

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.

| 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 mass-flow rate | 0.9 | g/10min | ISO 1133 |
| Melt mass-flow rate, Temperature | 230 | °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 | 1.5 | % | ISO 294-4, 2577 |
| Mechanical properties (TPE) | Value | Unit | Test Standard |
| Stress at 10% strain | 7 | MPa | ISO 527-1/-2 |
| Stress at 50% strain | 12 | MPa | ISO 527-1/-2 |
| Stress at 100% strain | 13 | MPa | ISO 527-1/-2 |
| Stress at 300% strain | 23 | MPa | ISO 527-1/-2 |
| Stress at break | 28 | MPa | ISO 527-1/-2 |
| Strain at break | >300 | % | ISO 527-1/-2 |
| Nominal strain at break | 350 | % | ISO 527-1/-2 |
| Tear strength, parallel | 110 | kN/m | ISO 34-1 |
| Tear strength, normal | 115 | kN/m | ISO 34-1 |
| Shore D hardness, max | 40 | - | ISO 7619-1 |
| Shore D hardness, 15s | 37 | - | ISO 7619-1 |
| Mechanical properties | Value | Unit | Test Standard |
| Tensile Modulus | 80 | MPa | ISO 527-1/-2 |
| Flexural Modulus | 80 | MPa | ISO 178 |
| Charpy impact strength | | | ISO 179/1eU |
| 73 °F | N | kJ/m ² | |
| -22 °F | N | kJ/m ² | |
| Charpy notched impact strength | | | ISO 179/1eA |
| 73 °F | N | kJ/m ² | |
| -40 °F | N ^[1] | kJ/m ² | |
| Tensile notched impact strength, 73 °F | 300 | kJ/m ² | ISO 8256/1 |
| Brittleness temperature | -100 | °C | ISO 974 |
| Izod notched impact strength, 73 °F | N | kJ/m ² | ISO 180/1A |

1: partial break might occur

| Thermal properties | Value | Unit | Test Standard |
|---|--------------------|-------------------|----------------|
| Melting temperature, 18°F/min | 207 | °C | ISO 11357-1/-3 |
| Glass transition temperature, 18°F/min | -40 ^[2] | °C | ISO 11357-1/-2 |
| Freezing temperature, 18°F/min | 167 | °C | ISO 11357-1/-2 |
| Temp. of deflection under load | | | ISO 75-1/-2 |
| 260 psi | 42 | °C | |
| 65 psi | 56 | °C | |
| Vicat softening temperature, 90°F, 2 lbf | 158 | °C | ISO 306 |
| Coeff. of linear therm. expansion, parallel | 170 | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion | | | ISO 11359-1/-2 |
| normal | 200 | E-6/K | |
| Normal, -40-23°C | 240 | E-6/K | |
| Parallel, -40-23°C | 230 | E-6/K | |
| Eff. thermal diffusivity | 5.44E-8 | m ² /s | - |

2: DSC method

| Flammability | Value | Unit | Test Standard |
|------------------------------|-------|--------|----------------------|
| FMVSS Class | B | - | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm | <100 | mm/min | ISO 3795 (FMVSS 302) |

| Electrical properties | Value | Unit | Test Standard |
|----------------------------|-------|-------|---------------|
| Dissipation factor | | | IEC 62631-2-1 |
| 100Hz | 300 | E-4 | |
| 1MHz | 95 | E-4 | |
| Volume resistivity | 8E10 | Ohm*m | IEC 62631-3-1 |
| Surface resistivity | 4E14 | Ohm | IEC 62631-3-2 |
| Electric strength | 19 | 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 | 0.5 | % | Sim. to ISO 62 |
| Density | 1140 | kg/m ³ | ISO 1183 |

