

DuPont™ Zytel® 70G43L 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® 70G43L NC010 is a 43% glass fiber reinforced polyamide 66 resin for injection molding.

| General information | Value | Unit | Test Standard |
|---|---------------|-------------------|-----------------|
| Resin Identification | PA66-GF43 | - | ISO 1043 |
| Part Marking Code | PA66-GF43 | - | ISO 11469 |
| Rheological properties | dry / cond | Unit | Test Standard |
| Molding shrinkage, parallel | 0.3 / - | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.0 / - | % | ISO 294-4, 2577 |
| Mechanical properties | dry / cond | Unit | Test Standard |
| Tensile Modulus | 14000 / 11000 | MPa | ISO 527-1/-2 |
| Stress at break | 225 / 160 | MPa | ISO 527-1/-2 |
| Strain at break | 3 / 4 | % | ISO 527-1/-2 |
| Flexural Modulus | 12000 / 8900 | MPa | ISO 178 |
| Flexural Strength | 340 / 260 | MPa | ISO 178 |
| Tensile creep modulus | | | ISO 899-1 |
| 1h | * / 10800 | MPa | |
| 1000h | * / 7960 | MPa | |
| Charpy impact strength | | | ISO 179/1eU |
| 73°F | 100 / 105 | kJ/m ² | |
| -22°F | 85 / 75 | kJ/m ² | |
| Charpy notched impact strength | | | ISO 179/1eA |
| 73°F | 16 / 19 | kJ/m ² | |
| -22°F | 12 / 12 | kJ/m ² | |
| -40°F | 11 / 11 | kJ/m ² | |
| Izod notched impact strength | | | ISO 180/1A |
| 73°F | 14 / 16 | kJ/m ² | |
| -22°F | 12 / 11 | kJ/m ² | |
| -40°F | 11 / 11 | kJ/m ² | |
| Izod impact strength | | | ISO 180/1U |
| 73°F | 105 / 90 | kJ/m ² | |
| -22°F | 105 / 65 | kJ/m ² | |
| Hardness, Rockwell, M-scale | 105 / 90 | - | ISO 2039-2 |
| Hardness, Rockwell, R-scale | 125 / 118 | - | ISO 2039-2 |
| 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 | 255 / * | °C | |
| 65 psi | 262 / * | °C | |
| Vicat softening temperature, 90°F/h, 11 lbf | 255 / * | °C | ISO 306 |
| Coeff. of linear therm. expansion, parallel | 15 / * | E-6/K | ISO 11359-1/-2 |

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| | | | |
|--------------------------------------|------------------------|-------------------|----------------------|
| Coeff. of linear therm. expansion | | | ISO 11359-1/-2 |
| normal | 79 / * | E-6/K | |
| Normal, -40-23°C | 61 / * | E-6/K | |
| Normal, 55-160°C | 130 / * | E-6/K | |
| Parallel, -40-23°C | 20 / * | E-6/K | |
| Parallel, 55-160°C | 9 / * | E-6/K | |
| Thermal conductivity of melt | 0.25 | W/(m K) | - |
| Spec. heat capacity of melt | 2050 | J/(kg K) | - |
| Eff. thermal diffusivity | 9.5E-8 | m ² /s | - |
| RTI, electrical | | | UL 746B |
| 30mil | 130 / * | °C | |
| 60mil | 130 / * | °C | |
| 120mil | 130 | °C | |
| RTI, impact | | | UL 746B |
| 30mil | 120 | °C | |
| 60mil | 120 / * | °C | |
| 120mil | 120 | °C | |
| RTI, strength | | | UL 746B |
| 30mil | 130 | °C | |
| 60mil | 130 / * | °C | |
| 120mil | 130 | °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 | 0.71 / * | mm | IEC 60695-11-10 |
| UL recognition | yes / * | - | UL 94 |
| Oxygen index | 23 / * | % | ISO 4589-1/-2 |
| Glow Wire Flammability Index | | | IEC 60695-2-12 |
| 30mil | 650 / - | °C | |
| 60mil | 650 / - | °C | |
| 120mil | 825 / - | °C | |
| Glow Wire Ignition Temperature | | | IEC 60695-2-13 |
| 30mil | 675 / - | °C | |
| 60mil | 675 / - | °C | |
| 120mil | 700 / - | °C | |
| FMVSS Class | B | - | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm | 27 | mm/min | ISO 3795 (FMVSS 302) |
| Electrical properties | dry / cond | Unit | Test Standard |
| Relative permittivity | | | IEC 62631-2-1 |
| 100Hz | 4.5 / - | - | |
| 1MHz | 4.1 / 4.9 | - | |
| Dissipation factor | | | IEC 62631-2-1 |
| 100Hz | 100 / - | E-4 | |
| 1MHz | 145 / 600 | E-4 | |
| Volume resistivity | >1E13 / 1E10 | Ohm*m | IEC 62631-3-1 |
| Surface resistivity | * / 1E12 | Ohm | IEC 62631-3-2 |
| Electric strength | 27 / - | kV/mm | IEC 60243-1 |
| Electric Strength, Short Time, 2mm | 27 / - | kV/mm | IEC 60243-1 |
| Other properties | dry / cond | Unit | Test Standard |
| Humidity absorption, 80mil | 1.5 / * | % | Sim. to ISO 62 |
| Water absorption, 80mil | 4.7 / * | % | Sim. to ISO 62 |
| Density | 1490 / - | kg/m ³ | ISO 1183 |
| Density of melt | 1290 | kg/m ³ | - |
| Water Absorption, Immersion 24h | 0.9 ^[1] / * | % | Sim. to ISO 62 |

