

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	900 / 400	MPa	ISO 527-1/-2
Yield stress	31 / -	MPa	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	850 / 360	MPa	ISO 178
Charpy impact strength			ISO 179/1eU
73°F	N / N	kJ/m ²	
-22°F	N / N	kJ/m ²	
Charpy notched impact strength			ISO 179/1eA
73°F	71 / 129	kJ/m ²	
-22°F	14 / 13	kJ/m ²	
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	218 / *	°C	ISO 11357-1/-3
Glass transition temperature, 18°F/min	50 / 0	°C	ISO 11357-1/-2
Temp. of deflection under load, 260 psi	47 / *	°C	ISO 75-1/-2
Vicat softening temperature, 90°F/h, 11 lbf	95 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	200 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	180 / *	E-6/K	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	130 / *	°C	
60mil	130 / *	°C	
120mil	130	°C	
RTI, impact			UL 746B
30mil	65	°C	
60mil	105 / *	°C	
120mil	105	°C	

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Page: 1 of 12

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DONGGUAN FUMEI PLASTICS CO.,LTD.

TEL: +86 0769-82339888 / 87798999

EMAIL: fumei@foomx.com



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RTI, strength			UL 746B
30mil	95	°C	
60mil	100 / *	°C	
120mil	110	°C	
Flammability	dry / cond	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	0.75 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<100	mm/min	ISO 3795 (FMVSS 302)
Electrical properties	dry / cond	Unit	Test Standard
Dissipation factor			IEC 62631-2-1
100Hz	80 / 550	E-4	
1MHz	140 / 1800	E-4	
Volume resistivity	1E13 / 1E11	Ohm*m	IEC 62631-3-1
Surface resistivity	* / 1E15	Ohm	IEC 62631-3-2
Electric strength	31 / -	kV/mm	IEC 60243-1
Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 80mil	2.3 / *	%	Sim. to ISO 62
Water absorption, 80mil	6.8 / *	%	Sim. to ISO 62
Density	1040 / -	kg/m ³	ISO 1183
Density of melt	880	kg/m ³	-
Film Properties	dry / cond	Unit	Test Standard
Strain at yield, parallel	4 / *	%	ISO 527-3
Injection	dry / cond	Unit	Test Standard
Drying Recommended	yes	-	-
Drying Temperature	≥60	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-
Melt Temperature Optimum	270	°C	-
Min. melt temperature	260	°C	-
Max. melt temperature	280	°C	-
Max. screw tangential speed	0.3 / *	m/s	-
Mold Temperature Optimum	70	°C	-
Min. mold temperature	50	°C	-
Max. mold temperature	90	°C	-
Hold pressure range	50 - 100	MPa	-
Hold pressure time	4	s/mm	-
Ejection temperature	190	°C	-
Extrusion	Value	Unit	Test Standard
Drying Temperature	≤60	°C	-
Drying Time, Dehumidified Dryer	4 - 6	h	-
Processing Moisture Content	≤0.06	%	-
Melt Temperature Optimum	240	°C	-
Melt Temperature Range	235 - 250	°C	-
Characteristics			
Processing	• Injection Molding	• Other Extrusion	
Delivery form	• Pellets		
Additives	• Release agent		
Special characteristics	• Heat stabilized or stable to heat		



DuPont™ Zytel® ST811HS NC010

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Regional Availability

- North America
- Europe

- Asia Pacific
- South and Central America

- Near East/Africa
- Global

To find out more, visit [DuPont Performance Polymers](#) or contact nearest DuPont location.

