

# DuPont™ Zytel® ST811HS NC010

## NYLON RESIN

Product Information

Common features of Zytel® nylon resin include mechanical and physical properties such as high mechanical strength, excellent balance of stiffness and toughness, good high temperature performance, good electrical and flammability properties, good abrasion and chemical resistance. In addition, Zytel® nylon resins are available in different modified and reinforced grades to create a wide range of products with tailored properties for specific processes and end-uses. Zytel® nylon resin, including most flame retardant grades, offer the ability to be coloured.

The good melt stability of Zytel® nylon resin normally enables the recycling of properly handled production waste. If recycling is not possible, DuPont recommends, as the preferred option, incineration with energy recovery (-31kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Zytel® nylon resin typically is used in demanding applications in the automotive, furniture, domestic appliances, sporting goods and construction industry.

**Zytel® ST811HS is a flexible, heat stabilized Super Tough polyamide 6 resin developed for extrusion and injection molding applications such as cable and rope jacketing, hose inner cores and fasteners and ski binding parts.**

General information	Value	Unit	Test Standard
Resin Identification	PA6-HI	-	ISO 1043
Part Marking Code	PA6-HI	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	0.9 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	130534 / 58015.2	psi	ISO 527-1/-2
Yield stress	4500 / -	psi	ISO 527-1/-2
Yield strain	29 / -	%	ISO 527-1/-2
Nominal strain at break	>50 / -	%	ISO 527-1/-2
Strain at Break, 23°C, 50mm/min	250 / -	%	ISO 527-1/-2
Flexural Modulus	123000 / 52200	psi	ISO 178
Charpy impact strength			ISO 179/1eU
73°F	N / N	ftlb/in <sup>2</sup>	
-22°F	N / N	ftlb/in <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	33.8 / 61.4	ftlb/in <sup>2</sup>	
-22°F	6.66 / 6.18	ftlb/in <sup>2</sup>	
Puncture energy			ISO 6603-2
73°F	16 / -	J	
-22°F	25 / -	J	
Hardness, Rockwell, M-scale	60 / -	-	ISO 2039-2
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	424 / *	°F	ISO 11357-1/-3
Glass transition temperature, 18°F/min	122 / 32	°F	ISO 11357-1/-2
Temp. of deflection under load, 260 psi	117 / *	°F	ISO 75-1/-2
Vicat softening temperature, 90°F/h, 11 lbf	203 / *	°F	ISO 306
Coeff. of linear therm. expansion, parallel	0.000111 / *	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	0.0001 / *	in/in/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.15	W/(m K)	-
Spec. heat capacity of melt	2600	J/(kg K)	-
RTI, electrical			UL 746B
30mil	266 / *	°F	
60mil	266 / *	°F	
120mil	266	°F	
RTI, impact			UL 746B
30mil	149	°F	
60mil	221 / *	°F	
120mil	221	°F	

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RTI, strength			UL 746B
30mil	203	°F	
60mil	212 / *	°F	
120mil	230	°F	
<b>Flammability</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Burning Behav. at 60mil nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	0.0591 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.0295 / *	in	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<100	in/min	ISO 3795 (FMVSS 302)
<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Dissipation factor			IEC 60250
100Hz	80 / 550	E-4	
1MHz	140 / 1800	E-4	
Volume resistivity	1E13 / 1E11	Ohm*m	IEC 60093
Surface resistivity	* / 1E15	Ohm	IEC 60093
Electric strength	787 / -	kV/in	IEC 60243-1
<b>Other properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 80mil	2.3 / *	%	Sim. to ISO 62
Water absorption, 80mil	6.8 / *	%	Sim. to ISO 62
Density	1.04 / -	g/cm <sup>3</sup>	ISO 1183
Density of melt	54.9	lb/ft <sup>3</sup>	-
<b>Film Properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Strain at yield, parallel	4 / *	%	ISO 527-3
<b>Injection</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Drying Recommended	yes	-	-
Drying Temperature	140	°F	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	518	°F	-
Min. melt temperature	500	°F	-
Max. melt temperature	536	°F	-
Max. screw tangential speed	0.3 / *	m/s	-
Mold Temperature Optimum	158	°F	-
Min. mold temperature	122	°F	-
Max. mold temperature	194	°F	-
Hold pressure range	7250 - 14500	psi	-
Hold pressure time	0.102	s/mil	-
Ejection temperature	374	°F	-
<b>Characteristics</b>			
Processing	• Injection Molding	• Other Extrusion	
Delivery form	• Pellets		
Additives	• Release agent		
Special characteristics	• Heat stabilized or stable to heat		
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