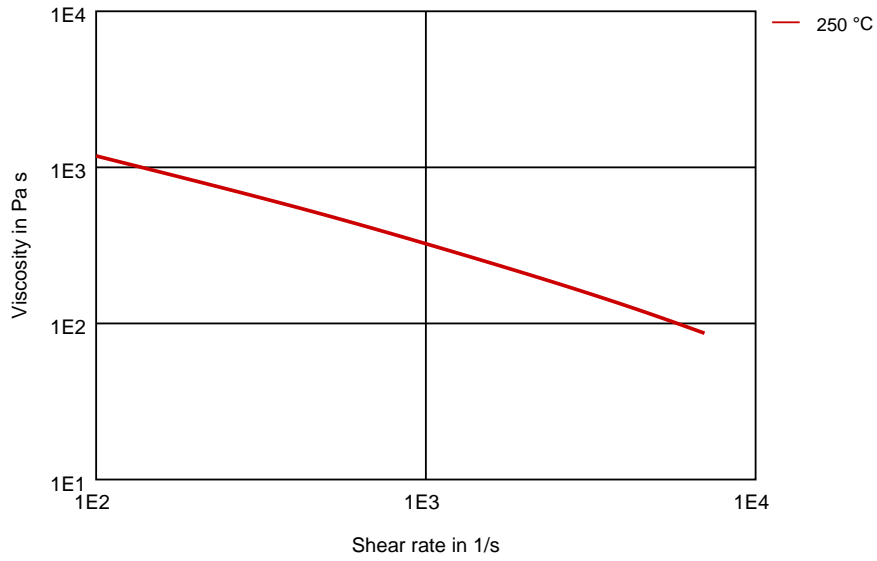
| Injection | Value | Unit | Test Standard |
|---------------------------------|-------|------|---------------|
| Drying Recommended | yes | - | - |
| Drying Temperature | ≥100 | °C | - |
| Drying Time, Dehumidified Dryer | 3 - 4 | h | - |
| Processing Moisture Content | ≤0.08 | % | - |
| Melt Temperature Optimum | 240 | °C | - |
| Min. melt temperature | 230 | °C | - |
| Max. melt temperature | 250 | °C | - |
| Mold Temperature Optimum | 45 | °C | - |
| Min. mold temperature | 40 | °C | - |
| Max. mold temperature | 50 | °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 • Coating | <ul style="list-style-type: none"> • Blow Molding • Casting • Thermoforming |
| Delivery form | <ul style="list-style-type: none"> • Pellets | | |
| Special characteristics | <ul style="list-style-type: none"> • Light stabilized or stable to light | <ul style="list-style-type: none"> • Heat stabilized or stable to heat | |
| 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 |

