

# Hytrel® HTR8888 BK190A (PRELIMINARY)

## 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® HTR8888 BK190A is designed for blow molding or processing techniques requiring high melt viscosity. It has nominal hardness of 55D, is pigmented black with fine particle size carbon black, and contains a general purpose stabilizer.

Typical applications:

Hollow thin wall parts requiring a tough polymer with excellent flexibility and temperature properties such as automotive ducts.

### Rheological properties

Melt mass-flow rate	5.4 g/10min	ISO 1133
Melt mass-flow rate, Temperature	230 °C	
Melt mass-flow rate, Load	10 kg	

### Typical mechanical properties

Tensile modulus	209 MPa	ISO 527-1/-2
Stress at 5% strain	8.2 MPa	ISO 527-1/-2
Stress at 10% strain	11.7 MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	16.7 MPa	ISO 527-1/-2
Tensile stress at break, 50mm/min	36 <sup>[1]</sup> MPa	ISO 527-1/-2
Tensile strain at break, 50mm/min	370 %	ISO 527-1/-2
Flexural modulus	214 MPa	ISO 178
Charpy notched impact strength, 23°C	N kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	134 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -40°C	24.1 kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.48	
Shore D hardness, 15s	53	ISO 48-4 / ISO 868
Shore D hardness, max	56	ISO 868
Tear strength, parallel	130 kN/m	ISO 34-1
Tear strength, normal	110 kN/m	ISO 34-1

[1]: molded 1BA bar, 50mm/min

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### Thermal properties

Melting temperature, 10 °C/min	190 <sup>[2]</sup> °C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	-15 °C	ISO 11357-1/-3
Vicat softening temperature, 50 °C/h 10N	156 °C	ISO 306

[2]: Select the highest peak in 2nd heating

### Physical/Other properties

Density	1170 kg/m <sup>3</sup>	ISO 1183
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### Injection

Drying Recommended	yes
Drying Temperature	100 °C
Drying Time, Dehumidified Dryer	2 - 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. mould temperature	40 °C
Max. mould temperature	50 °C

### Extrusion

Drying Temperature	80 - 110 °C
Drying Time, Dehumidified Dryer	3 - 5 h
Processing Moisture Content	≤0.03 %
Melt Temperature Optimum	235 °C
Melt Temperature Range	220 - 250 °C

### Blow Molding

Drying Recommended	yes
Drying Temperature	80 - 110 °C
Drying Time, Dehumidified Dryer	3 - 5 h
Processing Moisture Content	≤0.03 %
Melt Temperature Optimum	230 °C
Melt Temperature Range	220 - 240 °C
Swell ratio	1.9
Mold Temperature Optimum	80 °C
Mold Temperature Range	40 - 90 °C

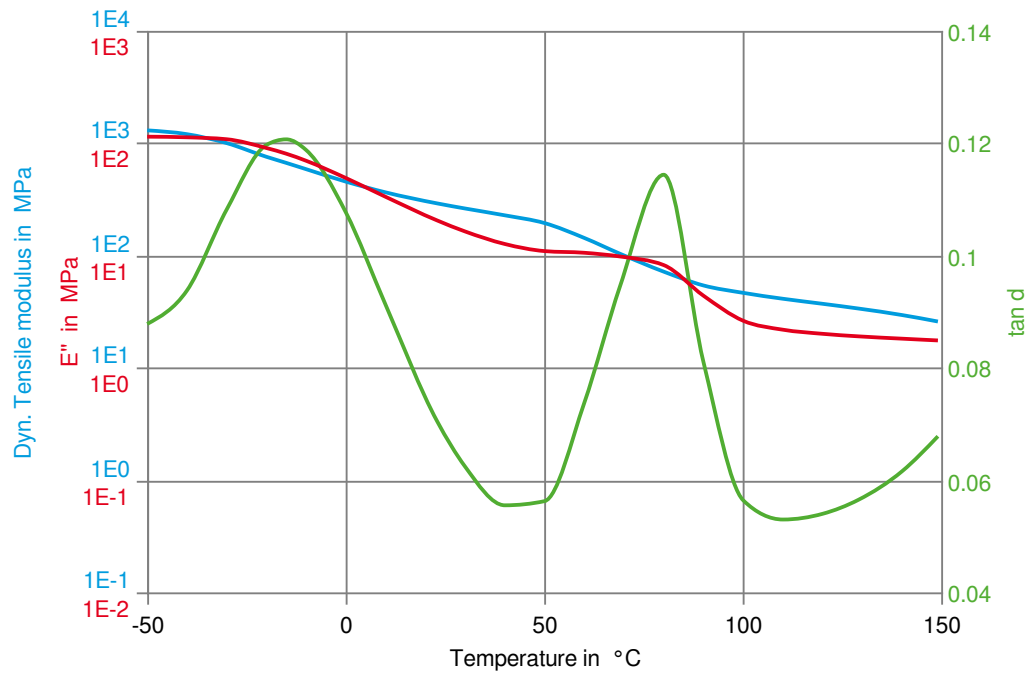
### Characteristics

Processing	Injection Moulding, Extrusion, Blow Moulding, Thermoforming
Delivery form	Pellets
Special characteristics	Light stabilised or stable to light, Heat stabilised or stable to heat

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### Dynamic Tensile modulus-temperature



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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
- ✓ 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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### 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).