DuPont™ Hytrel® 5555HS

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® 5555HS is a medium modulus Hytrel® grade, with nominal durometer hardness of 55D. It is a specially stabilized version of Hytrel® 5556 for superior heat and oil resistance properties.

Typical applications:

Parts with increased heat-ageing stability and oil and grease resistance such as tubing and hose, wire and cable jackets, film and sheeting, belting.

Precautions:

Contains a discoloring antioxidant. 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	8.5	cm³/10min	ISO 1133
Temperature	220	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	8.5	g/10min	ISO 1133
Melt mass-flow rate, Temperature	220	°C	ISO 1133
Melt mass-flow rate, Load	2.16	kg	ISO 1133
Molding shrinkage, parallel	1.3	%	ISO 294-4, 2577
Molding shrinkage, normal	1.4	%	ISO 294-4, 2577
Mechanical properties (TPE)	**Value**	**Unit**	**Test Standard**
Yield stress	15	MPa	ISO 527-1/-2
Yield strain	36	%	ISO 527-1/-2
Stress at 5% strain	6.9	MPa	ISO 527-1/-2
Stress at 10% strain	11.1	MPa	ISO 527-1/-2
Stress at 50% strain	14.7	MPa	ISO 527-1/-2
Stress at 100% strain	16	MPa	ISO 527-1/-2
Stress at break	35	MPa	ISO 527-1/-2
Strain at break	>300	%	ISO 527-1/-2
Nominal strain at break	640	%	ISO 527-1/-2
Compression Set at 70 °C	60	%	ISO 815
Tear strength, parallel	134	kN/m	ISO 34-1
Tear strength, normal	124	kN/m	ISO 34-1
Abrasion resistance	120	mm³	ISO 4649
Shore D hardness, max	55	-	ISO 7619-1
Shore D hardness, 15s	52	-	ISO 7619-1

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Mechanical properties	Value	Unit	Test Standard
Tensile Modulus	190	MPa	ISO 527-1/-2
Flexural Modulus	195	MPa	ISO 178
Shear Modulus	65	MPa	ISO 6721
Poisson's ratio	0.48	-	ISO 527-1/-2
Tensile creep modulus			ISO 899-1
1h	140	MPa	
1000h	100	MPa	
Charpy impact strength, 73°F	N	kJ/m²	ISO 179/1eU
Charpy notched impact strength			ISO 179/1eA
-22°F	30	kJ/m²	
-40°F	14	kJ/m²	
Tensile notched impact strength, 73°F	300	kJ/m²	ISO 8256/1
Brittleness temperature	-80	°C	ISO 974
Izod notched impact strength, -40°F	110[P]	kJ/m²	ISO 180/1A

P: Partial Break

Thermal properties	Value	Unit	Test Standard
Melting temperature, 18°F/min	201	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
260 psi	51	°C	
65 psi	78	°C	
Vicat softening temperature			ISO 306
90°F/h, 11 lbf	75	°C	
90°F, 2 lbf	177	°C	
Coeff. of linear therm. expansion, parallel	180	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	180	E-6/K	ISO 11359-1/-2
Eff. thermal diffusivity	5.44E-8	m²/s	-
RTI, electrical			UL 746B
30mil	90	°C	
60mil	90	°C	
120mil	90	°C	
RTI, impact			UL 746B
30mil	50	°C	
60mil	85	°C	
120mil	85	°C	
RTI, strength			UL 746B
30mil	50	°C	
60mil	85	°C	
120mil	85	°C	

Flammability	Value	Unit	Test Standard
Burning Behav. at 60mil 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
Flammability, 3.0mm	HB	-	IEC 60695-11-10
FMVSS Class	SE	-	ISO 3795 (FMVSS 302)

Electrical properties	Value	Unit	Test Standard
Comparative tracking index	600	-	IEC 60112

Other properties	Value	Unit	Test Standard
Humidity absorption, 80mil	0.2	%	Sim. to ISO 62
Water absorption, 80mil	0.6	%	Sim. to ISO 62
Density	1190	kg/m³	ISO 1183
Water Absorption, Immersion 24h	0.7	%	Sim. to ISO 62

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VDA Properties	Value	Unit	Test Standard	
Fogging, G-value (condensate)	0.1	mg	ISO 6452	DS

DS: Derived from similar grade

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	230	°C	-
Min. melt temperature	220	°C	-
Max. melt temperature	250	°C	-
Mold Temperature Optimum	45	°C	-
Min. mold temperature	45	°C	-
Max. mold temperature	55	°C	-

