

Hytrel® HTR8441 BK316

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® HTR8441 is a 55 nom. Shore D thermoplastic polyester elastomer for blow molding and extrusion. It provides good mechanical properties at high temperature.

Product information

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

Rheological properties

Melt volume-flow rate	9 cm ³ /10min	ISO 1133
Melt mass-flow rate	9 g/10min	ISO 1133
Temperature	240 °C	
Load	10 kg	
Melt mass-flow rate, Temperature	240 °C	
Melt mass-flow rate, Load	10 kg	
Moulding shrinkage, parallel	2.2 %	ISO 294-4, 2577
Moulding shrinkage, normal	2.1 %	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	190 MPa	ISO 527-1/-2
Stress at 5% strain	8 MPa	ISO 527-1/-2
Stress at 10% strain	13 MPa	ISO 527-1/-2
Stress at 50% strain	19 MPa	ISO 527-1/-2
Stress at break	38 MPa	ISO 527-1/-2
Nominal strain at break	450 %	ISO 527-1/-2
Strain at break	>300 %	ISO 527-1/-2
Flexural Modulus	190 MPa	ISO 178



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Charpy impact strength, 23°C	N kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	N kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	39 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -40°C	19 kJ/m ²	ISO 179/1eA
Tensile notched impact strength, 23°C	330 kJ/m ²	ISO 8256/1
Izod notched impact strength, -40°C	20 kJ/m ²	ISO 180/1A
Poisson's ratio	0.48	
Brittleness temperature	-54 °C	ISO 974
Shore D hardness, 15s	52	ISO 48-4 / ISO 868
Shore D hardness, max	56	ISO 868
Tear strength, parallel	150 kN/m	ISO 34-1
Tear strength, normal	140 kN/m	ISO 34-1

Thermal properties

Melting temperature, 10°C/min	214 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-40 °C	ISO 11357-1/-3
Vicat softening temperature, 50°C/h 10N	180 °C	ISO 306
Thermal conductivity of melt	0.16 W/(m K)	Internal
Spec. heat capacity of melt	2150 J/(kg K)	Internal

Flammability

FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	42 mm/min	ISO 3795 (FMVSS 302)

Other properties

Density	1190 kg/m ³	ISO 1183
Density of melt	1010 kg/m ³	Internal

VDA Properties

Odour	3.5 ^[DS] class	VDA 270
[DS]: Derived from similar grade		

Injection

Drying Recommended	yes	
Drying Temperature	100 °C	
Drying Time, Dehumidified Dryer	2 - 4 h	
Processing Moisture Content	≤0.08 %	
Melt Temperature Optimum	245 °C	Internal
Min. melt temperature	240 °C	
Max. melt temperature	255 °C	
Mold Temperature Optimum	45 °C	
Min. mould temperature	40 °C	
Max. mould temperature	55 °C	



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Extrusion

Drying Temperature	110 °C
Drying Time, Dehumidified Dryer	2 - 3 h
Processing Moisture Content	≤0.06 %
Melt Temperature Range	225 - 240 °C

