

Hytrel® 7246 ECO-B 452

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 ECO-B 452 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. It has the same performance and processing properties as Hytrel® 7246.

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

Hytrel® 7246 ECO-B 452 belongs to the Hytrel® ECO-B family. The products of this family are partially produced using bio-feedstock derived from waste*. This results in reduced lifecycle greenhouse gas emissions and lower fossil resource use.

*certified bio-circular according to ISCC Plus mass balance approach.

Typical applications:

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

Product information

ISO designation

ISO 20029-TPC-ET,,GLN,70-22-075

Rheological properties

| | | |
|----------------------------------|---------------------------|-----------------|
| Melt volume-flow rate | 12 cm ³ /10min | ISO 1133 |
| Temperature | 240 °C | |
| Load | 2.16 kg | |
| Melt mass-flow rate | 13 g/10min | ISO 1133 |
| Melt mass-flow rate, Temperature | 240 °C | |
| Melt mass-flow rate, Load | 2.16 kg | |
| Moulding shrinkage, parallel | 1.6 % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 1.6 % | ISO 294-4, 2577 |

Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

Typical mechanical properties

| | | |
|---------------------------------------|-----------------------|--------------------|
| Tensile modulus | 550 MPa | ISO 527-1/-2 |
| Tensile stress at yield | 27 MPa | ISO 527-1/-2 |
| Tensile strain at yield | 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 |
| Tensile stress at 50% strain, 1BA | 24 MPa | ISO 527-1/-2 |
| Tensile stress at break | 50 MPa | ISO 527-1/-2 |
| Nominal strain at break | 530 % | ISO 527-1/-2 |
| Tensile 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/m ² | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 8 kJ/m ² | ISO 179/1eA |
| Charpy notched impact strength, -40°C | 7 kJ/m ² | ISO 179/1eA |
| Tensile notched impact strength, 23°C | 300 kJ/m ² | ISO 8256/1 |
| Izod notched impact strength, 23°C | 38 kJ/m ² | ISO 180/1A |
| Izod notched impact strength, -40°C | 7.0 kJ/m ² | 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 | 180 kN/m | ISO 34-1 |
| Tear strength, normal | 170 kN/m | ISO 34-1 |
| Abrasion resistance | 100 mm ³ | 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 |
| Temperature of deflection under load, 1.8 MPa | 50 °C | ISO 75-1/-2 |
| Temperature 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 |
| Coefficient of linear thermal expansion (CLTE), 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 |
| Coefficient of linear thermal expansion (CLTE), normal | 170 E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.15 W/(m K) | ISO 22007-2 |
| Effective thermal diffusivity, flow | 8E-8 m ² /s | ISO 22007-4 |
| Specific heat capacity of melt | 2150 J/(kg K) | ISO 22007-4 |
| RTI, electrical, 1.5mm | 85 °C | UL 746B |
| RTI, impact, 1.5mm | 85 °C | UL 746B |
| RTI, strength, 1.5mm | 75 °C | UL 746B |

Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

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 | DNI | 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 |

Physical/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/m ³ | ISO 1183 |
| Density of melt | 1110 kg/m ³ | |

VDA Properties

| | | |
|-------------------------------|-----------|-----------|
| Light stability delta I | -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 |
| Max. mould temperature | 55 °C |
| Hold pressure range | ≤70 MPa |

Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

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 |

Characteristics

| | |
|-------------------------|---|
| Processing | Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Casting, Thermoforming |
| Delivery form | Pellets |
| Special characteristics | Light stabilised or stable to light |
| Sustainability | Bio-Content |

