DuPont™ Delrin® 100 NC010

ACETAL RESIN

Product Information

Common features of Delrin® acetal resins include mechanical and physical properties such as high mechanical strength and rigidity, excellent fatigue and impact resistance, as well as resistance to moisture, gasoline, lubricants, solvents, and many other neutral chemicals. Delrin® acetal resins also have excellent dimensional stability and good electrical insulating characteristics. They are naturally resilient, self-lubricating, and available in a variety of colors and speciality grades.

Delrin® acetal resin typically is used in demanding applications in the automotive, domestic appliances, sports, industrial engineering, electronics, and consumer goods industries.

Delrin® 100 is a high viscosity acetal homopolymer for use in easy-to-fill molds. Delrin® 100 provides optimum mechanical performance with its excellent combination of toughness and strength.

General information	Value	Unit	Test Standard
Resin Identification	POM	-	ISO 1043
Part Marking Code	POM	-	ISO 11469
Rheological properties	**Value**	**Unit**	**Test Standard**
Melt volume-flow rate	1.9	cm^3/10min	ISO 1133
Temperature	190	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	2.3	g/10min	ISO 1133
Molding shrinkage, parallel	2.2	%	ISO 294-4, 2577
Molding shrinkage, normal	1.8	%	ISO 294-4, 2577
Mechanical properties	**Value**	**Unit**	**Test Standard**
Tensile Modulus	3000	MPa	ISO 527-1/-2
Yield stress	72	MPa	ISO 527-1/-2
Yield strain	26	%	ISO 527-1/-2
Nominal strain at break	45	%	ISO 527-1/-2
Flexural Modulus	2900	MPa	ISO 178
Flexural Stress at 3.5%	79	MPa	ISO 178
Compressive strength	110	MPa	ISO 604
Tensile creep modulus			ISO 899-1
1h	2900	MPa	
1000h	1600	MPa	
Charpy impact strength			ISO 179/1eU
73°F	N	kJ/m^2	
-22°F	425	kJ/m^2	
Charpy notched impact strength			ISO 179/1eA
73°F	15	kJ/m^2	
-22°F	14	kJ/m^2	
Izod notched impact strength			ISO 180/1A
73°F	14	kJ/m^2	
-40°F	13	kJ/m^2	
Ball indentation hardness, H 358/30	173	MPa	ISO 2039-1
Hardness, Rockwell, M-scale	90	-	ISO 2039-2
Hardness, Rockwell, R-scale	121	-	ISO 2039-2
Thermal properties	**Value**	**Unit**	**Test Standard**
Melting temperature, 18°F/min	178	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
260 psi	100	°C	
65 psi	160	°C	
Vicat softening temperature			ISO 306
90°F/h, 11 lbf	160	°C	
90°F, 2 lbf	175	°C	
Coeff. of linear therm. expansion, parallel	110	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	110	E-6/K	
Normal, -40-23°C	100	E-6/K	
Parallel, -40-23°C	100	E-6/K	

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

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Spec. heat capacity of melt	3000	J/(kg K)	-
Eff. thermal diffusivity	1E-7	m²/s	-
RTI, electrical			UL 746B
30mil	50	°C	
60mil	105	°C	
120mil	105	°C	
240mil	105	°C	
RTI, impact			UL 746B
30mil	50	°C	
60mil	85	°C	
120mil	85	°C	
240mil	85	°C	
RTI, strength			UL 746B
30mil	50	°C	
60mil	90	°C	
120mil	90	°C	
240mil	90	°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	0.8	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Glow Wire Flammability Index			IEC 60695-2-1/2
40mil	550	°C	
80mil	550	°C	
120mil	550	°C	
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	30	mm/min	ISO 3795 (FMVSS 302)
Electrical properties	**Value**	**Unit**	**Test Standard**
Relative permittivity			IEC 60250
100Hz	3.9	-	
1MHz	3.8	-	
Dissipation factor			IEC 60250
100Hz	10	E-4	
1MHz	55	E-4	
Volume resistivity	>1E13	Ohm*m	IEC 60093
Surface resistivity	3E13	Ohm	IEC 60093
Electric strength	41	kV/mm	IEC 60243-1
Comparative tracking index	600	-	IEC 60112
Other properties	**Value**	**Unit**	**Test Standard**
Humidity absorption, 80mil	0.2	%	Sim. to ISO 62
Water absorption, 80mil	0.9	%	Sim. to ISO 62
Density	1420	kg/m³	ISO 1183
Density of melt	1190	kg/m³	-
VDA Properties	**Value**	**Unit**	**Test Standard**
Emissions	<8	mg/kg	VDA 275
Fogging, G-value (condensate)	0.3	mg	ISO 6452
Injection	**Value**	**Unit**	**Test Standard**
Drying Recommended	yes	-	-
Drying Temperature	80	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	215	°C	-
Min. melt temperature	210	°C	-

