

# Hytrel® 5526

## 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® 5526 is a medium modulus Hytrel® grade with nominal durometer hardness of 55D. It contains non-discoloring stabilizer. It is specially recommended for injection molding applications requiring high flow properties.

Typical applications:

Seals, packing and gaskets; gears and bearings.

### Product information

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

### Rheological properties

|                                  |                             |                 |
|----------------------------------|-----------------------------|-----------------|
| Melt volume-flow rate            | 17.5 cm <sup>3</sup> /10min | ISO 1133        |
| Melt mass-flow rate              | 18 g/10min                  | ISO 1133        |
| Temperature                      | 220 °C                      | ISO 1133        |
| Load                             | 2.16 kg                     | ISO 1133        |
| Melt mass-flow rate, Temperature | 220 °C                      | ISO 1133        |
| Melt mass-flow rate, Load        | 2.16 kg                     | ISO 1133        |
| Moulding shrinkage, parallel     | 1.4 %                       | ISO 294-4, 2577 |
| Moulding shrinkage, normal       | 1.4 %                       | ISO 294-4, 2577 |

# Hytrel® 5526

## THERMOPLASTIC POLYESTER ELASTOMER

### Typical mechanical properties

|                                       |                                      |                    |
|---------------------------------------|--------------------------------------|--------------------|
| Tensile Modulus                       | 190 MPa                              | ISO 527-1/-2       |
| Yield stress                          | 15 MPa                               | ISO 527-1/-2       |
| Yield strain                          | 35 %                                 | ISO 527-1/-2       |
| Stress at 5% strain                   | 6.9 MPa                              | ISO 527-1/-2       |
| Stress at 10% strain                  | 11 MPa                               | ISO 527-1/-2       |
| Stress at 50% strain                  | 14 MPa                               | ISO 527-1/-2       |
| Stress at break                       | 40 MPa                               | ISO 527-1/-2       |
| Nominal strain at break               | 780 %                                | 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             | 170 MPa                              | ISO 899-1          |
| Tensile creep modulus, 1000h          | 130 MPa                              | ISO 899-1          |
| Charpy impact strength, 23°C          | N kJ/m <sup>2</sup>                  | ISO 179/1eU        |
| Charpy impact strength, -30°C         | N kJ/m <sup>2</sup>                  | ISO 179/1eU        |
| Charpy notched impact strength, 23°C  | N kJ/m <sup>2</sup>                  | ISO 179/1eA        |
| Charpy notched impact strength, -30°C | 150 <sup>[P]</sup> kJ/m <sup>2</sup> | ISO 179/1eA        |
| Charpy notched impact strength, -40°C | 30 kJ/m <sup>2</sup>                 | ISO 179/1eA        |
| Tensile notched impact strength, 23°C | 270 kJ/m <sup>2</sup>                | ISO 8256/1         |
| Izod notched impact strength, -40°C   | 115 kJ/m <sup>2</sup>                | ISO 180/1A         |
| Poisson's ratio                       | 0.48                                 |                    |
| Brittleness temperature               | -98 °C                               | ISO 974            |
| Shore D hardness, 15s                 | 51                                   | ISO 48-4 / ISO 868 |
| Shore D hardness, max                 | 55                                   | ISO 868            |
| Tear strength, parallel               | 133 kN/m                             | ISO 34-1           |
| Tear strength, normal                 | 133 kN/m                             | ISO 34-1           |
| Abrasion resistance                   | 120 mm <sup>3</sup>                  | ISO 4649           |

[P]: Partial Break

### Thermal properties

|   |                        |                |
|---|------------------------|----------------|
| Melting temperature, 10°C/min                         | 203 °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               | 45 °C                  | ISO 75-1/-2    |
| Temp. of deflection under load, 0.45 MPa              | 65 °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, -40-23°C | 180 E-6/K              | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel           | 200 E-6/K              | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, -40-23°C   | 170 E-6/K              | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal             | 200 E-6/K              | ISO 11359-1/-2 |
| Thermal conductivity of melt                          | 0.19 W/(m K)           | ISO 22007-2    |
| Eff. thermal diffusivity                              | 9E-8 m <sup>2</sup> /s |                |
| Spec. heat capacity of melt                           | 2110 J/(kg K)          |                |

# Hytrel® 5526

## THERMOPLASTIC POLYESTER ELASTOMER

|                        |       |         |
|------------------------|-------|---------|
| RTI, electrical, 1.5mm | 85 °C | UL 746B |
| RTI, electrical, 3mm   | 85 °C | UL 746B |
| RTI, impact, 1.5mm     | 85 °C | UL 746B |
| RTI, impact, 3mm       | 85 °C | UL 746B |
| RTI, strength, 1.5mm   | 75 °C | UL 746B |
| RTI, strength, 3mm     | 80 °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                |
| 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                         | 21 %      | ISO 4589-1/-2        |
| FMVSS Class                          | SE/B      | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm         | 28 mm/min | ISO 3795 (FMVSS 302) |

### Electrical properties

|                              |            |               |
|------------------------------|------------|---------------|
| Relative permittivity, 100Hz | 4.9        | IEC 62631-2-1 |
| Relative permittivity, 1MHz  | 4.6        | IEC 62631-2-1 |
| Dissipation factor, 100Hz    | 90 E-4     | IEC 62631-2-1 |
| Dissipation factor, 1MHz     | 375 E-4    | IEC 62631-2-1 |
| Volume resistivity           | 4E11 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 | 0.6 %      | Sim. to ISO 62 |
| Density                         | 1190 kg/m³ | ISO 1183       |
| Density of melt                 | 1040 kg/m³ |                |

### VDA Properties

|                               |         |          |
|-------------------------------|---------|----------|
| Odour                         | 5 class | VDA 270  |
| Fogging, G-value (condensate) | 0.1 mg  | ISO 6452 |

