

DuPont™ Hytrel® 7246

THERMOPLASTIC POLYESTER ELASTOMER

Product Information

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, DuPont recommends, 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.

Typical applications:

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

| General information | Value | Unit | Test Standard |
|----------------------------------|--------|------------------------|-----------------|
| Resin Identification | TPC-ET | - | ISO 1043 |
| Part Marking Code | TPC-ET | - | ISO 11469 |
| Rheological properties | Value | Unit | Test Standard |
| Melt volume-flow rate | 12 | cm ³ /10min | ISO 1133 |
| Temperature | 240 | °C | ISO 1133 |
| Load | 2.16 | kg | ISO 1133 |
| Melt mass-flow rate | 13 | g/10min | ISO 1133 |
| Melt mass-flow rate, Temperature | 240 | °C | ISO 1133 |
| Melt mass-flow rate, Load | 2.16 | kg | ISO 1133 |
| Molding shrinkage, parallel | 1.6 | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.6 | % | ISO 294-4, 2577 |
| Mechanical properties (TPE) | Value | Unit | Test Standard |
| 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 |
| Strain at break | >300 | % | ISO 527-1/-2 |
| Nominal strain at break | 530 | % | ISO 527-1/-2 |
| Tear strength, parallel | 182 | kN/m | ISO 34-1 |
| Tear strength, normal | 172 | kN/m | ISO 34-1 |
| Abrasion resistance | 100 | mm ³ | ISO 4649 |
| Shore D hardness, max | 68 | - | ISO 7619-1 |
| Shore D hardness, 15s | 64 | - | ISO 7619-1 |
| Mechanical properties | Value | Unit | Test Standard |
| Tensile Modulus | 550 | MPa | ISO 527-1/-2 |
| Flexural Modulus | 550 | MPa | ISO 178 |
| Shear Modulus | 280 | MPa | ISO 6721 |
| Poisson's ratio | 0.47 | - | ISO 527-1/-2 |

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| | | | |
|---|--------------|-------------------|----------------------|
| Tensile creep modulus | | | ISO 899-1 |
| 1h | 360 | MPa | |
| 1000h | 310 | MPa | |
| Charpy notched impact strength | | | ISO 179/1eA |
| 73 °F | 36 | kJ/m ² | |
| -22 °F | 8 | kJ/m ² | |
| -40 °F | 7 | kJ/m ² | |
| Tensile notched impact strength, 73 °F | 300 | kJ/m ² | ISO 8256/1 |
| Brittleness temperature | -97 | °C | ISO 974 |
| Izod notched impact strength | | | ISO 180/1A |
| 73 °F | 38 | kJ/m ² | |
| -40 °F | 7 | kJ/m ² | |
| Thermal properties | Value | Unit | Test Standard |
| Melting temperature, 18 °F/min | 218 | °C | ISO 11357-1/-3 |
| Glass transition temperature, 18 °F/min | 25 | °C | ISO 11357-1/-2 |
| Temp. of deflection under load | | | ISO 75-1/-2 |
| 260 psi | 50 | °C | |
| 65 psi | 100 | °C | |
| Vicat softening temperature | | | ISO 306 |
| 90 °F/h, 11 lbf | 140 | °C | |
| 90 °F, 2 lbf | 205 | °C | |
| Coeff. of linear therm. expansion, parallel | 180 | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion | | | ISO 11359-1/-2 |
| normal | 170 | E-6/K | |
| Normal, -40-23 °C | 130 | E-6/K | |
| Parallel, -40-23 °C | 120 | E-6/K | |
| Thermal conductivity of melt | 0.15 | W/(m K) | - |
| Spec. heat capacity of melt | 2150 | J/(kg K) | - |
| Eff. thermal diffusivity | 8E-8 | m ² /s | - |
| RTI, electrical, 60mil | 85 | °C | UL 746B |
| RTI, impact, 60mil | 85 | °C | UL 746B |
| RTI, strength, 60mil | 75 | °C | UL 746B |
| Flammability | Value | Unit | Test Standard |
| Burning Behav. at 60mil 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 | Value | Unit | Test Standard |
| Relative permittivity | | | IEC 62631-2-1 |
| 100Hz | 4 | - | |
| 1MHz | 3.5 | - | |
| Dissipation factor | | | IEC 62631-2-1 |
| 100Hz | 160 | E-4 | |
| 1MHz | 300 | E-4 | |
| 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 | Value | Unit | Test Standard |
| Humidity absorption, 80mil | 0.2 | % | Sim. to ISO 62 |
| Water absorption, 80mil | 0.6 | % | Sim. to ISO 62 |
| Density | 1260 | kg/m ³ | ISO 1183 |
| Density of melt | 1110 | kg/m ³ | - |
| Water Absorption, Immersion 24h | 0.3 | % | Sim. to ISO 62 |

