DuPont™ Hytrel® G4774

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® G4774 is a medium modulus grade with nominal hardness of 47D. It contains discoloring stabilizer. It can be processed by many conventional thermoplastic processing techniques like injection molding and extrusion.

Typical applications:

Hose and tubing, wire and cable jackets, film and sheeting, profiles and moulded products. Not suited for light-colored finished products.

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	cm^3/10min	ISO 1133
Temperature	230	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	11	g/10min	ISO 1133
Melt mass-flow rate, Temperature	230	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Moulding shrinkage, parallel	1.5	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.2	%	ISO 294-4, 2577
Mechanical properties (TPE)	**Value**	**Unit**	**Test Standard**
Tensile Modulus	110	MPa	ISO 527-1/-2
Stress at 10% strain	7	MPa	ISO 527-1/-2
Stress at 50% strain	12	MPa	ISO 527-1/-2
Stress at break	17	MPa	ISO 527-1/-2
Strain at break	200	%	ISO 527-1/-2
Nominal strain at break	400	%	ISO 527-1/-2
Tear strength, parallel	100	kN/m	ISO 34-1
Tear strength, normal	90	kN/m	ISO 34-1
Abrasion resistance	33	mm^3	ISO 4649
Shore D hardness, max	48	-	ISO 7619-1
Shore D hardness, 15s	43	-	ISO 7619-1
Mechanical properties	**Value**	**Unit**	**Test Standard**
Flexural Modulus	111	MPa	ISO 178
Shear Modulus	39	MPa	ISO 6721
Poisson's ratio	0.4	-	ISO 527-1/-2
Charpy impact strength			ISO 179/1eU
23°C	N	kJ/m^2	
-30°C	N	kJ/m^2	

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

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Charpy notched impact strength			ISO 179/1eA
23°C	N	kJ/m²	
-30°C	N	kJ/m²	
-40°C	120[P]	kJ/m²	
Tensile notched impact strength, 23°C	260	kJ/m²	ISO 8256/1
Brittleness temperature	-66	°C	ISO 974
Izod notched impact strength			ISO 180/1A
23°C	N	kJ/m²	
-40°C	N	kJ/m²	

P: Partial Break

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	208	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-45	°C	ISO 11357-1/-2
Temp. of deflection under load, 0.45 MPa	60	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 10N	165	°C	ISO 306
Coeff. of linear therm. expansion, parallel	220	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	190	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.16	W/(m K)	-
Spec. heat capacity of melt	2100	J/(kg K)	-
Eff. thermal diffusivity	5.44E-8	m²/s	-
RTI, electrical			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°C	
RTI, impact			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°C	
RTI, strength			UL 746B
0.75mm	50	°C	
1.5mm	50	°C	
3mm	50	°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	3	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Glow Wire Flammability Index, 2mm	700	°C	IEC 60695-2-1/2
Glow Wire Ignition Temperature, 2mm	675	°C	IEC 60695-2-1/3
Glow Wire Temperature, No Flame, 2mm	650	°C	IEC 60335-1
Flammability, 3.0mm	HB	-	IEC 60695-11-10
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	33	mm/min	ISO 3795 (FMVSS 302)

Electrical properties	Value	Unit	Test Standard
Relative permittivity, 1MHz	4.7	-	IEC 60250
Volume resistivity	1E12	Ohm*m	IEC 60093
CTI, 23°C, 3.0mm	600	PLC	UL 746A

Other properties	Value	Unit	Test Standard
Density	1190	kg/m³	ISO 1183
Density of melt	1010	kg/m³	-
Water Absorption, Immersion 24h	2.5	%	Sim. to ISO 62

VDA Properties	Value	Unit	Test Standard
Emission of organic compounds	18	µgC/g	VDA 277
Odour	5	class	VDA 270

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Injection	Value	Unit	Test Standard
Drying Recommended	yes	-	-
Drying Temperature	100	°C	-
Drying Time, Dehumidified Dryer	2 - 3	h	-
Processing Moisture Content	≤0.08	%	-
Melt Temperature Optimum	240	°C	-
Min. melt temperature	235	°C	-
Max. melt temperature	260	°C	-
Mold Temperature Optimum	45	°C	-
Min. mould temperature	45	°C	-
Max. mould temperature	55	°C	-

Extrusion	Value	Unit	Test Standard
Processing Moisture Content	≤0.06	%	-
Melt Temperature Optimum	230	°C	-