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Max. melt temperature	220	°C	-
Mold Temperature Optimum	90	°C	-
Min. mold temperature	80	°C	-
Max. mold temperature	100	°C	-
Hold pressure range	90 - 110	MPa	-
Hold pressure time	8	s/mm	-
Annealing time, optional	30	min/mm	-
Annealing temperature	160	°C	-

Extrusion	Value	Unit	Test Standard
Drying Temperature	75 - 85	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	200	°C	-
Melt Temperature Range	195 - 205	°C	-

Characteristics

Processing	• Injection Molding • Profile Extrusion	• Sheet Extrusion • Other Extrusion	
Delivery form	• Pellets		
Additives	• Release agent		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

Processing Texts

Injection molding

Drying is recommended, but not necessary for newly opened packaging stored in a dry location.

Follow the drying guidelines above in the following cases:
· If moisture is above the Processing Moisture Content recommendation,
· When a resin container is damaged,
· When the material is not properly stored in a dry place at room temperature, or
· When packaging stays open for a significant time.

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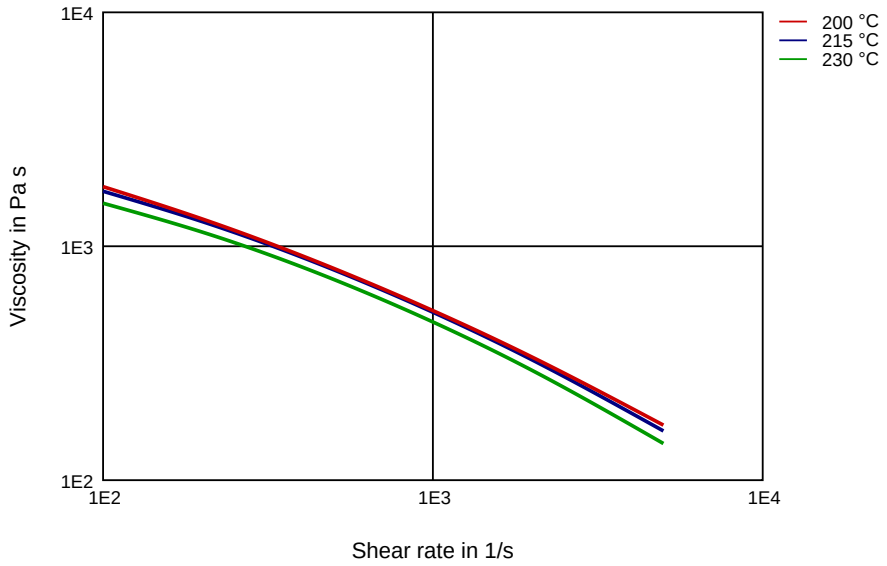
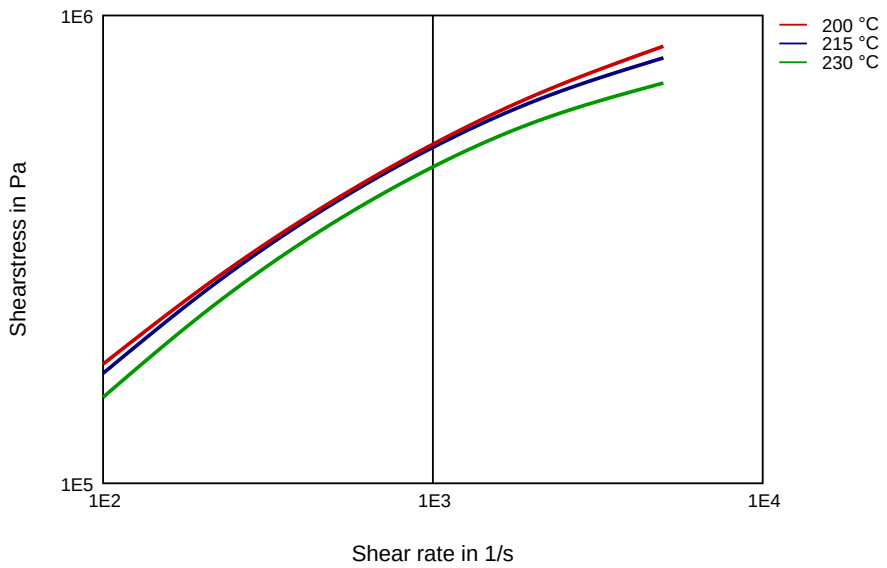
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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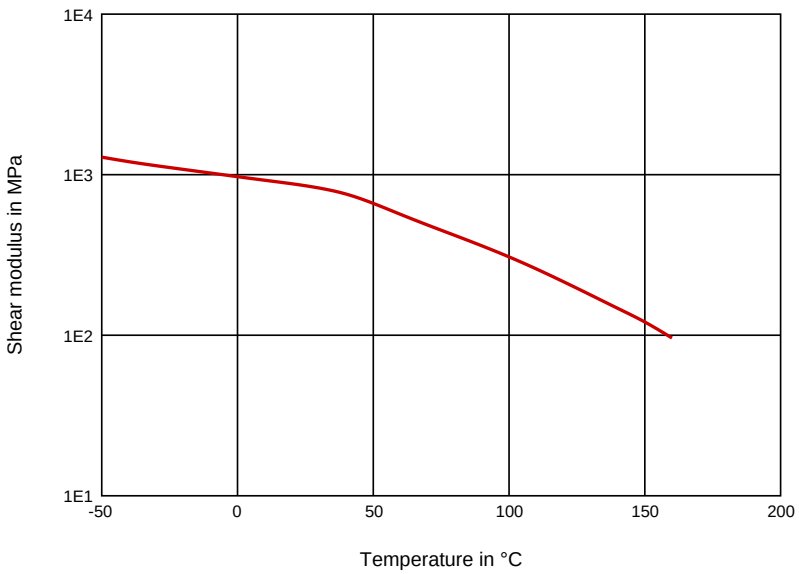
Dynamic Shear modulus-temperature



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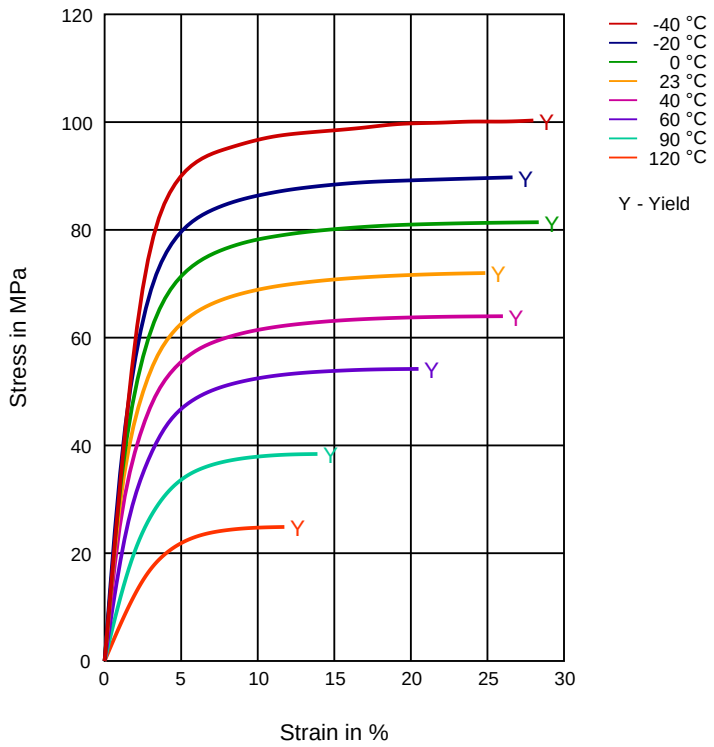
Stress-strain



