



ISO 1043

Hytrel® 4056

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® 4056 is a low modulus Hytrel® grade with nominal durometer hardness of 40D and with high impact resistance down to -40°C. It contains a non-discoloring stabilizer. It is recommended for extrusion and compounding.

TPC-ET

Typical applications:

Hose and tubing, hose jackets, wire and cable jackets, film and sheeting, belting and seals, PVC and rubber compound modification.

Product information

Resin Identification

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	5.6	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	60	MPa	ISO 527-1/-2
Stress at 5% strain	2.4	MPa	ISO 527-1/-2
Stress at 10% strain	4.6	MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA	8.4	MPa	ISO 527-1/-2
Tensile stress at break	22	MPa	ISO 527-1/-2
Nominal strain at break	500	%	ISO 527-1/-2
Tensile strain at break	>300	%	ISO 527-1/-2
Flexural modulus	60	MPa	ISO 178
Tensile creep modulus, 1h	54	MPa	ISO 899-1
Tensile creep modulus, 1000h		MPa	ISO 899-1
Charpy impact strength, 23°C		kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	N	kJ/m²	ISO 179/1eU

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Charpy notched impact strength, 23°C Charpy notched impact strength, -30°C Charpy notched impact strength, -40°C Tensile notched impact strength, 23°C Puncture - maximum force, 23°C Puncture - maximum force, -30°C Puncture energy, 23°C Puncture energy, -30°C Izod notched impact strength, 23°C Izod notched impact strength, -40°C Poisson's ratio Brittleness temperature Shore D hardness, 15s Shore D hardness, max Tear strength, parallel Tear strength, normal Abrasion resistance	N 230 1500 2800 19 37 N 0.5 -97 37 43 100 96	N J J kJ/m² kJ/m²	ISO 179/1eA ISO 179/1eA ISO 179/1eA ISO 8256/1 ISO 6603-2 ISO 6603-2 ISO 6603-2 ISO 6603-2 ISO 180/1A ISO 180/1A ISO 180/1A ISO 974 ISO 48-4 / ISO 868 ISO 868 ISO 34-1 ISO 34-1 ISO 4649
Abrasion resistance	200	mm	150 4649
Tribological properties	0.0		100 0005
Coefficient of static friction, against steel	0.6		ISO 8295
Thermal properties			
Melting temperature, 10°C/min	152		ISO 11357-1/-3
Glass transition temperature, 1 Hz	-38		ISO 6721
Temperature of deflection under load, 0.45 MPa		°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 10N	109		ISO 306
Coefficient of linear thermal expansion	130	E-6/K	ISO 11359-1/-2
(CLTE), parallel	100	E 0/1/	100 44050 4/0
Coefficient of linear thermal expansion (CLTE),	160	E-6/K	ISO 11359-1/-2
normal	0.50	m ² /a	100 22007 4
Effective thermal diffusivity, flow	8.5E-8	°C	ISO 22007-4 UL 746B
RTI, electrical, 1.5mm RTI, impact, 1.5mm		°C	UL 746B
RTI, strength, 1.5mm		°C	UL 746B
TGA curve	available	C	ISO 11359-1/-2
TOA Curve	avaliable		130 11339-1/-2
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
Burning Behav. at thickness h	HB	class	IEC 60695-11-10
Thickness tested	8.0	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	20	%	ISO 4589-1/-2
FMVSS Class	SE		ISO 3795 (FMVSS 302)

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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
Water absorption, Immersion 24h	0.6 %	Sim. to ISO 62
Density	1160 kg/m ³	ISO 1183
Density of melt	1020 kg/m ³	

Film Properties

WVTR, 23°C/85%r.h.	450 g/(m ² *d)	DIS 15106-1/-2
Oxygen transmission rate, 23°C/85%r.h.	14000 cm ³ /(m ^{2*} d*bar)	DIS 15105-1/-2
Thickness of specimen	0.025 mm	