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

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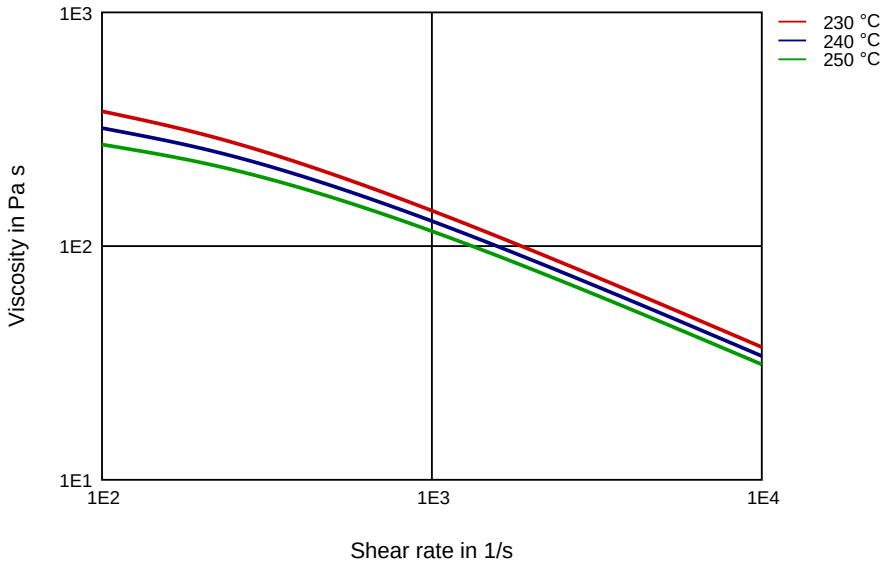
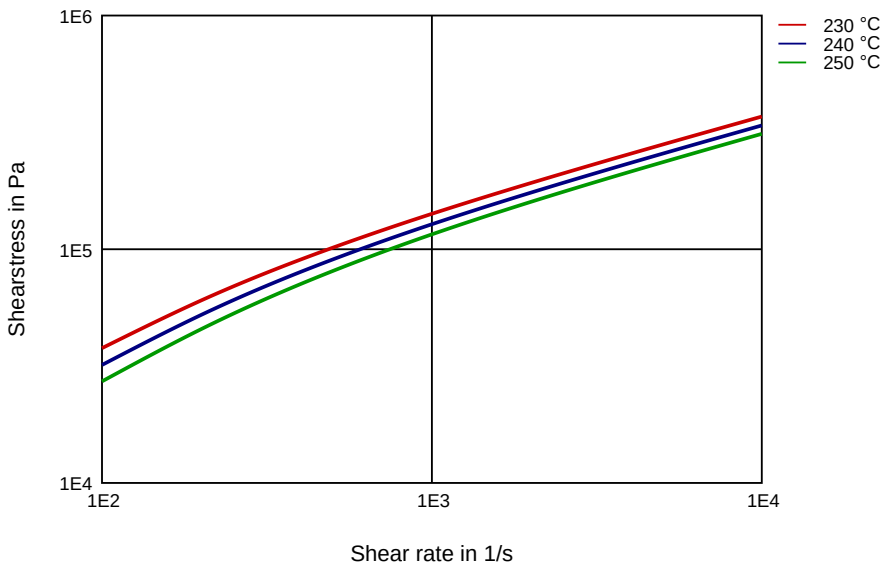
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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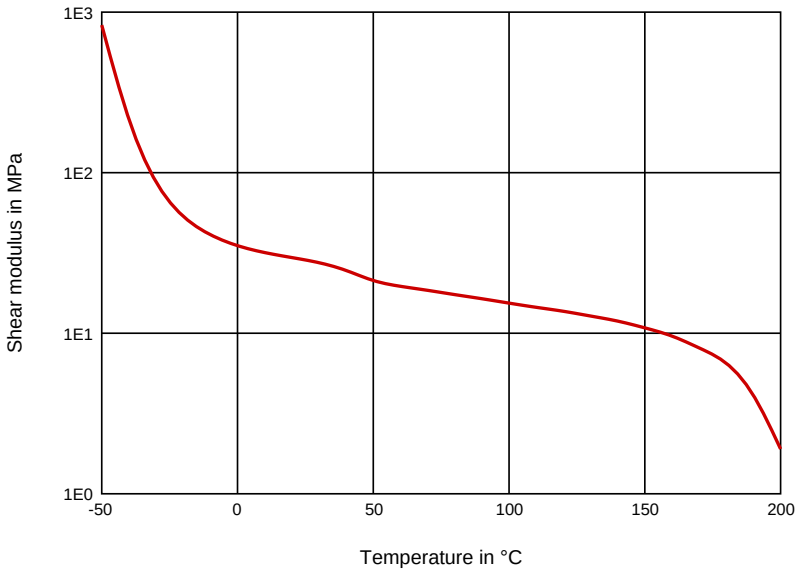
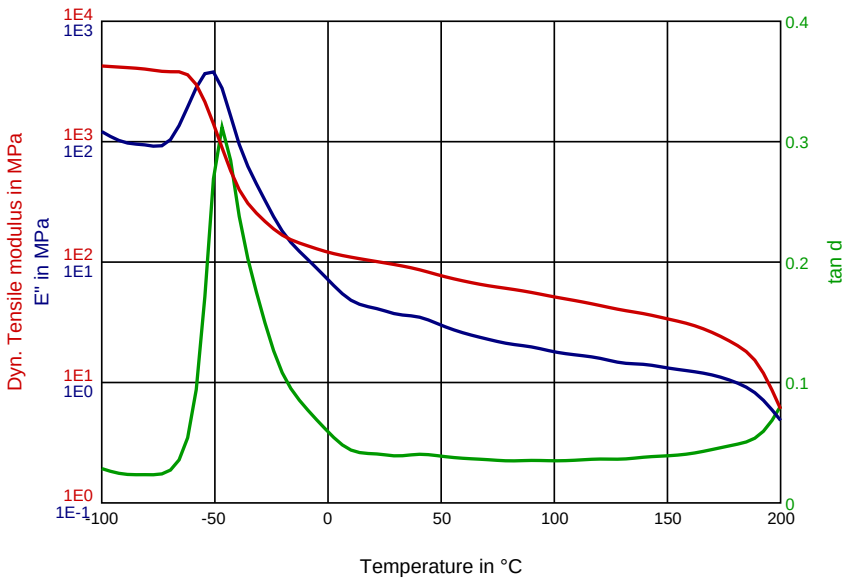
Dynamic Shear modulus-temperature