1: 2mm wall thickness

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| 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 | 295 | °C | - |
| Min. melt temperature | 285 | °C | - |
| Max. melt temperature | 305 | °C | - |
| Max. screw tangential speed | 0.2 / * | m/s | - |
| Mold Temperature Optimum | 100 | °C | - |
| Min. mold temperature | 70 | °C | - |
| Max. mold temperature | 120 | °C | - |
| Hold pressure range | 50 - 100 | MPa | - |
| Hold pressure time | 3 | s/mm | - |
| Ejection temperature | 210 | °C | - |

| Characteristics | | | |
|-----------------------|---------------------|-----------------------------|--------------------|
| Processing | • Injection Molding | | |
| Delivery form | • Pellets | | |
| Additives | • Lubricants | • Release agent | |
| Regional Availability | • North America | • Asia Pacific | • Near East/Africa |
| | • Europe | • South and Central America | • Global |

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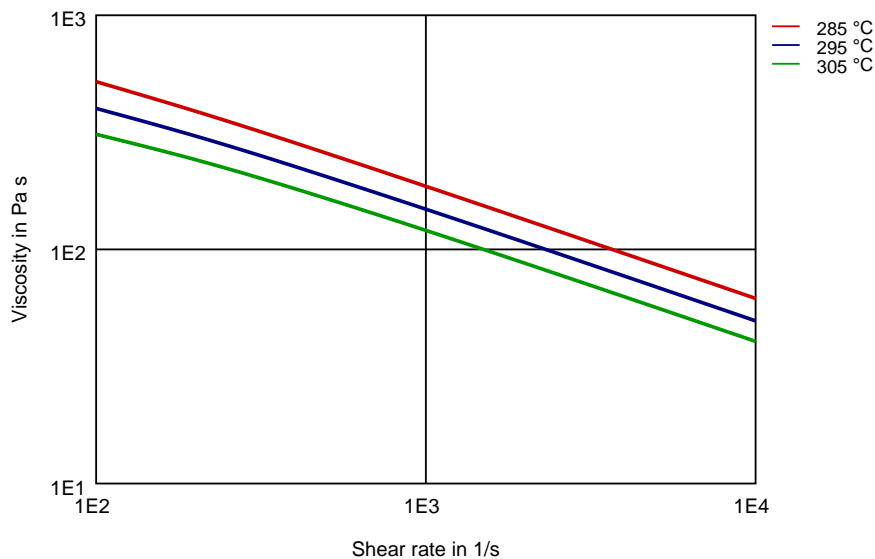


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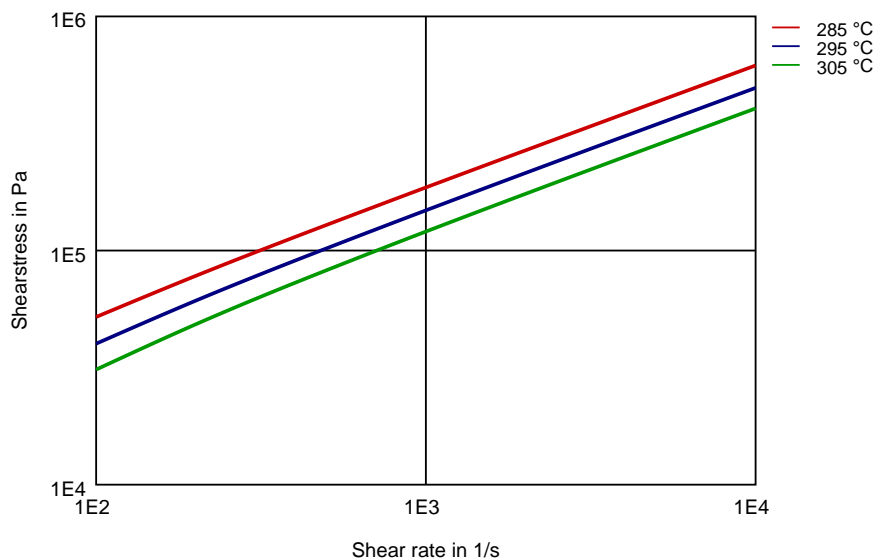
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Diagrams

