

THERMOPLASTIC POLYESTER ELASTOMER

Rheological properties

i neelegical properties			
Melt volume-flow rate	8	cm ³ /10min	ISO 1133
Temperature	220	°C	
Load	2.16	ka	
Melt mass-flow rate		g/10min	ISO 1133
Melt mass-flow rate, Temperature	220		
Melt mass-flow rate, Load	2.16		
Moulding shrinkage, parallel	1.0	-	ISO 294-4, 2577
Moulding shrinkage, paralel	0.9		ISO 294-4, 2577
woulding shinkage, normal	0.5	70	130 234-4, 2377
Typical mechanical properties			
Tensile modulus	45	MPa	ISO 527-1/-2
Stress at 10% strain		MPa	ISO 527-1/-2
Tensile stress at 50% strain, 1BA		MPa	ISO 527-1/-2
Tensile stress at break		MPa	ISO 527-1/-2
Nominal strain at break	800		ISO 527-1/-2
Tensile strain at break	>300		ISO 527-1/-2
Flexural modulus		MPa	ISO 178
Charpy impact strength, 23°C		kJ/m ²	ISO 179/1eU
Charpy impact strength, -30 °C		kJ/m ²	ISO 179/1eU
		kJ/m ²	ISO 179/1eO ISO 179/1eA
Charpy notched impact strength, 23°C		kJ/m ²	
Charpy notched impact strength, -30 °C			ISO 179/1eA
Charpy notched impact strength, -40°C		kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C		kJ/m ²	ISO 180/1A
Izod notched impact strength, -40 °C		kJ/m ²	ISO 180/1A
Brittleness temperature	-96	°C	ISO 974
Shore D hardness, 15s	33		ISO 48-4 / ISO 868
Shore D hardness, max	37		ISO 868
Tear strength, parallel	100	kN/m	ISO 34-1
Tear strength, normal	100	kN/m	ISO 34-1
Thermal properties			
Melting temperature, 10°C/min	193	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-50		ISO 11357-1/-3
Temperature of deflection under load, 0.45 MPa		°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 10N	130		ISO 306
o		E-6/K	
Coeff. of linear therm. expansion, parallel, -40-23°C			ISO 11359-1/-2
Coefficient of linear thermal expansion	220	E-6/K	ISO 11359-1/-2
(CLTE), parallel			
Coeff. of linear therm. expansion, normal, -40-23°C		E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	200	E-6/K	ISO 11359-1/-2
normal		_	
RTI, electrical, 1.5mm		°C	UL 746B
RTI, electrical, 3.0mm		°C	UL 746B
RTI, impact, 1.5mm		°C	UL 746B
RTI, impact, 3.0mm		°C	UL 746B
RTI, strength, 1.5mm	50	°C	UL 746B



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RTI, strength, 3.0mm	50	°C	UL 746B
Flammability			
Burning Behav. at 1.5mm nom. thickn. Thickness tested UL recognition	1.5 yes	class mm	IEC 60695-11-10 IEC 60695-11-10 UL 94
Burning Behav. at thickness h Thickness tested UL recognition	3 yes	class mm	IEC 60695-11-10 IEC 60695-11-10 UL 94
Oxygen index FMVSS Class Burning rate, Thickness 1 mm	20 B <80	% mm/min	ISO 4589-1/-2 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Electrical properties			
Relative permittivity, 100Hz Relative permittivity, 1MHz Dissipation factor, 100Hz Dissipation factor, 1MHz Volume resistivity Surface resistivity Electric strength Comparative tracking index	3E14	E-4 Ohm.m	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 62631-3-2 IEC 60243-1 IEC 60112
Physical/Other properties			
Humidity absorption, 2mm Water absorption, 2mm Water absorption, Immersion 24h Density Density of melt		%	Sim. to ISO 62 Sim. to ISO 62 Sim. to ISO 62 ISO 1183
Film Properties			
WVTR, 23°C/85%r.h. Thickness of specimen	900 0.025	g/(m²*d) mm	DIS 15106-1/-2
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 Mold Temperature Optimum	yes 100 2 - 3 ≤0.08 225 220 250 40	h % °C °C	



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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, Coatable, Casting, Thermoforming
Delivery form	Pellets
Special characteristics	Light stabilised or stable to light
Sustainability	Bio-Content

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 = 40 °C Mold temperature range = 30-40 °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



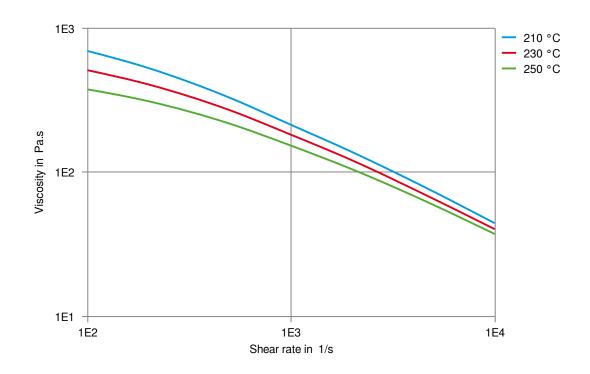


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Automotive

OEM VW Group STANDARD VW 50123 TPC-ET 55D

Viscosity-shear rate

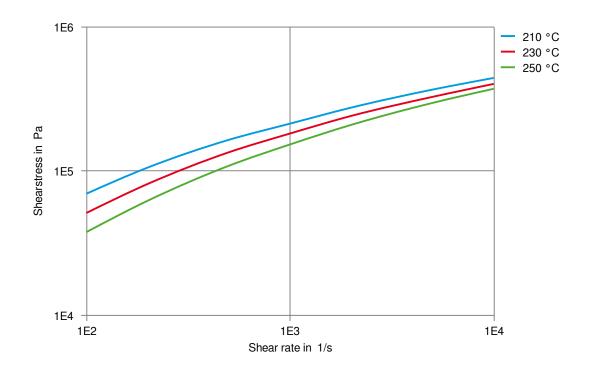






Hytrel[®] 4069 ECO-B 652 THERMOPLASTIC POLYESTER ELASTOMER

Shearstress-shear rate





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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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- 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
- 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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