

Hytrel® HTR8223 BK320

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® HTR8223 BK320 is designed for blow moulding or processing techniques requiring high melt viscosity. It has nominal hardness of 42D.

Typical applications:

Constant velocity joint boots.

Product information

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

Rheological properties

Melt volume-flow rate	10 cm ³ /10min	ISO 1133
Melt mass-flow rate	13 g/10min	ISO 1133
Temperature	230 °C	
Load	10 kg	
Melt mass-flow rate, Temperature	230 °C	
Melt mass-flow rate, Load	10 kg	
Moulding shrinkage, parallel	1.6 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.6 %	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	75 MPa	ISO 527-1/-2
Stress at 5% strain	3.5 MPa	ISO 527-1/-2
Stress at 10% strain	5.5 MPa	ISO 527-1/-2
Stress at 50% strain	10 MPa	ISO 527-1/-2
Stress at 100% strain	13 MPa	ISO 527-1/-2
Stress at 300% strain	19 MPa	ISO 527-1/-2
Stress at break	26 MPa	ISO 527-1/-2
Nominal strain at break	680 %	ISO 527-1/-2



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

Strain at break	>300 %	ISO 527-1/-2
Flexural Modulus	79 MPa	ISO 178
Charpy impact strength, -40°C	N kJ/m ²	ISO 179/1eU
Charpy notched impact strength, -40°C	110 kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C	N kJ/m ²	ISO 180/1A
Izod notched impact strength, -45°C	N kJ/m ²	ISO 180/1A
Brittleness temperature	-100 °C	ISO 974
Shore D hardness, 15s	36	ISO 48-4 / ISO 868
Shore D hardness, max	42	ISO 868
Tear strength, parallel	120 kN/m	ISO 34-1
Tear strength, normal	130 kN/m	ISO 34-1
Abrasion resistance	22 mm ³	ISO 4649

Thermal properties

Melting temperature, 10°C/min	195 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-50 °C	ISO 11357-1/-3
Vicat softening temperature, 50°C/h 10N	150 °C	ISO 306
Coeff. of linear therm. expansion, parallel	170 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	170 E-6/K	ISO 11359-1/-2
Eff. thermal diffusivity	5.44E-8 m ² /s	Internal

Flammability

FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80 mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Dissipation factor, 100Hz	70 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	125 E-4	IEC 62631-2-1
Volume resistivity	9E10 Ohm.m	IEC 62631-3-1
Surface resistivity	2E14 Ohm	IEC 62631-3-2
Electric strength	18 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	0.8 %	Sim. to ISO 62
Water absorption, Immersion 24h	0.6 %	Sim. to ISO 62
Density	1130 kg/m ³	ISO 1183
Density of melt	980 kg/m ³	Internal



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

Injection

Drying Recommended	yes	
Drying Temperature	110 °C	
Drying Time, Dehumidified Dryer	3 - 4 h	
Processing Moisture Content	≤0.08 %	
Melt Temperature Optimum	230 °C	Internal
Min. melt temperature	220 °C	
Max. melt temperature	240 °C	
Mold Temperature Optimum	45 °C	
Min. mould temperature	40 °C	
Max. mould temperature	50 °C	

