

DuPont™ Zytel® MT409AHS 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® MT409AHS NC010 is a Medium Toughened, high performance, heat stabilized polyamide 66 resin having good stiffness, improved knit line strength, surface appearance with outstanding processability.

General information	Value	Unit	Test Standard
Resin Identification	PA66-I	-	ISO 1043
Part Marking Code	PA66-I	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	1.5 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.7 / -	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	2400 / 1100	MPa	ISO 527-1/-2
Yield stress	61 / 43	MPa	ISO 527-1/-2
Yield strain	5 / 28	%	ISO 527-1/-2
Nominal strain at break	25 / >50	%	ISO 527-1/-2
Flexural Modulus	2200 / 1000	MPa	ISO 178
Flexural Strength	75 / 53	MPa	ISO 178 C
Tensile creep modulus, 1000h	* / 820	MPa	ISO 899-1
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	21 / 40	kJ/m ²	
-22 °F	13 / 13	kJ/m ²	
-40 °F	13 / -	kJ/m ²	
Izod notched impact strength			ISO 180/1A
73 °F	18 / 29	kJ/m ²	
-22 °F	15 / 15	kJ/m ²	
-40 °F	13 / 11	kJ/m ²	
Ball indentation hardness, H 358/30	125 / 60 ^[1]	MPa	ISO 2039-1 OT
1: 132/30 C: Calculated OT: One time tested			
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18 °F/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 18 °F/min	80 / -	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	66 / *	°C	
65 psi	205 / *	°C	
Coeff. of linear therm. expansion, parallel	100 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	120 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.14	W/(m K)	-
Spec. heat capacity of melt	2730	J/(kg K)	-

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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	
RTI, strength			UL 746B
30mil	95	°C	
60mil	105 / *	°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	0.8 / *	mm	IEC 60695-11-10
Thickness tested	3 / *	mm	IEC 60695-11-20
UL recognition	yes / *	-	UL 94
Glow Wire Flammability Index, 40mil	750 / -	°C	IEC 60695-2-12 DS
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	29	mm/min	ISO 3795 (FMVSS 302)
DS: Derived from similar grade			
Electrical properties	dry / cond	Unit	Test Standard
Relative permittivity			IEC 62631-2-1
100Hz	3.6 / 6.6	-	
1MHz	3.4 / 3.7	-	
Dissipation factor			IEC 62631-2-1
100Hz	50 / 1800	E-4	
1MHz	120 / 440	E-4	
Volume resistivity	>1E13 / 3E10	Ohm*m	IEC 62631-3-1
Surface resistivity	* / 1E13	Ohm	IEC 62631-3-2
Electric strength	23 / 22	kV/mm	IEC 60243-1
Comparative tracking index	600 / -	-	IEC 60112
Electric Strength, Short Time, 2mm	23 / 22	kV/mm	IEC 60243-1
Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 80mil	2.1 / *	%	Sim. to ISO 62
Water absorption, 80mil	7.2 / *	%	Sim. to ISO 62 C
Density	1110 / -	kg/m ³	ISO 1183
Density of melt	930	kg/m ³	-
Water Absorption, Immersion 24h	1.3 / *	%	Sim. to ISO 62
C: Calculated			
Film Properties	dry / cond	Unit	Test Standard
Strain at yield, parallel	4.4 / *	%	ISO 527-3
VDA Properties	dry / cond	Unit	Test Standard
Emission of organic compounds	10	µgC/g	VDA 277
Odor test	4	class	VDA 270
Fogging, G-value (condensate)	0.1 / *	mg	ISO 6452
Injection	dry / cond	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	290	°C	-
Min. melt temperature	280	°C	-

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Max. melt temperature	300	°C	-
Max. screw tangential speed	0.3 / *	m/s	-
Mold Temperature Optimum	80	°C	-
Min. mold temperature	50	°C	-
Max. mold temperature	100	°C	-
Hold pressure range	50 - 100	MPa	-
Hold pressure time	4	s/mm	-
Ejection temperature	190	°C	-