Viscosity-shear rate



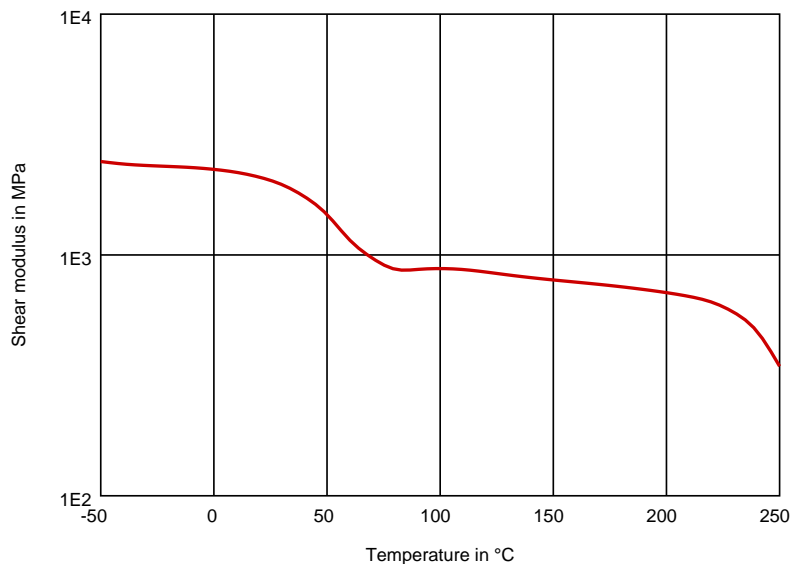
Shearstress-shear rate



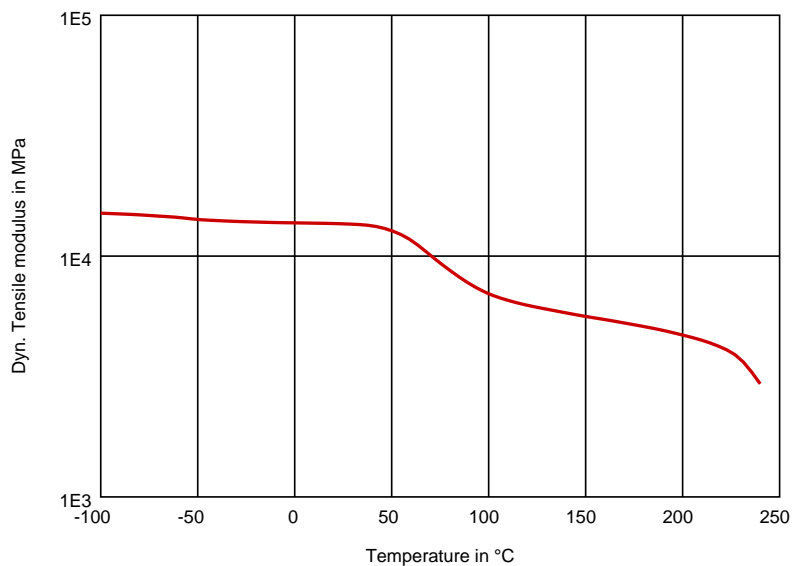
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Dynamic Shear modulus-temperature (dry)



Dynamic Tensile modulus-temperature (dry)



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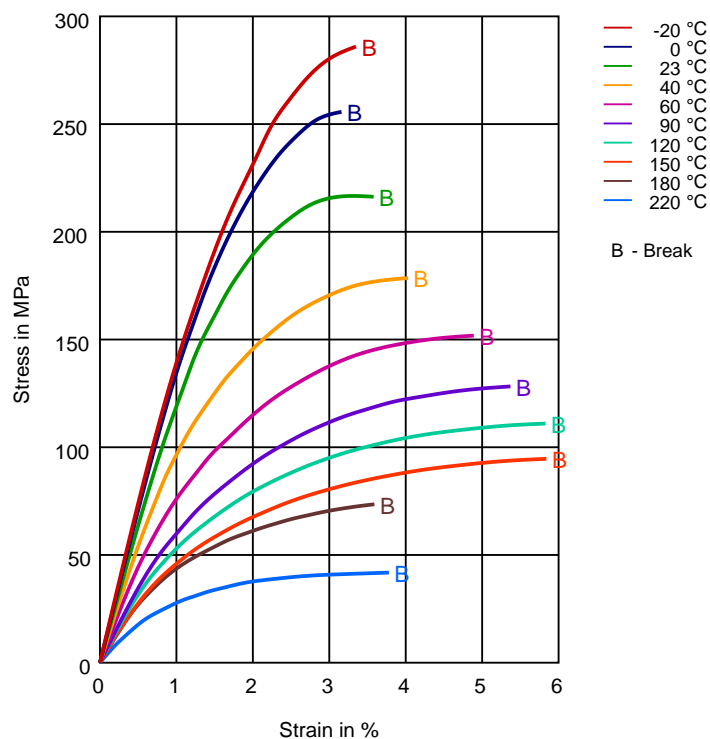
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Stress-strain (dry)



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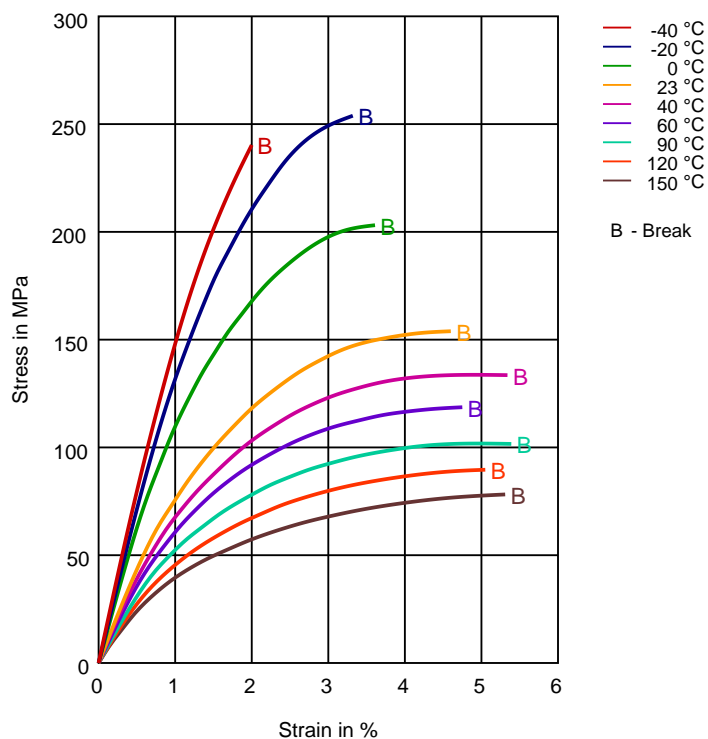
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DuPont™ Zytel® 70G43L NC010

