



### 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® 4556 is a medium modulus grade with nominal hardness of 45D. It contains non-discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

### **Product information**

TPC-ET		ISO 1043
>TPC-ET<		ISO 11469
7.5	cm <sup>3</sup> /10min	ISO 1133
220	°C	
2.16	kg	
8.5	g/10min	ISO 1133
220	°C	
2.16	kg	
1.2	%	ISO 294-4, 2577
1.1	%	ISO 294-4, 2577
85	MPa	ISO 527-1/-2
5.7	MPa	ISO 527-1/-2
9.8	MPa	ISO 527-1/-2
11	MPa	ISO 527-1/-2
17	MPa	ISO 527-1/-2
34	MPa	ISO 527-1/-2
740	%	ISO 527-1/-2
>300	%	ISO 527-1/-2
87	MPa	ISO 178
N	kJ/m²	ISO 179/1eU
N	kJ/m²	ISO 179/1eU
N	kJ/m²	ISO 179/1eA
		ISO 179/1eA
N	kJ/m²	ISO 179/1eA
1600	N	ISO 6603-2
	>TPC-ET<  7.5 220 2.16 8.5 220 2.16 1.2 1.1  85 5.7 9.8 11 17 34 740 >300 87 N N N N N	

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### THERMOPLASTIC POLYESTER ELASTOMER

Puncture - maximum force, -30°C	2700	N	ISO 6603-2
Puncture energy, 23°C	19	J	ISO 6603-2
Puncture energy, -30°C	34	J	ISO 6603-2
Izod notched impact strength, 23°C	N	kJ/m²	ISO 180/1A
Izod notched impact strength, -40 °C	N	kJ/m²	ISO 180/1A
Ball indentation hardness, H 961/30		MPa	ISO 2039-1
Poisson's ratio	0.49	۵	.55 2555 .
Brittleness temperature	-100	°C	ISO 974
Shore D hardness, 15s	42	Ü	ISO 48-4 / ISO 868
Shore D hardness, max	45		ISO 868
Tear strength, parallel		kN/m	ISO 34-1
Tear strength, normal		kN/m	ISO 34-1
Abrasion resistance		mm <sup>3</sup>	ISO 4649
Abrasion resistance	130	HIIII	150 4049
Thermal properties			
Melting temperature, 10 ° C/min	193	°C	ISO 11357-1/-3
Glass transition temperature, 1 Hz	-52		ISO 6721
Temperature of deflection under load, 1.8 MPa		°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa		°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N		°C	ISO 306
· · · · · · · · · · · · · · · · · · ·	155		
Vicat softening temperature, 50°C/h 10N			ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C		E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion	170	E-6/K	ISO 11359-1/-2
(CLTE), parallel	010	E 0/1/	100 44050 4/0
Coeff. of linear therm. expansion, normal, -40-23°C		E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	190	E-6/K	ISO 11359-1/-2
normal		0.	
Effective thermal diffusivity, flow	5.44E-8		ISO 22007-4
RTI, electrical, 0.75mm		°C	UL 746B
RTI, electrical, 1.5mm		°C	UL 746B
RTI, electrical, 3.0mm		°C	UL 746B
RTI, impact, 0.75mm		°C	UL 746B
RTI, impact, 1.5mm	85	°C	UL 746B
RTI, impact, 3.0mm	85	°C	UL 746B
RTI, strength, 0.75mm	50	°C	UL 746B
RTI, strength, 1.5mm	75	°C	UL 746B
RTI, strength, 3.0mm	80	°C	UL 746B
Flammability			
-	LID	alaaa	IFC 6060F 11 10
Burning Behav. at 1.5mm nom. thickn.		class	IEC 60695-11-10
Thickness tested		mm	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. at thickness h		class	IEC 60695-11-10
Thickness tested		mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	20	%	ISO 4589-1/-2
FMVSS Class	В		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	21 <sup>[DS]</sup>	mm/min	ISO 3795 (FMVSS 302)
[DS]: Derived from similar grade			