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| VDA Properties | | Value | Unit | Test Standard |
|---------------------------------|--|---|--|---------------|
| Emission of organic compounds | | 300 | µgC/g | VDA 277 |
| Injection | | Value | Unit | Test Standard |
| 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. mold temperature | | 45 | °C | - |
| Max. mold temperature | | 55 | °C | - |
| Hold pressure range | | ≤70 | MPa | - |
| Extrusion | | Value | Unit | Test Standard |
| 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 | <ul style="list-style-type: none"> • Injection Molding • Film Extrusion • Profile Extrusion | <ul style="list-style-type: none"> • Sheet Extrusion • Other Extrusion • Casting | <ul style="list-style-type: none"> • Thermoforming | |
| Delivery form | <ul style="list-style-type: none"> • Pellets | | | |
| Special characteristics | <ul style="list-style-type: none"> • Light stabilized or stable to light | | | |
| Regional Availability | <ul style="list-style-type: none"> • North America • Europe | <ul style="list-style-type: none"> • Asia Pacific • South and Central America | <ul style="list-style-type: none"> • Near East/Africa • Global | |

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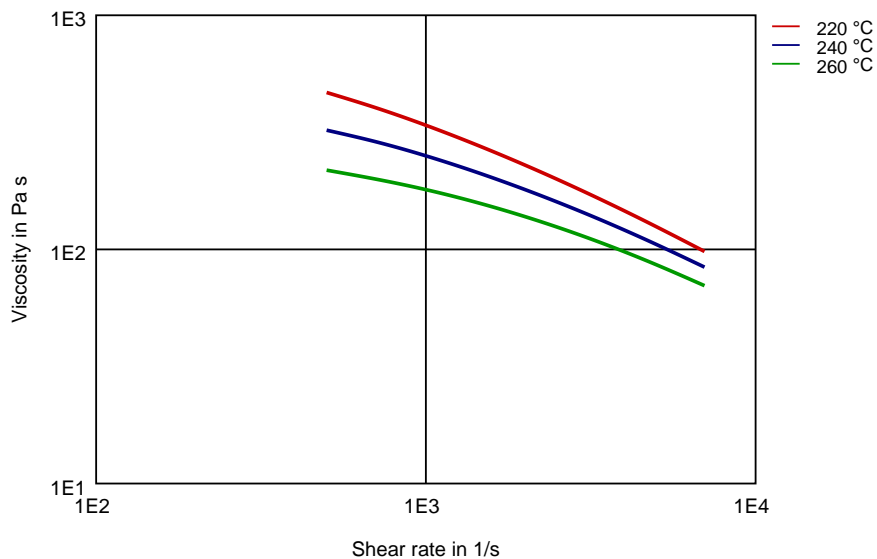