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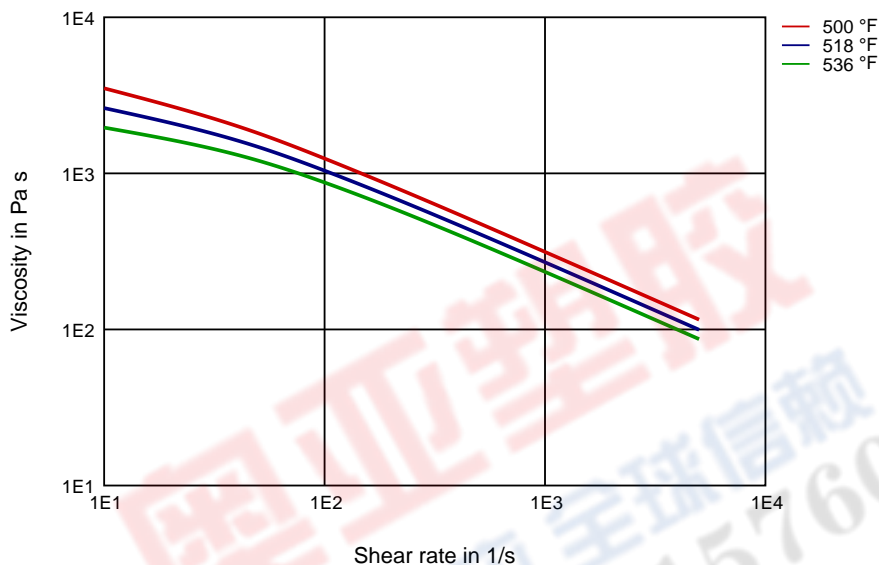
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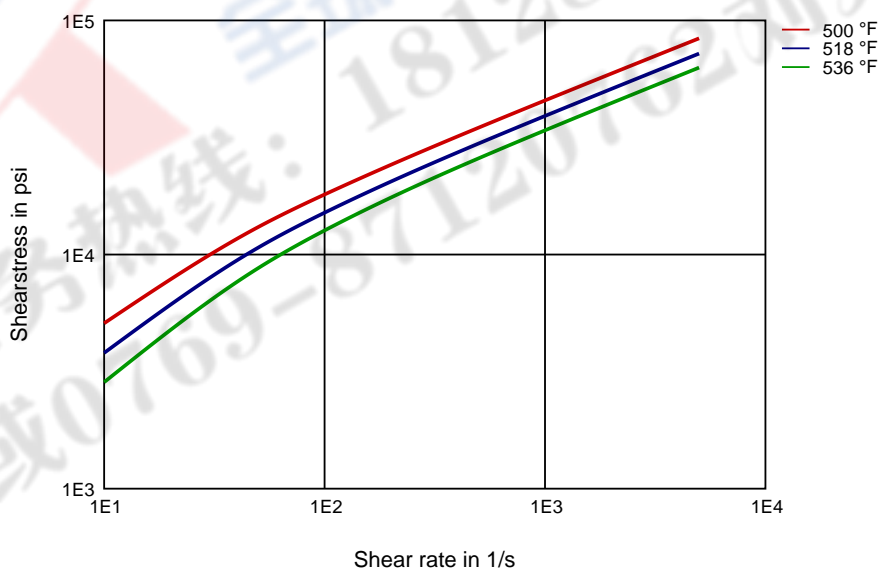
## NYLON RESIN