Injection

Drying Recommended	yes
Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2-3 h
Processing Moisture Content	≤0.08 %
Melt Temperature Optimum	181 °C
Min. melt temperature	180 °C
Max. melt temperature	205 °C
Mold Temperature Optimum	40 °C
Min. mould temperature	30 °C
Max. mould temperature	41 °C
Ejection temperature	50 °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 Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coatable, Calendering,

Casting, Thermoforming

Delivery form Pellets

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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

Automotive

OEM STANDARD ADDITIONAL INFORMATION

HyundaiMS220-24 Type EMercedes-BenzDBL5562.50 TPC

Stellantis - Chrysler MS-DB-448 / CPN-2344 Natural Stellantis - Chrysler MS-DB-448 / CPN-2560 Black

Stellantis - Chrysler MS-DB-448 / CPN-2956 Non-matched Color

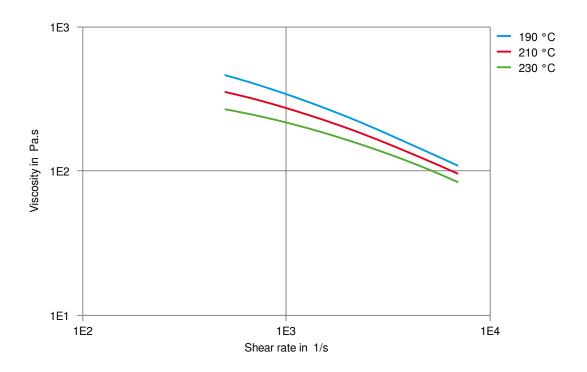
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Viscosity-shear rate



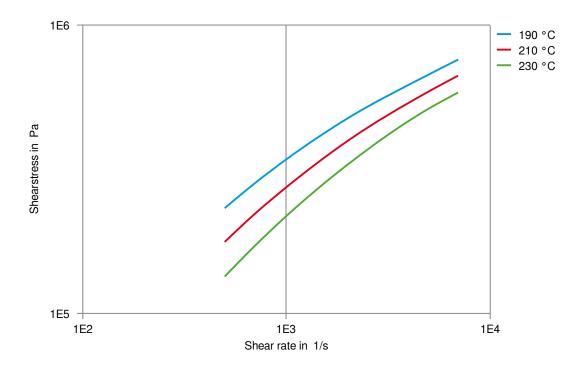
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Shearstress-shear rate



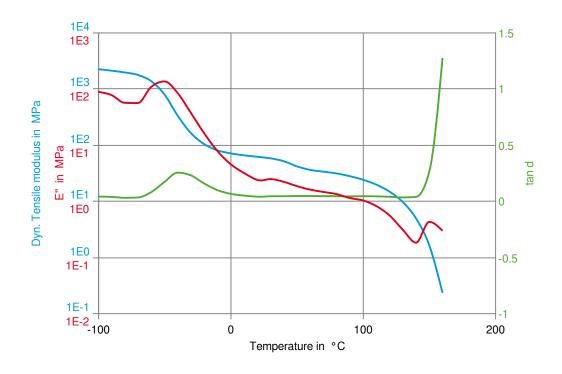
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Dynamic Tensile modulus-temperature



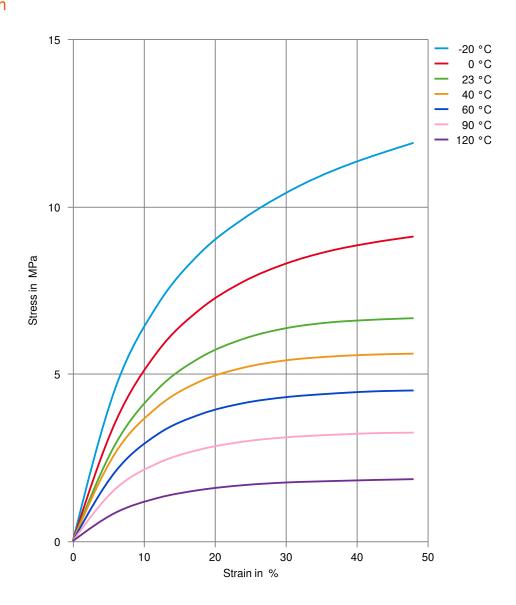
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Stress-strain