# Hytrel® 5526

## THERMOPLASTIC POLYESTER ELASTOMER

### 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  |
| 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   |

### Additional information

Injection molding

#### PREPROCESSING

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

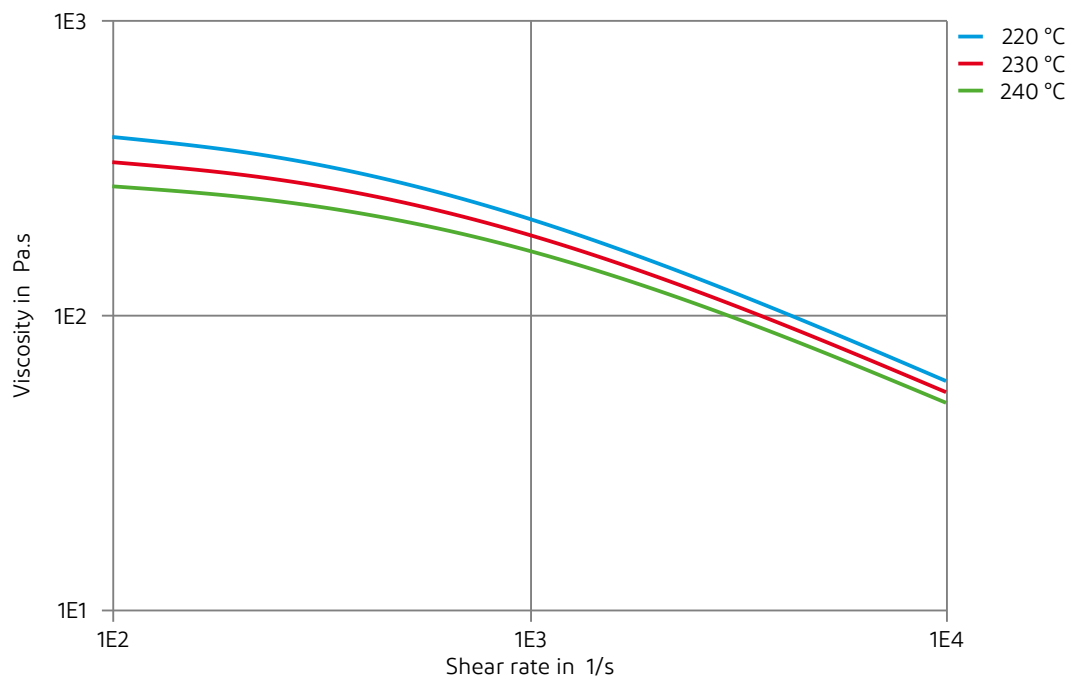
#### PROCESSING

Melt temperature optimum = 230°C  
Melt temperature range = 220-250°C  
Mold temperature optimum = 45°C  
Mold temperature range = 45-55°C

# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

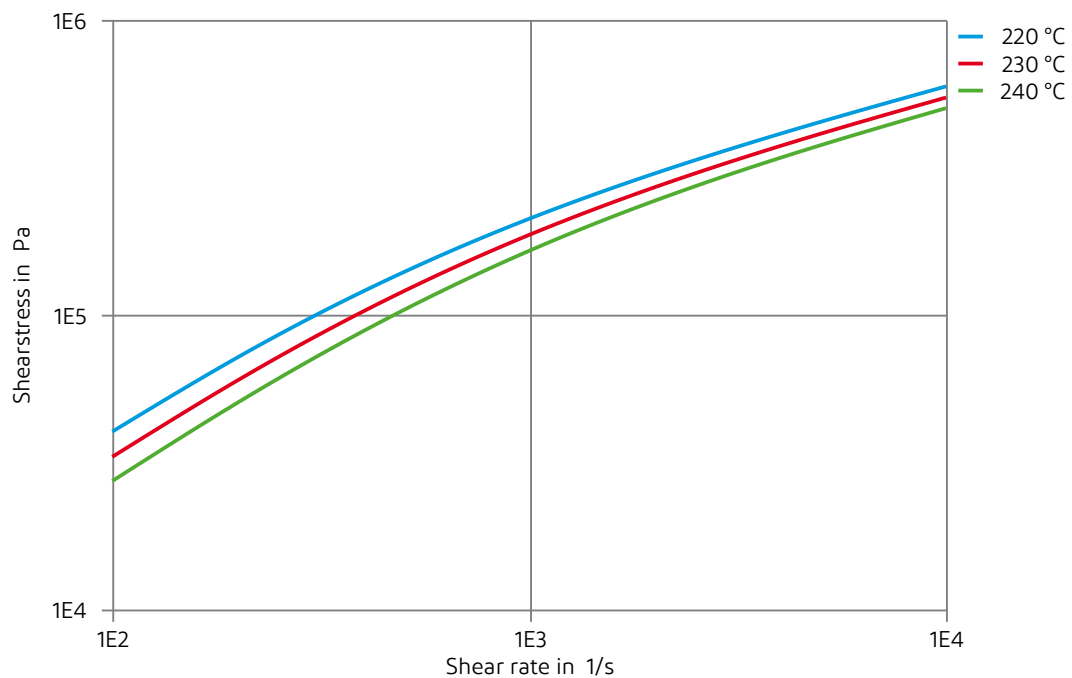
Viscosity-shear rate



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

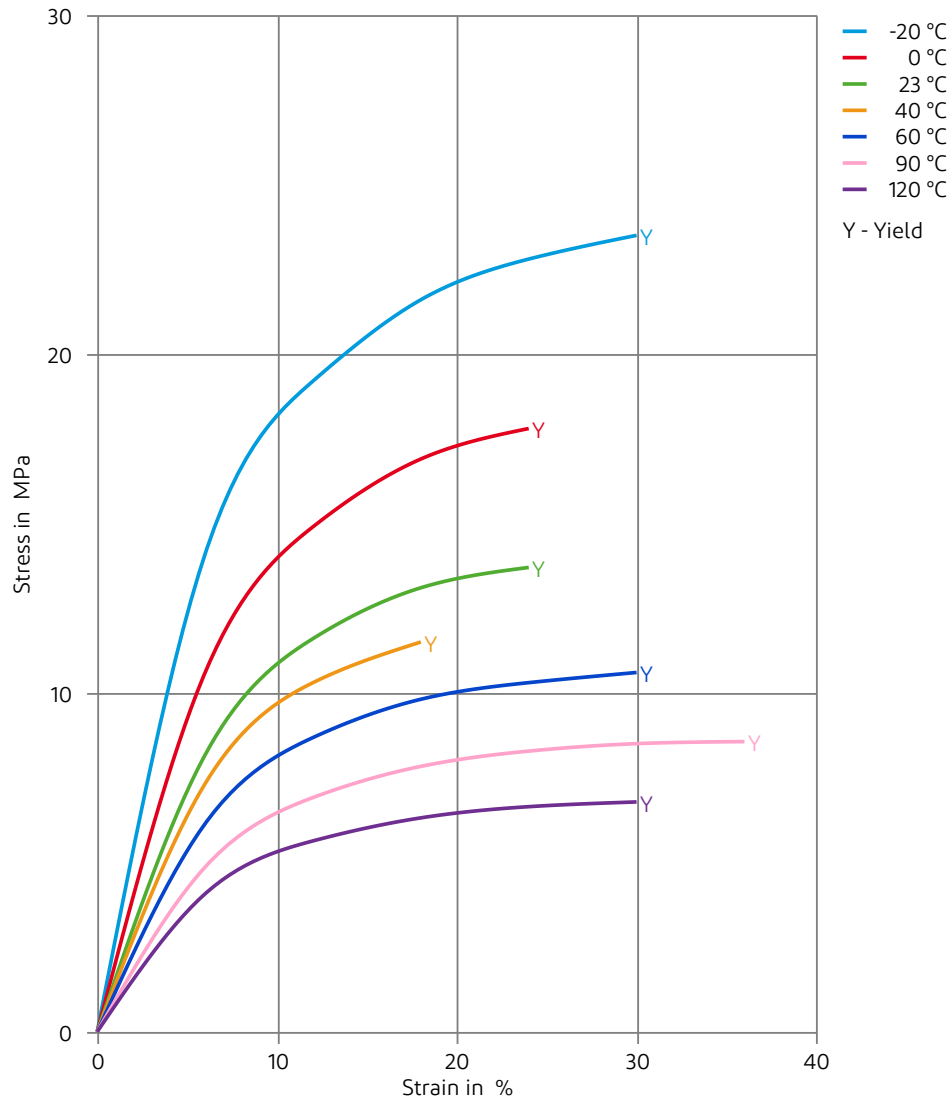
Shearstress-shear rate



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

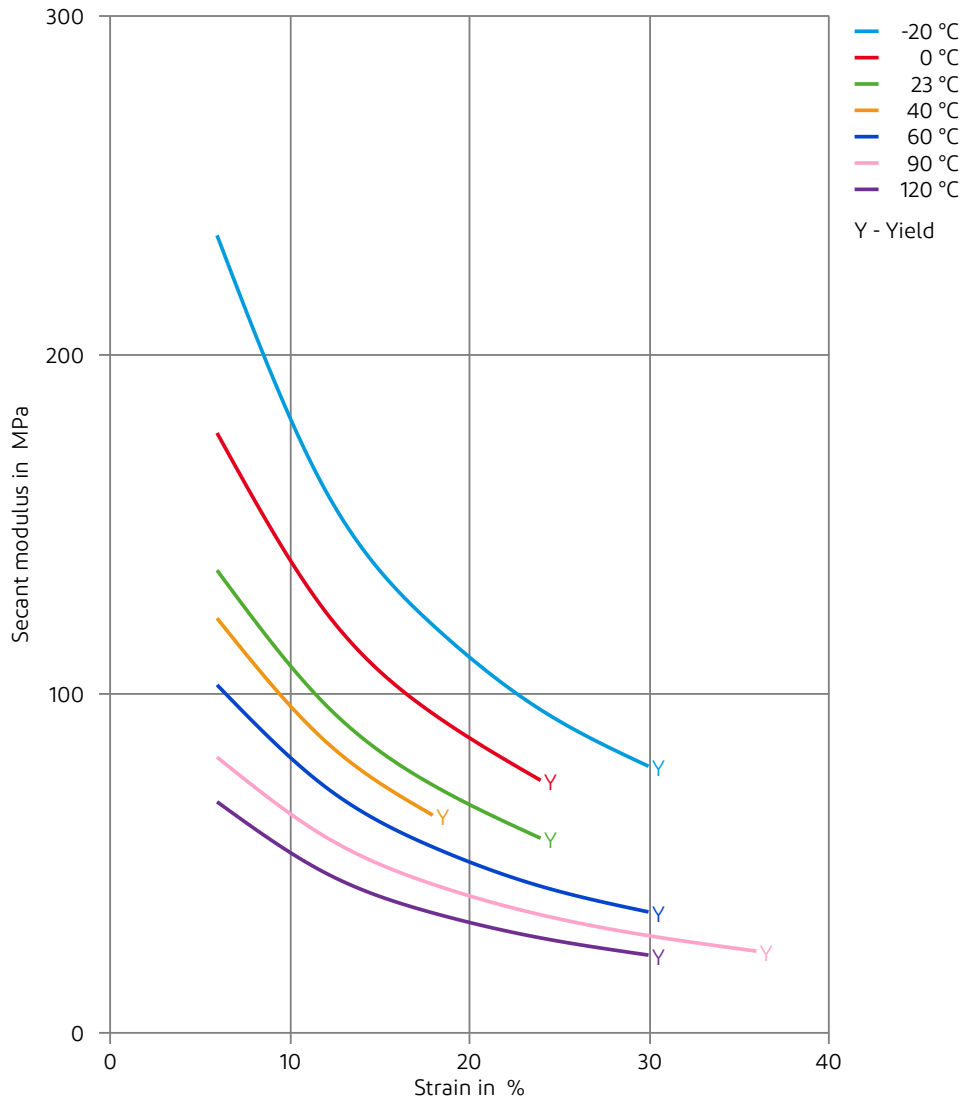