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Stress-strain (cond.)



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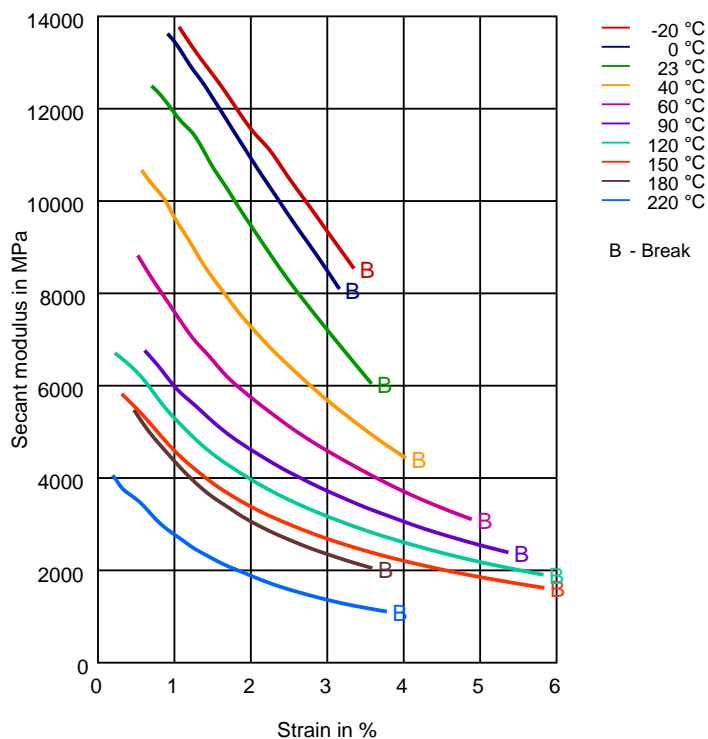
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NYLON RESIN

Secant modulus-strain (dry)



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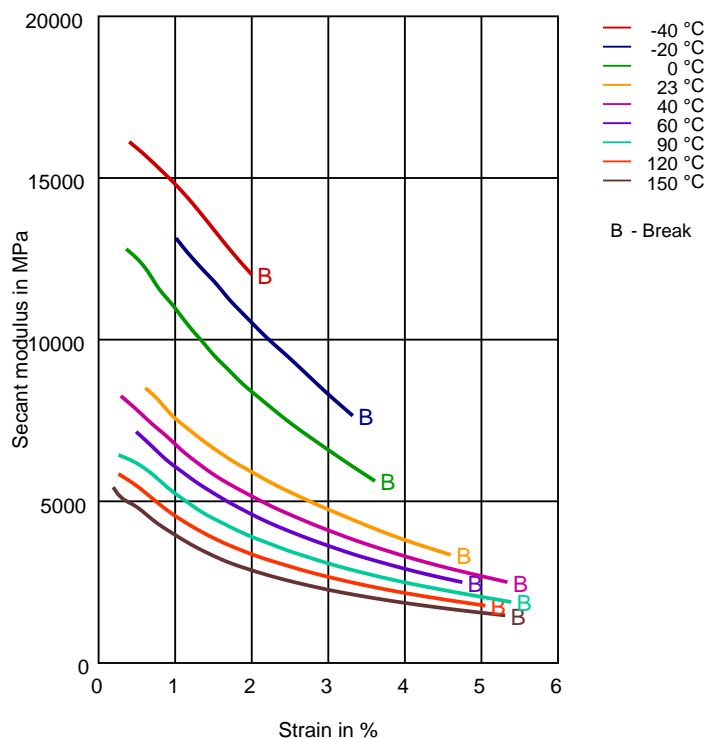
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Secant modulus-strain (cond.)



