

DuPont™ Zytel® E42A NC010

NYLON RESIN

Product Information

Zytel® E42A NC010 is an Unreinforced High Viscosity Polyamide 66 Developed for Extrusion

| General information | Value | Unit | Test Standard |
|---|------------------------|--------------------|----------------------|
| Resin Identification | PA66 | - | ISO 1043 |
| Part Marking Code | PA66 | - | ISO 11469 |
| Rheological properties | dry / cond | Unit | Test Standard |
| Viscosity number | 300 ⁽¹⁾ / * | cm ³ /g | ISO 307, 1157, 1628 |
| Molding shrinkage, parallel | 1.4 / - | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.4 / - | % | ISO 294-4, 2577 |
| 1: Sulfuric acid 96% | | | |
| Mechanical properties | dry / cond | Unit | Test Standard |
| Tensile Modulus | 3100 / 1200 | MPa | ISO 527-1/-2 |
| Yield stress | 86 / 52 | MPa | ISO 527-1/-2 |
| Yield strain | 5 / 27 | % | ISO 527-1/-2 |
| Nominal strain at break | >50 / >50 | % | ISO 527-1/-2 |
| 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 | 6 / 20 | kJ/m ² | |
| -22°F | 5 / 4 | kJ/m ² | |
| Izod notched impact strength | | | ISO 180/1A |
| 73°F | 5.5 / 12 | kJ/m ² | |
| -22°F | 4.3 / 4 | kJ/m ² | |
| Thermal properties | dry / cond | Unit | Test Standard |
| Melting temperature, 18°F/min | 263 / * | °C | ISO 11357-1/-3 |
| Glass transition temperature, 18°F/min | 70 / - | °C | ISO 11357-1/-2 |
| Temp. of deflection under load | | | ISO 75-1/-2 |
| 260 psi | 72 / * | °C | |
| 65 psi | 205 / * | °C | |
| Vicat softening temperature, 90°F/h, 11 lbf | 244 / * | °C | ISO 306 |
| Coeff. of linear therm. expansion, parallel | 100 / * | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal | 100 / * | E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.16 | W/(m K) | - |
| Spec. heat capacity of melt | 2790 | J/(kg K) | - |
| 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 | 0.81 / * | mm | IEC 60695-11-10 |
| UL recognition | yes / * | - | UL 94 |
| Oxygen index | 28 / * | % | ISO 4589-1/-2 |
| Flammability, 3.0mm | V-2 / * | - | IEC 60695-11-10 |
| 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 |
| Relative permittivity | | | IEC 62631-2-1 |
| 100Hz | 4.3 / 10.3 | - | |
| 1MHz | 3.6 / 4.2 | - | |
| Dissipation factor | | | IEC 62631-2-1 |
| 100Hz | 150 / 2000 | E-4 | |
| 1MHz | 240 / 750 | E-4 | |

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| | | | |
|---------------------------------|------------|-------------------|----------------|
| Volume resistivity | 1E11 / 1E9 | Ohm*m | IEC 62631-3-1 |
| Electric strength | 30.5 / - | kV/mm | IEC 60243-1 |
| Other properties | dry / cond | Unit | Test Standard |
| Humidity absorption, 80mil | 2.7 / * | % | Sim. to ISO 62 |
| Water absorption, 80mil | 8.5 / * | % | Sim. to ISO 62 |
| Density | 1140 / - | kg/m ³ | ISO 1183 |
| Density of melt | 1010 | kg/m ³ | - |
| Injection | dry / cond | Unit | Test Standard |
| Drying Recommended | yes | - | - |
| Drying Temperature | ≥80 | °C | - |
| Drying Time, Dehumidified Dryer | 2 - 4 | h | - |
| Processing Moisture Content | ≤0.05 | % | - |
| Melt Temperature Optimum | 290 | °C | - |
| Min. melt temperature | 280 | °C | - |
| Max. melt temperature | 300 | °C | - |
| Max. screw tangential speed | 0.4 / * | 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 | ≤80 | °C | - |
| Drying Time, Dehumidified Dryer | 4 - 6 | h | - |
| Processing Moisture Content | ≤0.06 | % | - |
| Melt Temperature Optimum | 285 | °C | - |
| Melt Temperature Range | 275 - 290 | °C | - |