## Stress-strain



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

## Secant modulus-strain

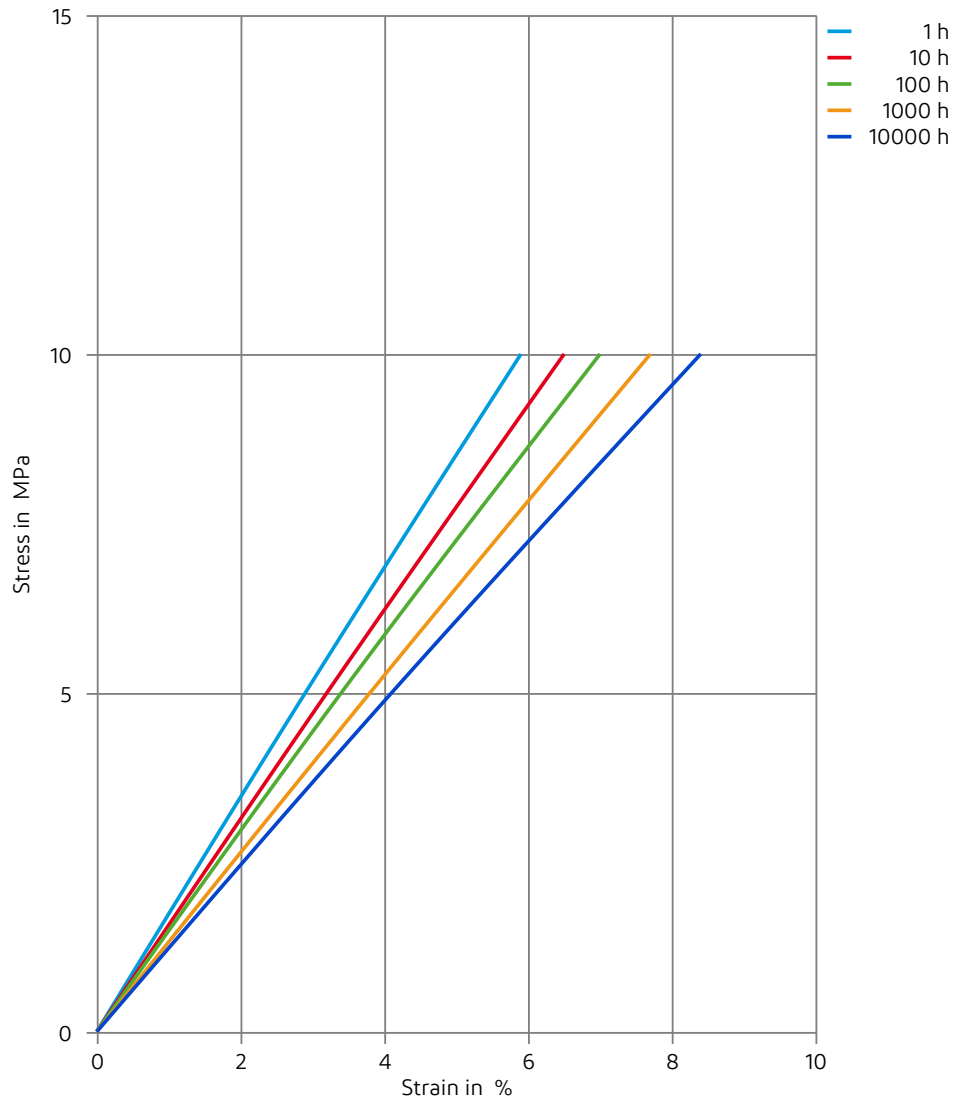




# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

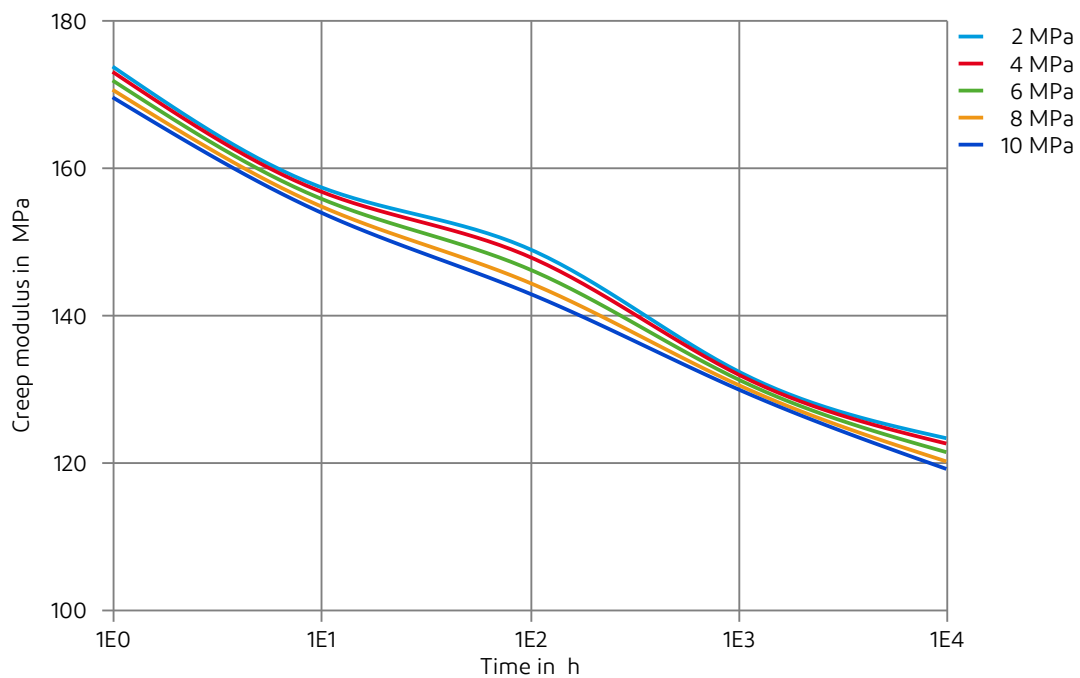
Stress-strain (isochronous) 23°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

