DuPont™ Hytrel® 8238

THERMOPLASTIC POLYESTER ELASTOMER

Product Information

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, DuPont recommends, 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® 8238 is the highest modulus grade, with nominal hardness of 82D. It contains non-discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

Typical applications:

Cubing, wire and cable, gears, sprockets, electrical connectors and oil field parts.

General information	Value	Unit	Test Standard
Resin Identification	TPC-ET	-	ISO 1043
Part Marking Code	TPC-ET	-	ISO 11469
Rheological properties	**Value**	**Unit**	**Test Standard**
Melt volume-flow rate	11.5	cm^3/10min	ISO 1133
Temperature	240	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	12.5	g/10min	ISO 1133
Melt mass-flow rate, Temperature	240	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	1.6	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.6	%	ISO 294-4, 2577
Mechanical properties (TPE)	**Value**	**Unit**	**Test Standard**
Yield stress	38	MPa	ISO 527-1/-2
Yield strain	19	%	ISO 527-1/-2
Stress at 10% strain	34	MPa	ISO 527-1/-2
Stress at 50% strain	28	MPa	ISO 527-1/-2
Stress at 100% strain	26	MPa	ISO 527-1/-2
Stress at break	46	MPa	ISO 527-1/-2
Strain at break	>300	%	ISO 527-1/-2
Nominal strain at break	340	%	ISO 527-1/-2
Tear strength, parallel	228	kN/m	ISO 34-1
Tear strength, normal	212	kN/m	ISO 34-1
Shore D hardness, max	76	-	ISO 7619-1
Shore D hardness, 15s	70	-	ISO 7619-1
Mechanical properties	**Value**	**Unit**	**Test Standard**
Tensile Modulus	1200	MPa	ISO 527-1/-2
Flexural Modulus	1150	MPa	ISO 178
Charpy notched impact strength			ISO 179/1eA
23°C	15	kJ/m^2	
-30°C	5	kJ/m^2	
-40°C	5	kJ/m^2	

To find out more, visit DuPont Performance Polymers or contact nearest DuPont location.

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Tensile notched impact strength, 23°C	57	kJ/m²	ISO 8256/1
Brittleness temperature	-84	°C	ISO 974
Izod notched impact strength			ISO 180/1A
23°C	11	kJ/m²	
-40°C	5.5	kJ/m²	
Thermal properties	**Value**	**Unit**	**Test Standard**
Melting temperature, 10°C/min	221	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	50	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	45	°C	
0.45 MPa	105	°C	
Vicat softening temperature			ISO 306
50°C/h, 50N	150	°C	
50°C/h, 10N	213	°C	
Coeff. of linear therm. expansion, parallel	150	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	140	E-6/K	
Normal, -40-23°C	100	E-6/K	
Parallel, -40-23°C	90	E-6/K	
Thermal conductivity of melt	0.15	W/(m K)	-
Spec. heat capacity of melt	2150	J/(kg K)	-
Eff. thermal diffusivity	5.44E-8	m²/s	-
RTI, electrical			UL 746B
0.75mm	50	°C	
1.5mm	90	°C	
3mm	90	°C	
RTI, impact			UL 746B
0.75mm	50	°C	
1.5mm	85	°C	
3mm	85	°C	
RTI, strength			UL 746B
0.75mm	50	°C	
1.5mm	85	°C	
3mm	85	°C	
Flammability	**Value**	**Unit**	**Test Standard**
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	0.91	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Oxygen index	22	%	ISO 4589-1/-2
Flammability, 3.0mm	HB	-	IEC 60695-11-10
FMVSS Class	SE	-	ISO 3795 (FMVSS 302)
Electrical properties	**Value**	**Unit**	**Test Standard**
Relative permittivity			IEC 60250
100Hz	4	-	
1MHz	3.7	-	
Dissipation factor			IEC 60250
100Hz	100	E-4	
1MHz	175	E-4	
Volume resistivity	>1E13	Ohm*m	IEC 60093
Surface resistivity	>1E15	Ohm	IEC 60093
Electric strength	21	kV/mm	IEC 60243-1
Comparative tracking index	600	-	IEC 60112