Characteristics

| | | | |
|-----------------------|--|---|---|
| Processing | <ul style="list-style-type: none">• Injection Molding• Film Extrusion• Profile Extrusion | <ul style="list-style-type: none">• Sheet Extrusion• Other Extrusion• Coating | <ul style="list-style-type: none">• Casting |
| Delivery form | <ul style="list-style-type: none">• Pellets | | |
| Additives | <ul style="list-style-type: none">• Release agent | | |
| Regional Availability | <ul style="list-style-type: none">• Europe | <ul style="list-style-type: none">• Near East/Africa | |

Processing Texts

Profile extrusion

PREPROCESSING

Drying recommended = Yes, if moisture content of resin exceeds recommended level

Drying temperature = 80°C

Drying time, dehumidified dryer = 4-6 h

Processing moisture content = <0.05 %

PROCESSING

Melt temperature optimum = 285°C

Melt temperature range = 280-290°C

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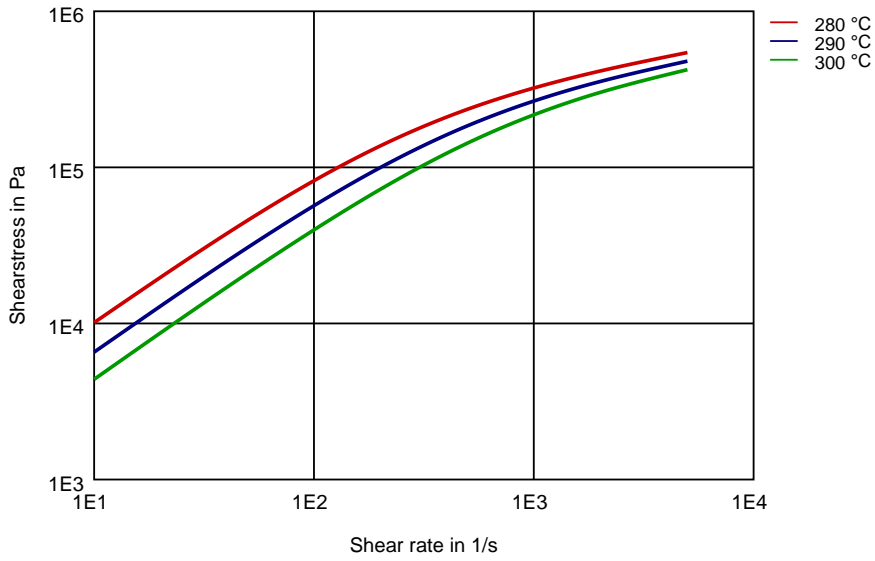


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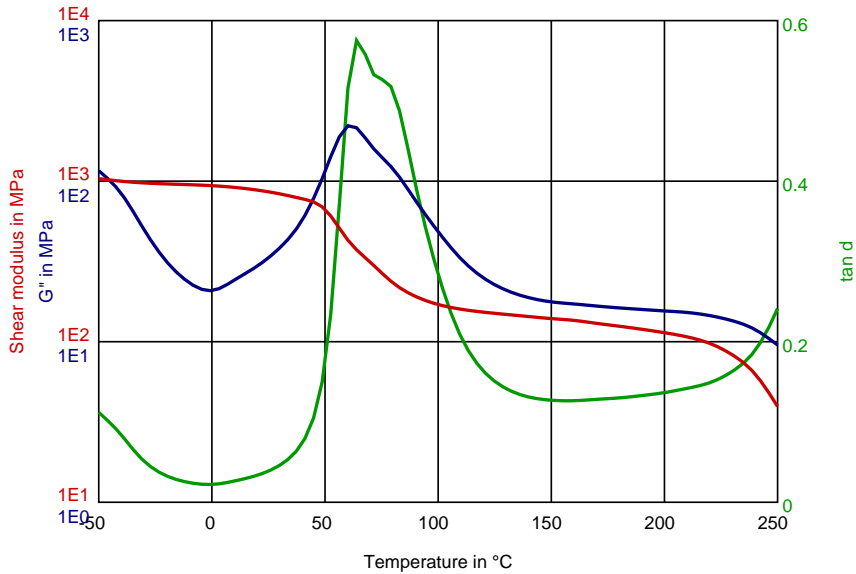
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Diagrams