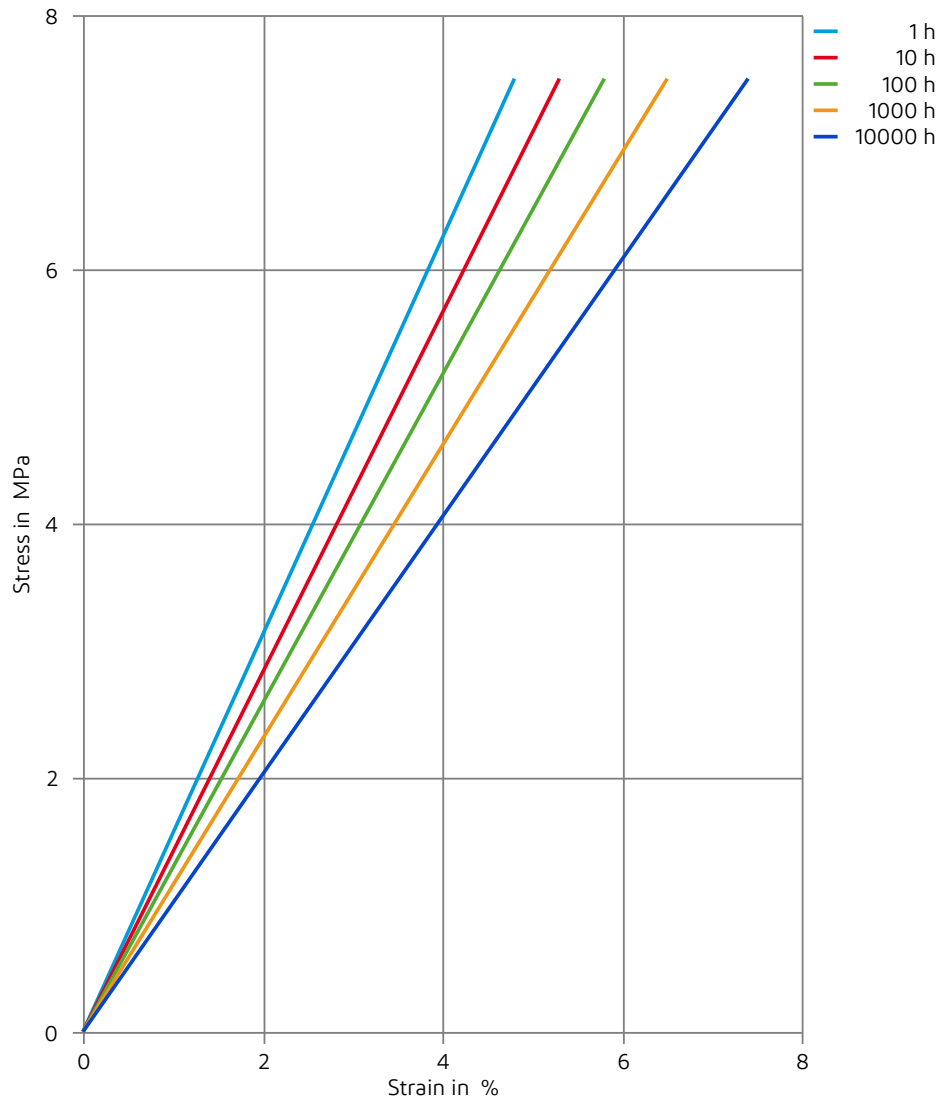
Creep modulus-time 23°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

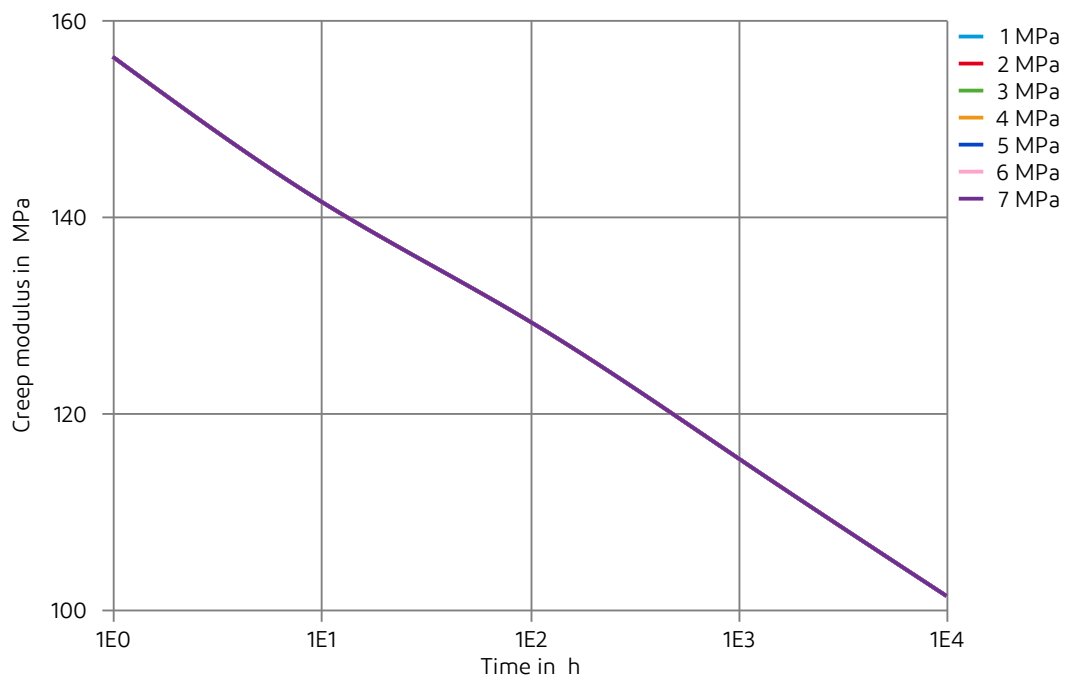
Stress-strain (isochronous) 40°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