Characteristics

Processing	• Injection Molding	• Profile 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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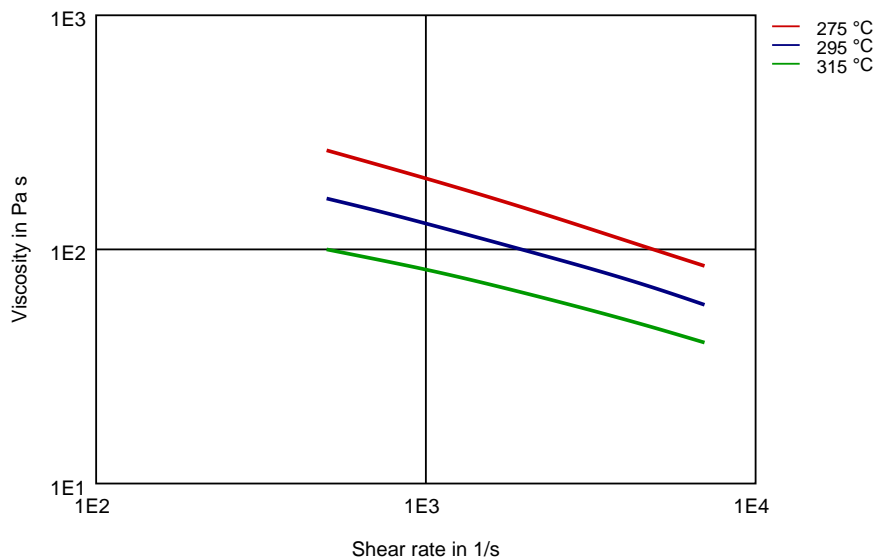


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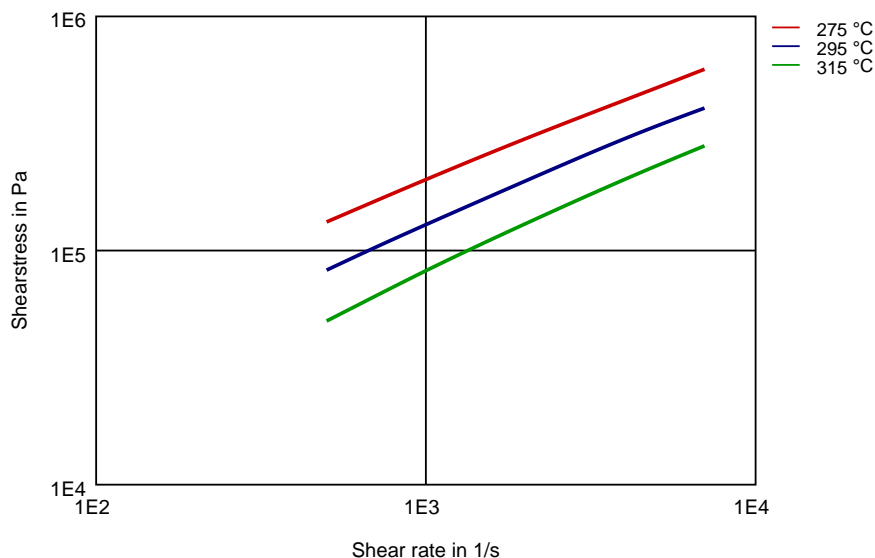
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Diagrams