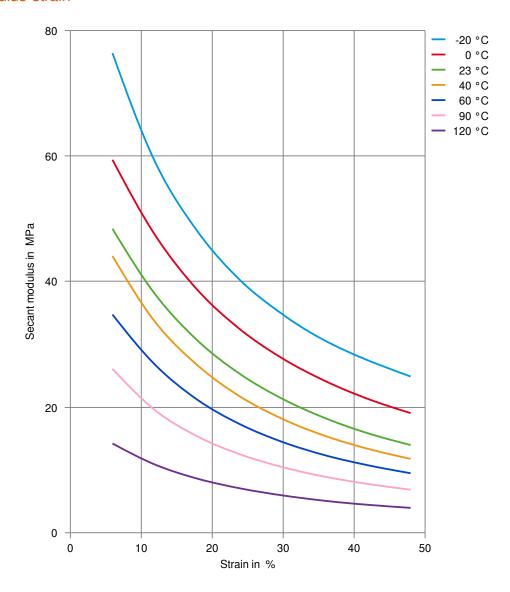
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Secant modulus-strain



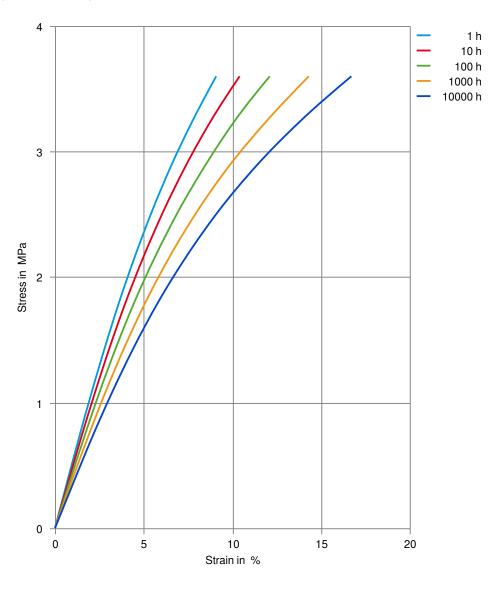
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Stress-strain (isochronous) 23°C



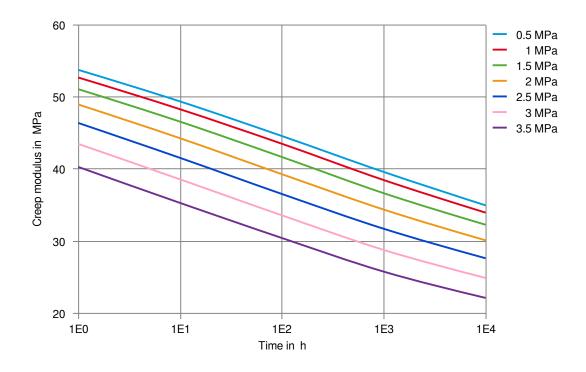
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Creep modulus-time 23°C



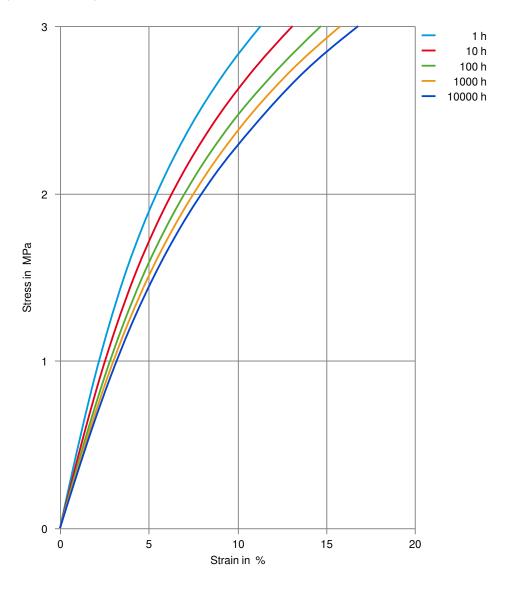
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Stress-strain (isochronous) 40°C