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## Hytrel<sup>®</sup> 4556

### THERMOPLASTIC POLYESTER ELASTOMER

### **Electrical properties**

Relative permittivity, 100Hz	4.8		IEC 62631-2-1
Relative permittivity, 1MHz	4.5		IEC 62631-2-1
Dissipation factor, 100Hz	95	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	300	E-4	IEC 62631-2-1
Volume resistivity	8E10	Ohm.m	IEC 62631-3-1
Surface resistivity	4E14	Ohm	IEC 62631-3-2
Electric strength	19	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	0.6 %	Sim. to ISO 62
Water absorption, Immersion 24h	0.6 %	Sim. to ISO 62
Density	1140 kg/m³	ISO 1183

### Film Properties

WVTR, 23°C/85%r.h.	600 g/(m <sup>2</sup> *d)	DIS 15106-1/-2
Thickness of specimen	0.025 mm	

### Injection

Drying Recommended	yes
Drying Temperature	100 °C
Drying Time, Dehumidified Dryer	2-3 h
Processing Moisture Content	≤0.08 %
Melt Temperature Optimum	235 °C
Min. melt temperature	220 °C
Max. melt temperature	250 °C
Mold Temperature Optimum	50 °C
Min. mould temperature	45 °C
Max. mould temperature	55 °C
Ejection temperature	108 °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,

Coatable, Casting, Thermoforming

Delivery form Pellets

Special characteristics Light stabilised or stable to light

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### Hytrel<sup>®</sup> 4556

### THERMOPLASTIC POLYESTER ELASTOMER

### Additional information

Injection molding

### **PREPROCESSING**

Drying recommended = Yes
Drying temperature = 100°C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.08 %

### **PROCESSING**

Melt temperature range = 220-250°C Melt temperature optimum = 225°C Mold temperature optimum = 45°C Mold temperature range = 45-55°C

Profile extrusion

### **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

### **Automotive**

OEM STANDARD ADDITIONAL INFORMATION

General Motors GMW17327P-TPC-ET-Type 2

Mercedes-Benz DBL5562 AA41 TPU
Mercedes-Benz DBL5562 AA41 TPV

Stellantis - Chrysler MS-DB-448 / CPN-4176 Natural Stellantis - Chrysler MS-DB-448 / CPN-4906 Natural

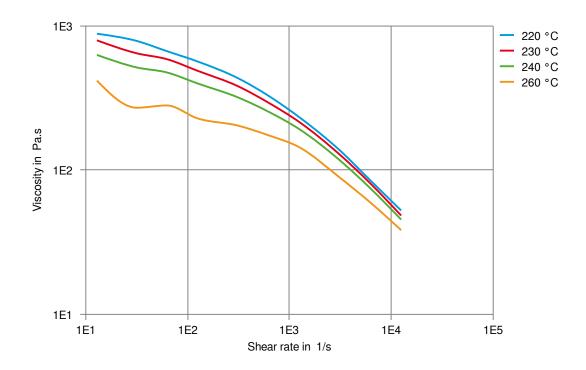
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THERMOPLASTIC POLYESTER ELASTOMER

Viscosity-shear rate



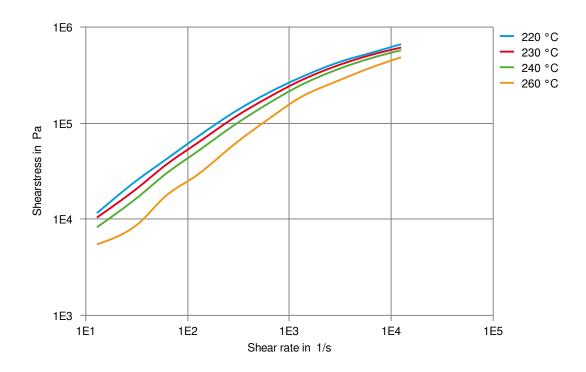
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# Hytrel® 4556 THERMOPLASTIC POLYESTER ELASTOMER