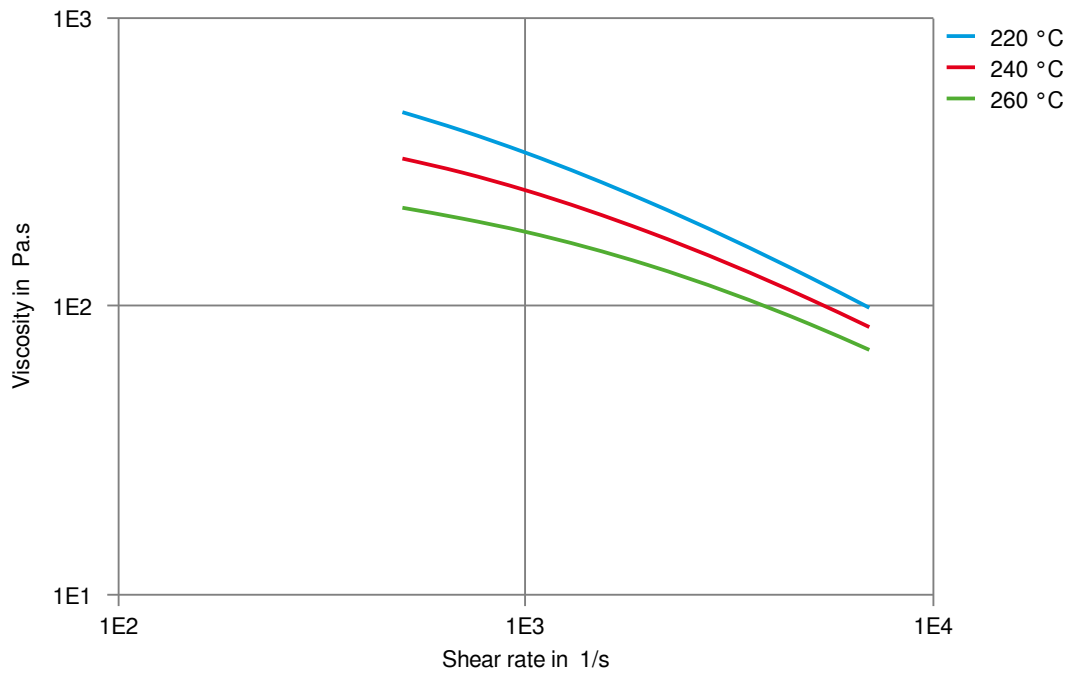
Automotive

| | |
|---------------|---------------------|
| OEM | STANDARD |
| Hyundai | MS220-24 Type B |
| Mercedes-Benz | DBL5562.50 TPC |
| VW Group | VW 50123 TPC-ET 55D |

Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

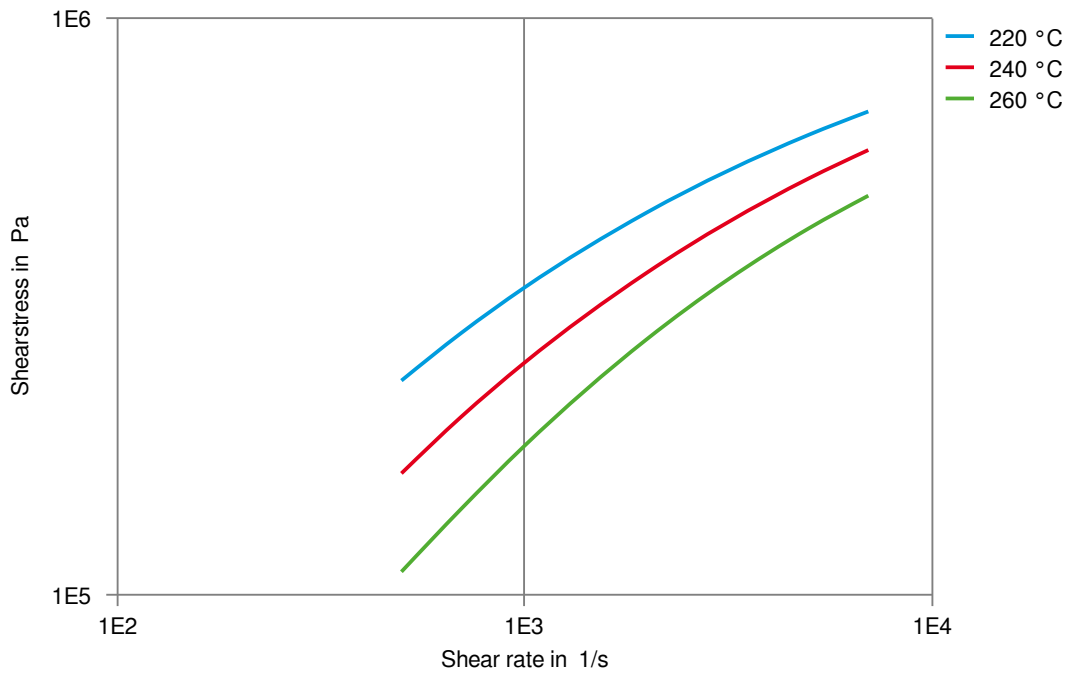
Viscosity-shear rate



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

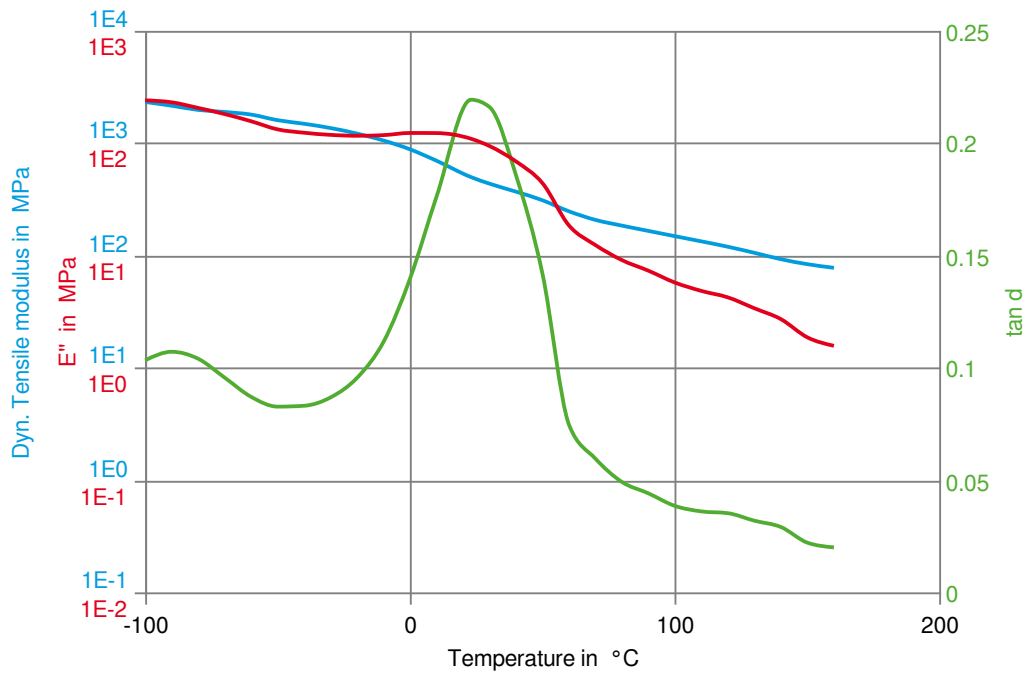
Shearstress-shear rate