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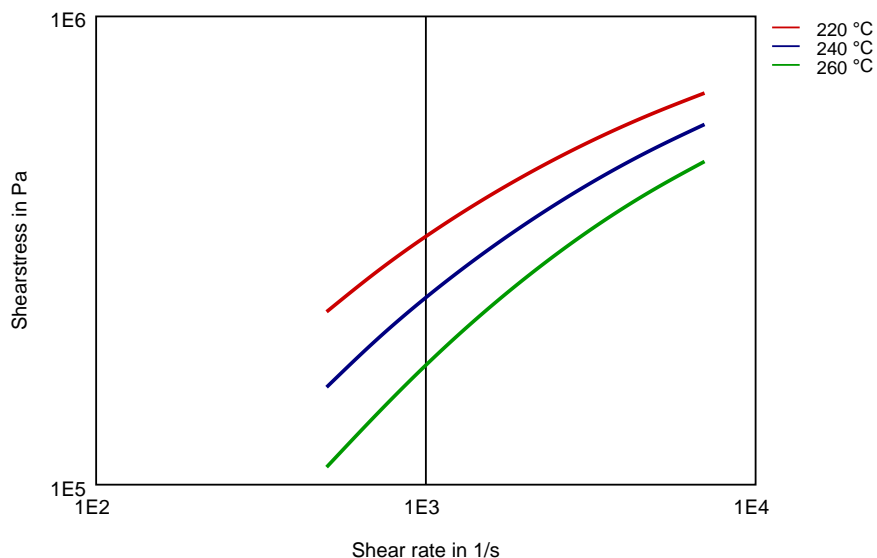
THERMOPLASTIC POLYESTER ELASTOMER

Diagrams

Viscosity-shear rate



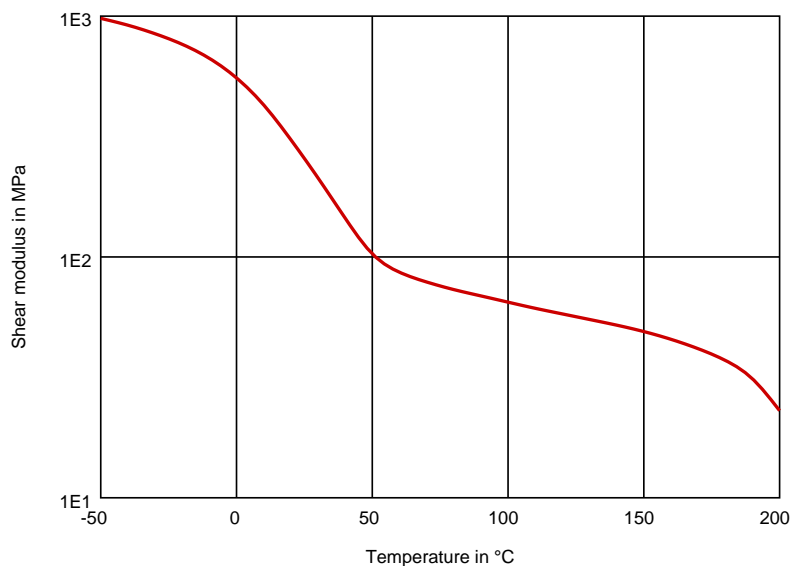
Shearstress-shear rate



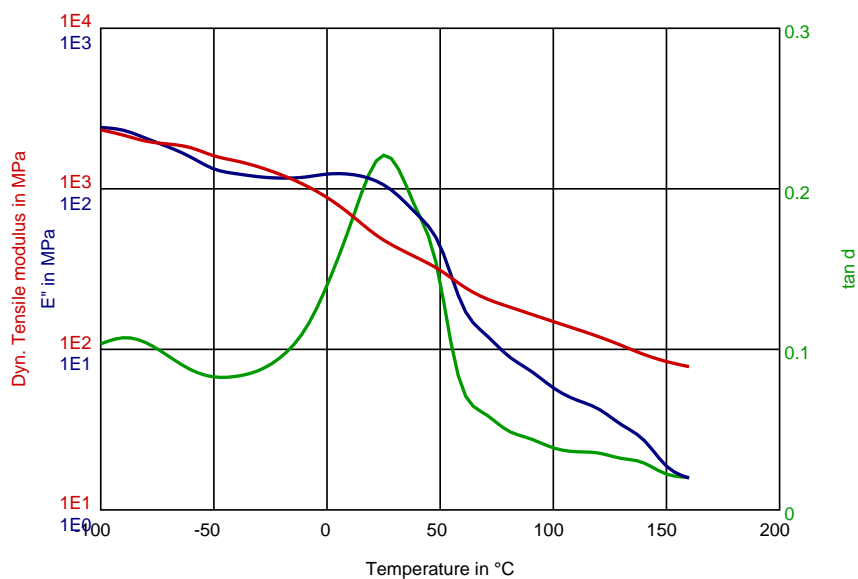
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Dynamic Shear modulus-temperature