Dynamic Tensile modulus-temperature



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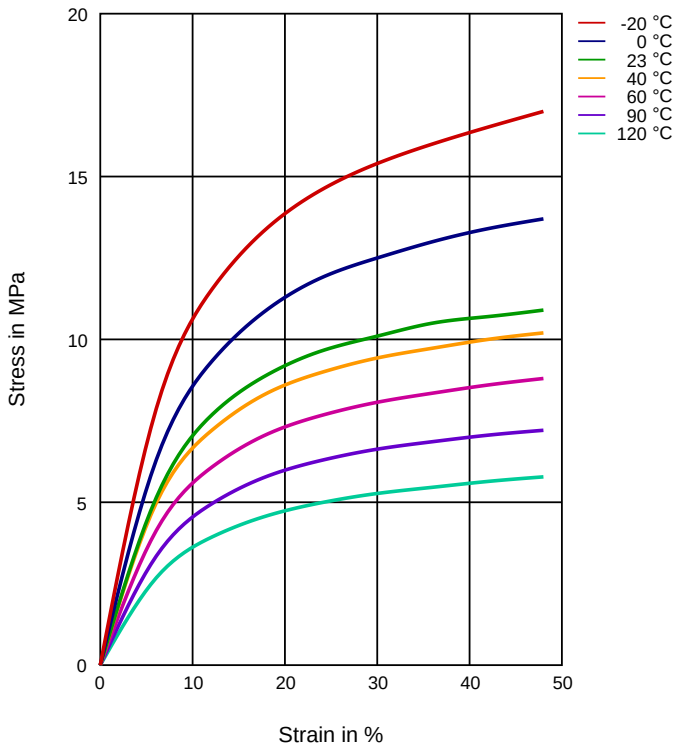
Stress-strain



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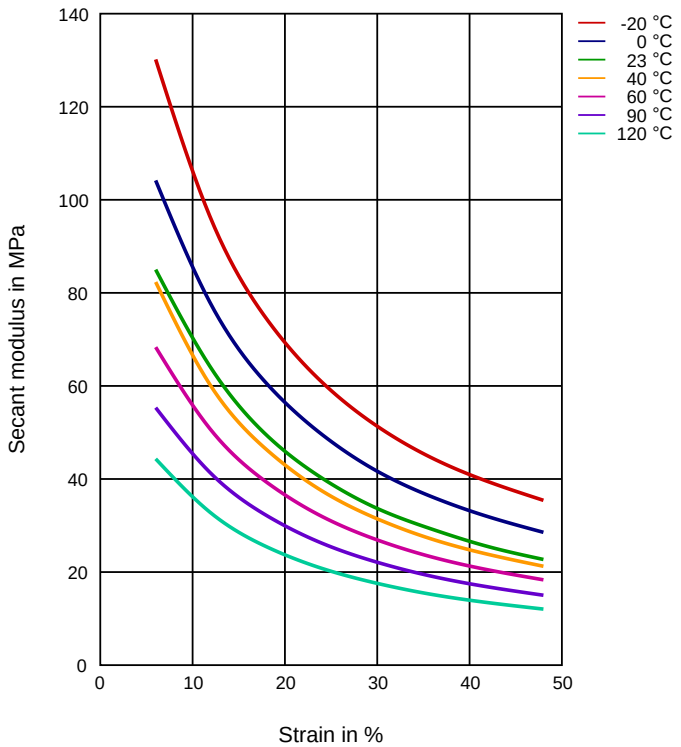
Secant modulus-strain