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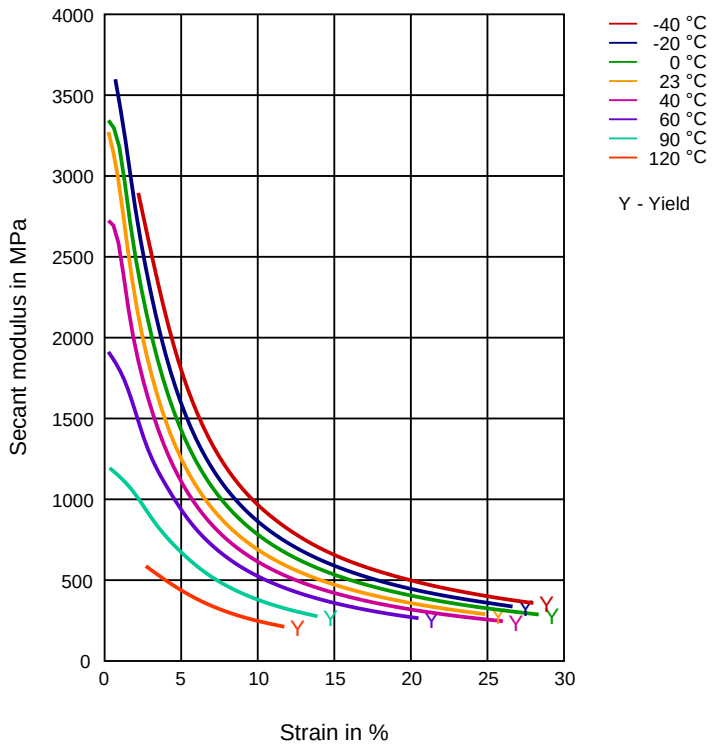
Secant modulus-strain