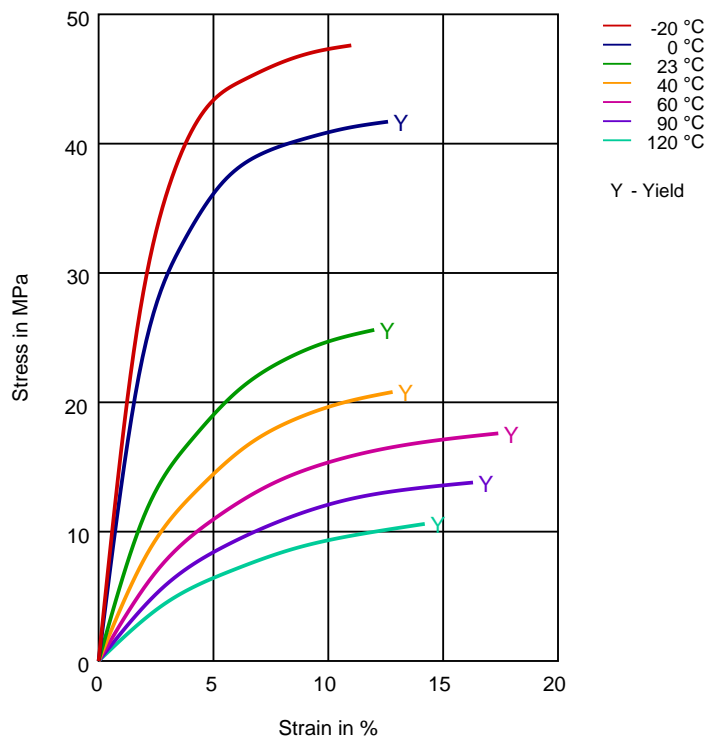
Dynamic Tensile modulus-temperature



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Stress-strain



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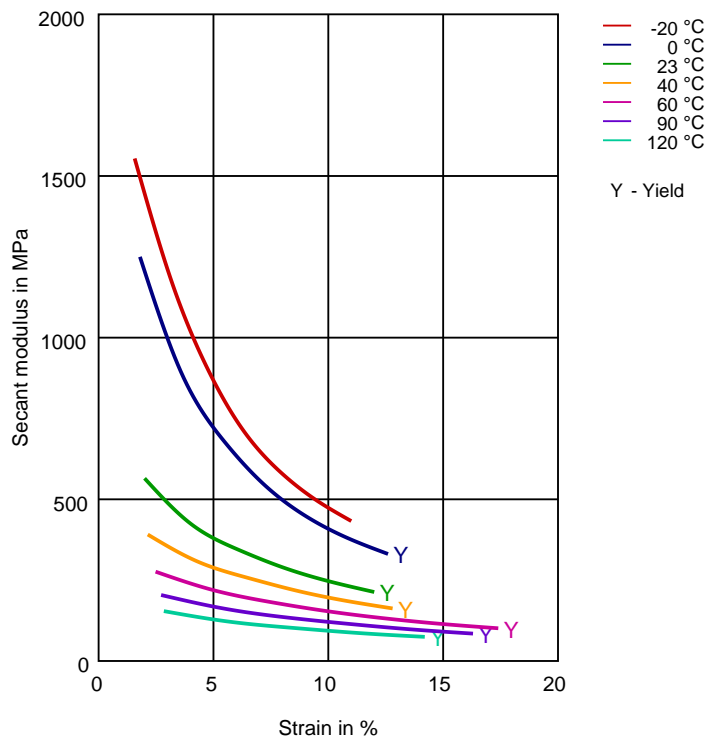
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Secant modulus-strain