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

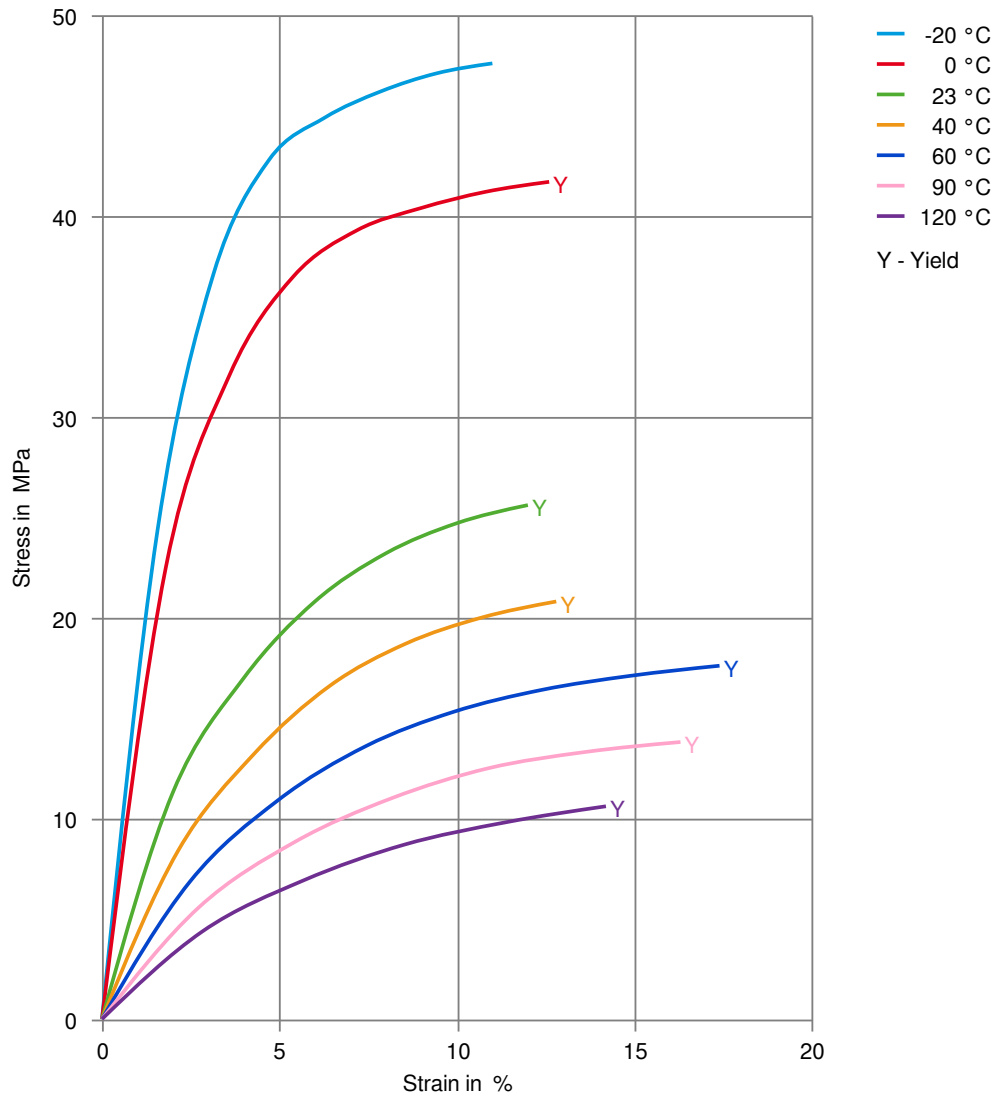
Dynamic Tensile modulus-temperature



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

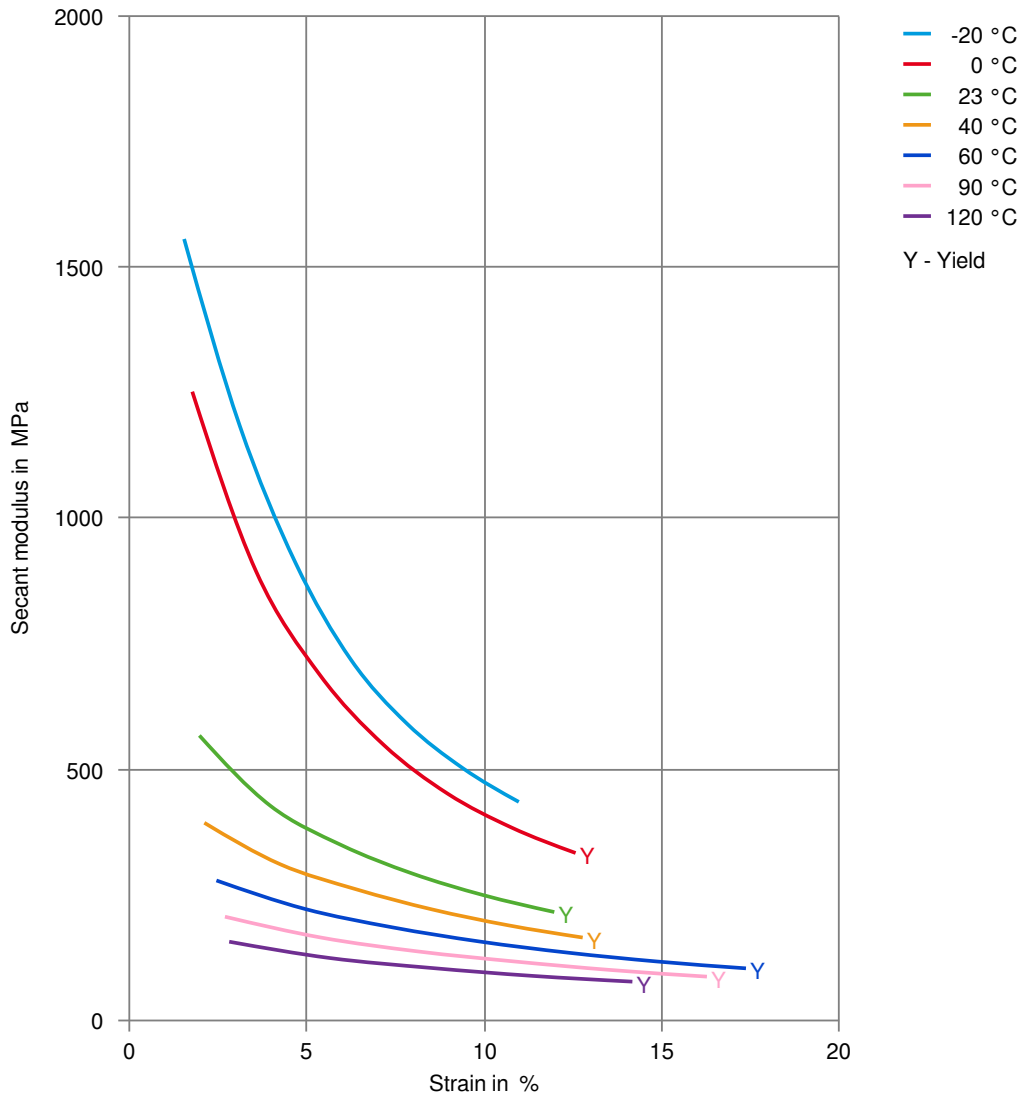
Stress-strain



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

