Hytrel® G4074

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, 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® G4074 is a low modulus grade with nominal hardness of 40D. It contains discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

Typical applications:
Hose and tubing, hose jackets, wire and cable jackets, film and sheeting, moulded products. Not suited for light-colored finished products.

Product information

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

Rheological properties

Melt volume-flow rate	5	cm³/10min	ISO 1133
Melt mass-flow rate	5.3	g/10min	ISO 1133
Temperature	190	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate, Temperature	190	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	0.8	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8	%	ISO 294-4, 2577

Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

Typical mechanical properties

Tensile Modulus	55	MPa	ISO 527-1/-2
Stress at 5% strain	2.5	MPa	ISO 527-1/-2
Stress at 10% strain	4.4	MPa	ISO 527-1/-2
Stress at 50% strain	8	MPa	ISO 527-1/-2
Stress at break	20	MPa	ISO 527-1/-2
Nominal strain at break	360	%	ISO 527-1/-2
Strain at break	250	%	ISO 527-1/-2
Flexural Modulus	65	MPa	ISO 178
Shear Modulus	16	MPa	ISO 6721
Tensile creep modulus, 1000h	35	MPa	ISO 899-1
Charpy impact strength, 23°C	N	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	N	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	N	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	N	kJ/m²	ISO 179/1eA
Puncture - maximum force, -30°C	3000	N	ISO 6603-2
Puncture energy, -30°C	37	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
Brittleness temperature	-60	°C	ISO 974
Shore D hardness, 15s	35	-	ISO 48-4
Shore D hardness, max	40	-	ISO 48-4
Tear strength, parallel	86	kN/m	ISO 34-1
Tear strength, normal	96	kN/m	ISO 34-1
Abrasion resistance	50	mm³	ISO 4649

Thermal properties

Melting temperature, 10°C/min	170	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-35	°C	ISO 11357-1/-2
Vicat softening temperature, 50°C/h 10N	115	°C	ISO 306
CLTE, Parallel, -40-23°C	220	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	210	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	180	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	200	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.26	W/(m K)	
Eff. thermal diffusivity	5.44E-8	m²/s	
Spec. heat capacity of melt	2050	J/(kg K)	
RTI, electrical, 0.75mm	90	°C	UL 746B
RTI, electrical, 1.5mm	90	°C	UL 746B
RTI, electrical, 3mm	90	°C	UL 746B
RTI, impact, 0.75mm	50	°C	UL 746B
RTI, impact, 1.5mm	85	°C	UL 746B
RTI, impact, 3mm	85	°C	UL 746B
RTI, strength, 0.75mm	50	°C	UL 746B

Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

RTI, strength, 1.5mm	85	°C	UL 746B
RTI, strength, 3mm	85	°C	UL 746B

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	3	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Oxygen index	20	%	ISO 4589-1/-2
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	51	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	5.7	-	IEC 62631-2-1
Relative permittivity, 1MHz	5	-	IEC 62631-2-1
Dissipation factor, 100Hz	550	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	530	E-4	IEC 62631-2-1
Volume resistivity	4E9	Ohm.m	IEC 62631-3-1
Surface resistivity	2E13	Ohm	IEC 62631-3-2
Electric strength	17	kV/mm	IEC 60243-1

Other properties

Density	1180	kg/m³	ISO 1183
Density of melt	1030	kg/m³	

Film Properties

WVTR, 23°C/85%r.h.	1900	g/(m²*d)	DIS 15106-1/-2
Oxygen transmission rate, 23°C/85%r.h.	34000	cm³/(m²*d*bar)	DIS 15105-1/-2
Thickness of specimen	0.025	mm	

VDA Properties

Odour	4	class	VDA 270

Injection

Drying Recommended	yes	
Drying Temperature	100	°C
Drying Time, Dehumidified Dryer	2 - 3	h
Processing Moisture Content	≤0.08	%
Melt Temperature Optimum	200	°C
Min. melt temperature	190	°C
Max. melt temperature	220	°C

Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

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

Extrusion

Drying Temperature	≤80 °C
Drying Time, Dehumidified Dryer	2 - 3 h
Processing Moisture Content	≤0.06 %
Melt Temperature Optimum	195 °C
Melt Temperature Range	185 - 200 °C

Additional Information

Profile extrusion

PREPROCESSING

Drying temperature = 80°C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.06 %

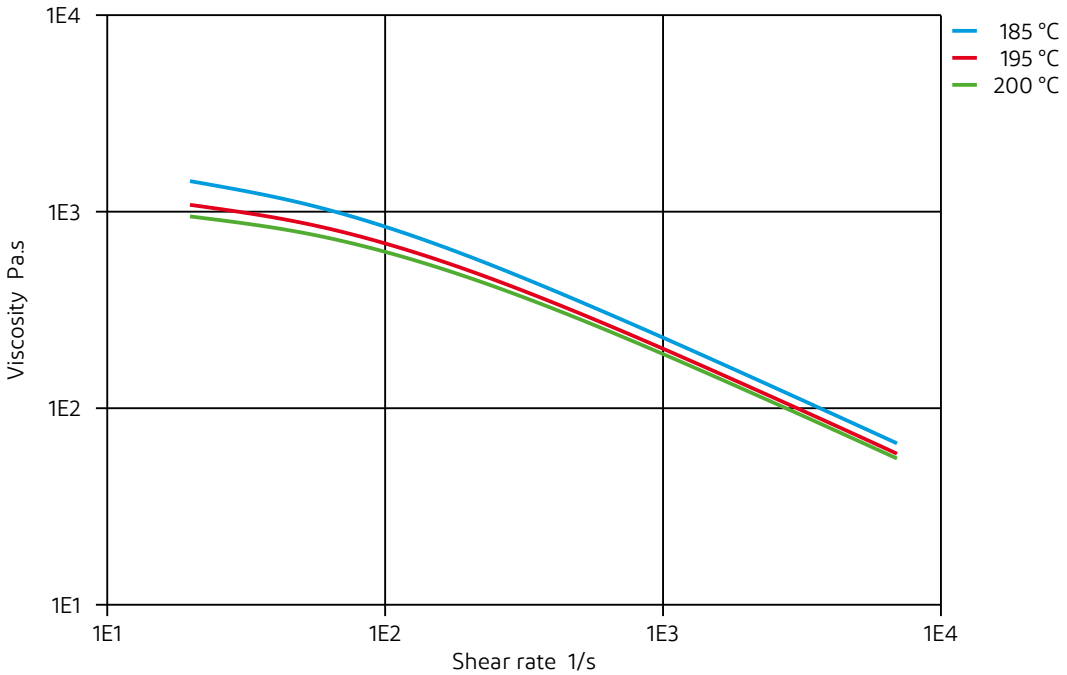
PROCESSING

Melt temperature optimum = 195°C
Melt temperature range = 185-200°C

Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

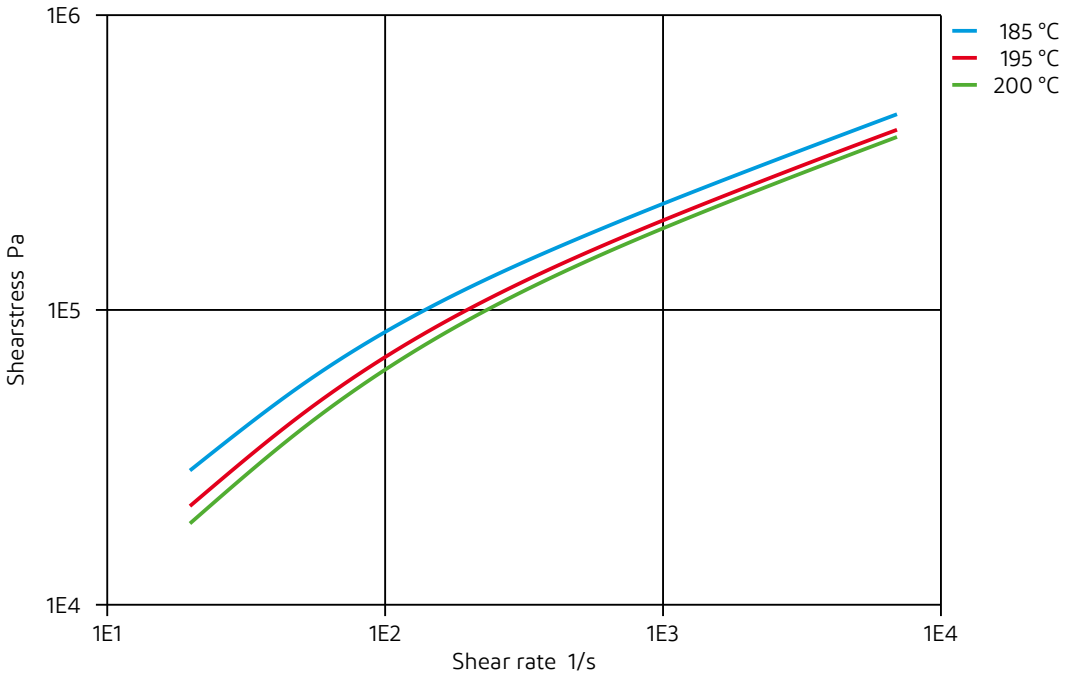
Viscosity-shear rate