Extrusion

Processing Moisture Content	≤0.06 %
Melt Temperature Optimum	230 °C

Blow Molding

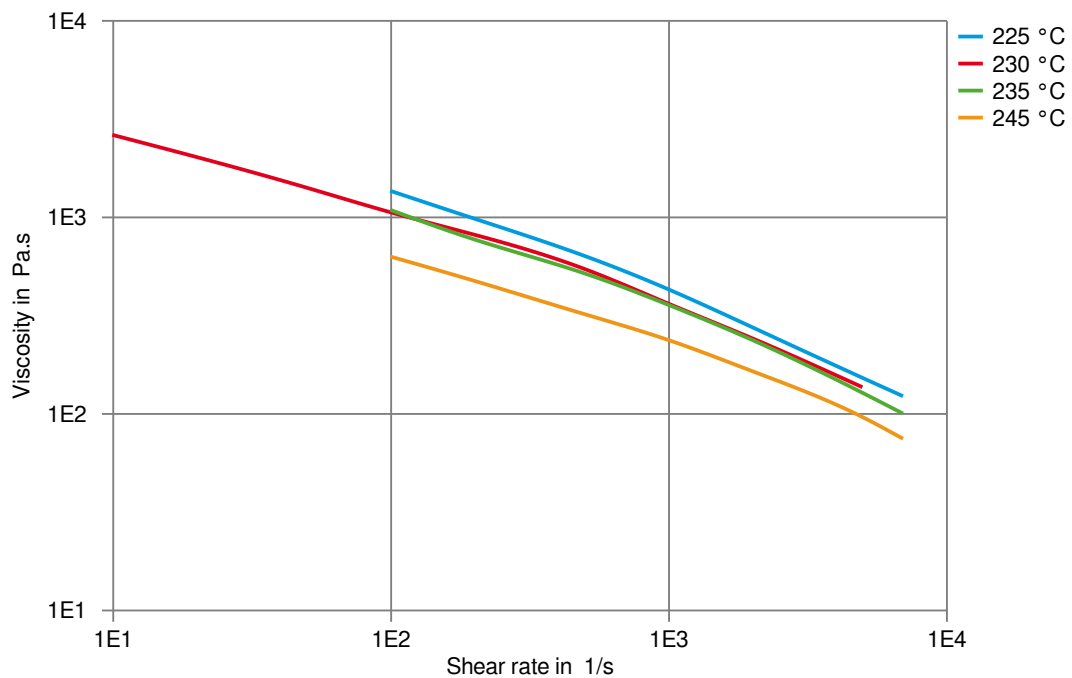
Drying Temperature	≤100 °C
Processing Moisture Content	≤0.02 %
Melt Temperature Optimum	235 °C