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Other properties	Value	Unit	Test Standard
Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.6	%	Sim. to ISO 62
Density	1280	kg/m³	ISO 1183
Density of melt	1130	kg/m³	-
Water Absorption, Immersion 24h	0.3	%	Sim. to ISO 62
VDA Properties	**Value**	**Unit**	**Test Standard**
Emission of organic compounds	550	µgC/g	VDA 277
Injection	**Value**	**Unit**	**Test Standard**
Drying Recommended	yes	-	-
Drying Temperature	110	°C	-
Drying Time, Dehumidified Dryer	2 - 3	h	-
Processing Moisture Content	≤0.08	%	-
Melt Temperature Optimum	250	°C	-
Min. melt temperature	245	°C	-
Max. melt temperature	260	°C	-
Mold Temperature Optimum	45	°C	-
Min. mould temperature	45	°C	-
Max. mould temperature	55	°C	-
Hold pressure range	≤70	MPa	-
Extrusion	**Value**	**Unit**	**Test Standard**
Drying Temperature	100 - 120	°C	-

Characteristics			
Processing	• Injection Moulding • Film Extrusion • Profile Extrusion	• Sheet Extrusion • Other Extrusion • Casting	• Thermoforming
Delivery form	• Pellets		
Special characteristics	• Light stabilised or stable to light		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

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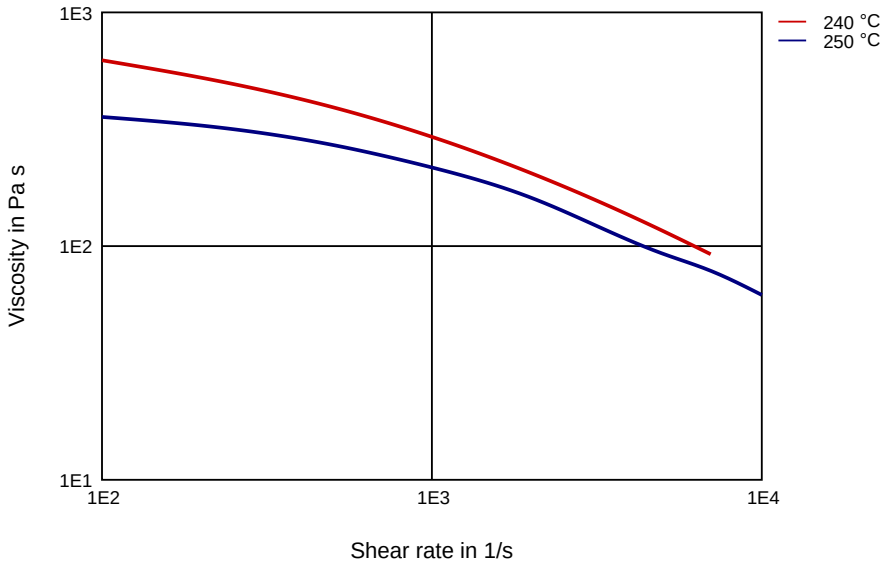
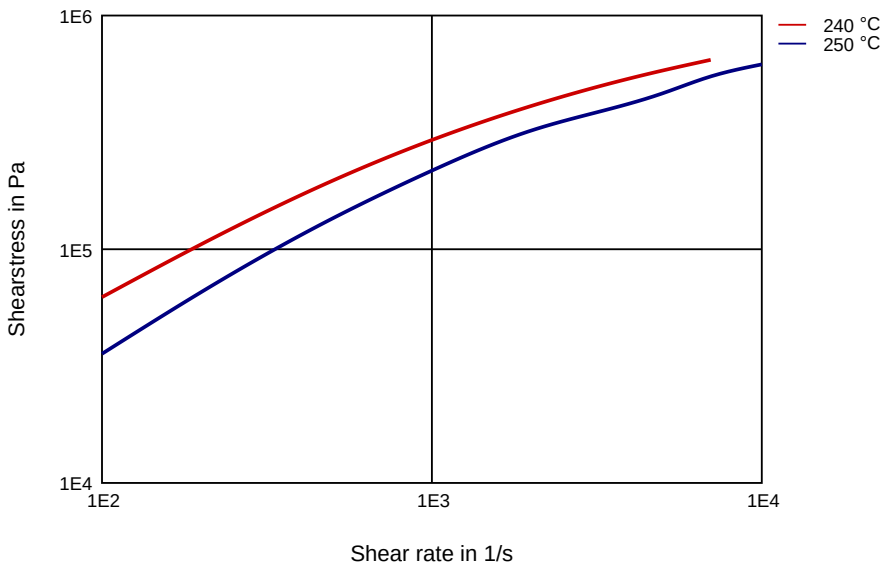
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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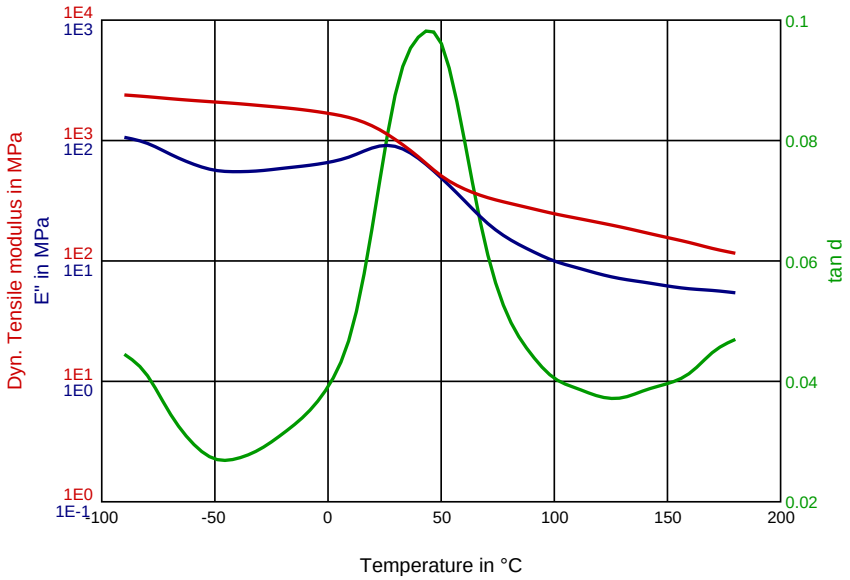
Dynamic Tensile modulus-temperature