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

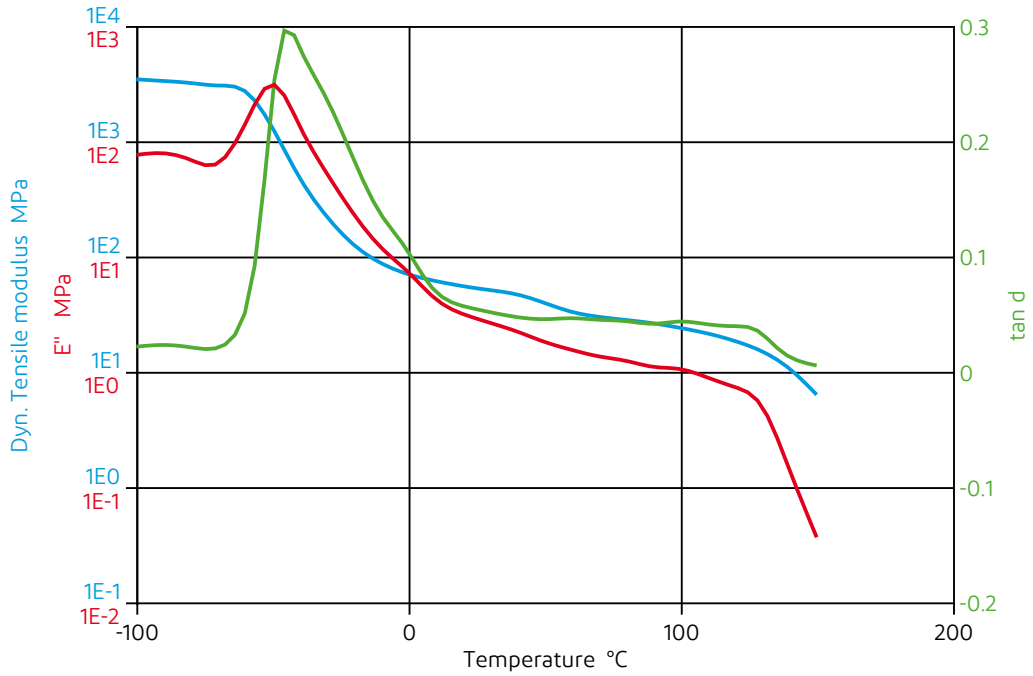
Shearstress-shear rate



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

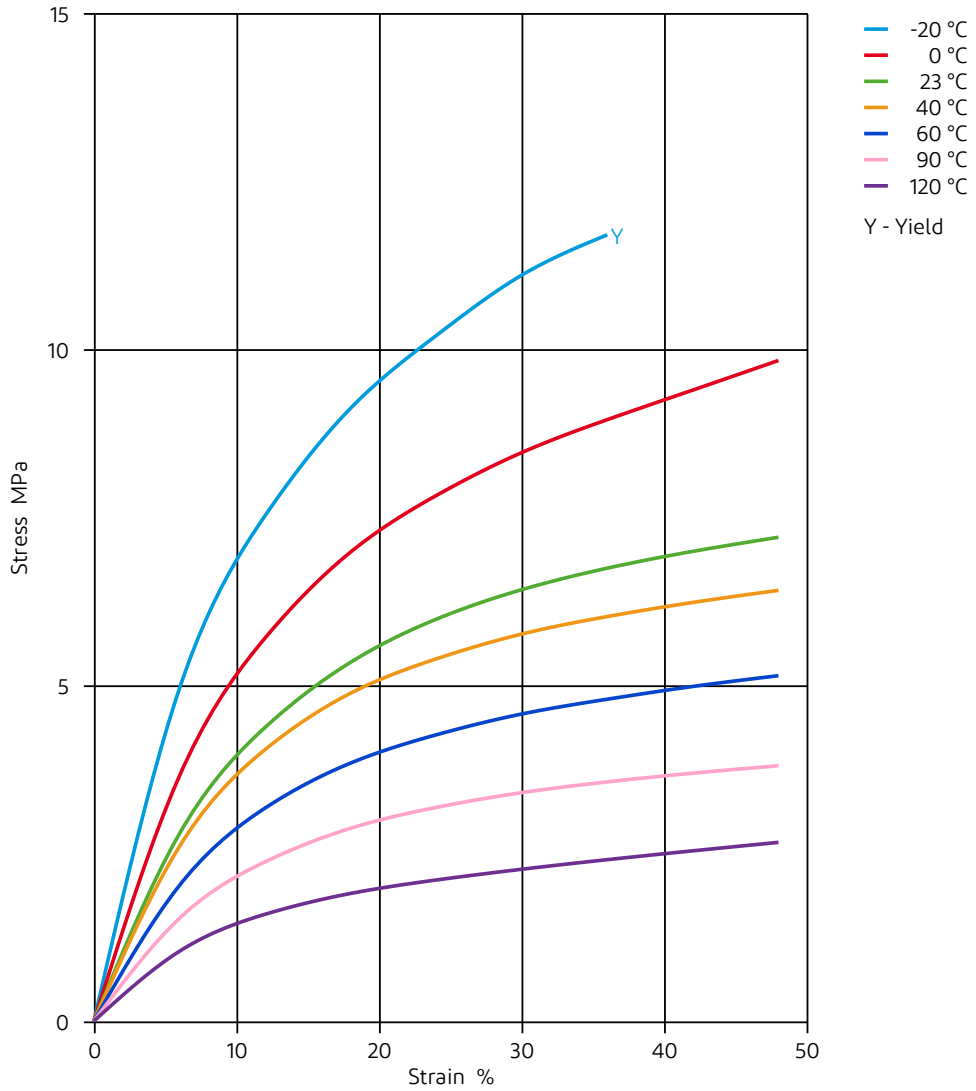
Dynamic Tensile modulus-temperature



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