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

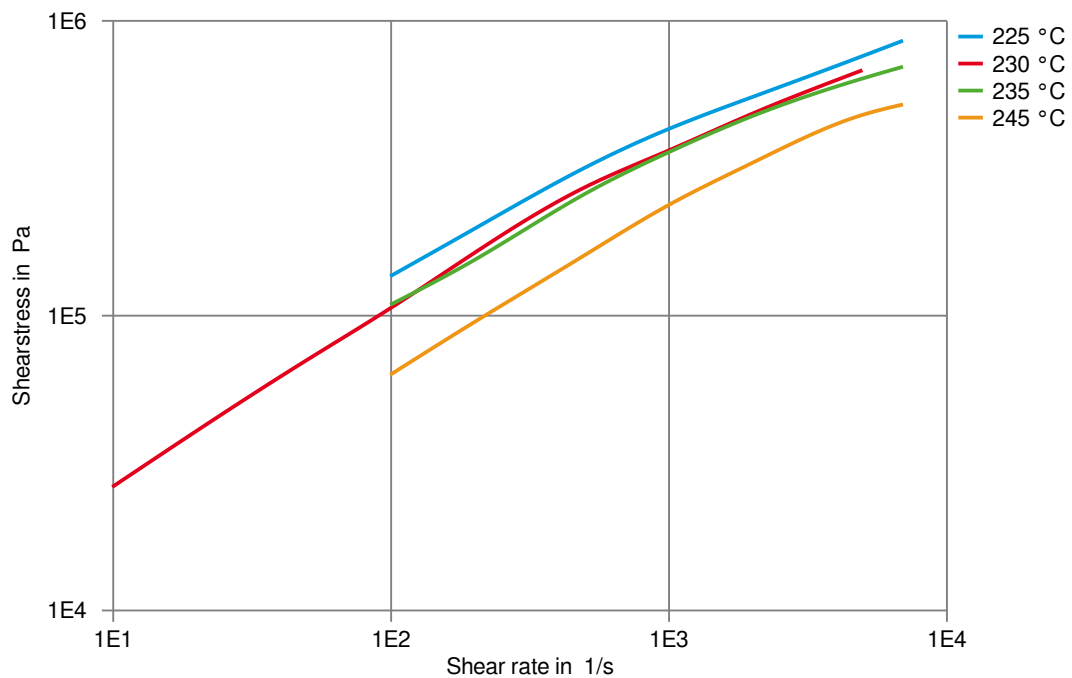
Viscosity-shear rate



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

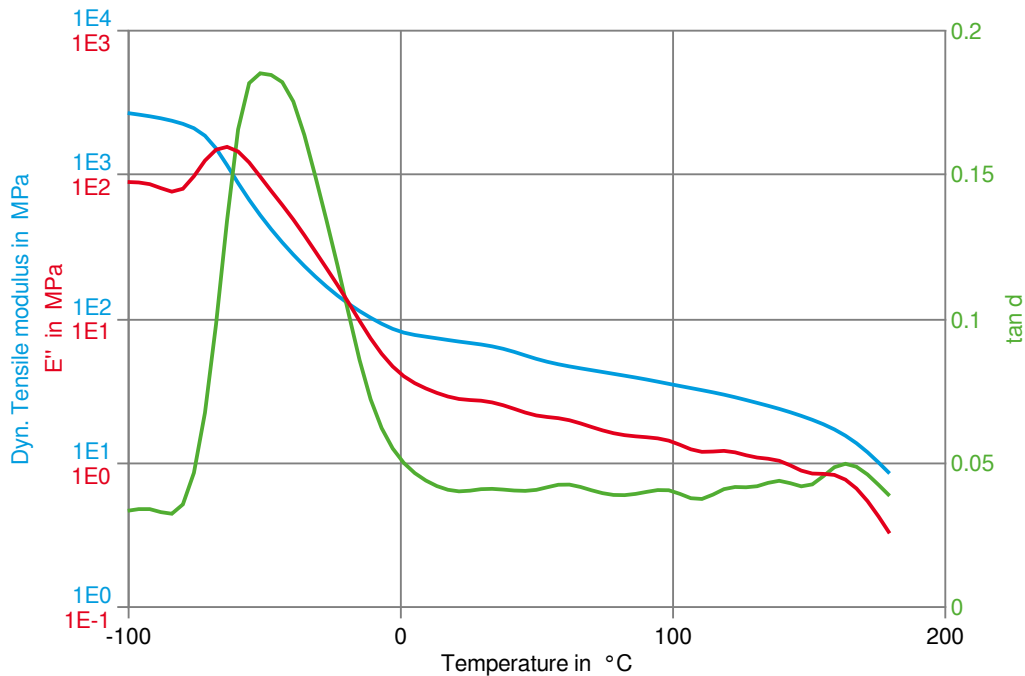
Shearstress-shear rate



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

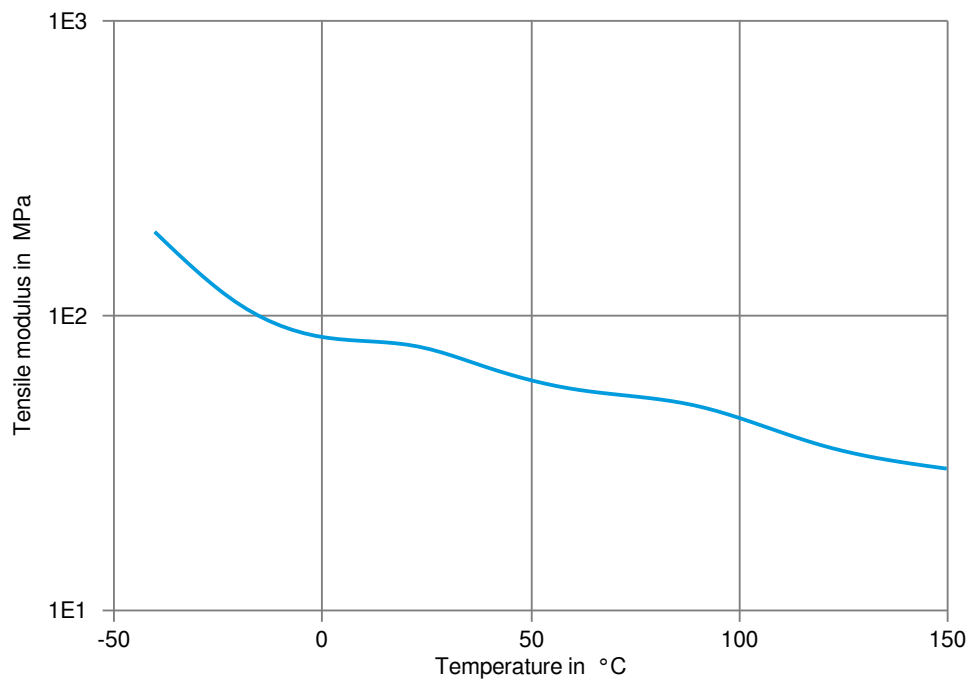
Dynamic Tensile modulus-temperature



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