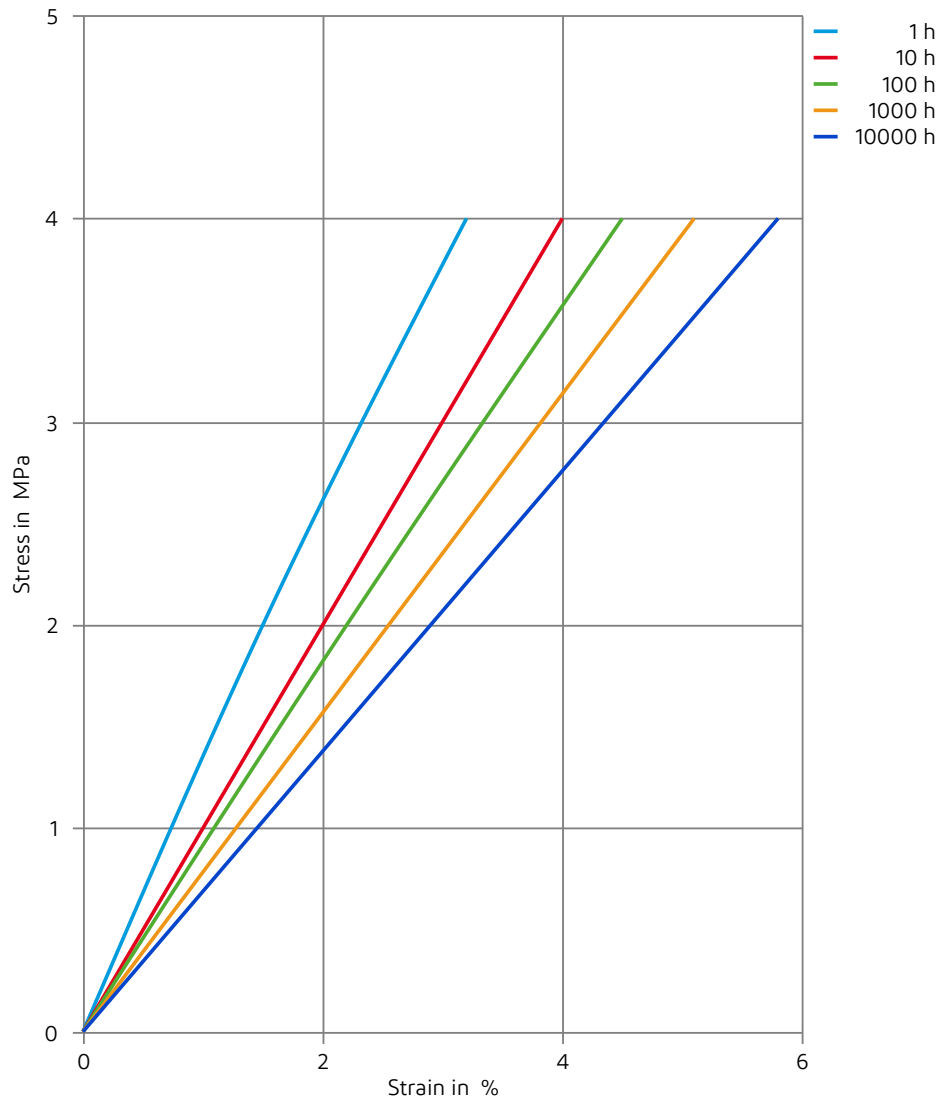
Creep modulus-time 40°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

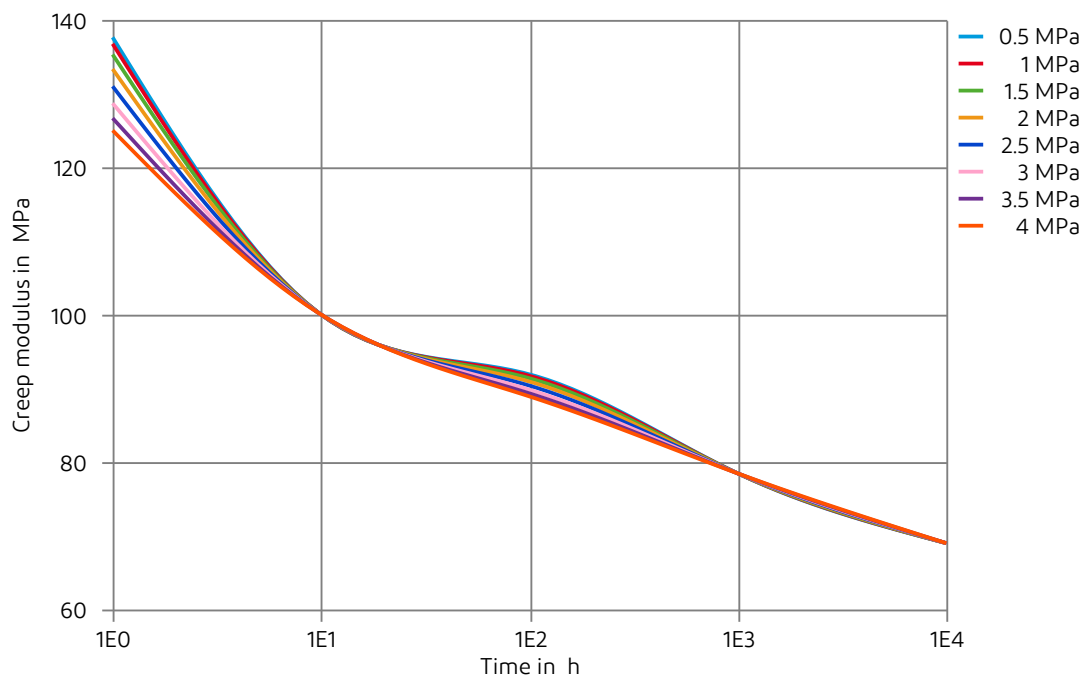
Stress-strain (isochronous) 90°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