North America

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EMAIL: fumei@foomx.com

Asia Pacific

TEL: +86 0769-82339888 / 87798999

Europe/Middle East/Africa

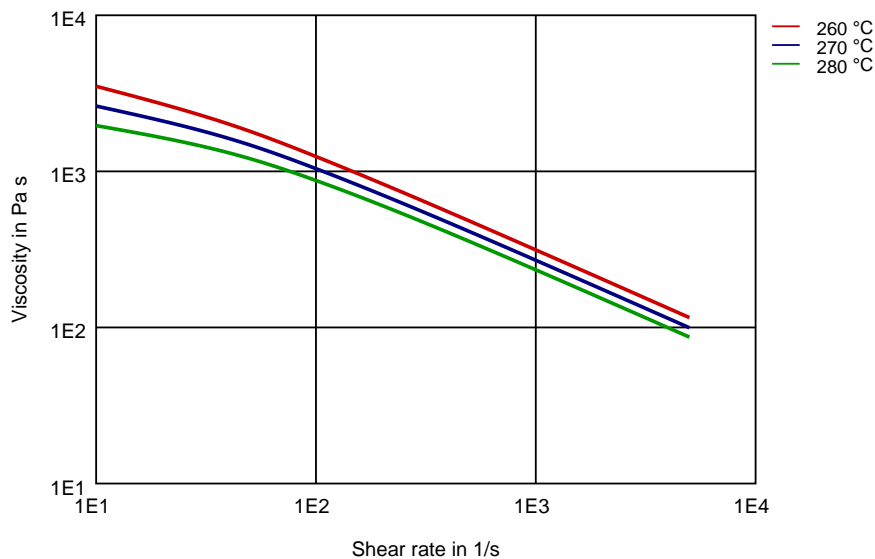


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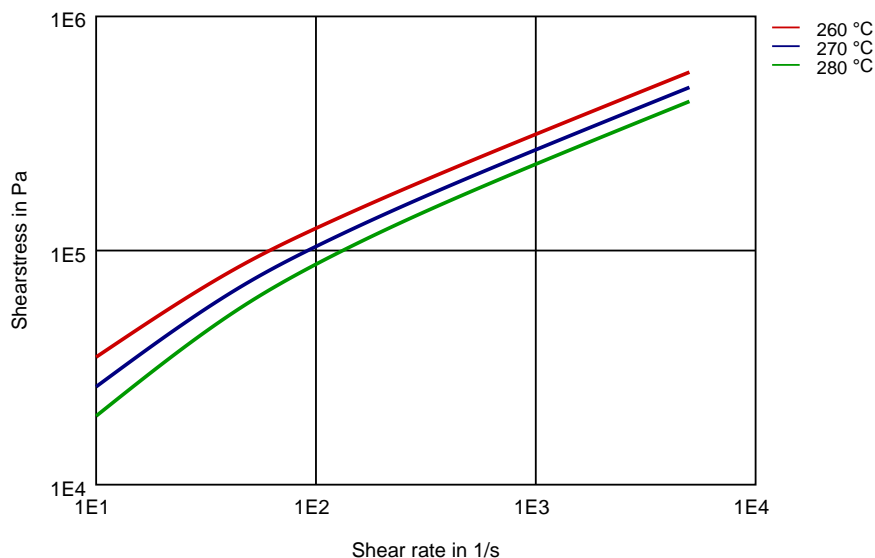
NYLON RESIN

