

## Hytrel<sup>®</sup> HTR8813 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® HTR8813 BK320 is a medium hardness halogen-free flame retarded thermoplastic elastomer with very good flammability performance. It can be processed by thermoplastic techniques such as injection moulding and extrusion.

#### **Product information**

Resin Identification Part Marking Code	TPC-ET-FR(40+3 >TPC-ET-FR(40+	,	ISO 1043 ISO 11469
Rheological properties			
Melt mass-flow rate	15	g/10min	ISO 1133
Melt mass-flow rate, Temperature	230	°C	
Melt mass-flow rate, Load	2.16	kg	
Moulding shrinkage, parallel	1.3	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1	%	ISO 294-4, 2577
Typical mechanical properties			
Tensile modulus	372	MPa	ISO 527-1/-2
Stress at 10% strain	11	MPa	ISO 527-1/-2
Tensile stress at break	11.2	MPa	ISO 527-1/-2
Tensile strain at break	126	%	ISO 527-1/-2
Flexural modulus	359	MPa	ISO 178
Charpy notched impact strength, -40°C	4.7	kJ/m²	ISO 179/1eA
Shore D hardness, 15s	55		ISO 48-4 / ISO 868
Shore D hardness, max	58		ISO 868
Tear strength, parallel	85	kN/m	ISO 34-1
Tear strength, normal	85	kN/m	ISO 34-1
Thermal properties			
Melting temperature, 10°C/min	200	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-30		ISO 11357-1/-3
Vicat softening temperature, 50°C/h 10N	164	°C	ISO 306



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### Flammability

Burning Behav. at 1.5mm nom. thickn Thickness tested UL recognition Burning Behav. at thickness h Thickness tested Oxygen index Glow Wire Ignition Temperature, 2.0m FMVSS Class Burning rate, Thickness 1 mm	1.5 yes V-0 0.8 49 1m 700 B		IEC 60695-11-10 IEC 60695-11-10 UL 94 IEC 60695-11-10 IEC 60695-11-10 ISO 4589-1/-2 IEC 60695-2-13 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)	
Electrical properties				
Electric Strength, Short Time, 3.2mm	(0.126in) 17.5	kV/mm	ASTM D 149	
Physical/Other properties				
Density	1240	kg/m³	ISO 1183	
Injection Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Optimum Min. melt temperature Max. melt temperature Mold Temperature Optimum Min. mould temperature Max. mould temperature Ejection temperature	40	h % °C °C °C °C °C °C		
Extrusion Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Range	100 2 - 3 ≤0.06 220 - 235	h %		
Characteristics				
Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Extrusion - Wire and Cable, Other Extrusion			
Delivery form	Pellets			
Additives	Flame retardant, Non-halogenated/Red phosphorous free flame retardant			

Special characteristics

Flame retardant, Non-halogenated/Red phosphorous free flame retardant Flame retardant, Light stabilised or stable to light, U.V. stabilised or stable to weather, Heat stabilised or stable to heat

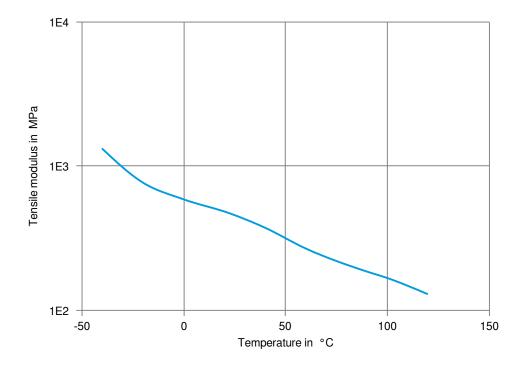
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Tensile modulus-temperature

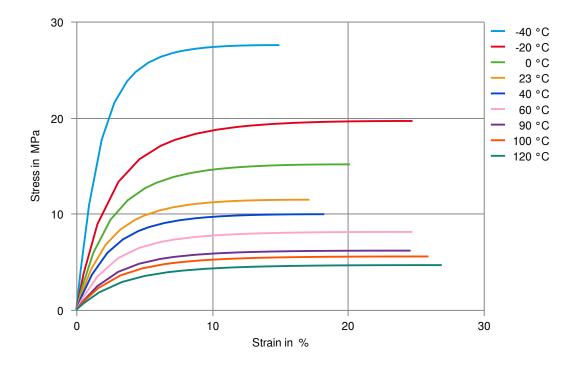






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Stress-Strain (Flexible Materials)





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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
- X Nitric Acid (40% by mass), 23°C
- X 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

X Acetone, 23°C

#### Ethers

X 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**

- X ISO 1817 Liquid 1 E5, 60°C
- X 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

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### THERMOPLASTIC POLYESTER ELASTOMER

#### Salt solutions

- ✓ Sodium Chloride solution (10% by mass), 23°C
- X 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
- X Hydrogen peroxide, 23°C
- X 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).

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