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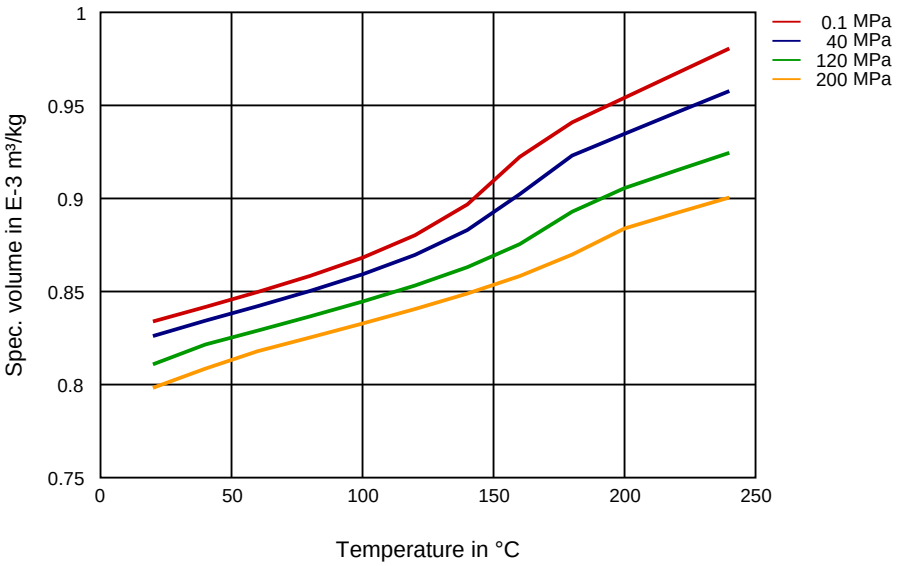
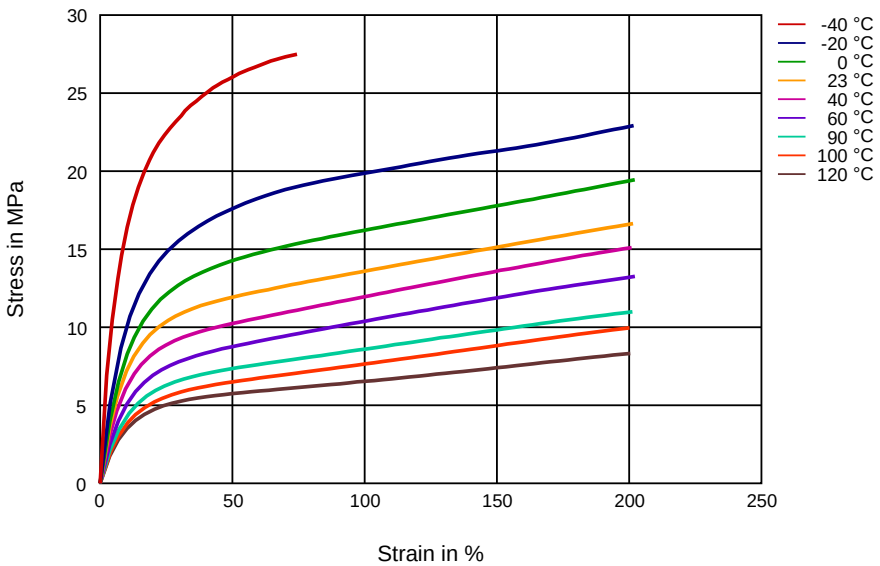
Specific volume-temperature (pvT)



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)
- ✗ Motor oil OS206 304 Ref.Eng.Oil, ISP (135°C)
- ✗ Automatic hypoid-gear oil Shell Donax TX (135°C)
- ✗ Hydraulic oil Pentosin CHF 202 (125°C)

Standard Fuels

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

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- ✗ 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)

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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