrusion

Drying Temperature	90 - 110 °C
Drying Time, Dehumidified Dryer	2 - 3 h
Processing Moisture Content	≤0.06 %
Melt Temperature Optimum	225 °C
Melt Temperature Range	220 - 235 °C

Additional information

Injection molding

PREPROCESSING

Drying recommended = Yes
Drying temperature = 100°C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.08 %

PROCESSING

Melt temperature optimum = 230°C
Mold temperature optimum = 45°C
Mold temperature range = 45-55°C

Profile extrusion

PREPROCESSING

Drying temperature = 100°C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.06%

PROCESSING

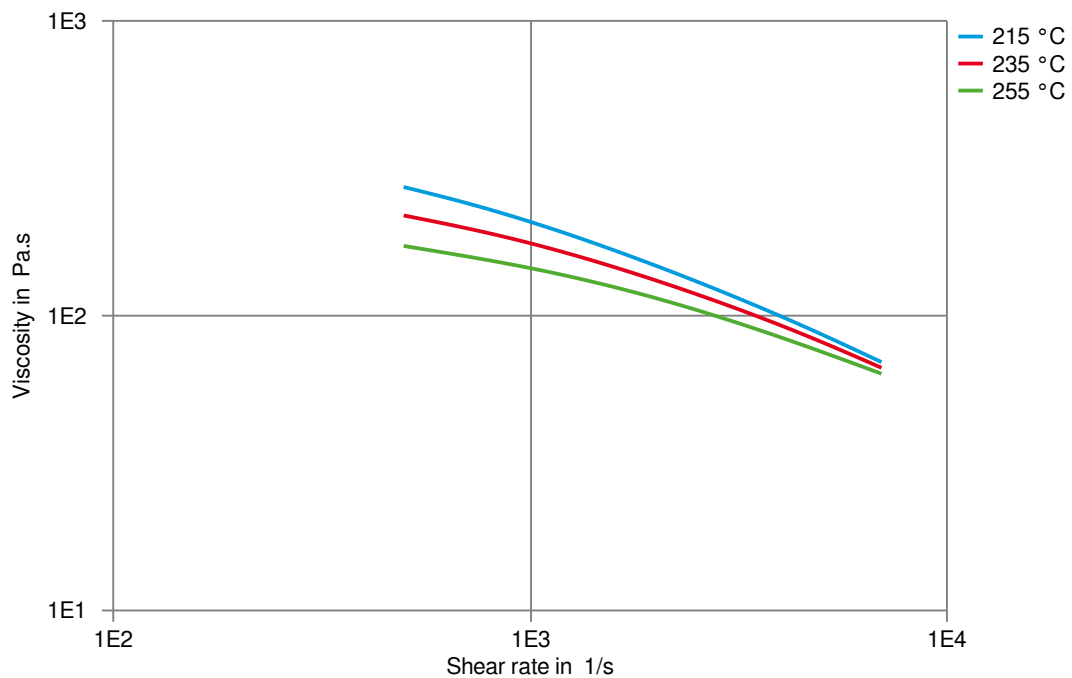
Melt temperature optimum = 225°C



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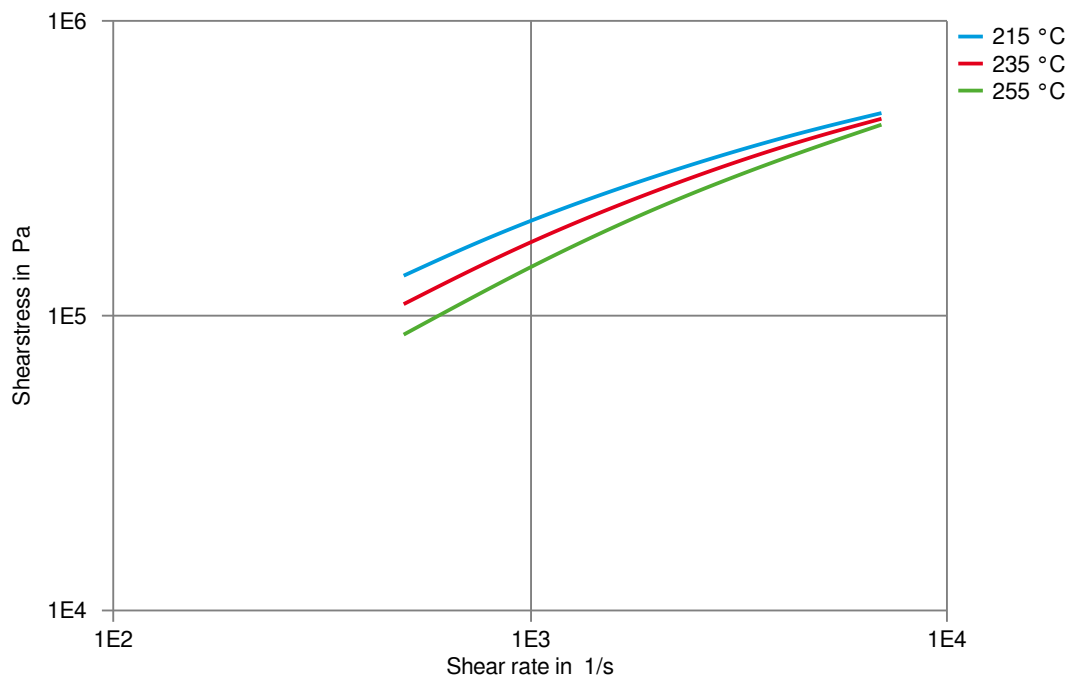
Viscosity-shear rate



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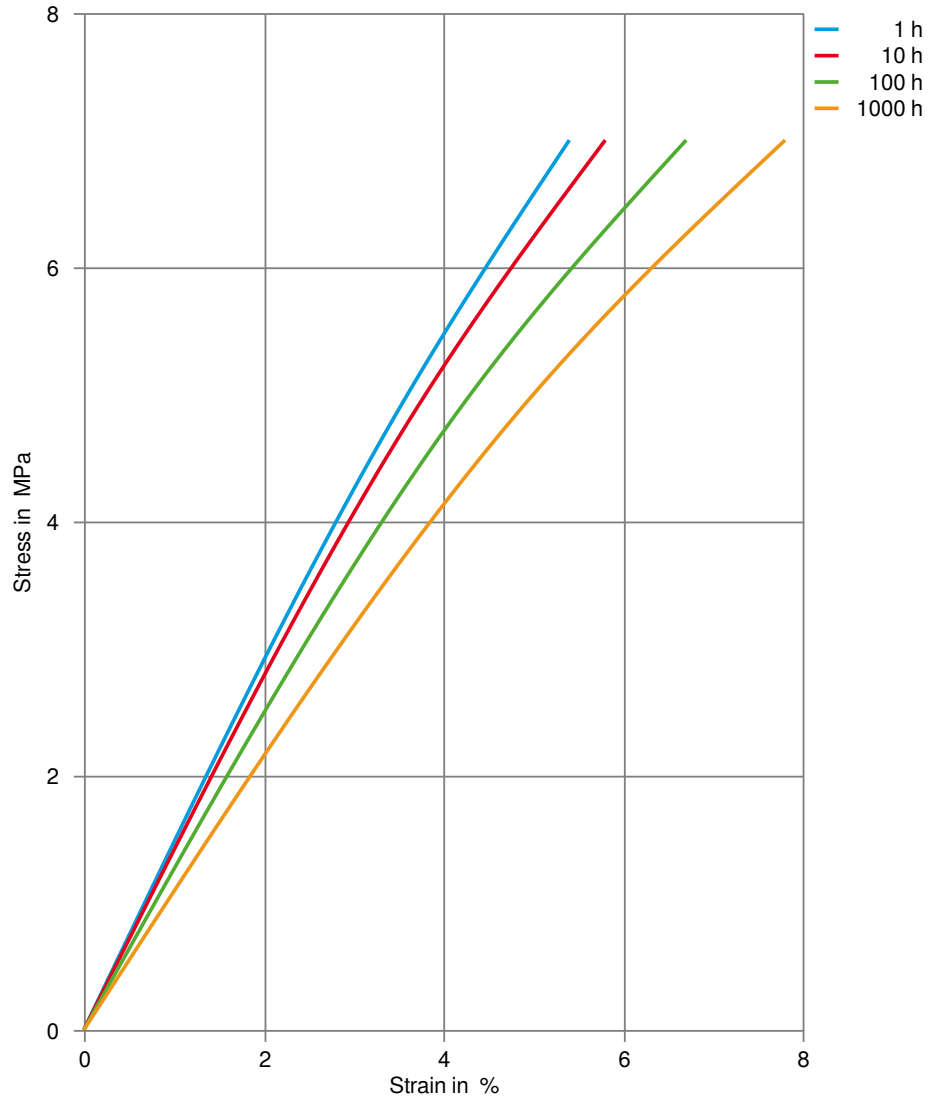
Shearstress-shear rate



