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Hytrel® 4053FG NC010

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® 4053FG is a low modulus high performance thermoplastic elastomer developed for applications in contact with food. It is suitable for extrusion and injection molding processes.

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.

Typical applications:
Hose and tubing, hose jackets, wire and cable jackets, film and sheeting, belting and seals.

Product information

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

Rheological properties

Melt volume-flow rate	5	cm^3/10min	ISO 1133
Temperature	190	°C	
Load	2.16	kg	
Melt mass-flow rate	5.3	g/10min	ISO 1133
Melt mass-flow rate, Temperature	190	°C	
Melt mass-flow rate, Load	2.16	kg	
Moulding shrinkage, parallel	0.2	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.4	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	56	MPa	ISO 527-1/-2
Stress at 5% strain	2.4	MPa	ISO 527-1/-2
Stress at 10% strain	4.4	MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	7.3	MPa	ISO 527-1/-2
Tensile stress at break	26	MPa	ISO 527-1/-2
Tensile strain at break	>300	%	ISO 527-1/-2
Tensile creep modulus, 1h	50	MPa	ISO 899-1
Tensile creep modulus, 1000h	40	MPa	ISO 899-1
Charpy impact strength, 23°C	N	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30°C	N	kJ/m^2	ISO 179/1eU

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Charpy notched impact strength, 23 °C	N	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	N	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	N	kJ/m²	ISO 179/1eA
Tensile notched impact strength, 23 °C	230	kJ/m²	ISO 8256/1
Poisson's ratio	0.5		
Shore D hardness, 15s	38		ISO 48-4 / ISO 868
Tear strength, parallel	110	kN/m	ISO 34-1

Thermal properties

Melting temperature, 10 °C/min	150	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	-50	°C	ISO 11357-1/-3
Temperature of deflection under load, 0.45 MPa	50	°C	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	220	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	220	E-6/K	ISO 11359-1/-2
Effective thermal diffusivity, flow	5.44E-8	m²/s	ISO 22007-4

Flammability

Burning Behav. at 1.5mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	1.5	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	20	%	ISO 4589-1/-2
FMVSS Class	SE		ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	5.2		IEC 62631-2-1
Relative permittivity, 1MHz	4.7		IEC 62631-2-1
Dissipation factor, 100Hz	110	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	525	E-4	IEC 62631-2-1
Volume resistivity	7E10	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

Physical/Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.7	%	Sim. to ISO 62
Density	1160	kg/m³	ISO 1183
Density of melt	1020	kg/m³	

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.08	%
Melt Temperature Optimum	180	°C

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Min. melt temperature	170	°C
Max. melt temperature	190	°C
Mold Temperature Optimum	40	°C
Min. mould temperature	30	°C
Max. mould temperature	40	°C

Extrusion

Drying Temperature	70 - 90	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	170	°C
Melt Temperature Range	165 - 180	°C

Characteristics

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

Additional information

Injection molding — Snake Flow Test , mm

Inject press 62MPa, 1mm	80
Inject press 62MPa, 2.5mm	330
Inject press 83MPa(12,000psi), 1mm	95
Inject press 83MPa(12,000psi), 2.5mm	430

Chemical Media Resistance

Other

✔ Water, 90 °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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