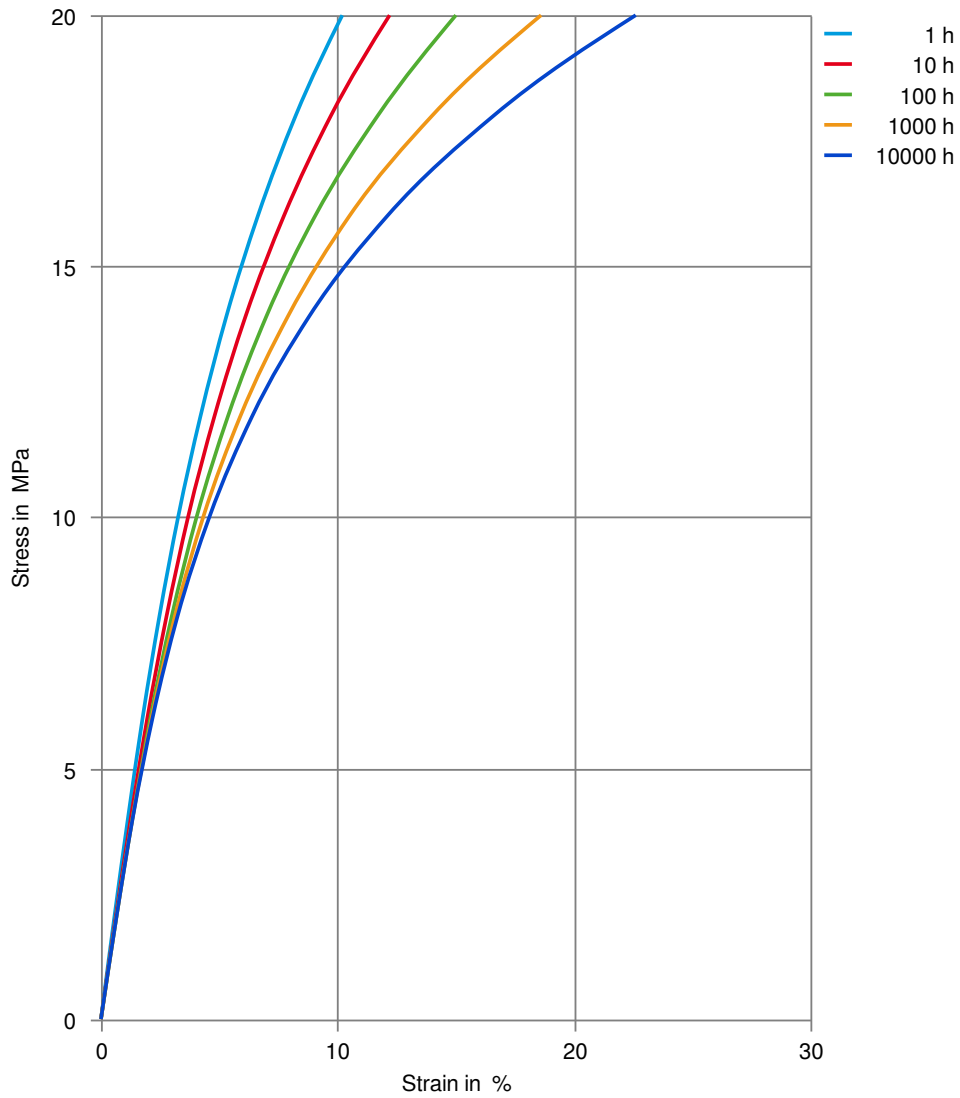
Secant modulus-strain



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

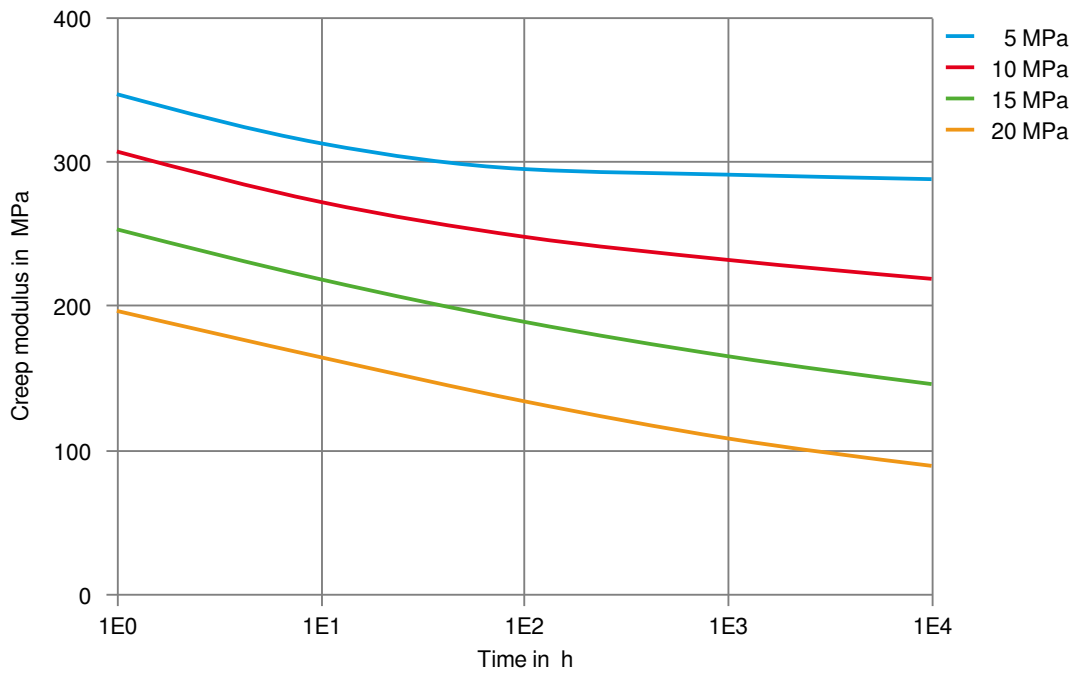
Stress-strain (isochronous) 23°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