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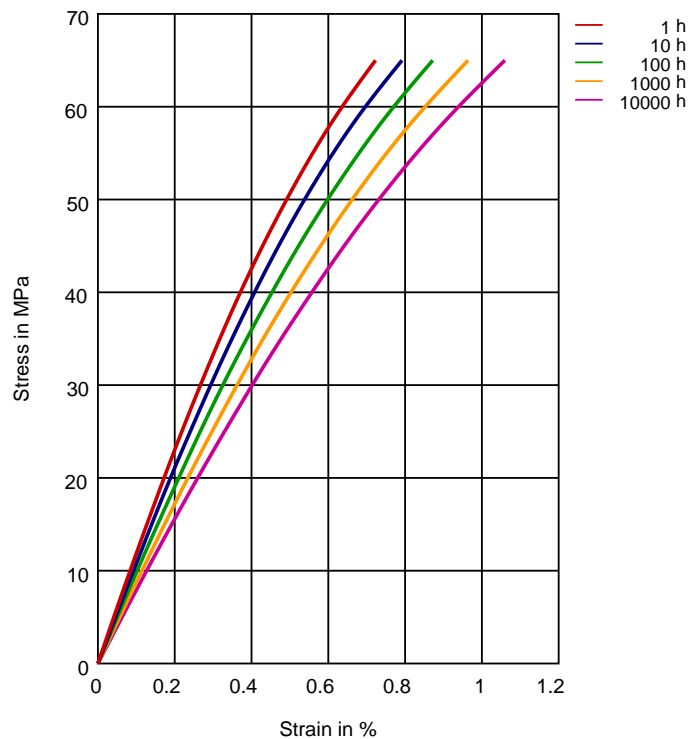
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DuPont™ Zytel® 70G43L NC010

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Stress-strain (isochronous) 23°C (cond.)



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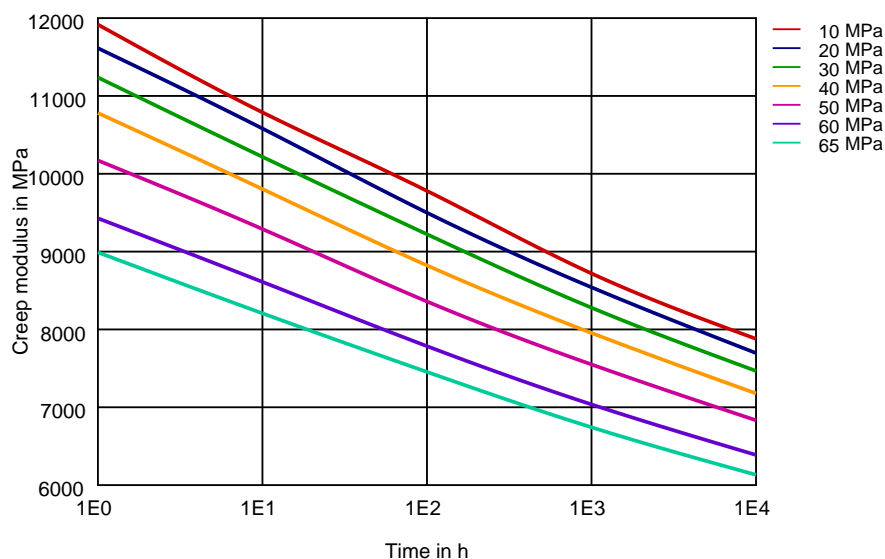
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Creep modulus-time 23 °C (cond.)



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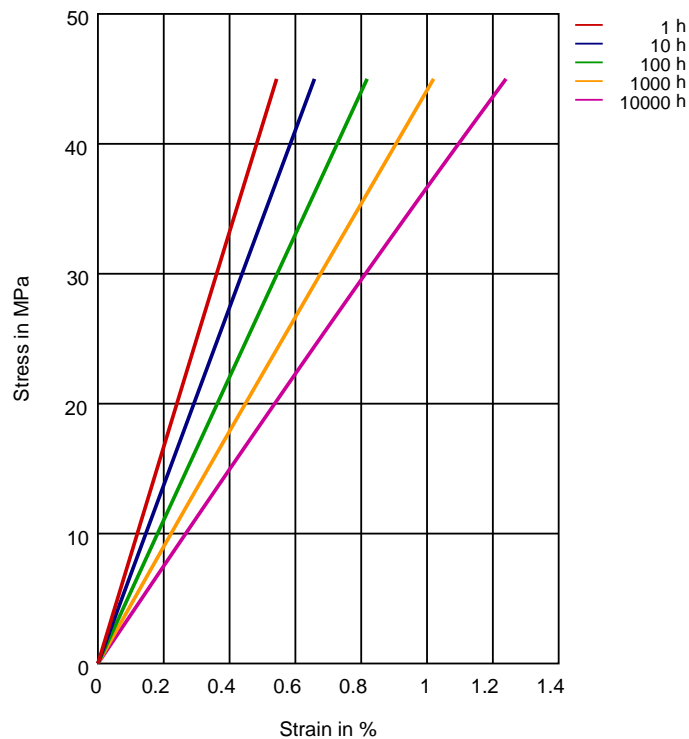
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Stress-strain (isochronous) 60°C (cond.)



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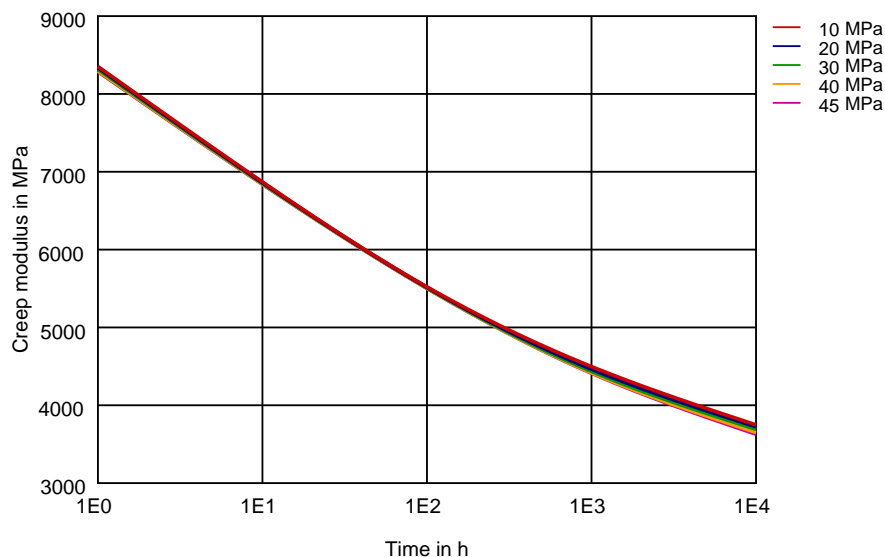
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Creep modulus-time 60 °C (cond.)