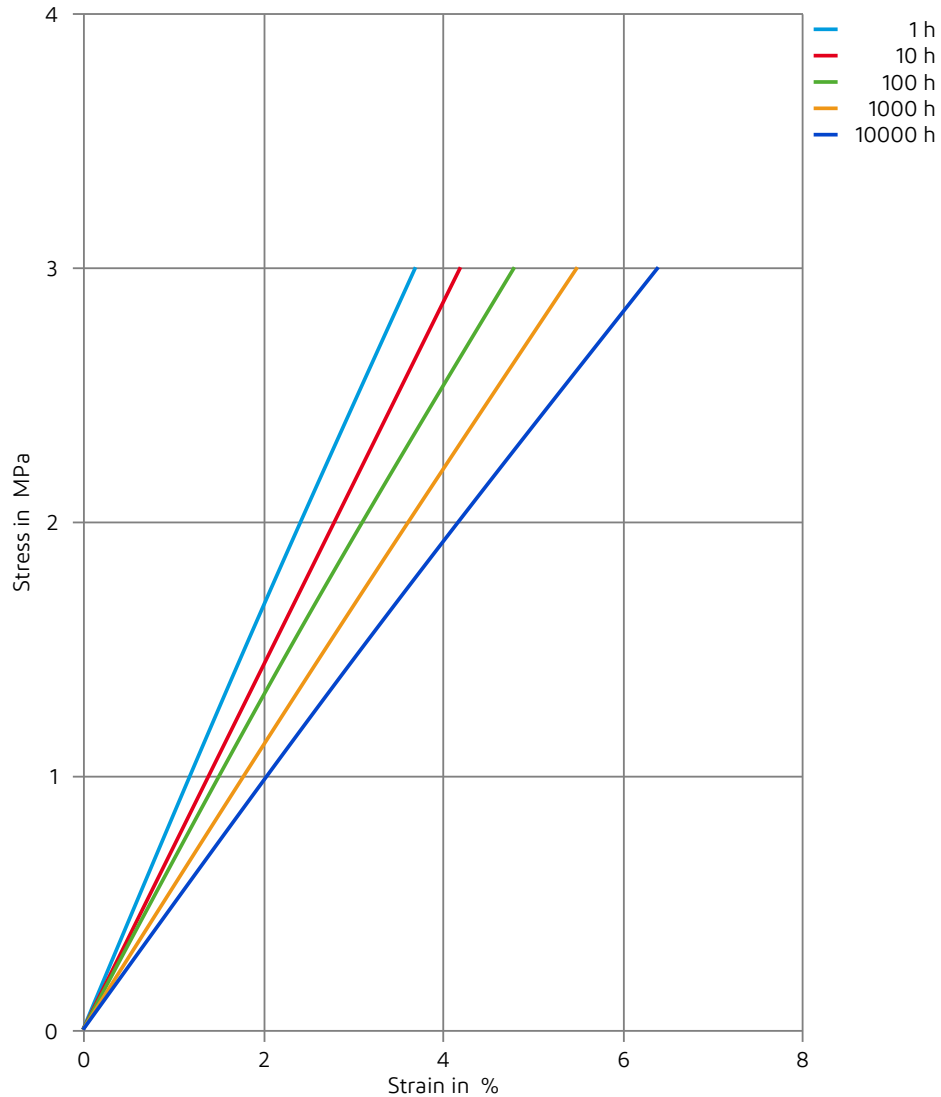
Creep modulus-time 90°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