Extrusion	Value	Unit	Test Standard
Drying Temperature	90 - 110	°C	-
Drying Time, Dehumidified Dryer	2 - 3	h	-
Processing Moisture Content	≤0.06	%	-
Melt Temperature Optimum	225	°C	-
Melt Temperature Range	220 - 235	°C	-

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

Processing Texts

Profile extrusion

PREPROCESSING

Drying temperature = 100°C
Drying time, dehumidified dryer = 2-3 h
Processing moisture content = <0.06%

PROCESSING

Melt temperature optimum = 225°C

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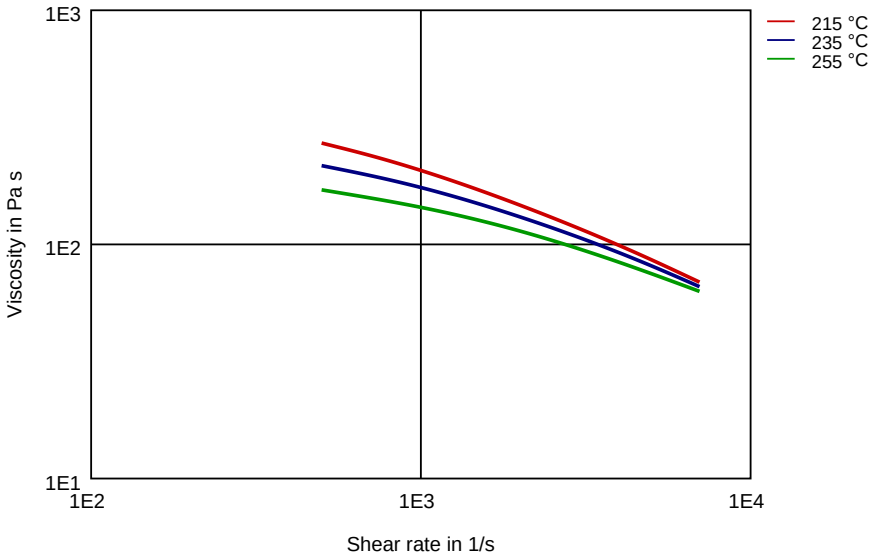
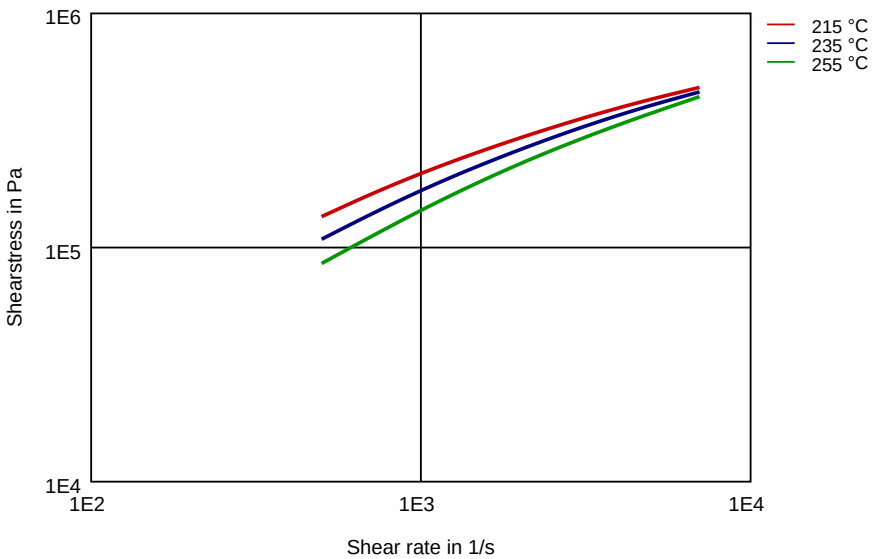
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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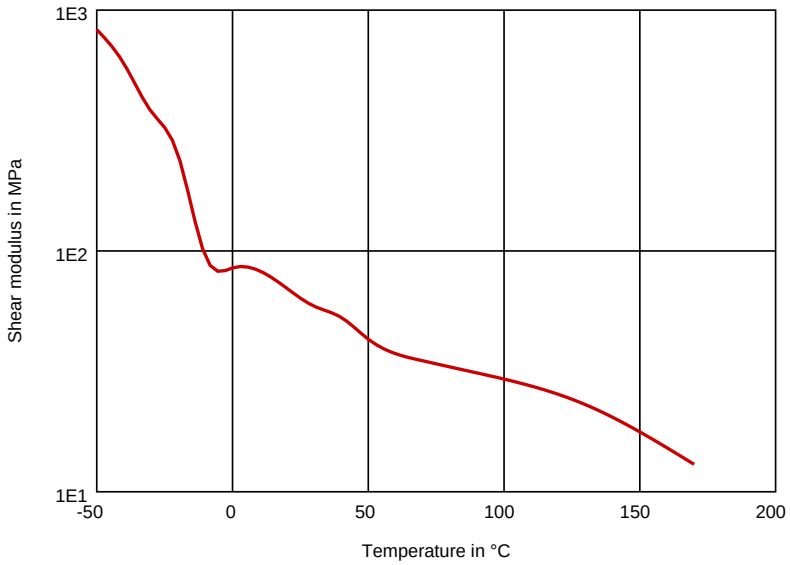
Dynamic Shear modulus-temperature



