

## Hytrel<sup>®</sup> HTR237BG 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® HTR237BG is designed for blow moulding or processing techniques requiring high viscosity. It has nominal durometer hardness of 45D, is pigmented black with fine particle size carbon black and contains a general purpose stabiliser.

#### Product information

Resin Identification Part Marking Code	TPC-ET >TPC-ET<		ISO 1043 ISO 11469
Rheological properties			
Melt mass-flow rate		g/10min	ISO 1133
Melt mass-flow rate, Temperature	220	-	
Melt mass-flow rate, Load	2.16	kg	
[1]: 4.5 g/10min at 220 Celsius @10kg			
Typical mechanical properties			
Tensile modulus	90	MPa	ISO 527-1/-2
Stress at 10% strain	7.6	MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	12.1	MPa	ISO 527-1/-2
Tensile stress at 100% strain	15	MPa	ISO 527-1/-2
Stress at 300% strain	26	MPa	ISO 527-1/-2
Tensile stress at break	30	MPa	ISO 527-1/-2
Tensile strain at break	>300	%	ISO 527-1/-2
Flexural modulus	90	MPa	ISO 178
Charpy notched impact strength, 23°C	Ν	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	119	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	Ν	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	Ν	kJ/m²	ISO 180/1A
Brittleness temperature	-100	°C	ISO 974
Shore D hardness, 15s	41		ISO 48-4 / ISO 868
Shore D hardness, max	45		ISO 868
Tear strength, parallel	120	kN/m	ISO 34-1
Tear strength, normal	120	kN/m	ISO 34-1

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### Thermal properties

Melting temperature, 10 °C/min Glass transition temperature, 1 Hz Temperature of deflection under load Temperature of deflection under load Vicat softening temperature, 50 °C/h Coeff. of linear therm. expansion, par Coefficient of linear thermal expansio (CLTE), parallel Coeff. of linear therm. expansion, par Coeff. of linear therm. expansion, par	, 0.45 MPa 10N allel, -40-23°C n allel, 55-160°C	57 164 197 210 219	°C °C °C	ISO 11357-1/-3 ISO 6721 ISO 75-1/-2 ISO 75-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2
Coefficient of linear thermal expansion normal	n (CLTE),	200	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, nor Thermal conductivity, flow Thermal conductivity of melt	mal, 55-160°C	0.25	E-6/K W/(m K) W/(m K)	ISO 11359-1/-2 ISO 22007-2 ISO 22007-2
Flammability				
FMVSS Class Burning rate, Thickness 1 mm		B <80	mm/min	ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Physical/Other properties				
Density Density of melt [2]: at 230 °C			kg/m³ 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		yes 100 2 - 3 ≤0.08 225 220 250	h % °C °C	
Blow Molding				
Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content		yes ≤110 ≥2 ≤0.02	h	
Characteristics				
Processing	Blow Moulding			

Frocessing	BIOW WOULDING
Delivery form	Pellets
Special characteristics	Heat stabilised or stable to heat

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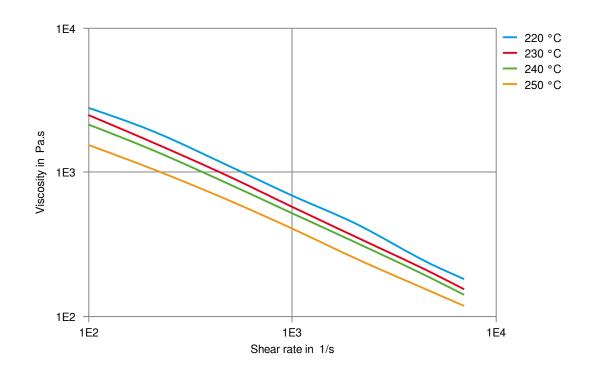


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### Automotive

OEM NIO STANDARD NIO-SM.51.041

### Viscosity-shear rate

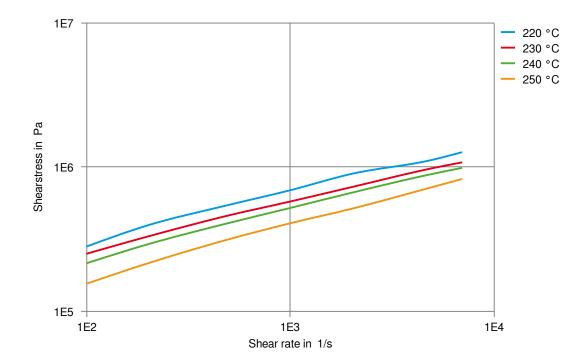






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Shearstress-shear rate

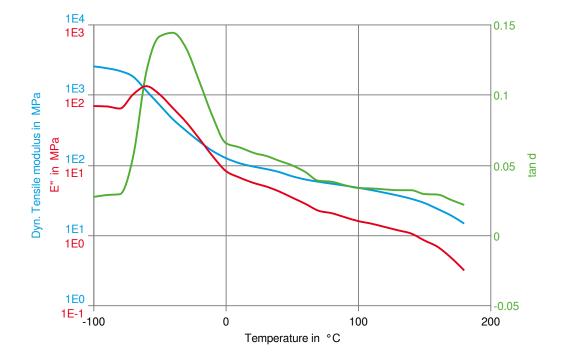






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Dynamic Tensile modulus-temperature

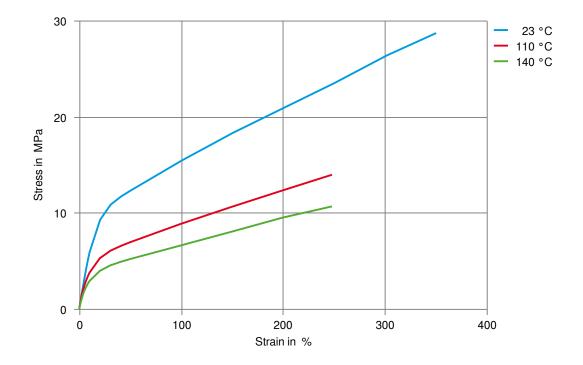






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Stress-Strain (Flexible Materials)





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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
- X 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
- X SAE 10W40 multigrade motor oil, 130°C
- X SAE 80/90 hypoid-gear oil, 130 °C
- ✓ Insulating Oil, 23°C

#### **Standard Fuels**

- X ISO 1817 Liquid 1 E5, 60°C
- ¥ ISO 1817 Liquid 2 M15E4, 60°C
- X ISO 1817 Liquid 3 M3E7, 60°C
- X 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
- X 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

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- ✓ 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
- X 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).

X 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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NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design not intended for use in medical or dental implants. Regardless of any such product expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials the lowest that texist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the m

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