Blow Molding

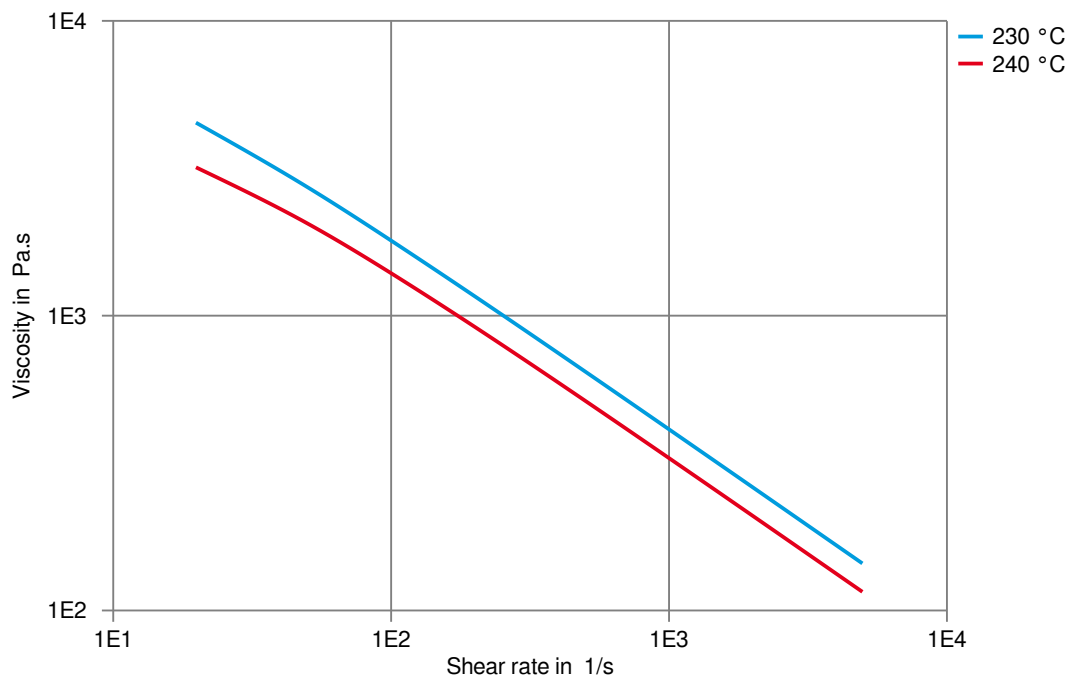
Drying Recommended	yes
Drying Temperature	90 - 100 °C
Drying Time, Dehumidified Dryer	4 - 6 h
Processing Moisture Content	≤0.03 %
Melt Temperature Optimum	240 °C
Melt Temperature Range	230 - 240 °C
Swell ratio	2.4
Mold Temperature Optimum	50 °C
Mold Temperature Range	30 - 70 °C



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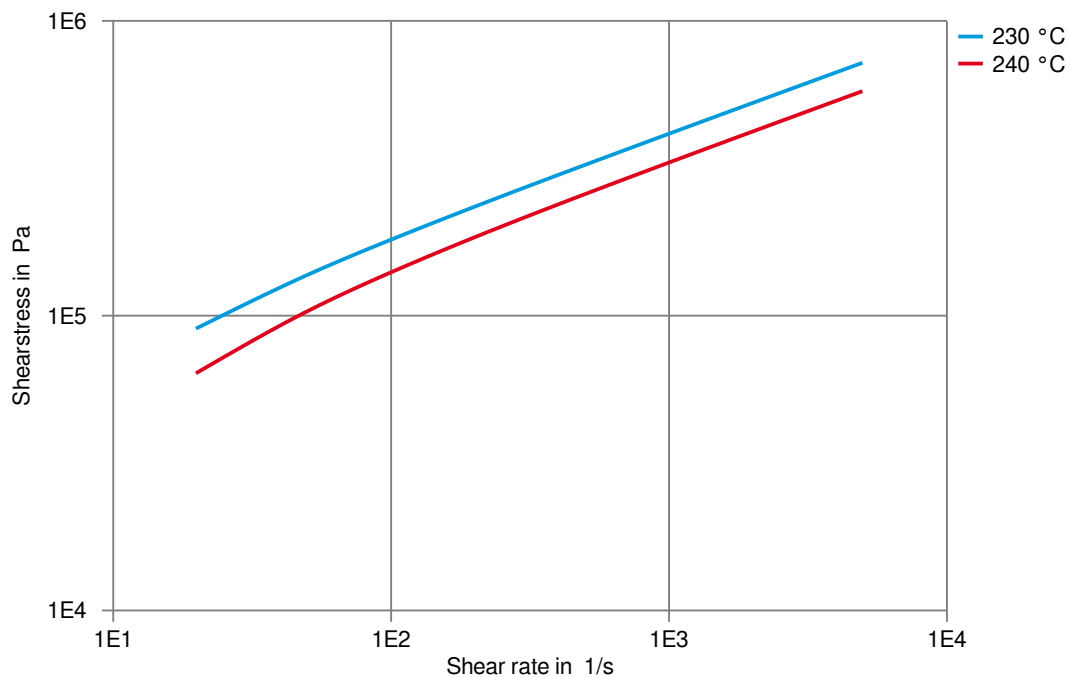
Viscosity-shear rate