### Diagrams

#### Viscosity-shear rate



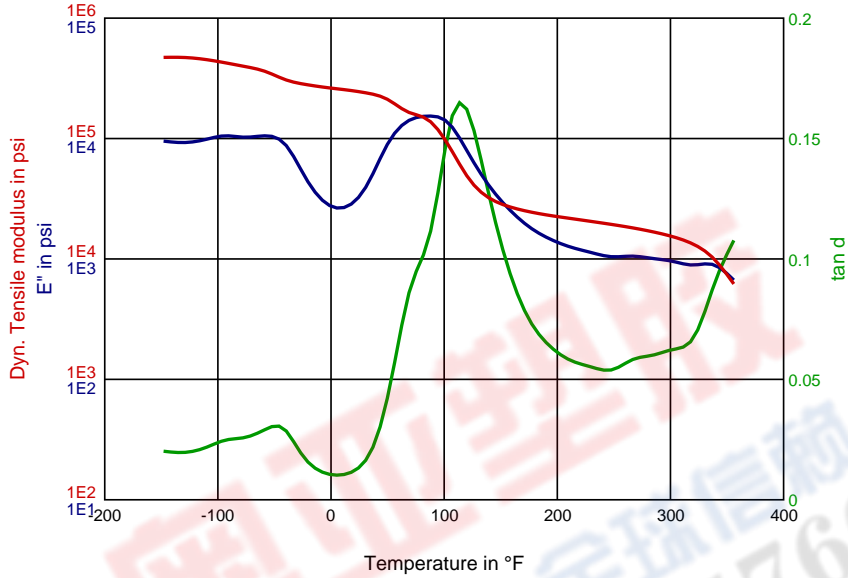
#### Shearstress-shear rate



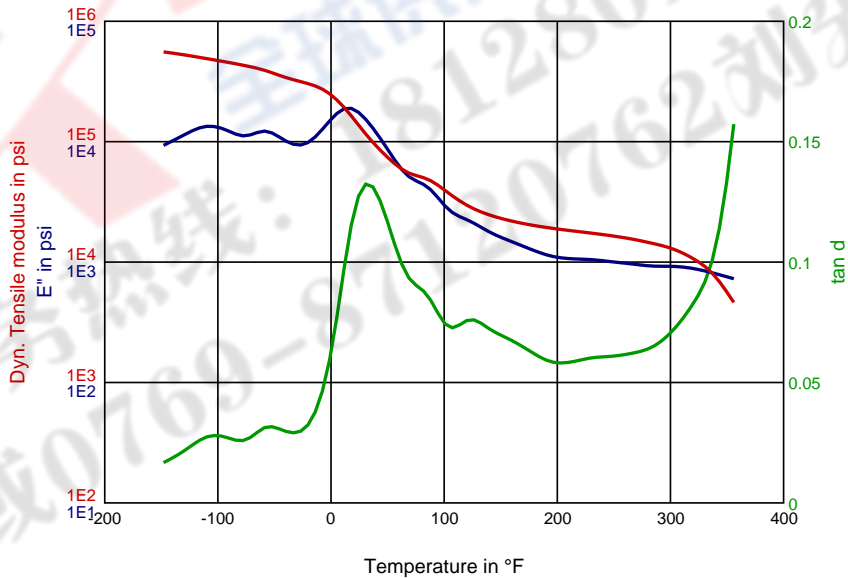
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## NYLON RESIN

Dynamic Tensile modulus-temperature (dry)



Dynamic Tensile modulus-temperature (cond.)



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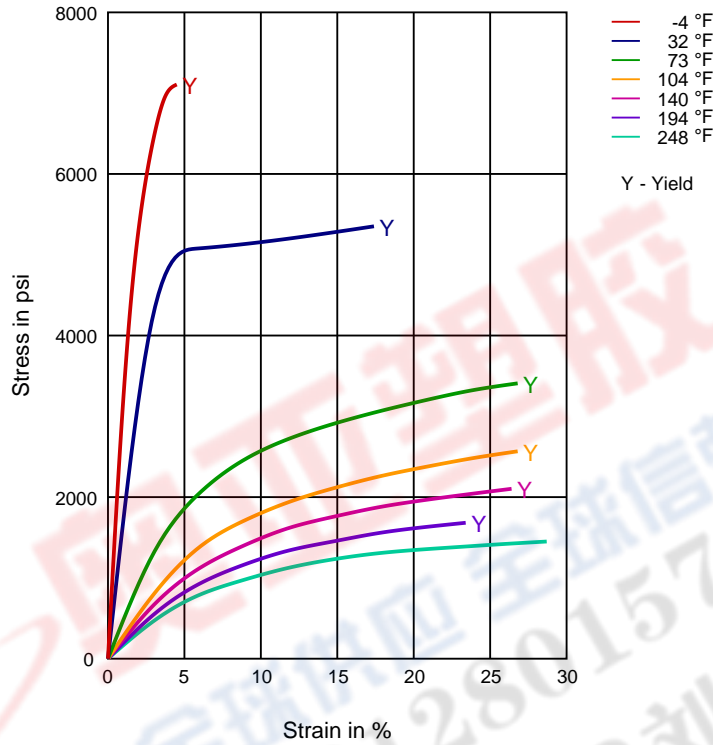
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## NYLON RESIN