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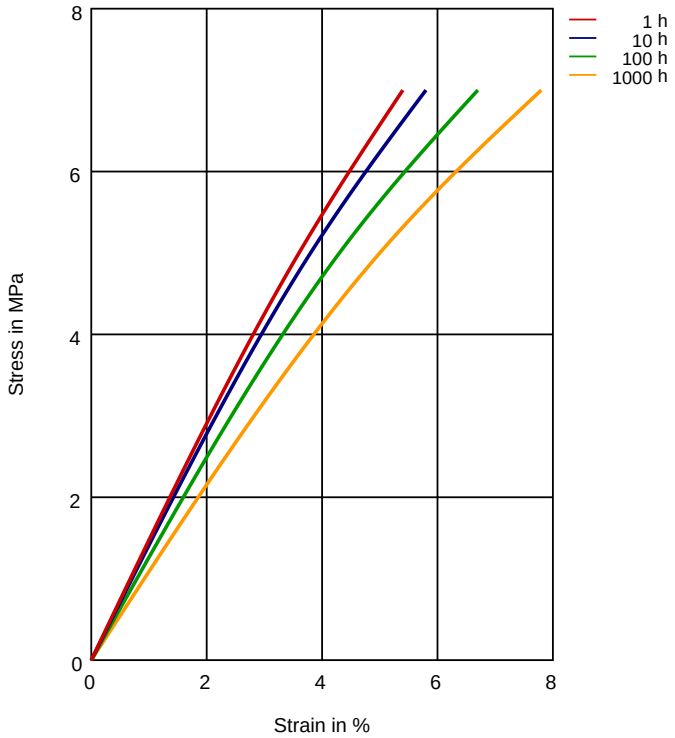
Stress-strain (isochronous) 23°C



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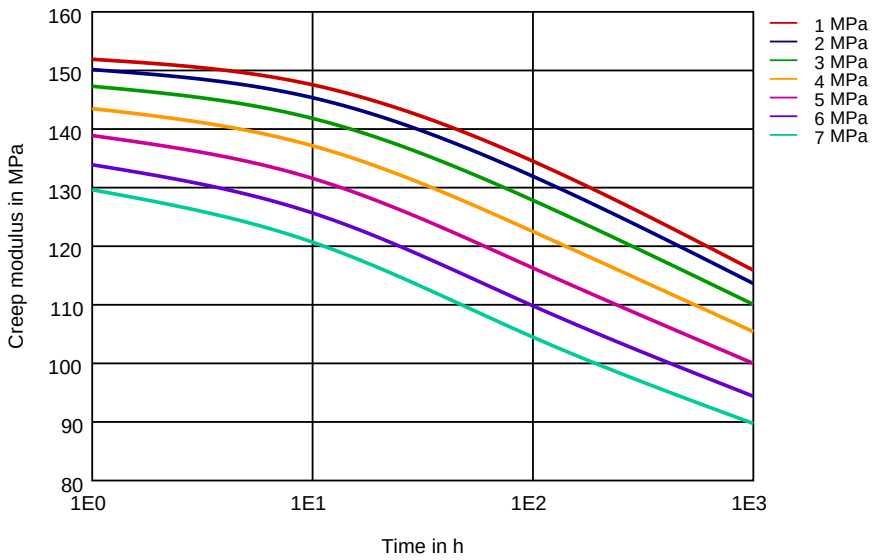
Creep modulus-time 23 °C