Diagrams

Viscosity-shear rate



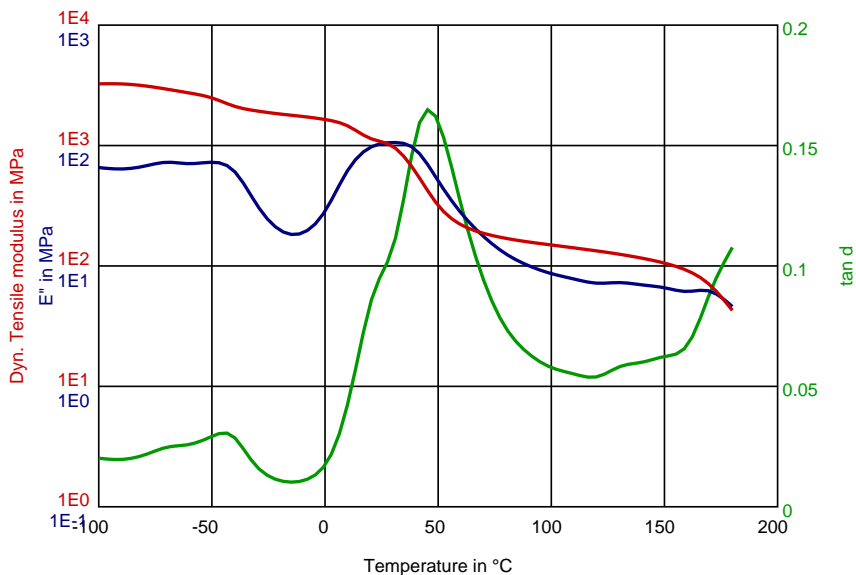
Shearstress-shear rate



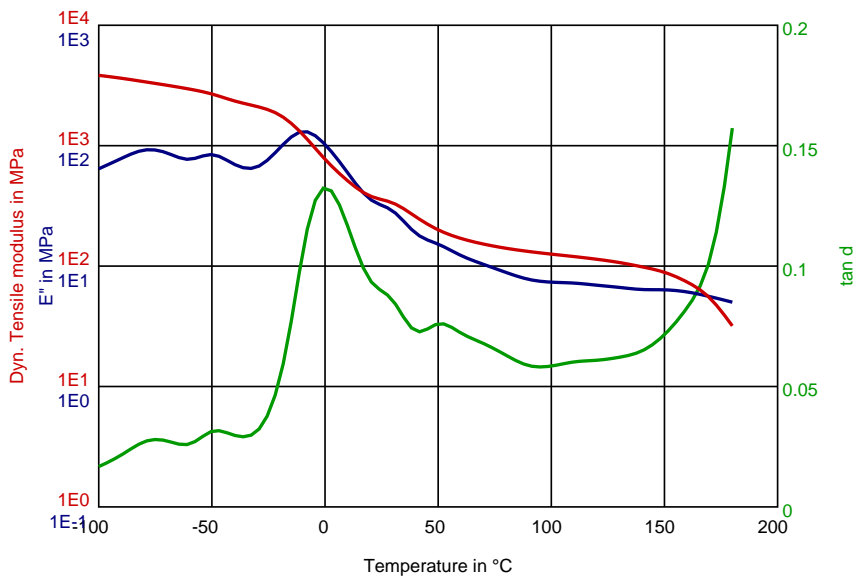
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Dynamic Tensile modulus-temperature (dry)



Dynamic Tensile modulus-temperature (cond.)



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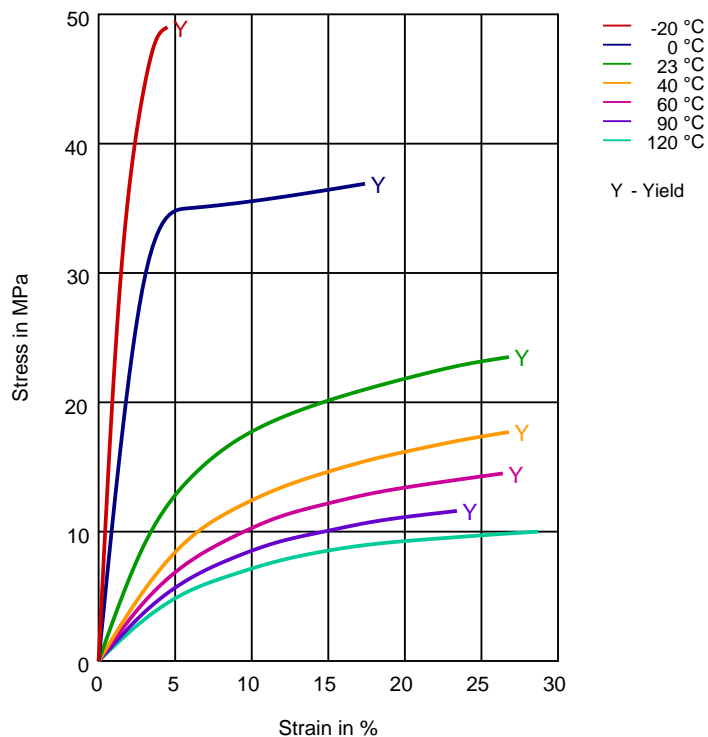
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Stress-strain (dry)