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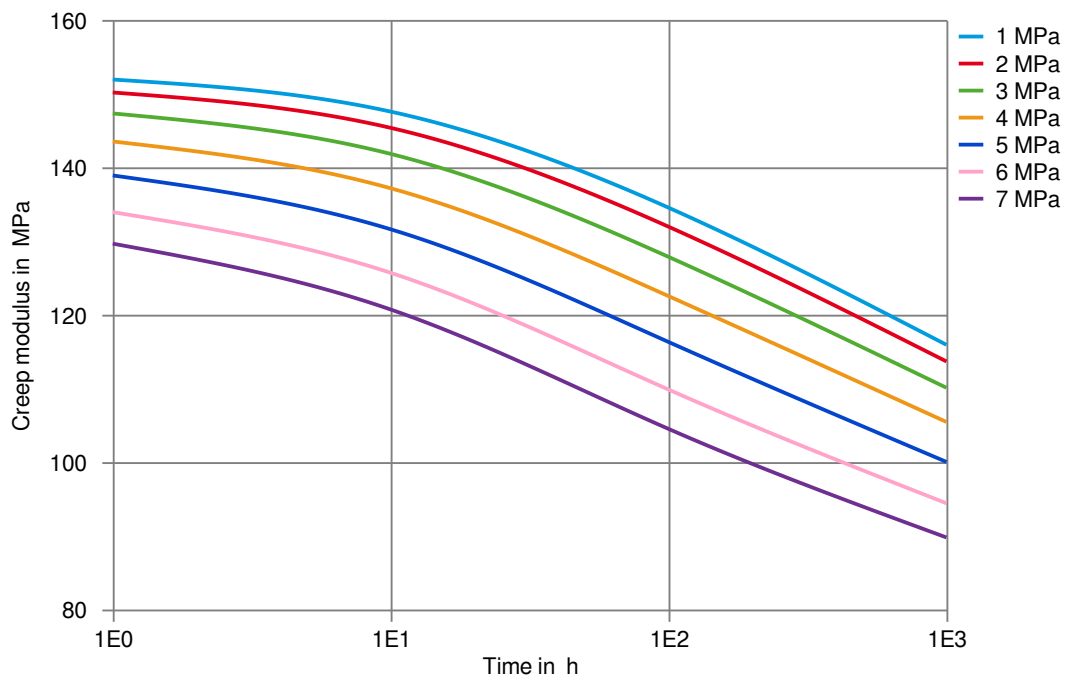
Stress-strain (isochronous) 23°C