Shearstress-shear rate



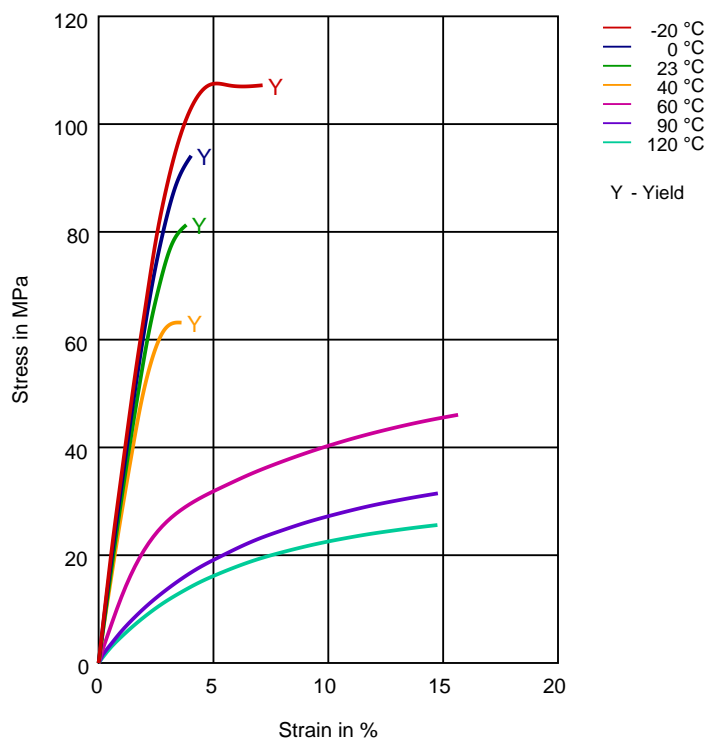
Dynamic Shear modulus-temperature (dry)



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Stress-strain (dry)



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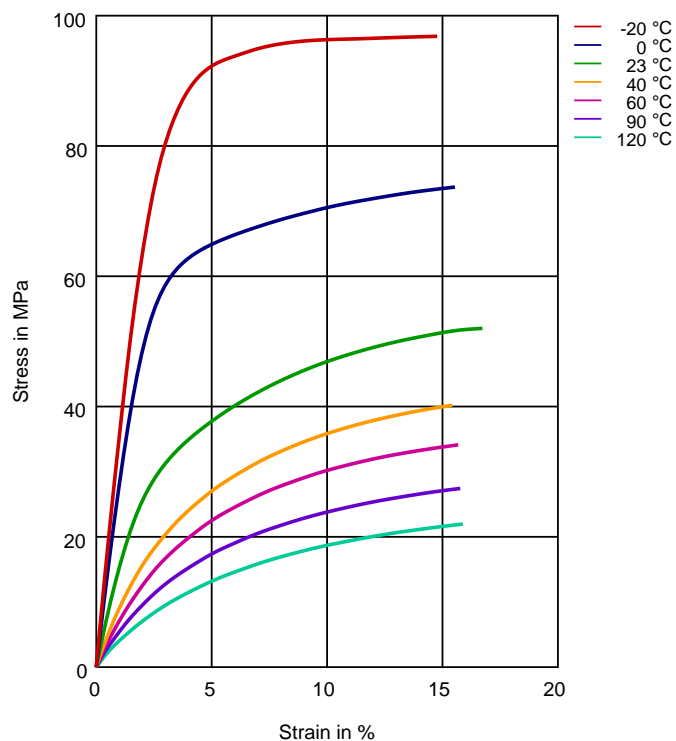
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Stress-strain (cond.)



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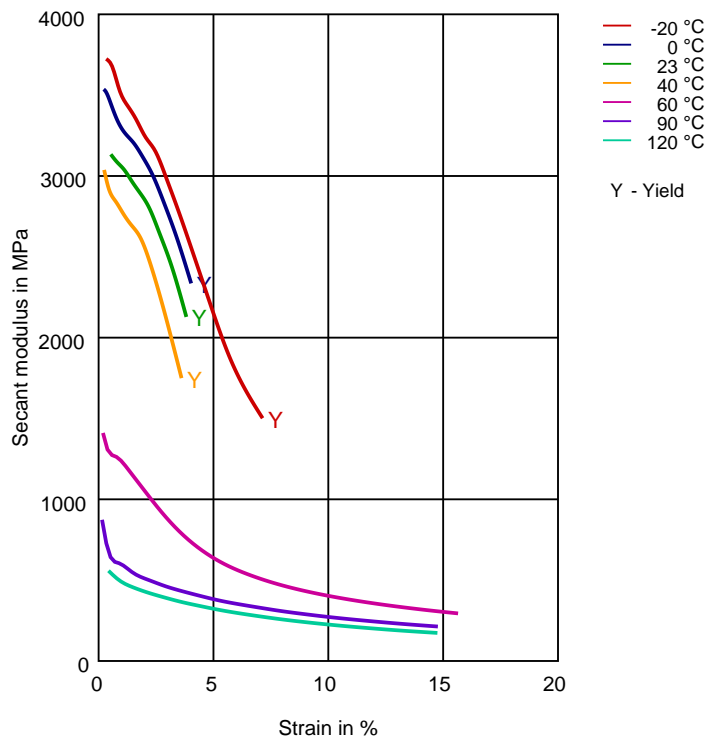
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Secant modulus-strain (dry)