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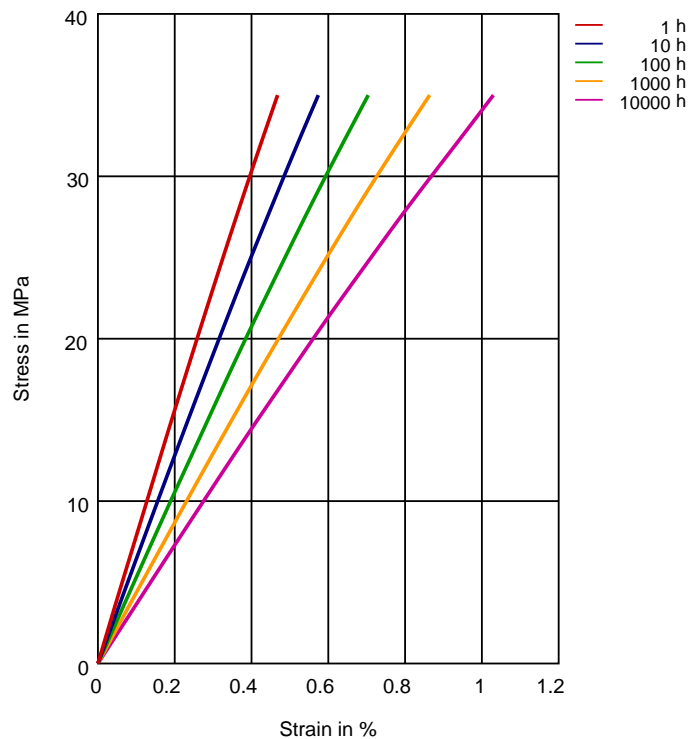
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Stress-strain (isochronous) 90°C (cond.)



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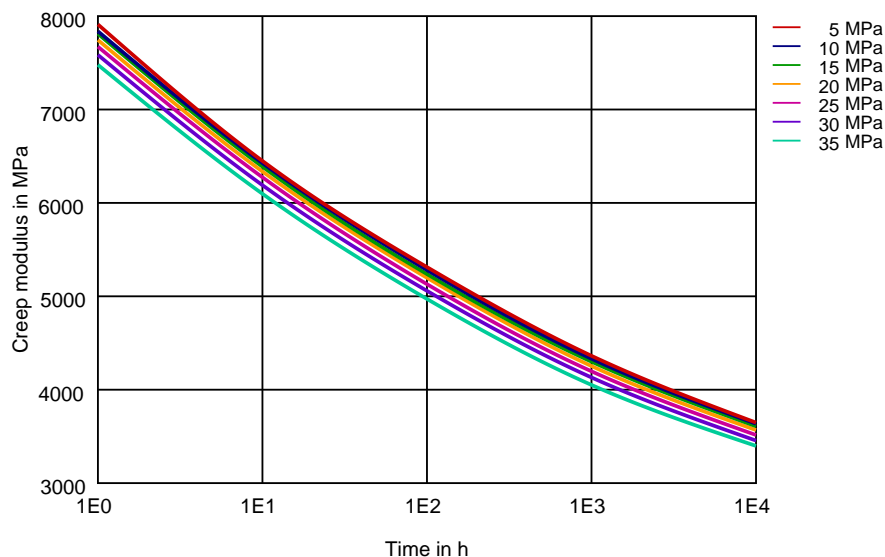
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Creep modulus-time 90 °C (cond.)



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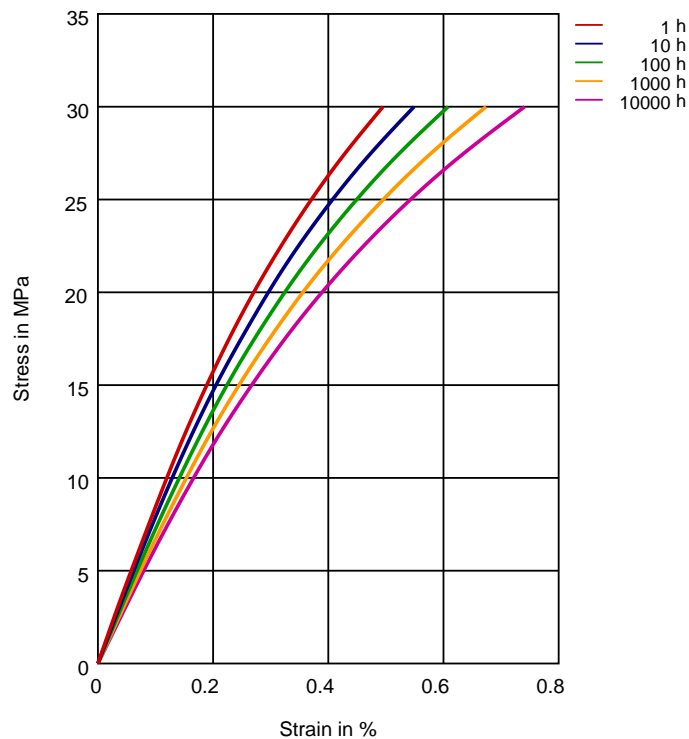
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Stress-strain (isochronous) 100°C (cond.)