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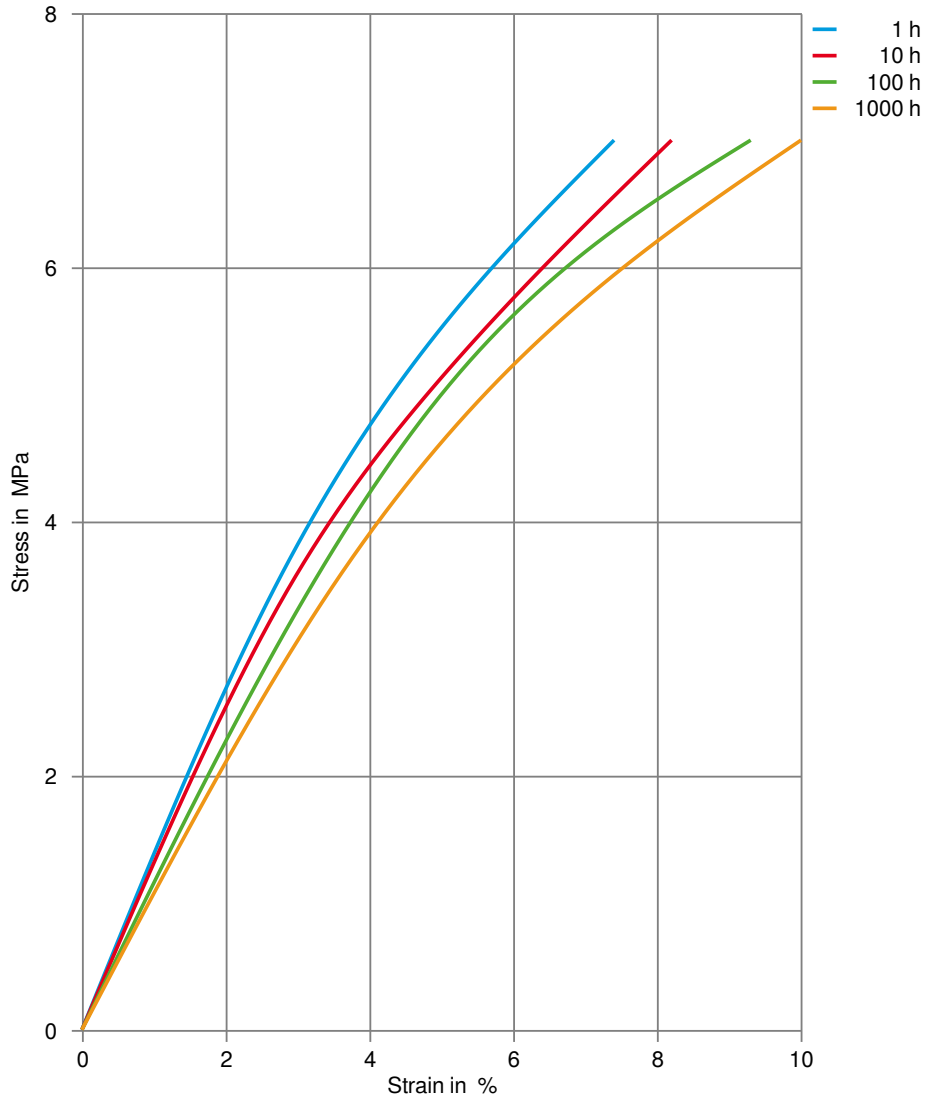
Creep modulus-time 23°C