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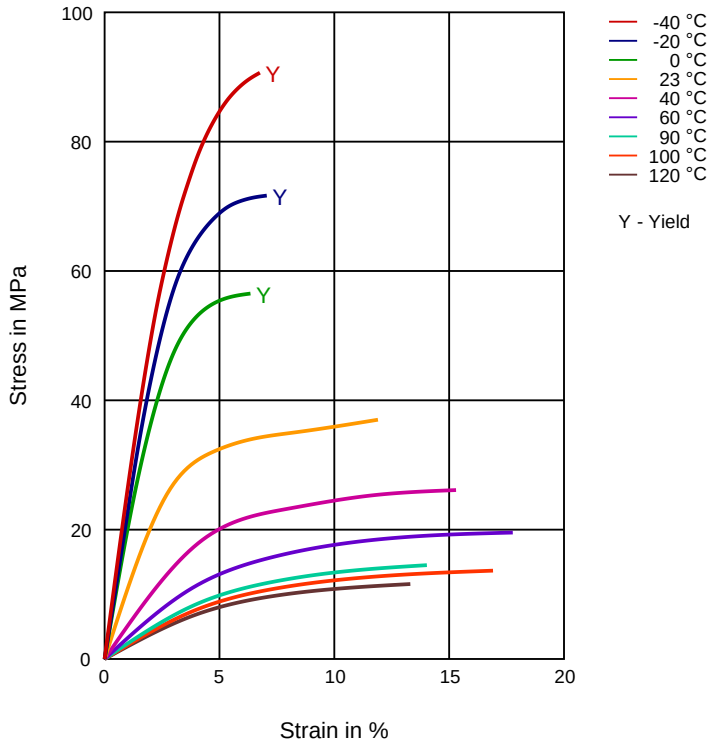
Stress-strain