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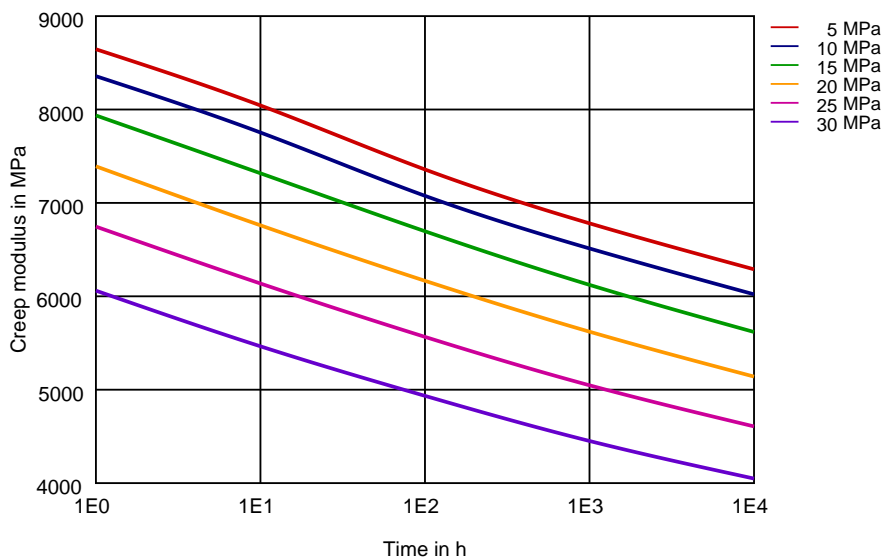
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NYLON RESIN

Creep modulus-time 100°C (cond.)



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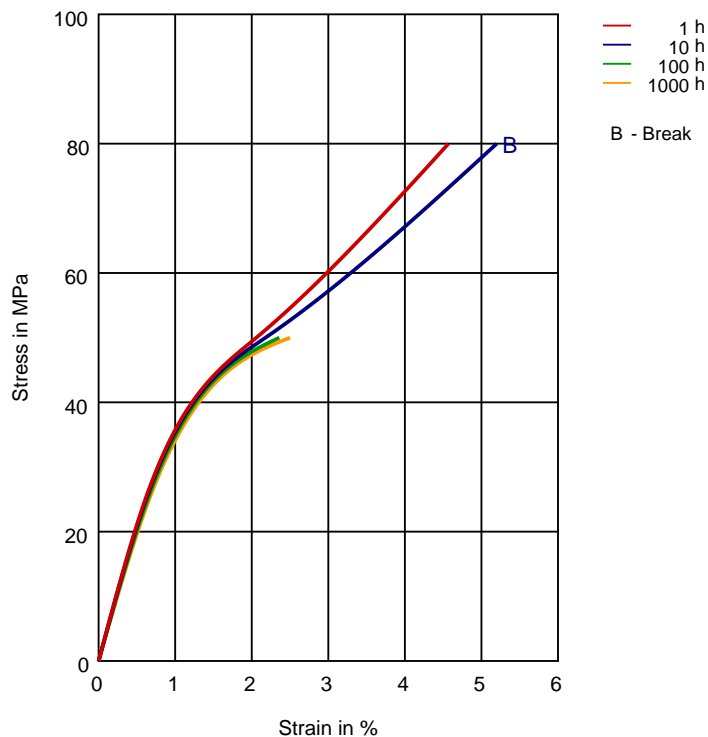
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DuPont™ Zytel® 70G43L NC010

NYLON RESIN

Stress-strain (isochronous) 150°C (cond.)