Stress-strain (dry)



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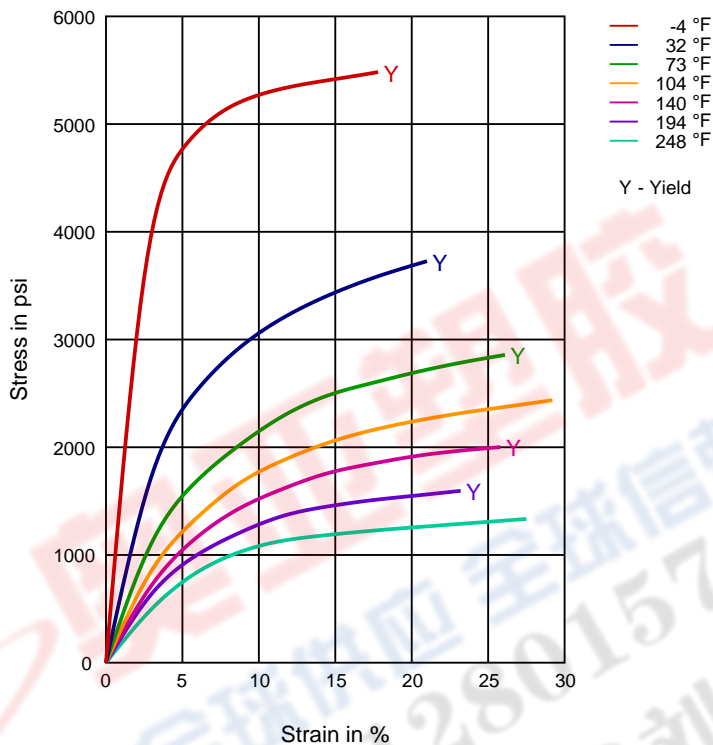


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## NYLON RESIN

Stress-strain (cond.)



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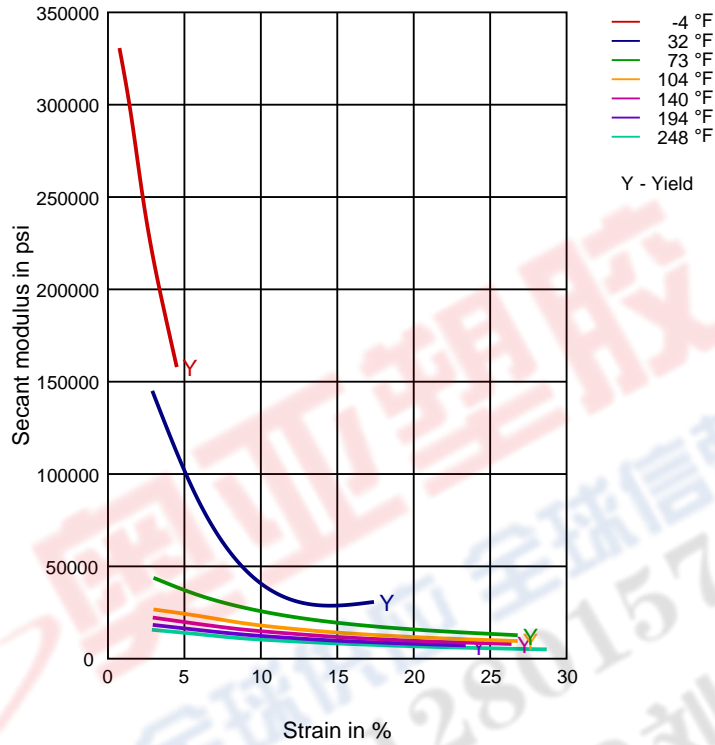