Shearstress-shear rate



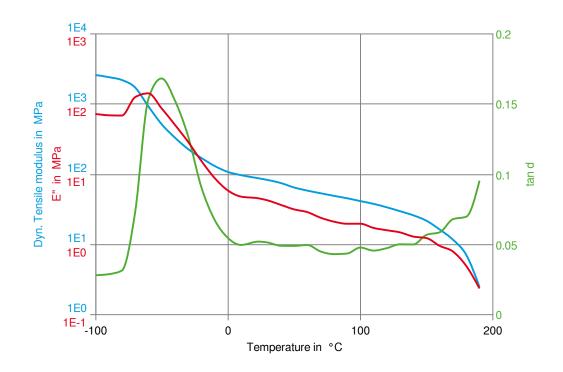
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# Hytrel® 4556 THERMOPLASTIC POLYESTER ELASTOMER

Dynamic Tensile modulus-temperature



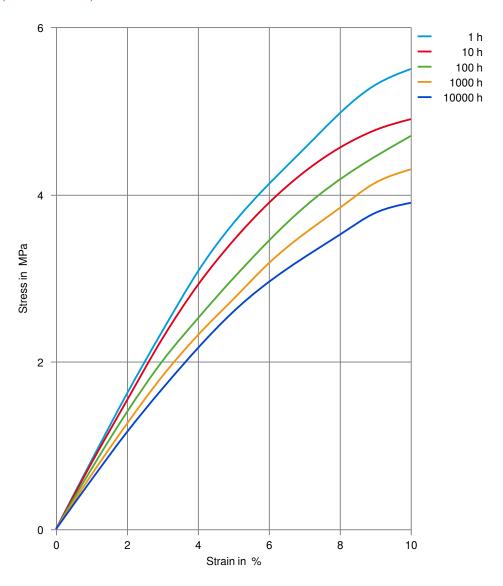
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### THERMOPLASTIC POLYESTER ELASTOMER

Stress-strain (isochronous) 23°C



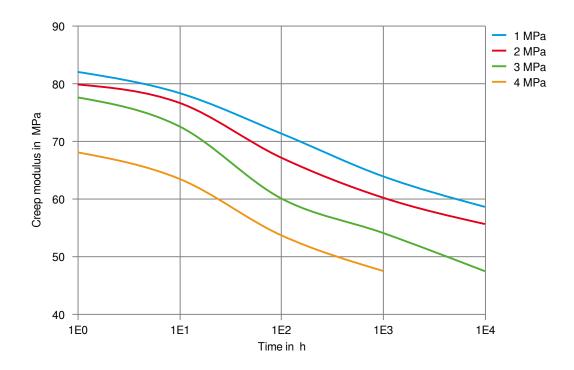
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### THERMOPLASTIC POLYESTER ELASTOMER

Creep modulus-time 23°C



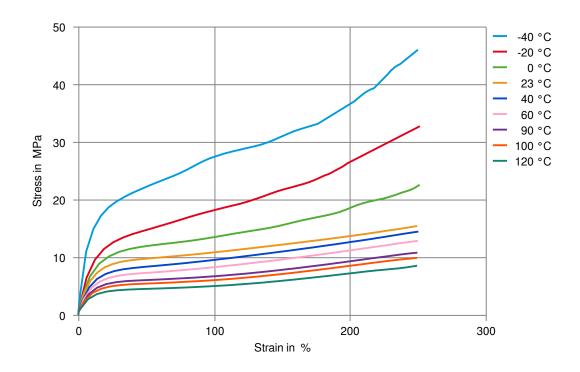
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# Hytrel® 4556 THERMOPLASTIC POLYESTER ELASTOMER

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
- X Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ★ Automatic hypoid-gear oil Shell Donax TX, 135°C
- X Hydraulic oil Pentosin CHF 202, 125°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
- X 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
- ➤ 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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Revised: 2025-04-19 Source: Celanese Materials Database

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 conditions and environmental exposure. Other than those products 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 should not be construed 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 to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, pr

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