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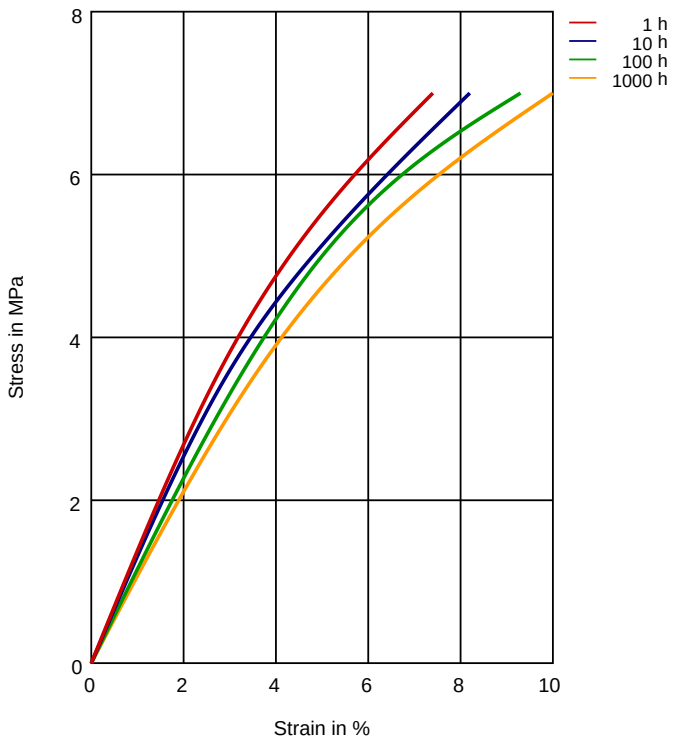
Stress-strain (isochronous) 40°C



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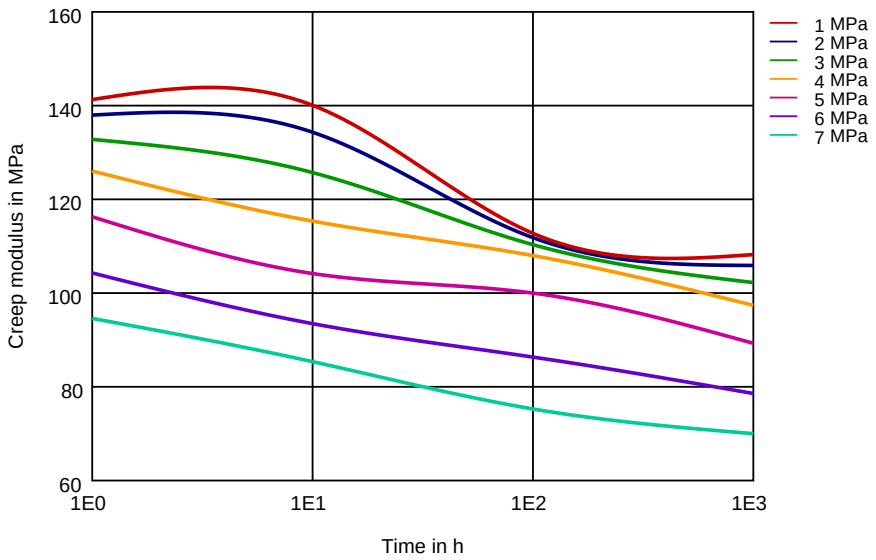
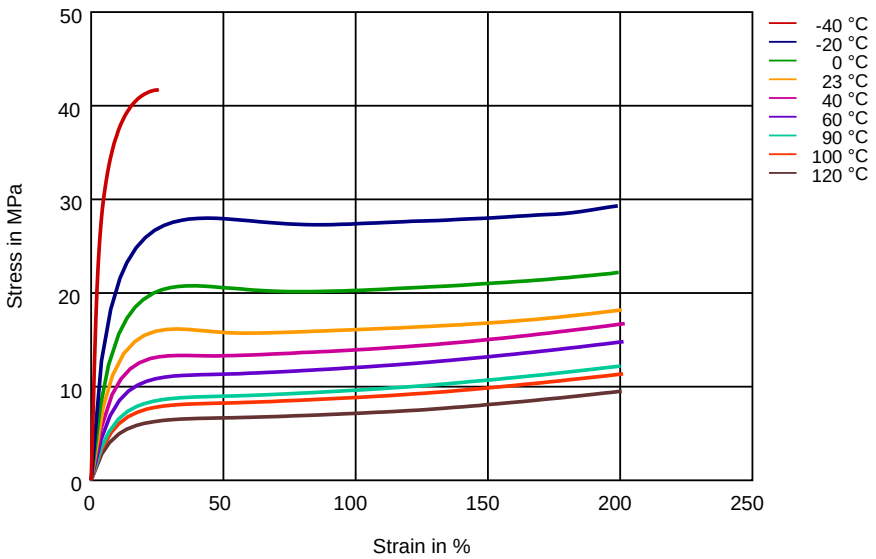
Creep modulus-time 40°C



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)
✓	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 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

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