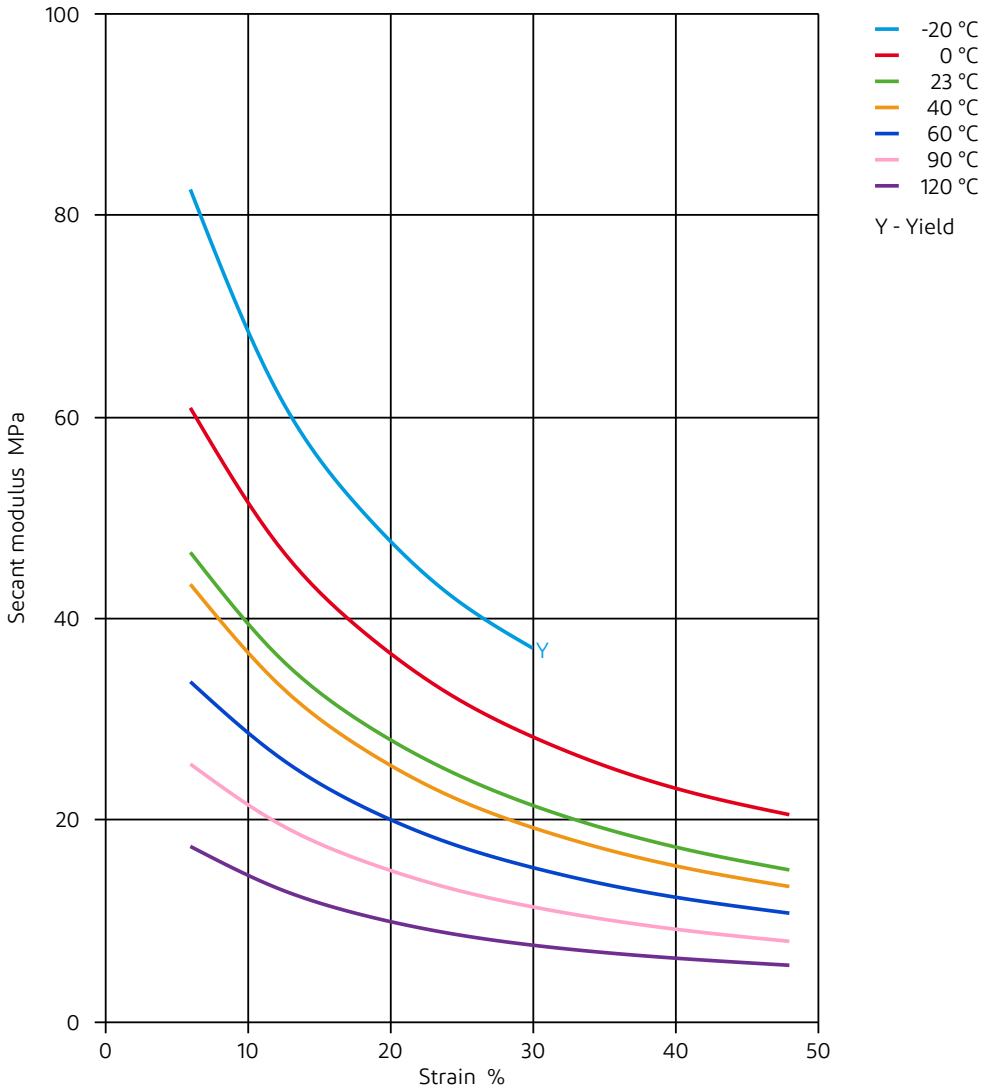
Stress-strain



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

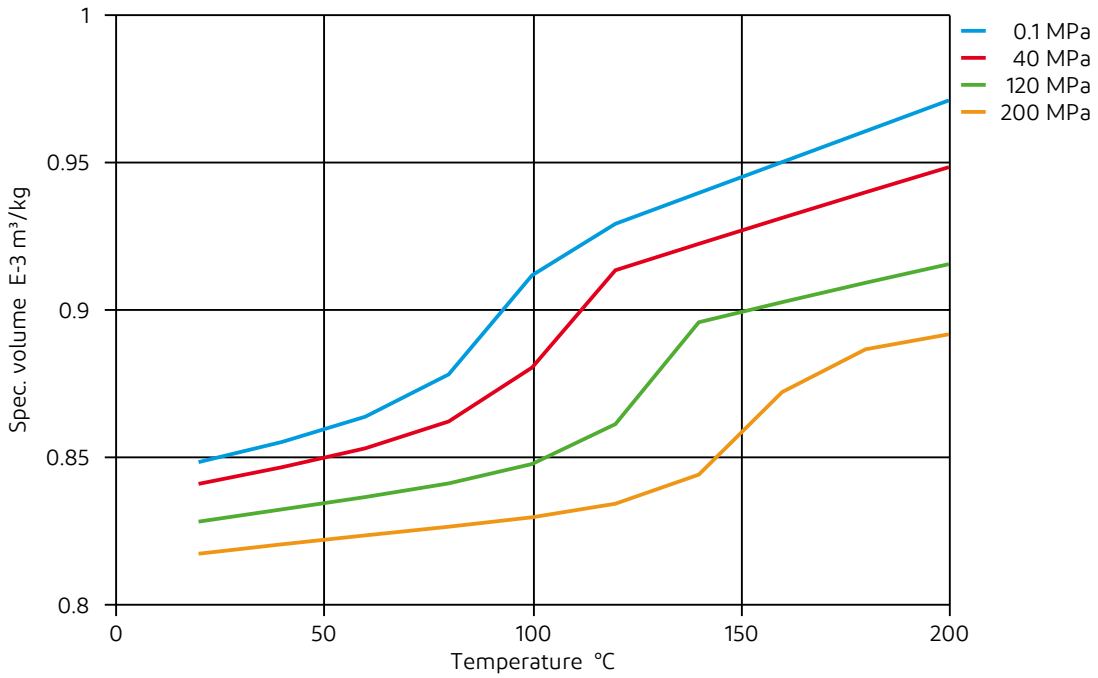
Secant modulus-strain



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

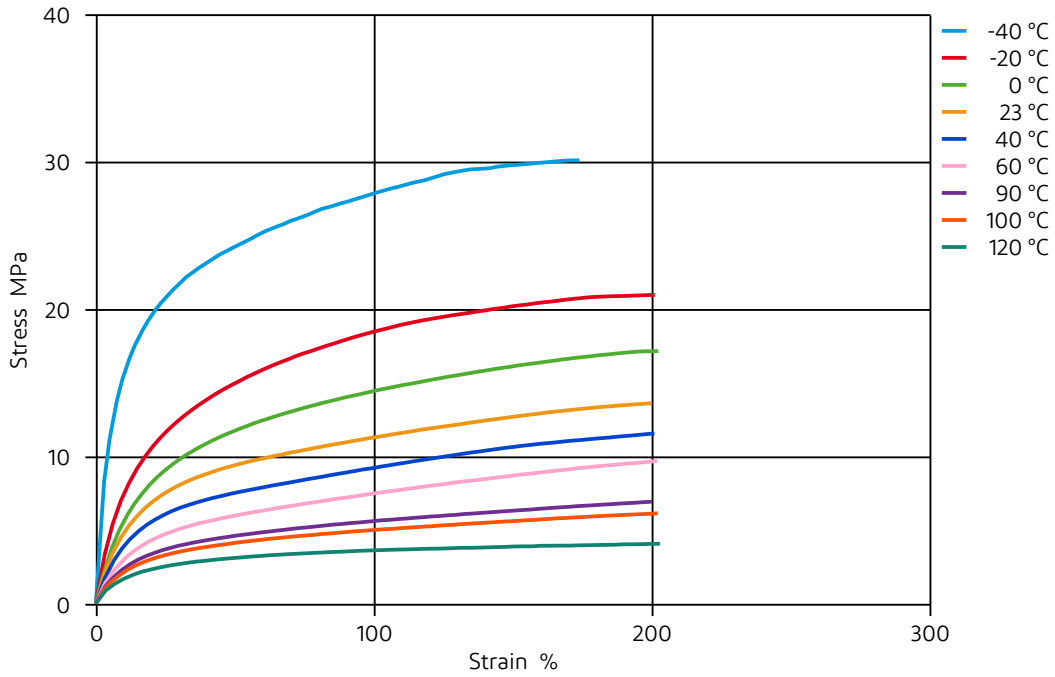
Specific volume-temperature (pvT)



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

Stress-Strain (Flexible Materials)



Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

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
- ✔ 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

Hytrel® G4074

THERMOPLASTIC POLYESTER ELASTOMER

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).