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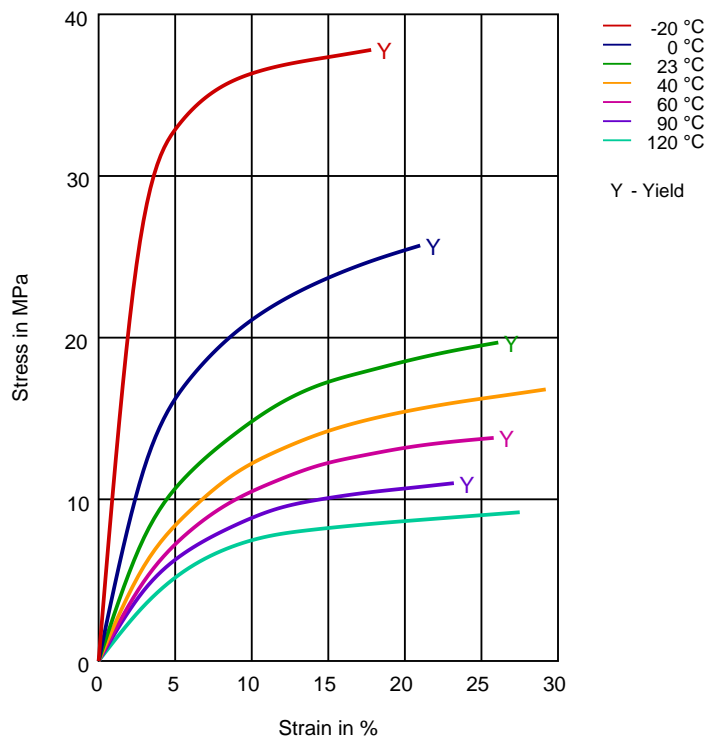
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Stress-strain (cond.)



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Page: 7 of 12

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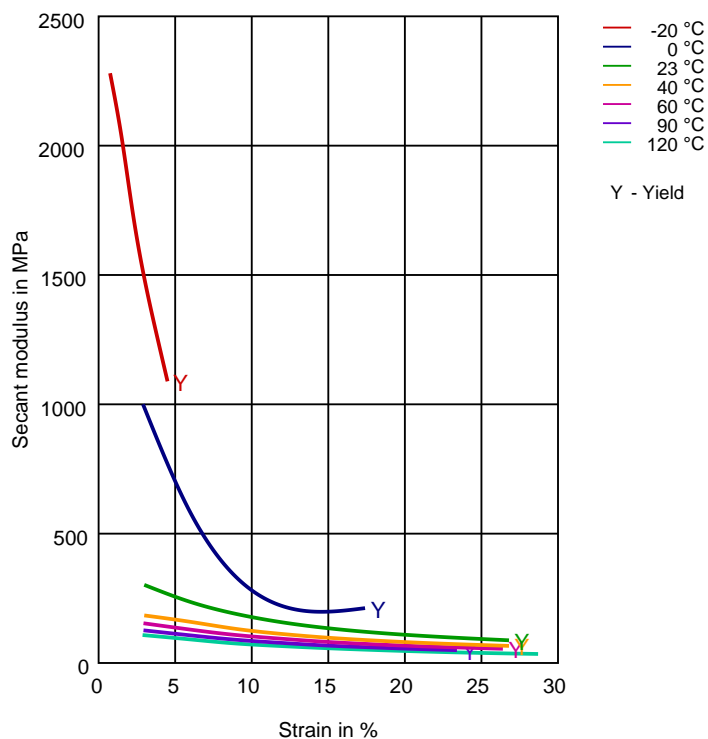
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Secant modulus-strain (dry)