Viscosity-shear rate



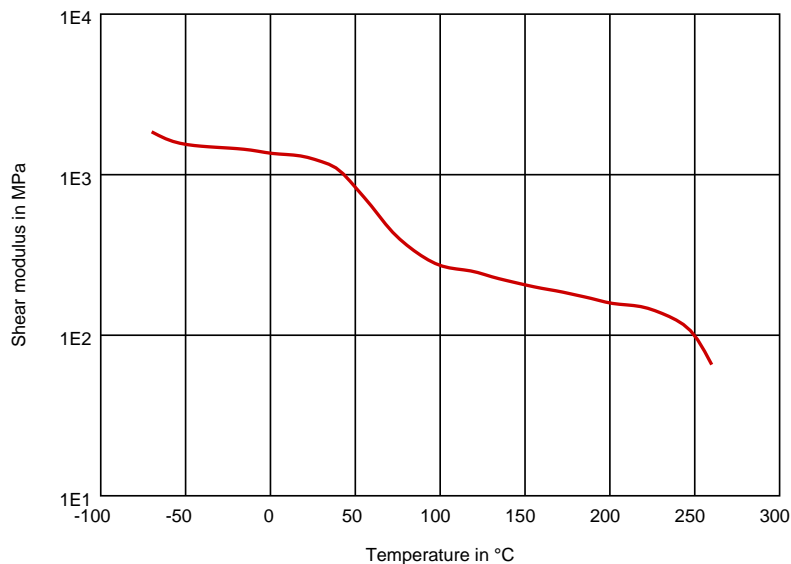
Shearstress-shear rate



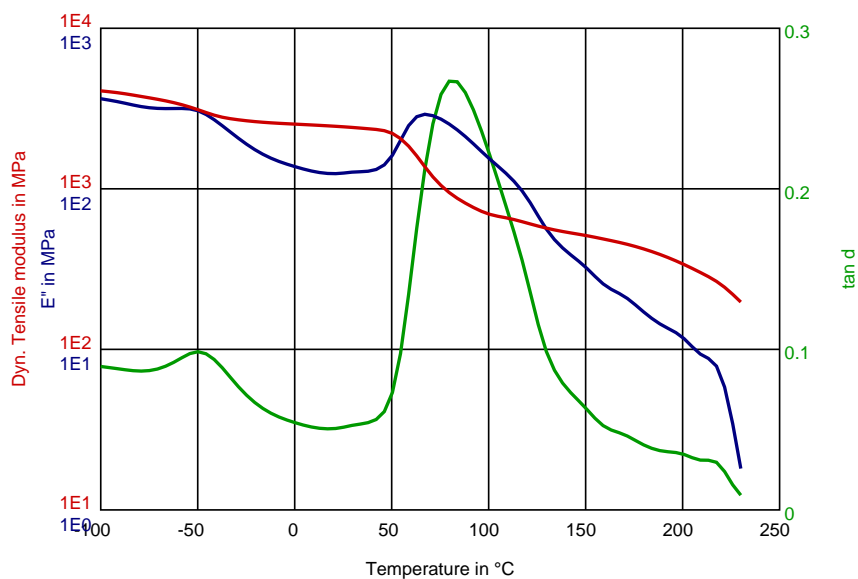
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Dynamic Shear modulus-temperature (dry)



Dynamic Tensile modulus-temperature (dry)



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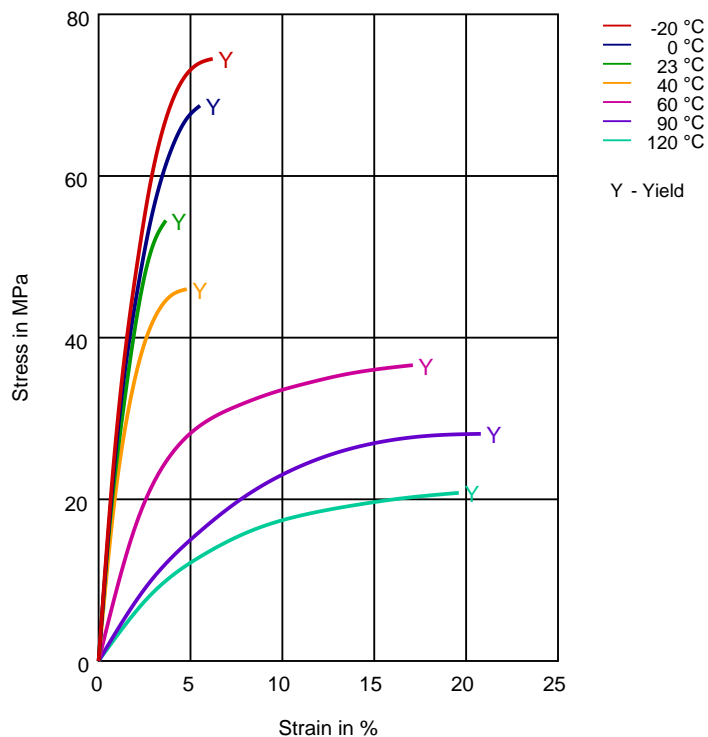
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Stress-strain (dry)