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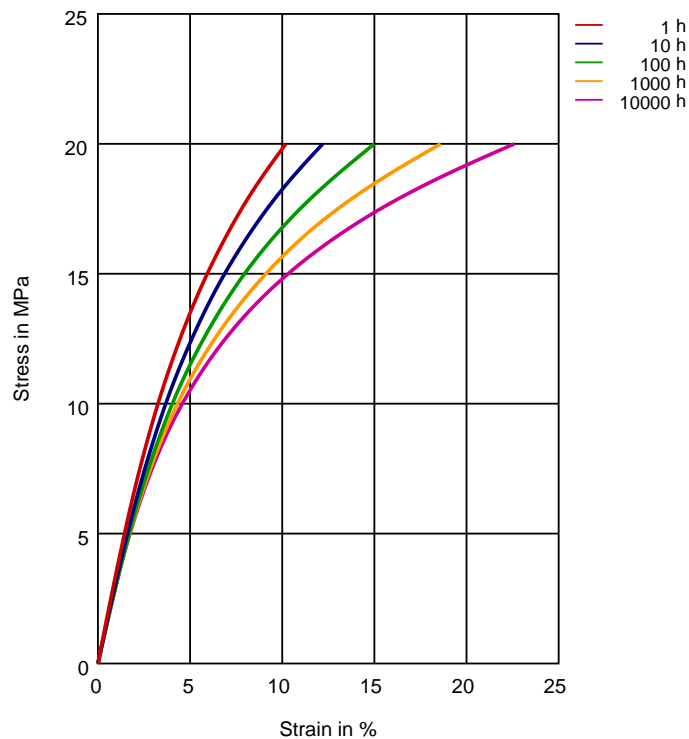
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Stress-strain (isochronous) 23 °C



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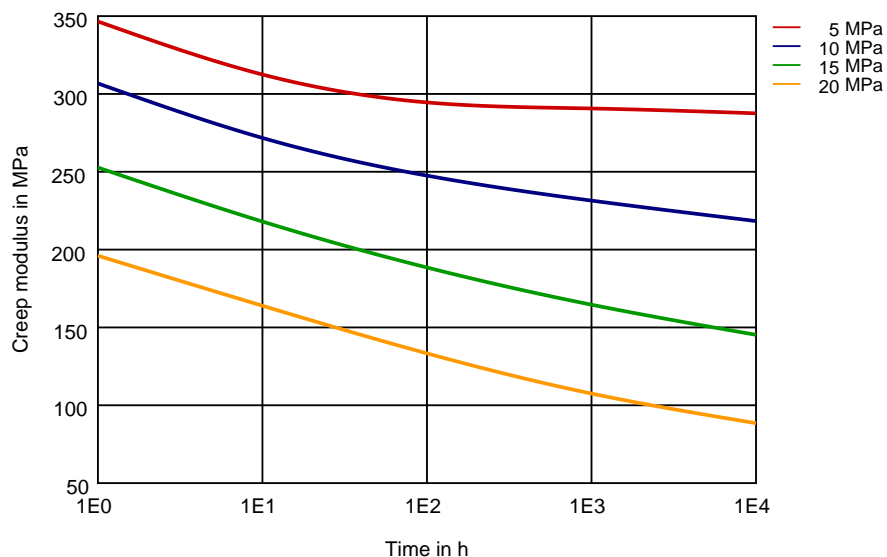
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Creep modulus-time 23 °C