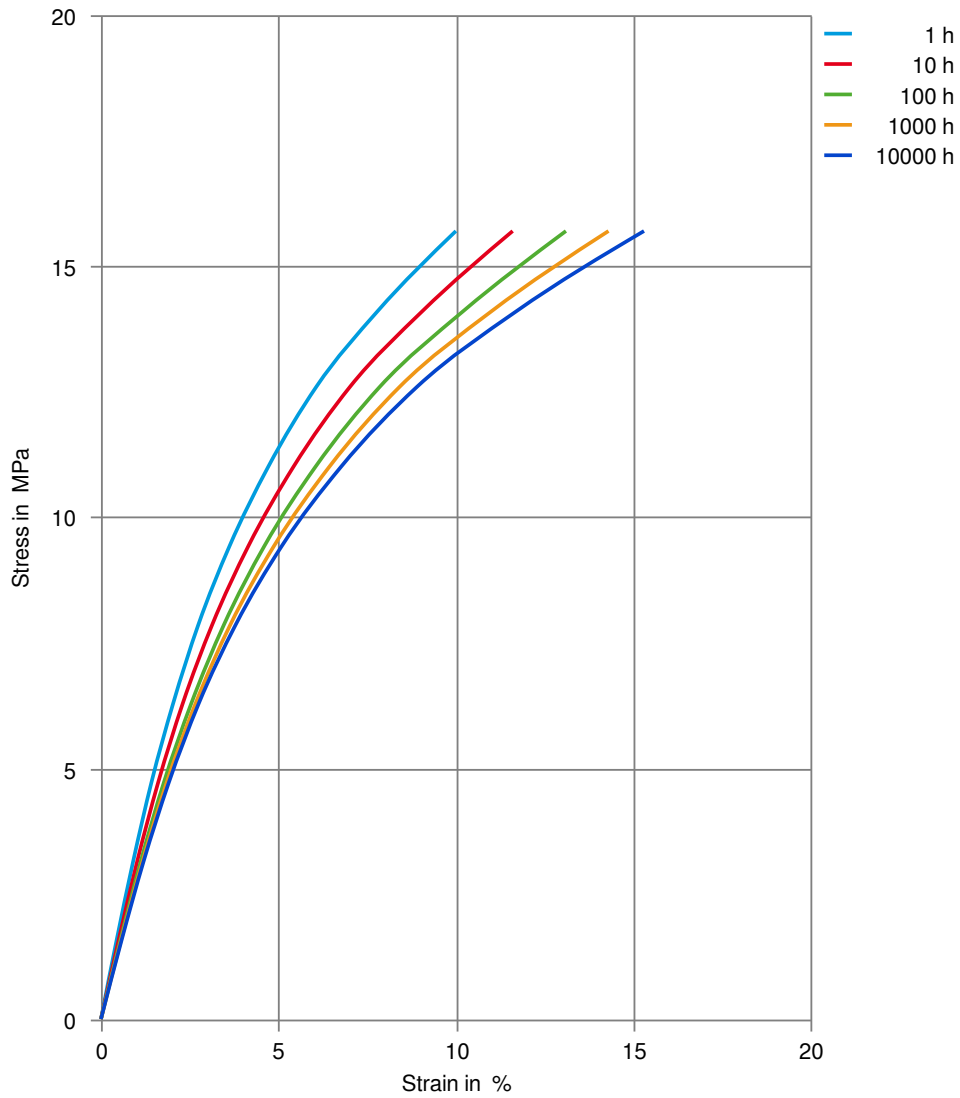
Creep modulus-time 23°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

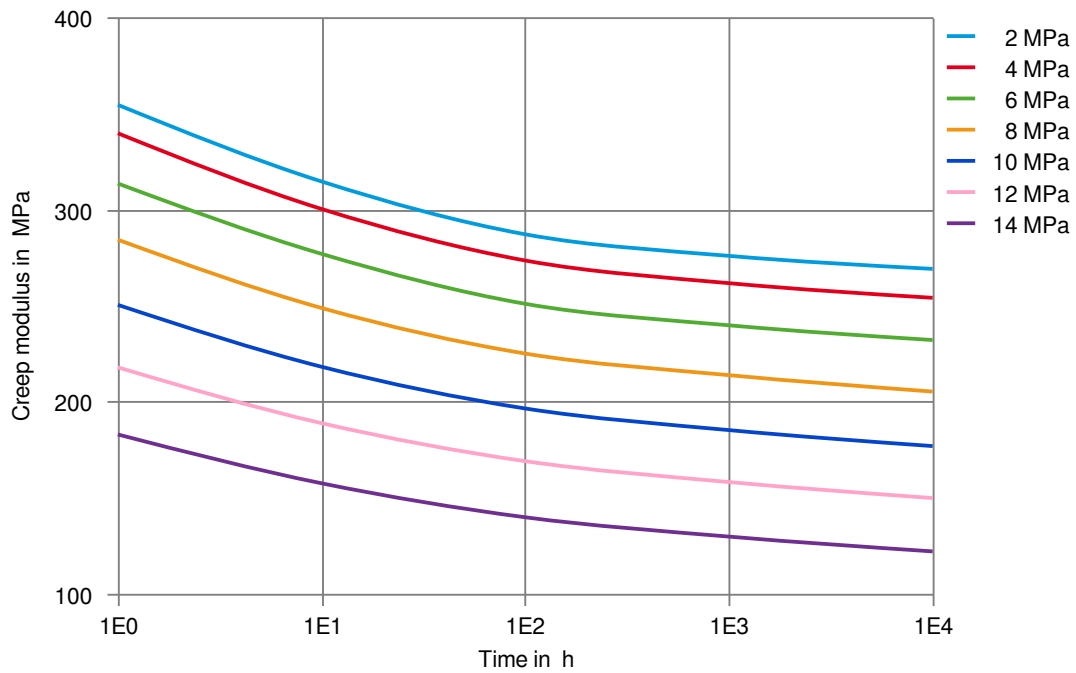
Stress-strain (isochronous) 40°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