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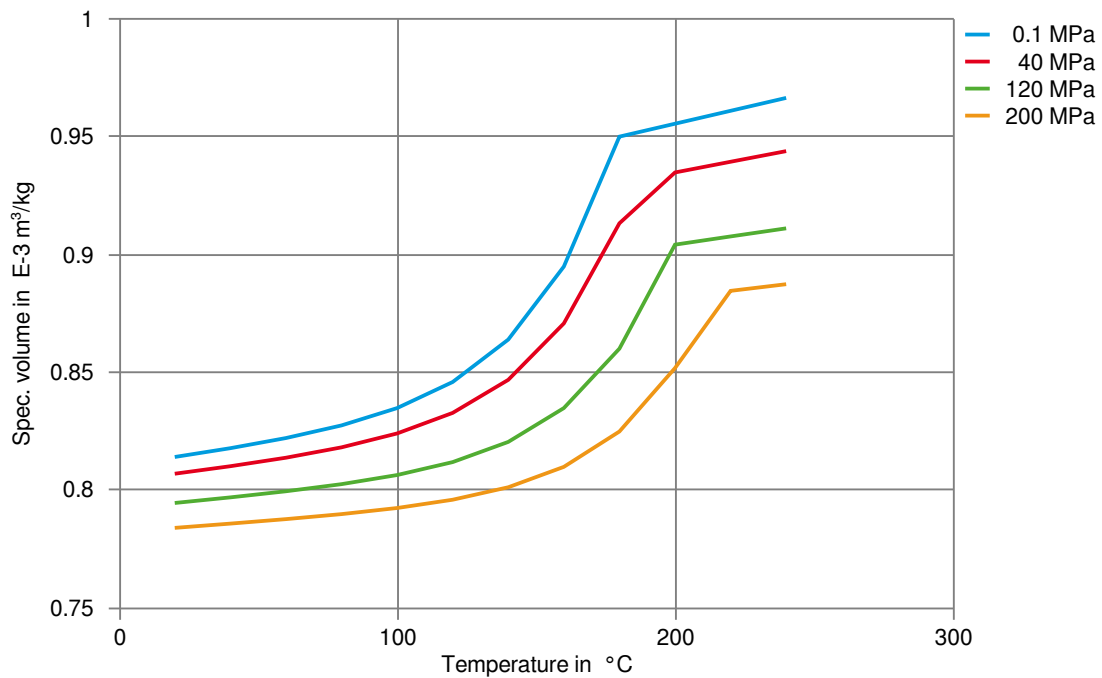
Shearstress-shear rate



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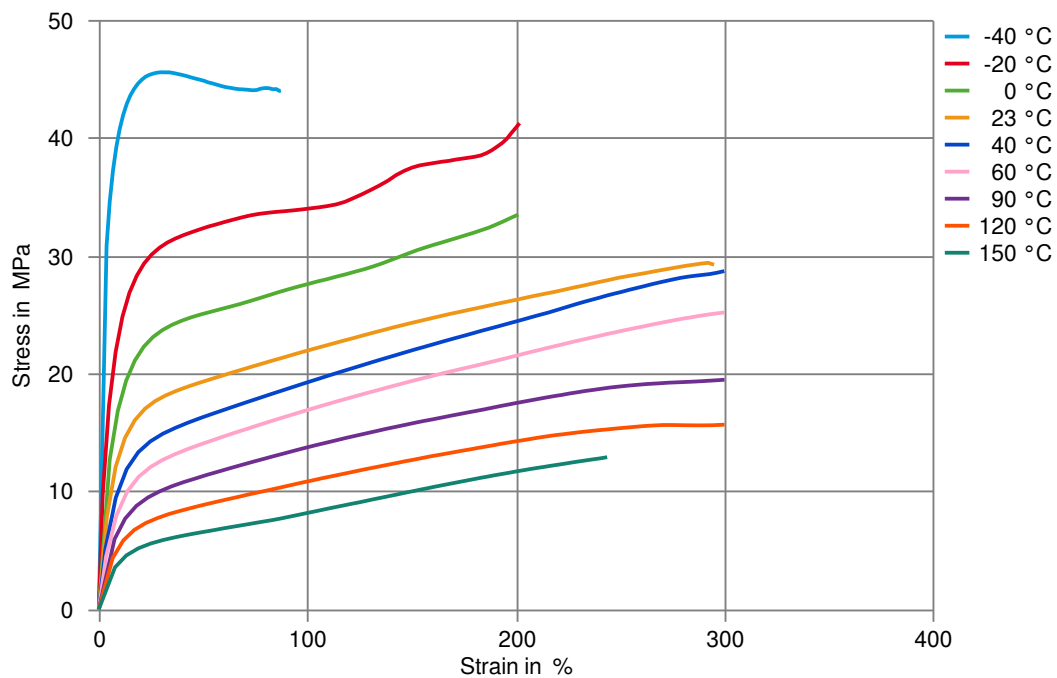
Specific volume-temperature (pvT)



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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
- ✓ 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).