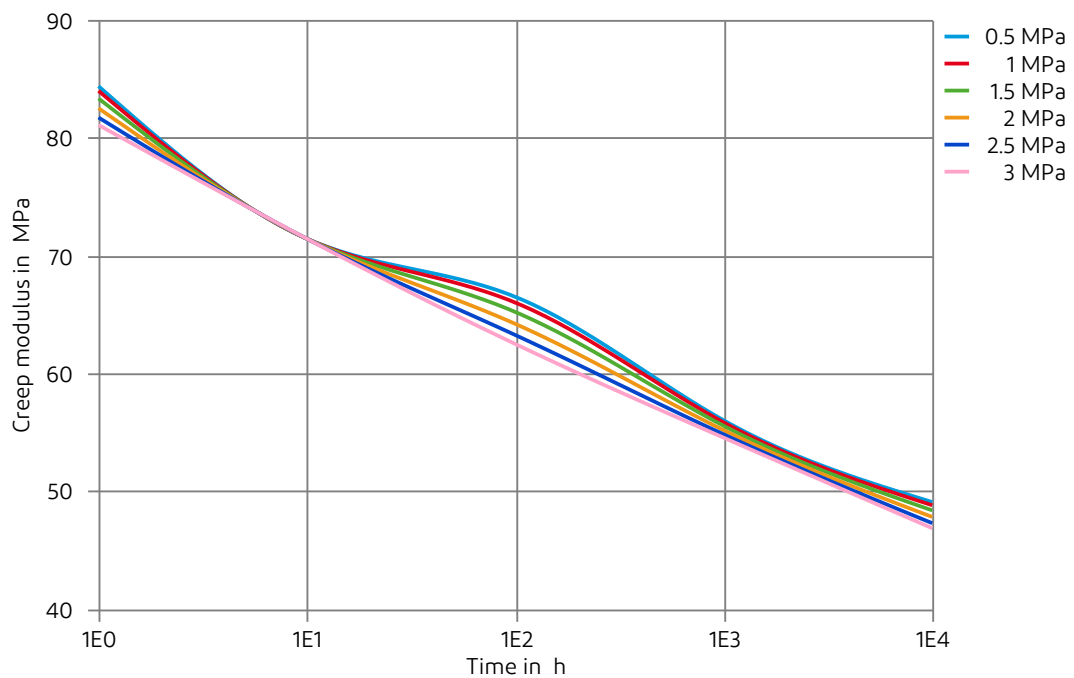
Stress-strain (isochronous) 110°C



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 110°C

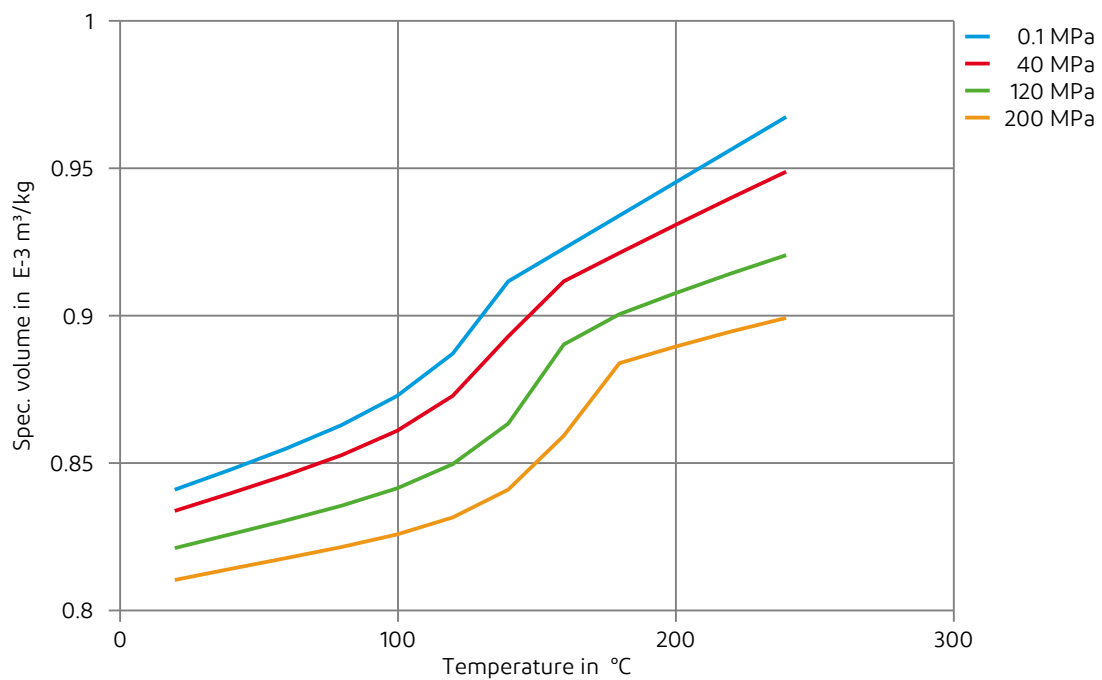




# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

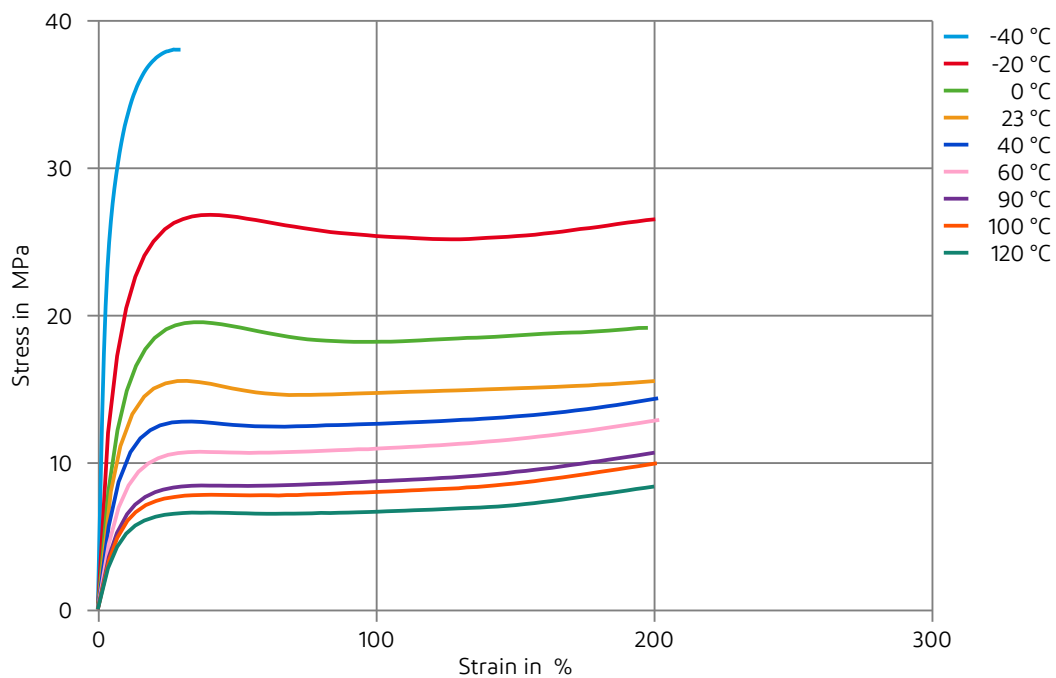
Specific volume-temperature (pvT)



# Hytrel® 5526

THERMOPLASTIC POLYESTER ELASTOMER

Stress-Strain (Flexible Materials)



# Hytrel® 5526

## 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
- ✗ 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

# Hytrel® 5526

## THERMOPLASTIC POLYESTER ELASTOMER

- ✓ 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).

## Mobility & Materials

The information set forth herein is furnished free of charge, is based on technical data that Celanese believes to be reliable, and represents typical values that fall within the normal range of properties. This information relates only to the specific material designated and may not be valid for such material used in combination with other materials or in other processes. It is intended for use by persons having technical skill, at their own discretion and risk. This information should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards and comply with applicable law. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents.

CAUTION: Do not use Celanese materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from Celanese under a written contract or other acknowledgement that is consistent with the Celanese policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your Celanese representative.

Celanese's sole warranty is that our products will meet our standard sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, CELANESE SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR NON-INFRINGEMENT. CELANESE DISCLAIMS LIABILITY FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.