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## NYLON RESIN

Secant modulus-strain (dry)



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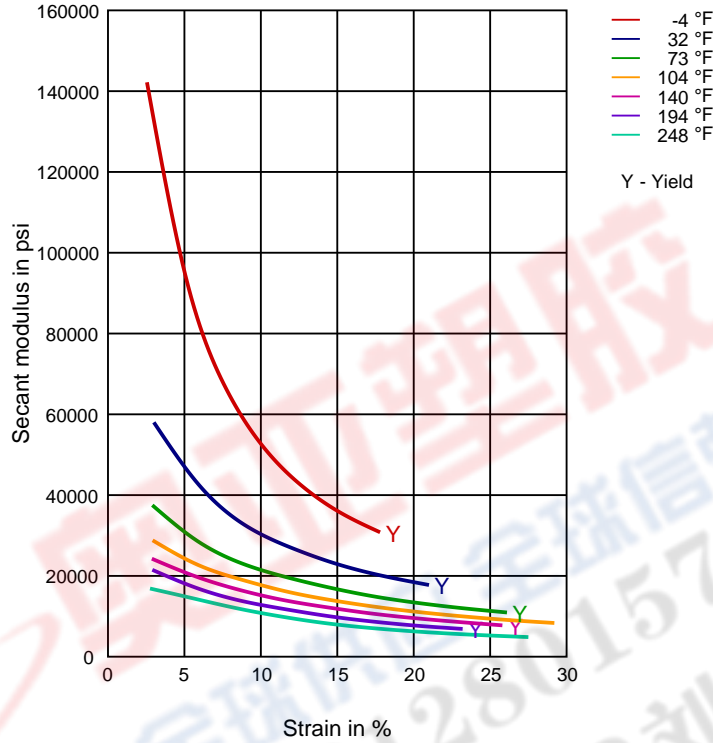
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Secant modulus-strain (cond.)



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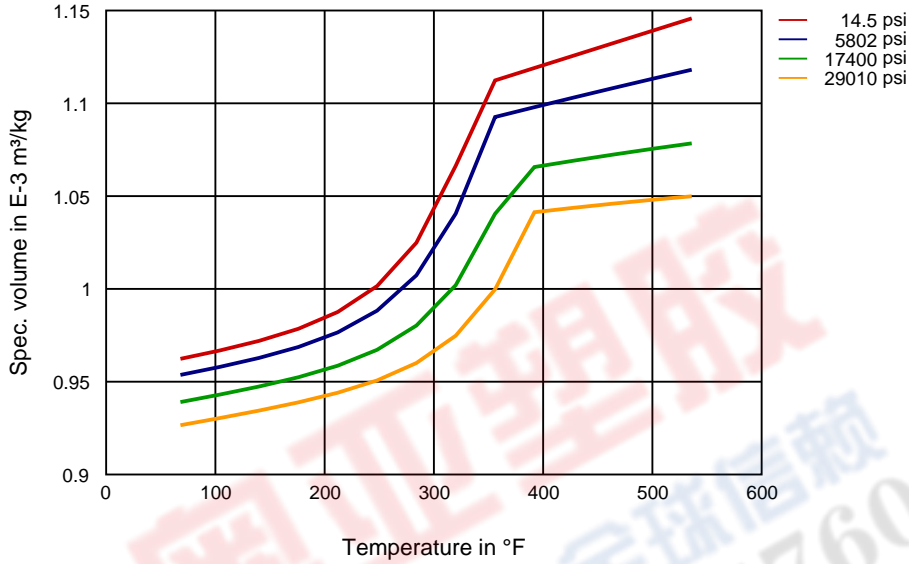




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## NYLON RESIN

Specific volume-temperature (pvT)



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 全球供应 全球信赖  
 服务热线: 18128015760  
 或0769-87120762 刘先生

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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 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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