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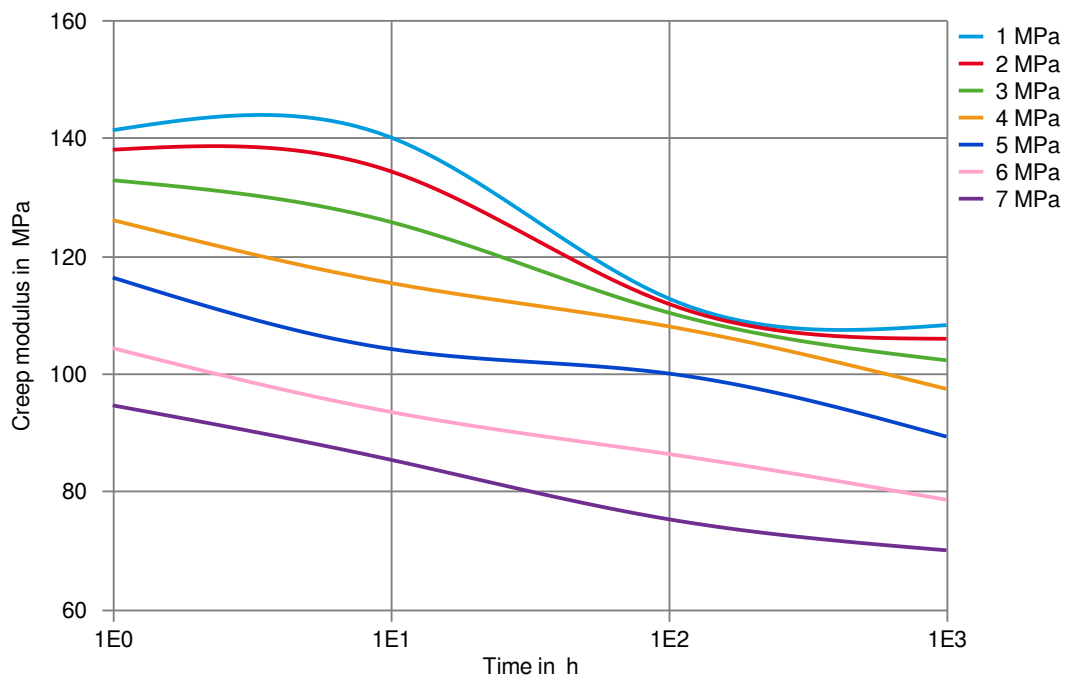
Stress-strain (isochronous) 40°C



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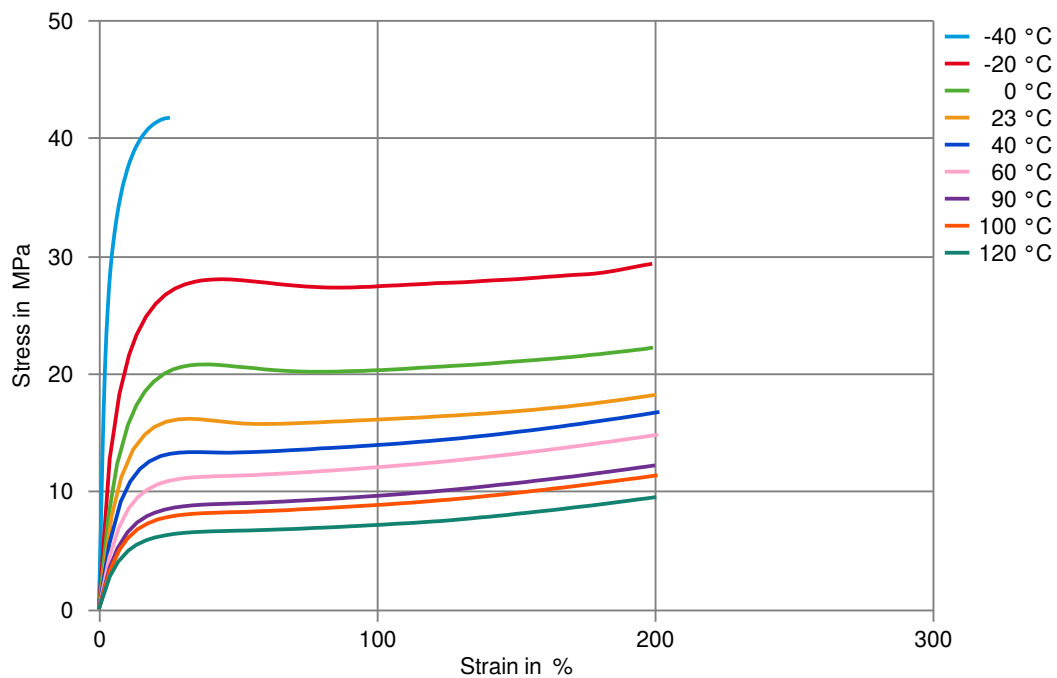
Creep modulus-time 40°C



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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
- ✓ 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



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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
- ✓ 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).