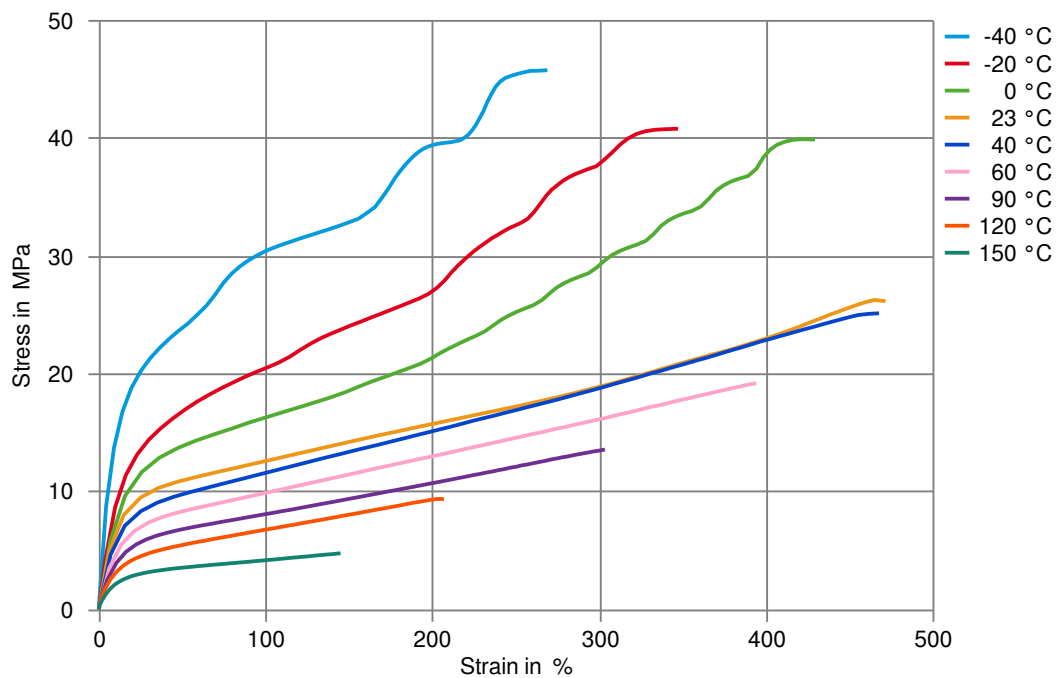
Tensile modulus-temperature



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

Stress-Strain (Flexible Materials)



Hytrel® HTR8223 BK320

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

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



Hytrel® HTR8223 BK320

THERMOPLASTIC POLYESTER ELASTOMER

✗ 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

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).