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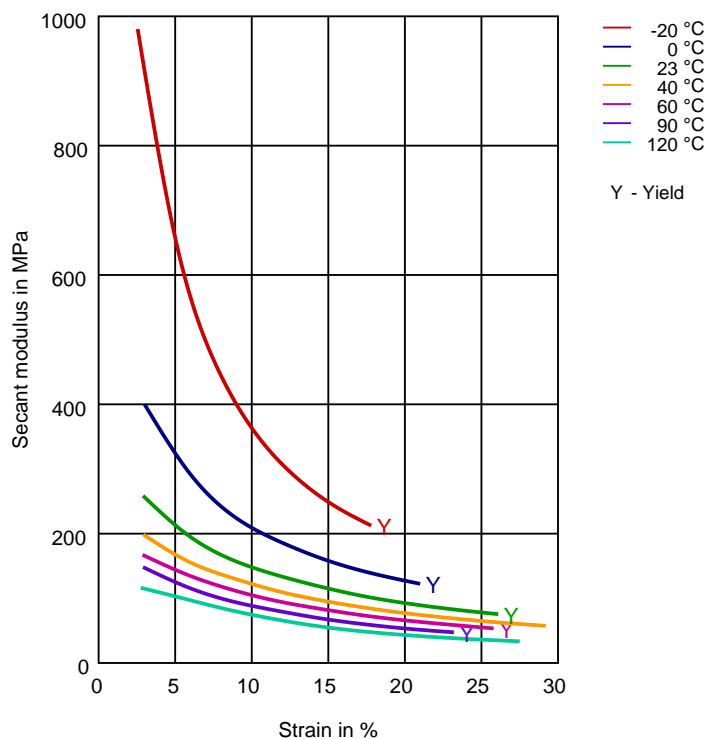
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Secant modulus-strain (cond.)



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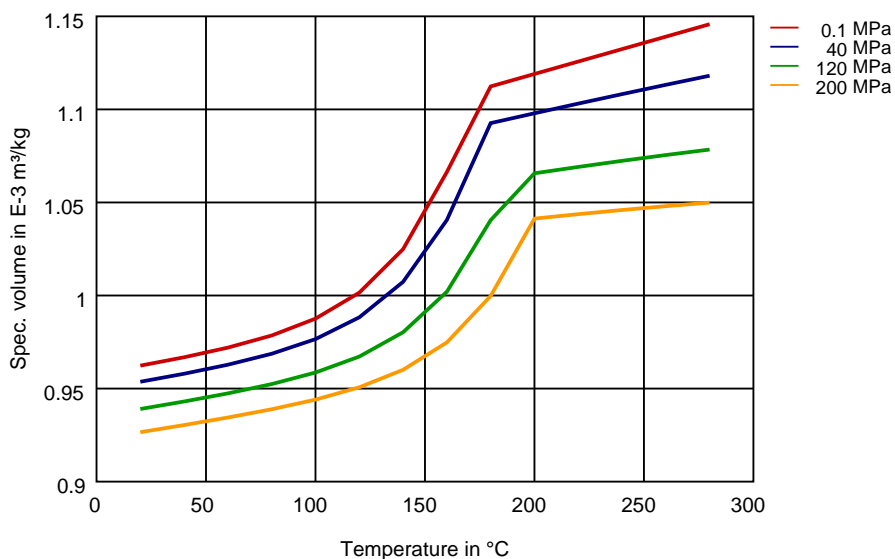
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Specific volume-temperature (pvT)



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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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