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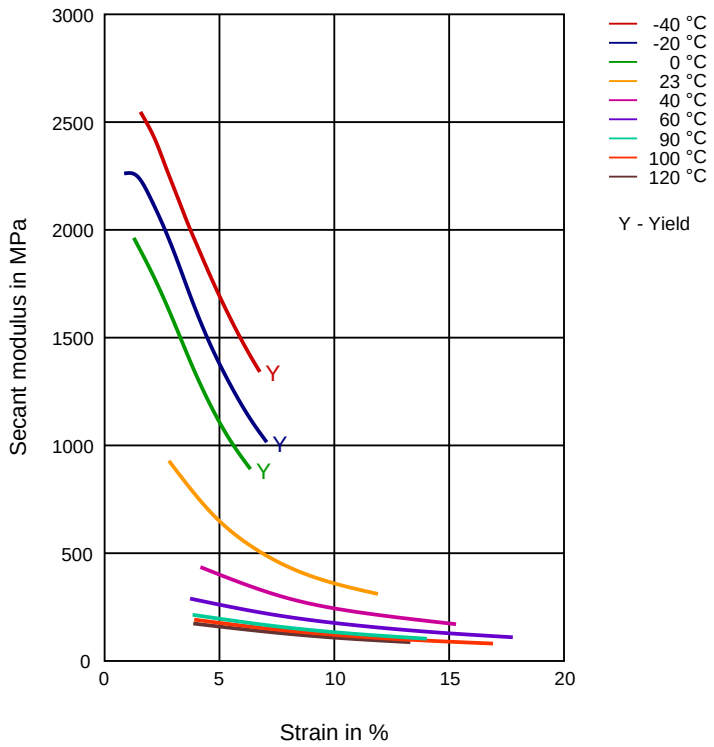
Secant modulus-strain



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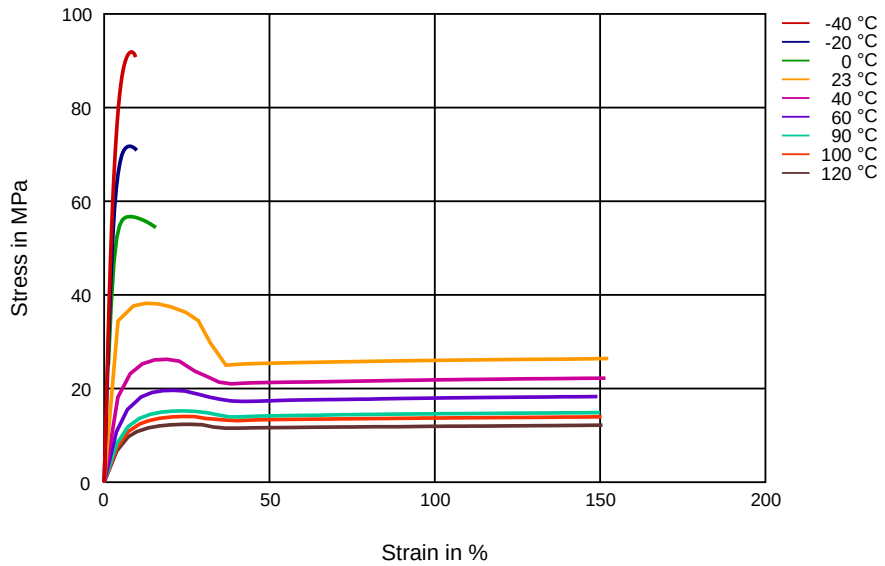
Stress-Strain (TPE)



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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)
- ✗ Nitric Acid (40% by mass) (23°C)
- ✗ Sulfuric Acid (38% by mass) (23°C)
- ✓ Sulfuric Acid (5% by mass) (23°C)
- ✗ 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

- ✗ Acetone (23°C)

Ethers

- ✗ Diethyl ether (23°C)

Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23°C)
- ✗ SAE 10W40 multigrade motor oil (130°C)
- ✗ SAE 80/90 hypoid-gear oil (130°C)
- ✓ Insulating Oil (23°C)

Standard Fuels

- ✗ ISO 1817 Liquid 1 - E5 (60°C)
- ✗ ISO 1817 Liquid 2 - M15E4 (60°C)
- ✗ ISO 1817 Liquid 3 - M3E7 (60°C)
- ✗ 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)

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- ✓ 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)

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)
- ✗ 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).

✗ 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 4mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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