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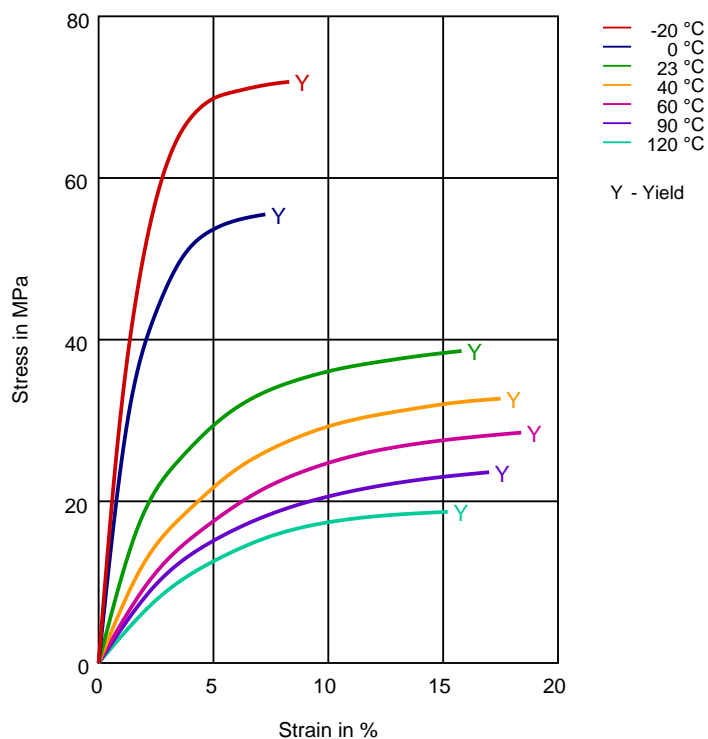
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Stress-strain (cond.)



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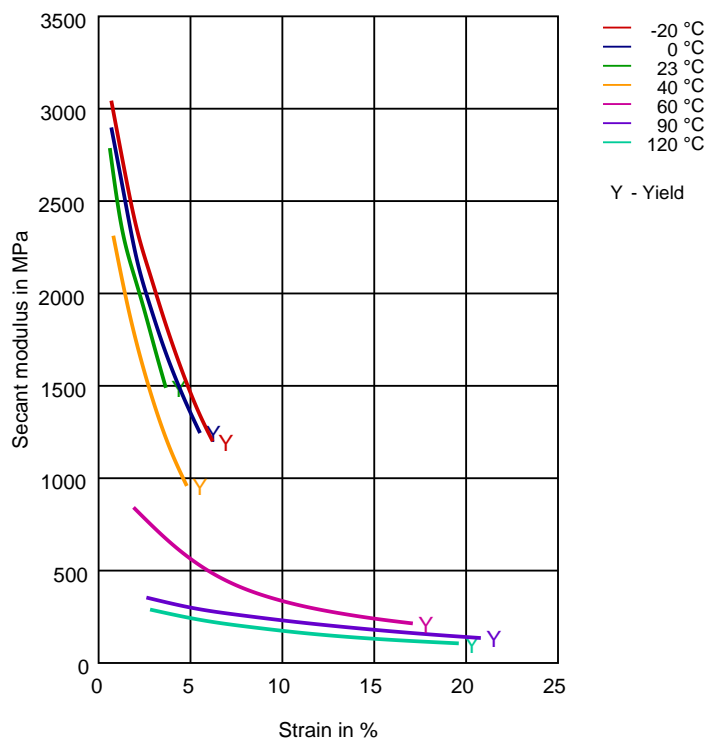
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Secant modulus-strain (dry)