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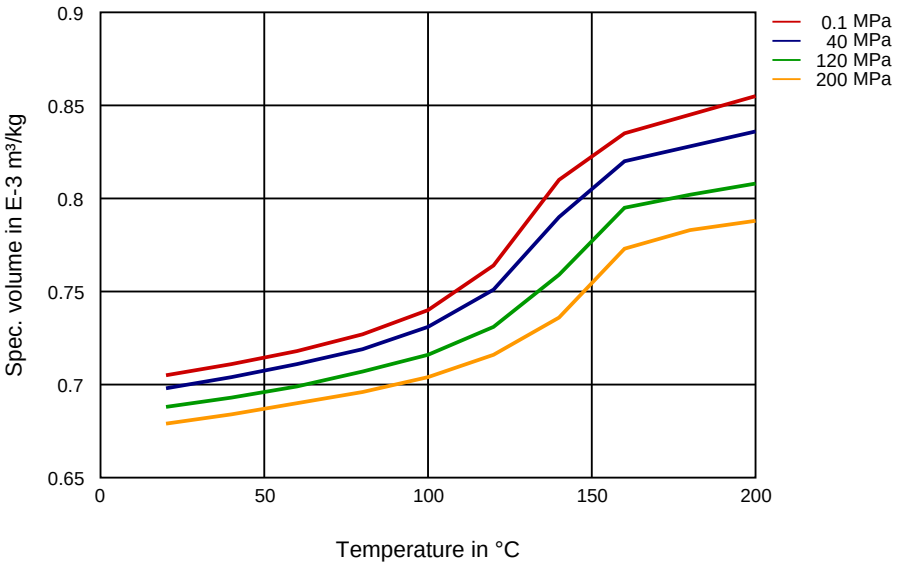
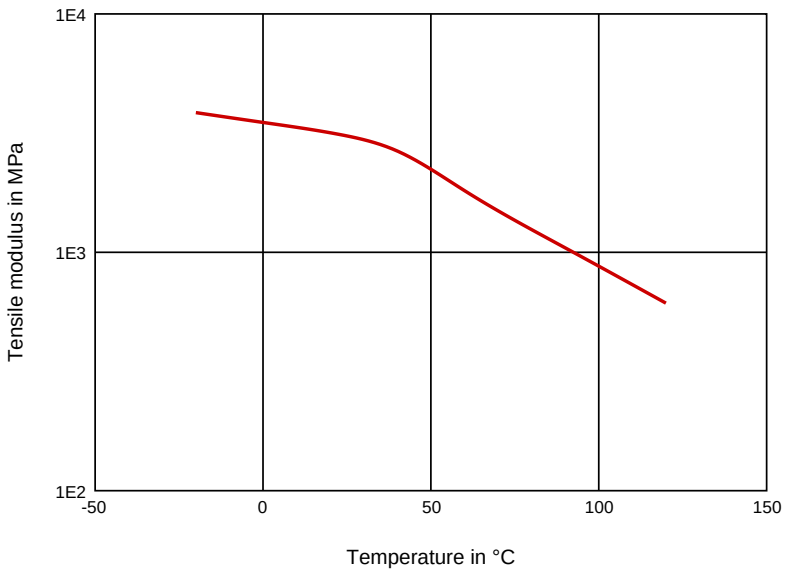
Specific volume-temperature (pvT)



Tensile modulus-temperature



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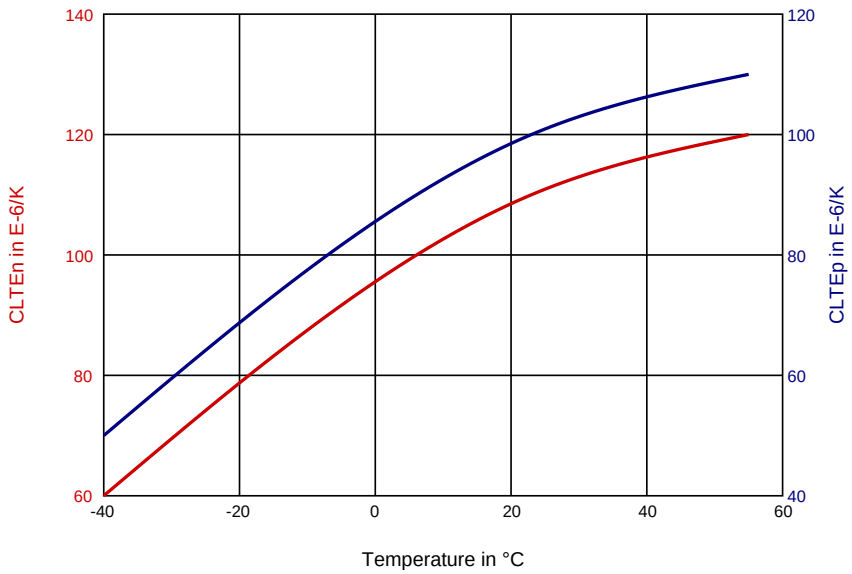
Coeff. of linear thermal expansion, normal



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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)
✗	Diesel EN 590 (100°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)
✗	DOT No. 4 Brake fluid (120°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 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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