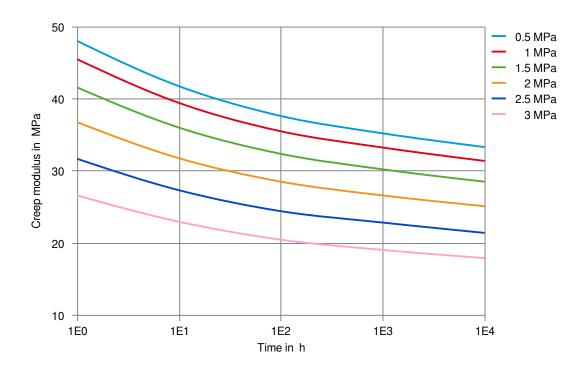
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Creep modulus-time 40°C



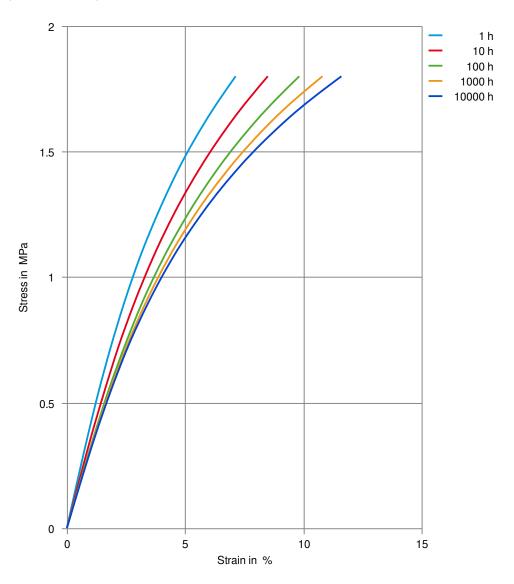
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Stress-strain (isochronous) 80°C



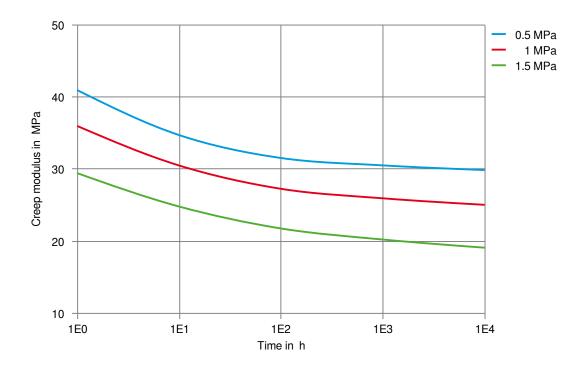
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Creep modulus-time 80°C



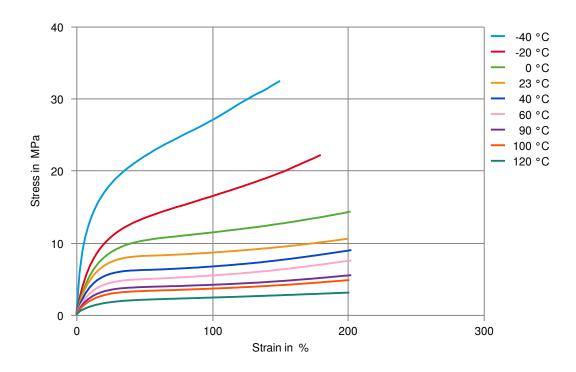
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Stress-Strain (Flexible Materials)



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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
- X 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
- ★ SAE 80/90 hypoid-gear oil, 130°C
- ✓ Insulating Oil, 23°C
- ★ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- X Automatic hypoid-gear oil Shell Donax TX, 135°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- X 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
- ➤ 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
- 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
- ★ 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).

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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Revised: 2025-04-17 Source: Celanese Materials Database

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