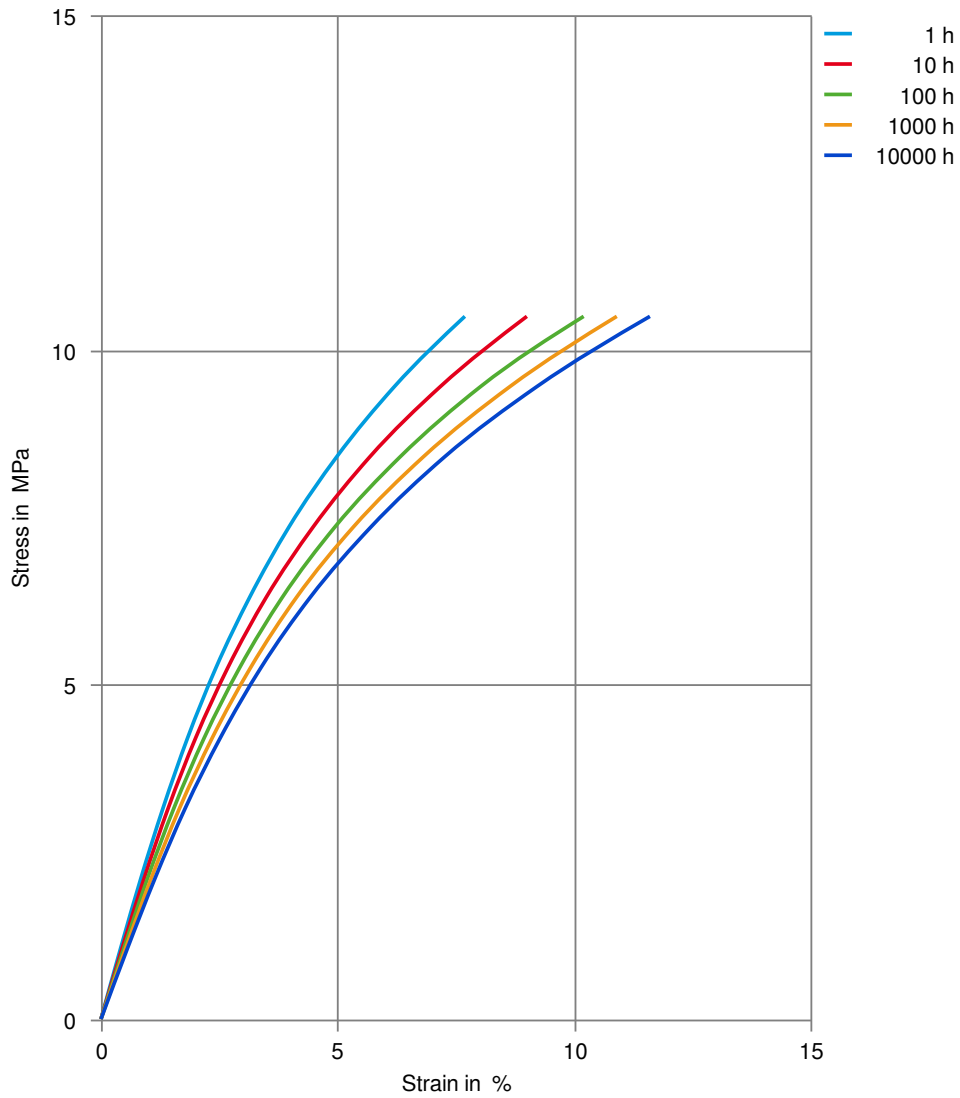
Creep modulus-time 40°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