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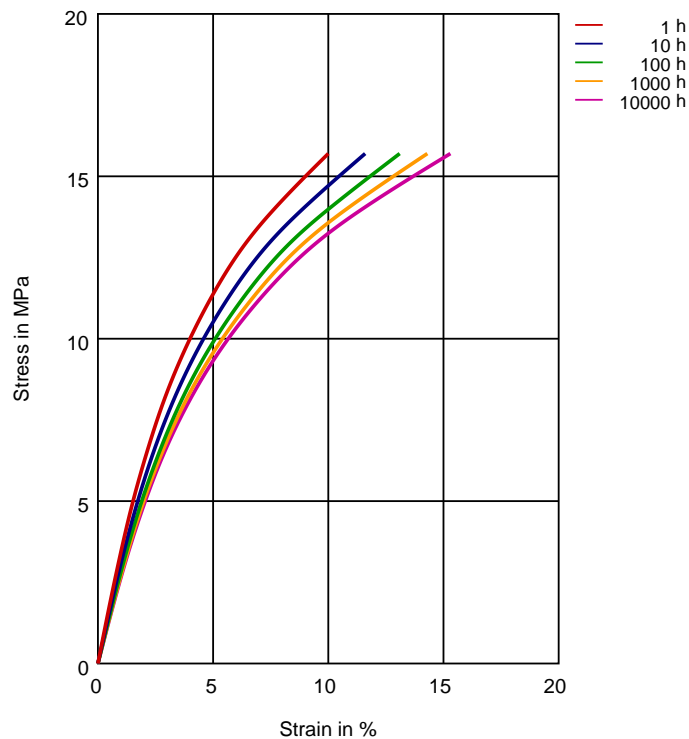


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Stress-strain (isochronous) 40 °C



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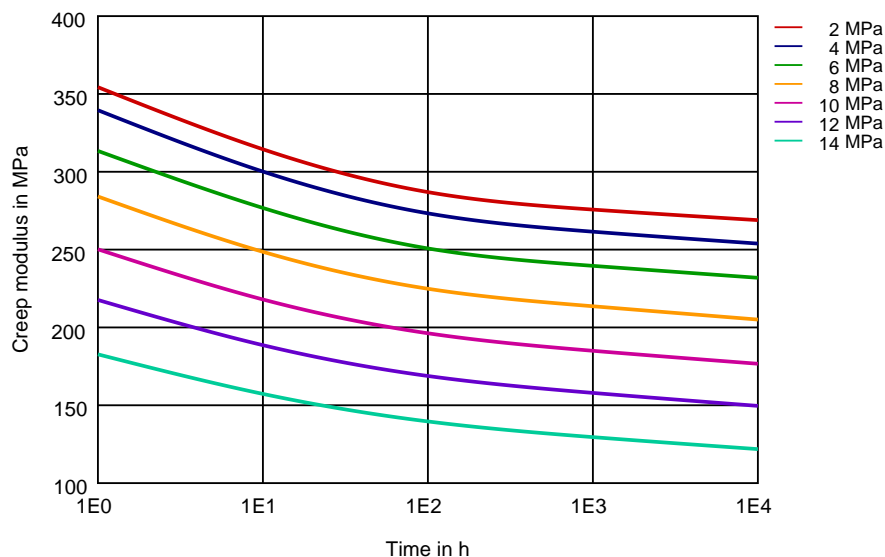
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Creep modulus-time 40 °C



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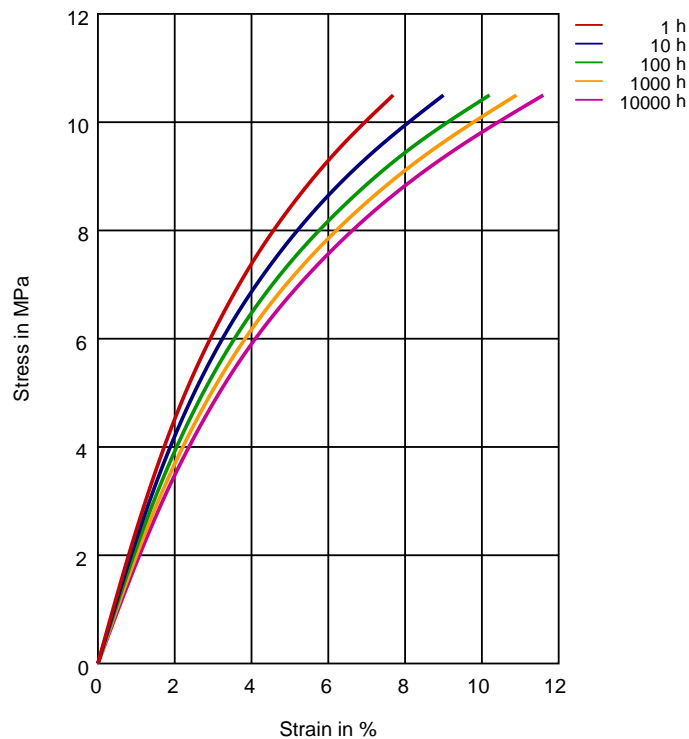
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THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 80°C