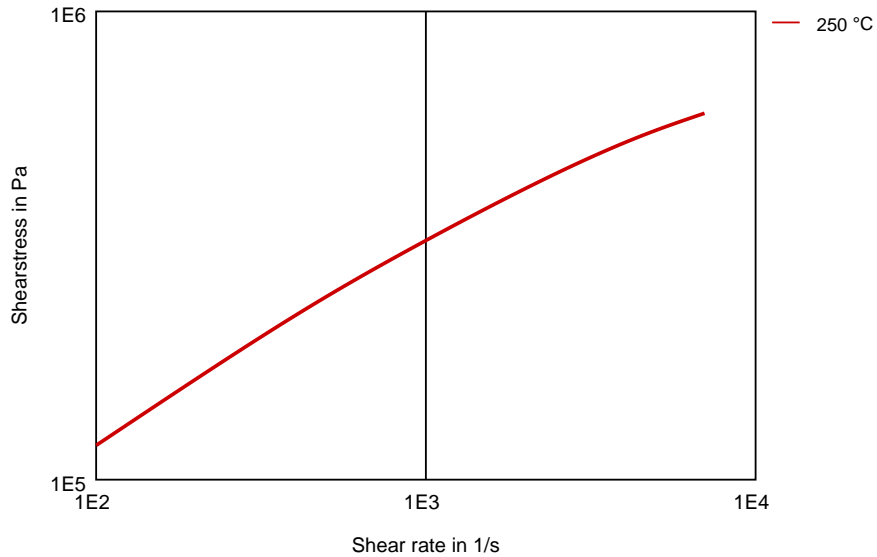


Diagrams

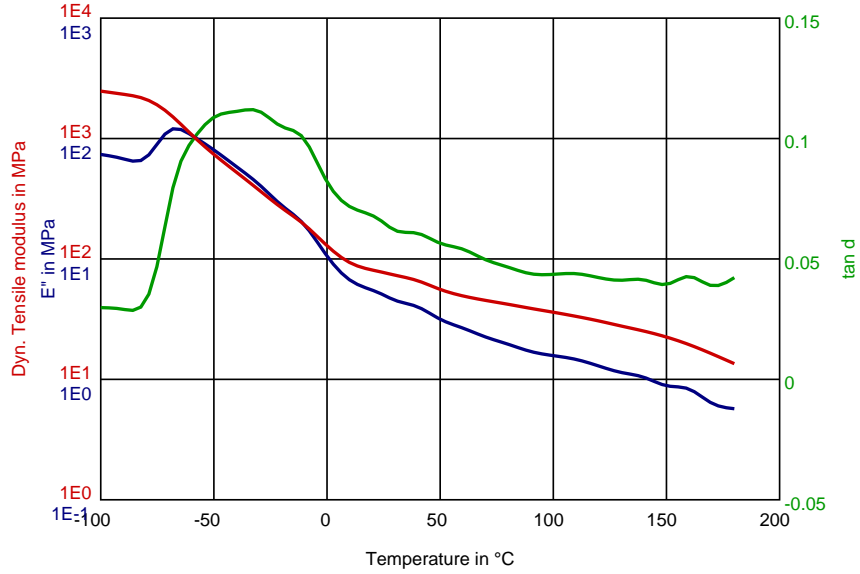
Viscosity-shear rate



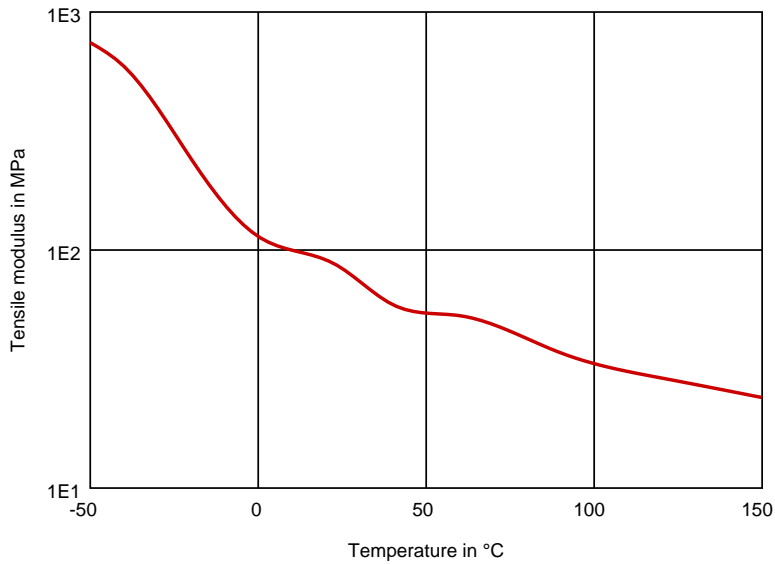
Shearstress-shear rate

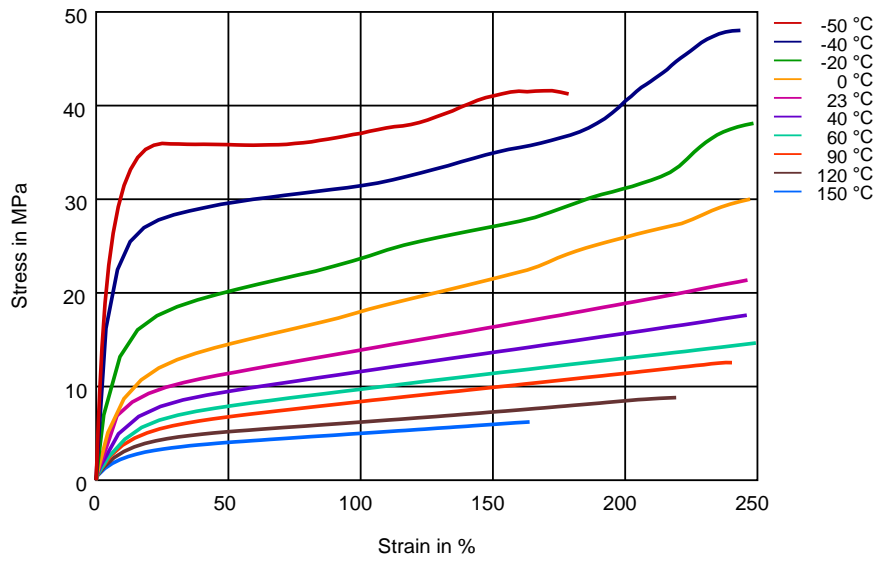


Dynamic Tensile modulus-temperature



Tensile modulus-temperature





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)
- ✓ 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)

✓ 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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