

Hytrel[®] 4068FG

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® 4068FG is a high performance thermoplastic polyester elastomer developed for applications in contact with food.

FOOD CONTACT

This product is manufactured according to Good Manufacturing Practice (GMP) principles and generally accepted in food contact applications in Europe and the USA when meeting applicable use conditions. For details, individual compliance statements are available from our representative.

Product information

Resin Identification Part Marking Code	TPC-ET >TPC-ET<		ISO 1043 ISO 11469
Rheological properties			
Melt volume-flow rate Temperature Load	8.8 220 2.16	-	ISO 1133
Melt mass-flow rate Melt mass-flow rate, Temperature Melt mass-flow rate, Load		g/10min °C	ISO 1133
Moulding shrinkage, parallel Moulding shrinkage, normal	1.0 0.9	%	ISO 294-4, 2577 ISO 294-4, 2577
Typical mechanical properties			
Tensile modulus Stress at 5% strain		MPa MPa	ISO 527-1/-2 ISO 527-1/-2
Stress at 10% strain Tensile stress at 50% strain, 1BA	6.7	MPa MPa	ISO 527-1/-2 ISO 527-1/-2
Tensile stress at break Nominal strain at break Tensile strain at break		, •	ISO 527-1/-2 ISO 527-1/-2 ISO 527-1/-2
Flexural modulus Tensile creep modulus, 1000h	47	MPa MPa	ISO 178 ISO 899-1
Charpy impact strength, 23°C Charpy impact strength, -30°C Charpy notched impact strength, 23°C Charpy notched impact strength, -30°C	N N	kJ/m ² kJ/m ² kJ/m ² kJ/m ²	ISO 179/1eU ISO 179/1eU ISO 179/1eA ISO 179/1eA



Hytrel[®] 4068FG THERMOPLASTIC POLYESTER ELASTOMER

Tensile notched impact strength, 23°C Izod notched impact strength, 23°C Izod notched impact strength, -30°C Izod notched impact strength, -40°C Shore D hardness, 15s Shore D hardness, max Tear strength, parallel Tear strength, normal Abrasion resistance	N N 31 37 100 100	kJ/m ² kJ/m ² kJ/m ² kJ/m ² kN/m kN/m mm ³	ISO 8256/1 ISO 180/1A ISO 180/1A ISO 180/1A ISO 48-4 / ISO 868 ISO 868 ISO 34-1 ISO 34-1 ISO 4649
Thermal properties			
Melting temperature, 10°C/min Glass transition temperature, 10°C/min Vicat softening temperature, 50°C/h 10N Coefficient of linear thermal expansion (CLTE), parallel Coefficient of linear thermal expansion (CLTE), normal Effective thermal diffusivity, flow		°C °C E-6/K E-6/K	ISO 11357-1/-3 ISO 11357-1/-3 ISO 306 ISO 11359-1/-2 ISO 11359-1/-2 ISO 22007-4
	0.442 0	111/5	100 22007 4
Flammability FMVSS Class Burning rate, Thickness 1 mm	B <80	mm/min	ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Electrical properties			
Relative permittivity, 100Hz Relative permittivity, 1MHz Electric strength Comparative tracking index	4.8 4.7 18 600	kV/mm	IEC 62631-2-1 IEC 62631-2-1 IEC 60243-1 IEC 60112
Physical/Other properties			
Humidity absorption, 2mm Water absorption, 2mm Density	0.3 0.7 1110		Sim. to ISO 62 Sim. to ISO 62 ISO 1183
VDA Properties			
Emission of organic compounds Odour		μgC/g class	VDA 277 VDA 270
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	



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Mold Temperature Optimum	40 °C
Min. mould temperature	30 °C
Max. mould temperature	40 °C

Extrusion

Drying Temperature	90 - 110 °C
Drying Time, Dehumidified Dryer	2-3 h
Processing Moisture Content	≤0.06 %
Melt Temperature Optimum	215 °C
Melt Temperature Range	210 - 225 °C

Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Casting, Thermoforming
Delivery form	Pellets
Special characteristics	Light stabilised or stable to light

Additional information

Injection molding

PREPROCESSING

Drying temperature = 100 °C Drying time, dehumidified dryer = 2-3 h Processing moisture content = <0.06 %

PROCESSING

Melt termperature range = 205-230 °C Melt temperature optimum = 215 °C

Profile extrusion

PREPROCESSING

Drying temperature = $100 \degree C$ Drying time, dehumidified dryer = 2-3 h Processing moisture content = <0.06 %

PROCESSING

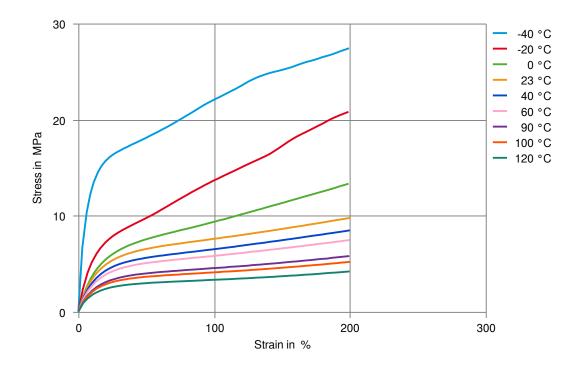
Melt termperature range = 205-230 °C Melt temperature optimum = 215 °C





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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
- ✗ 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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THERMOPLASTIC POLYESTER ELASTOMER

- 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
- 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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