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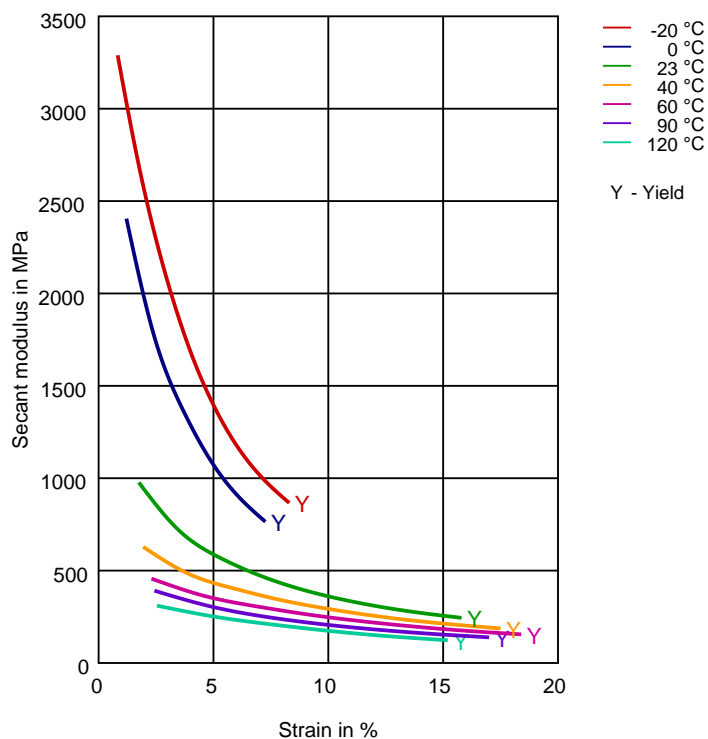
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Secant modulus-strain (cond.)



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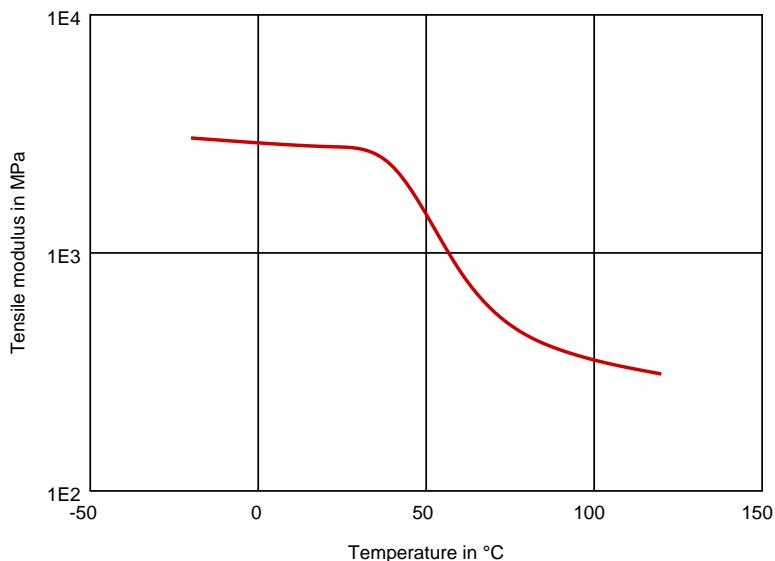
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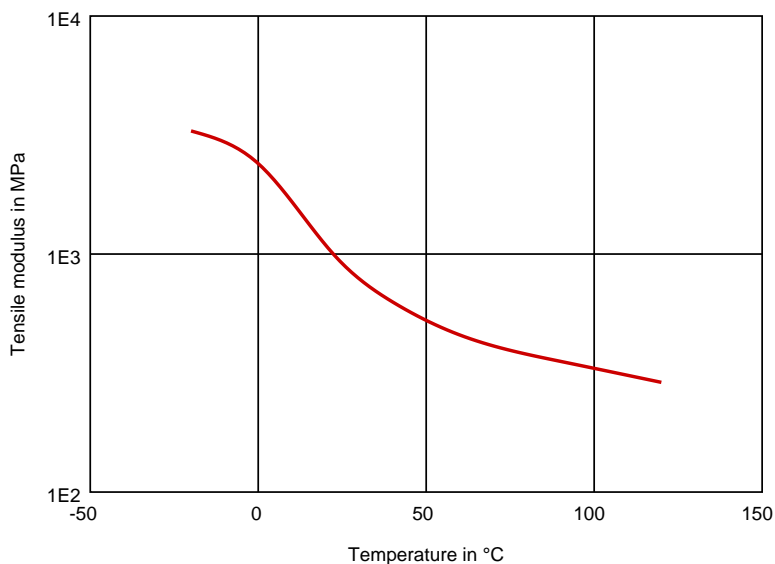
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Tensile modulus-temperature (dry)



Tensile modulus-temperature (cond.)



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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 160 mil (Hytrell® 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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