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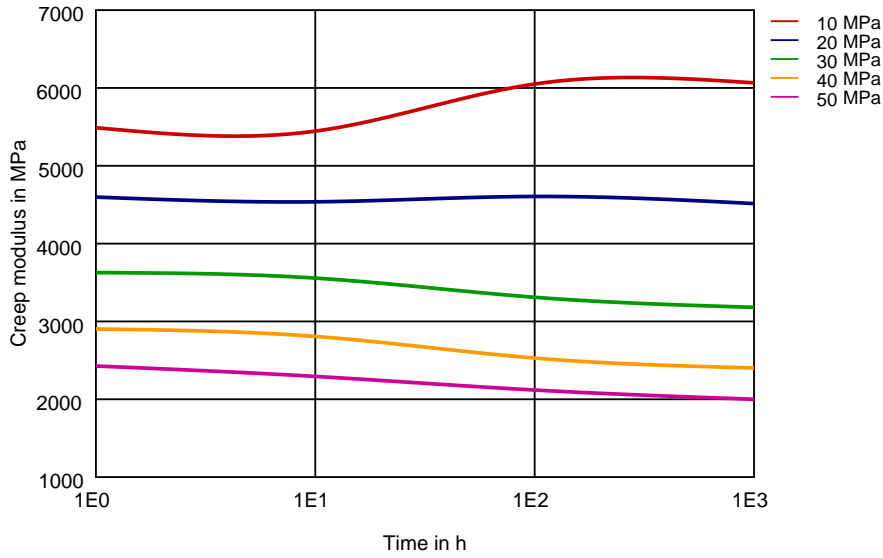
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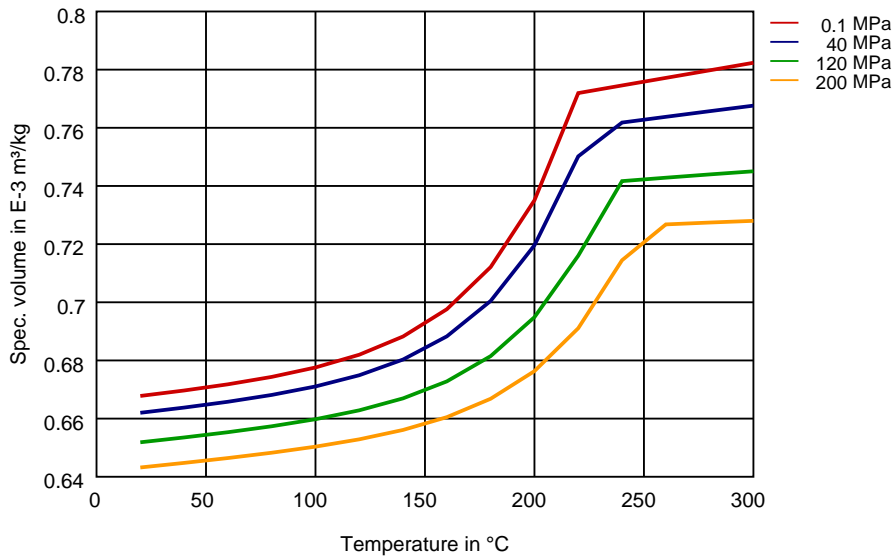
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Creep modulus-time 150°C(cond.)



Specific volume-temperature (pvT)



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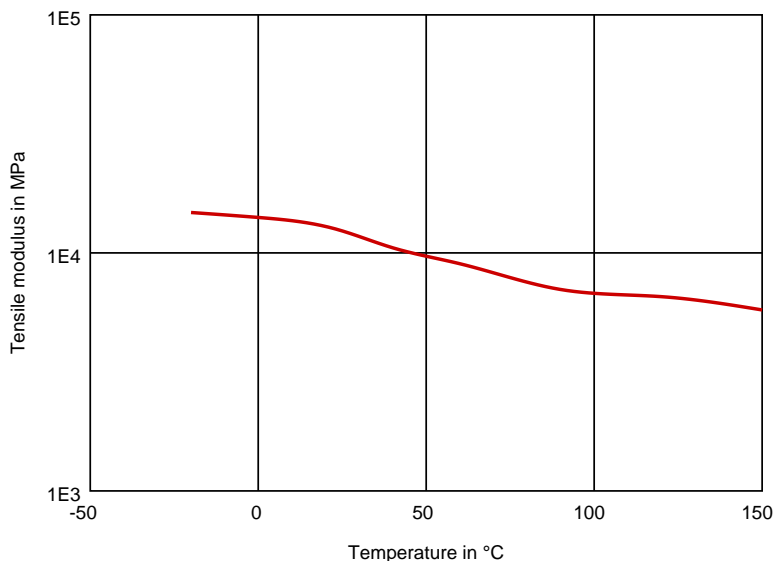
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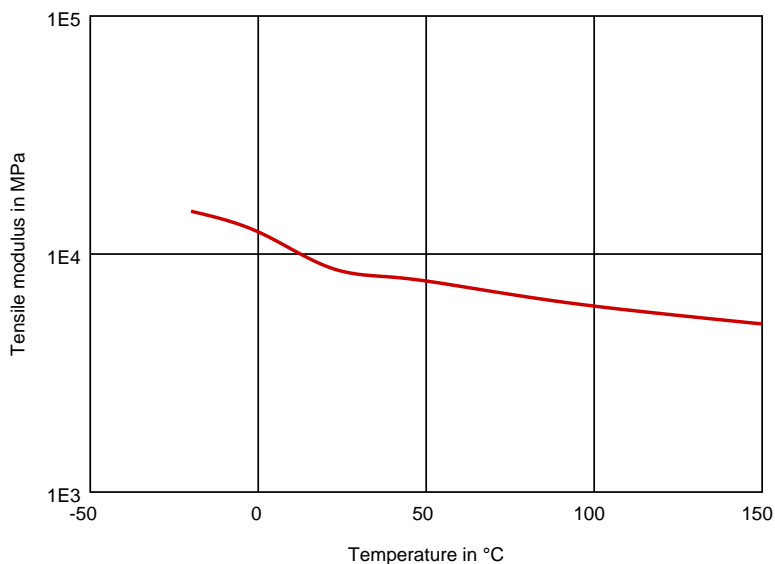
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Tensile modulus-temperature (dry)



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)

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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