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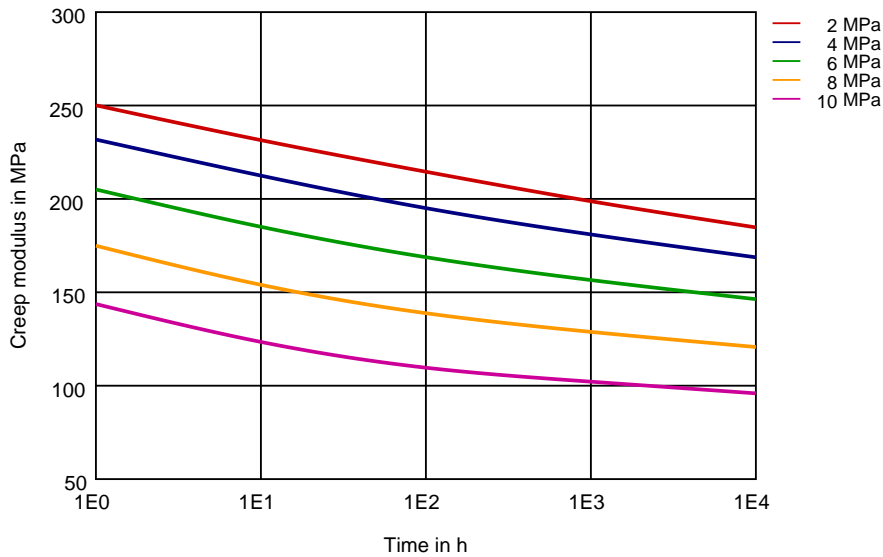
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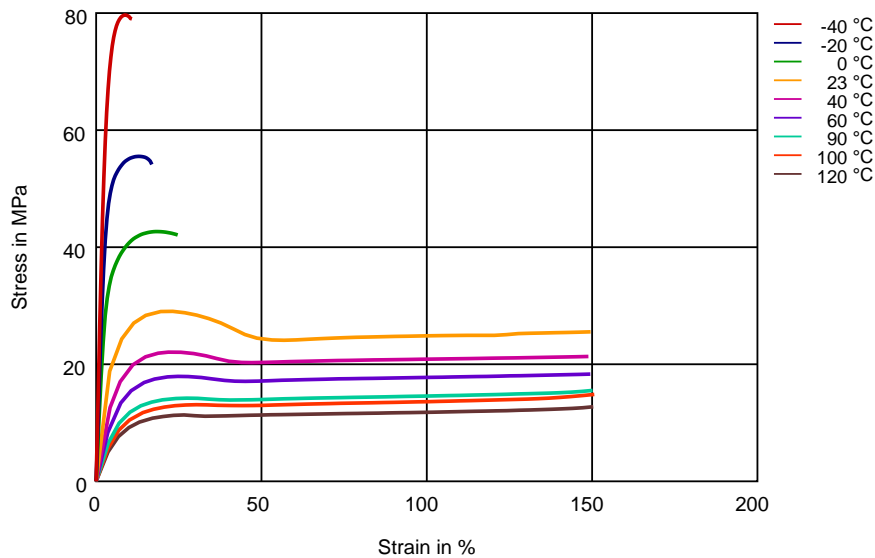
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Creep modulus-time 80 °C



Stress-Strain (TPE)



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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)

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- ✓ 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)
- ✓ 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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the human body. For other medical applications, discuss with your DuPont customer representative and read Medical Caution H-50103-5.

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