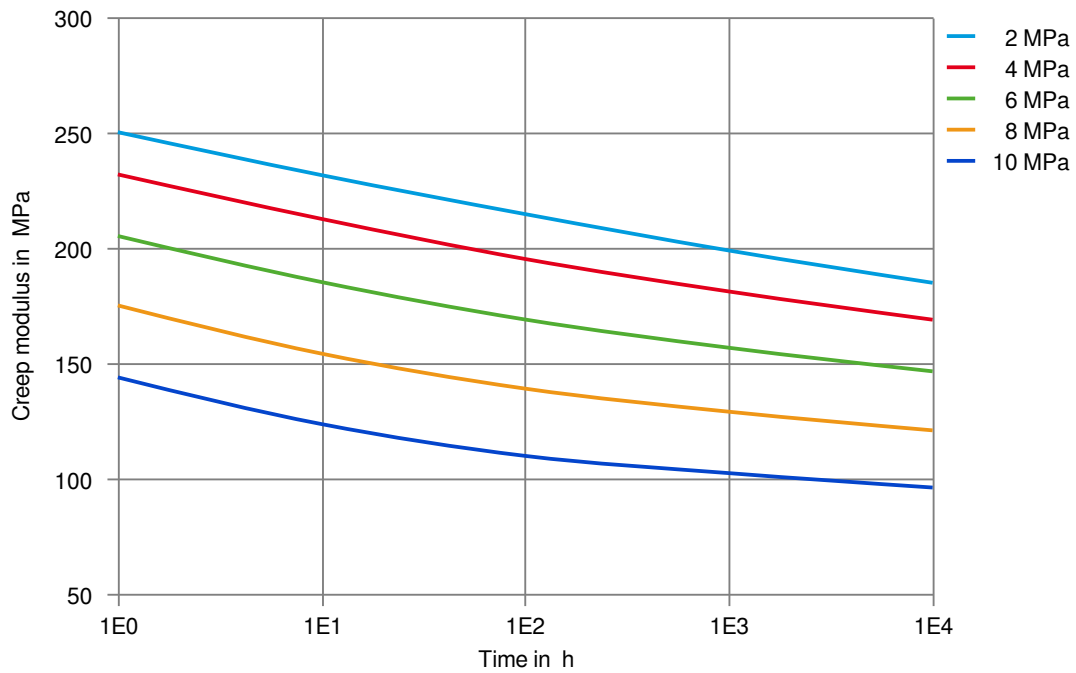
Stress-strain (isochronous) 80°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

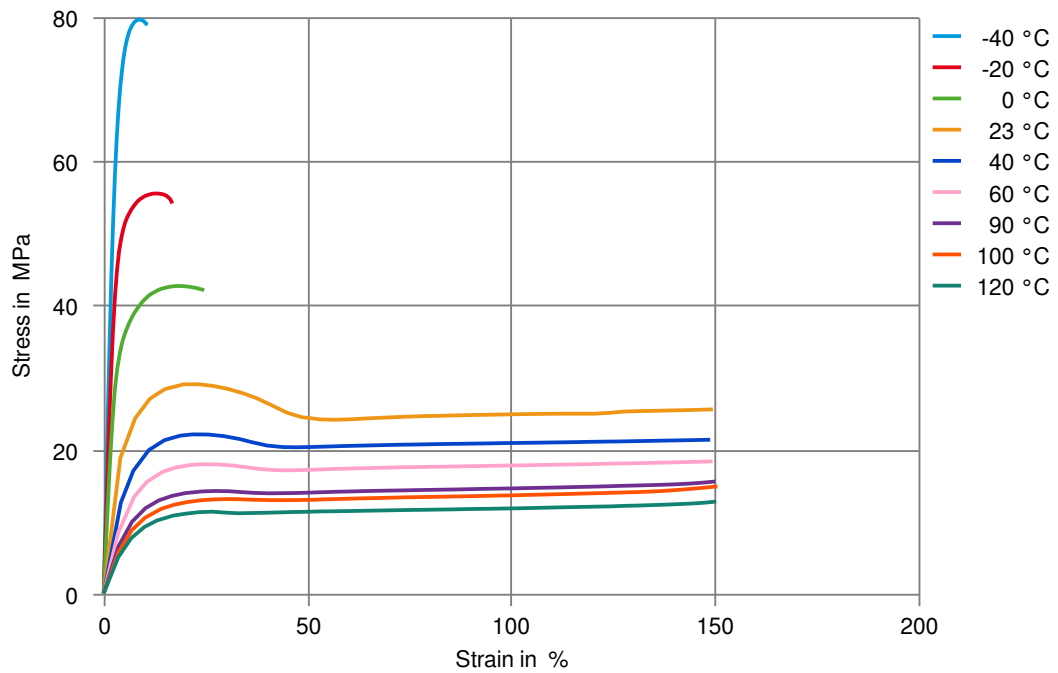
Creep modulus-time 80°C



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

Stress-Strain (Flexible Materials)



Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

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
- ✓ Diesel fuel (pref. ISO 1817 Liquid F), 90°C
- ✗ Diesel fuel (pref. ISO 1817 Liquid F), >90°C

Hytrel® 7246 ECO-B 452

THERMOPLASTIC POLYESTER ELASTOMER

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).