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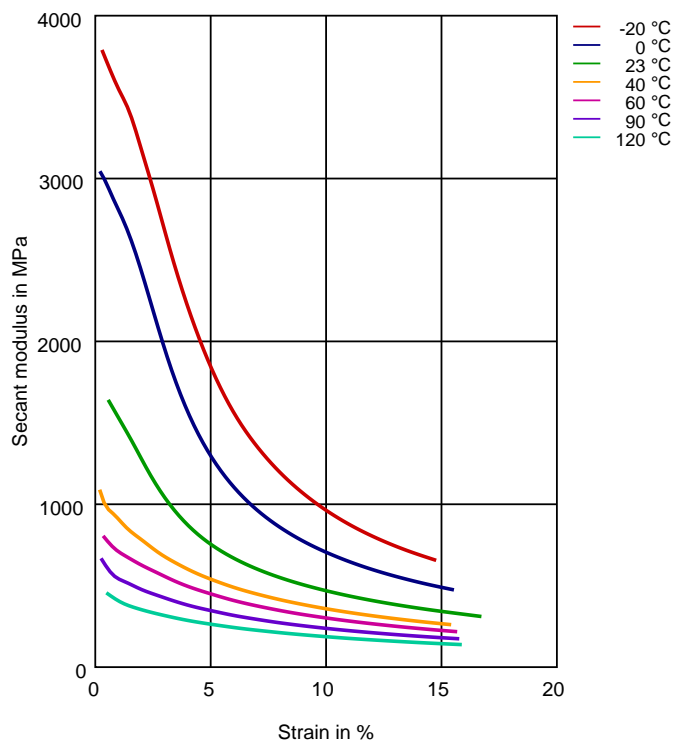
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Secant modulus-strain (cond.)



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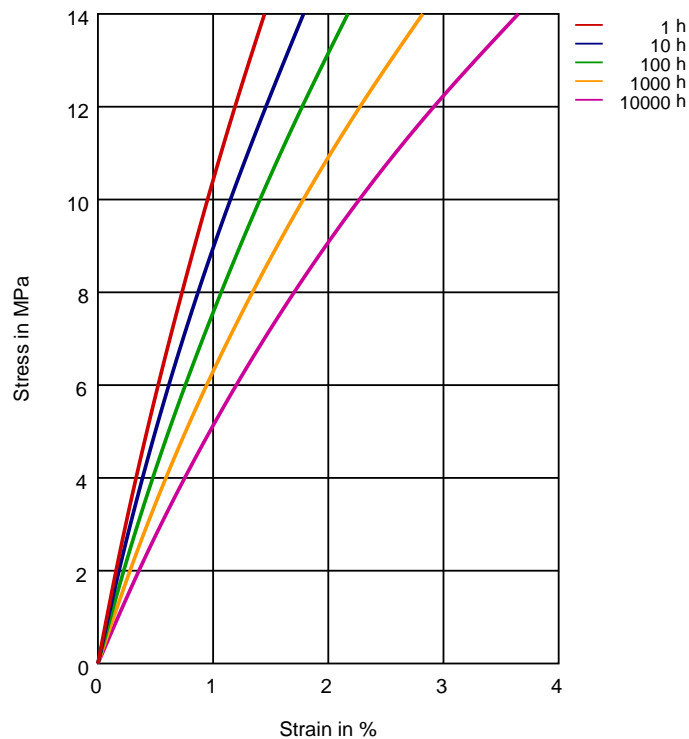
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Stress-strain (isochronous) 23°C (cond.)



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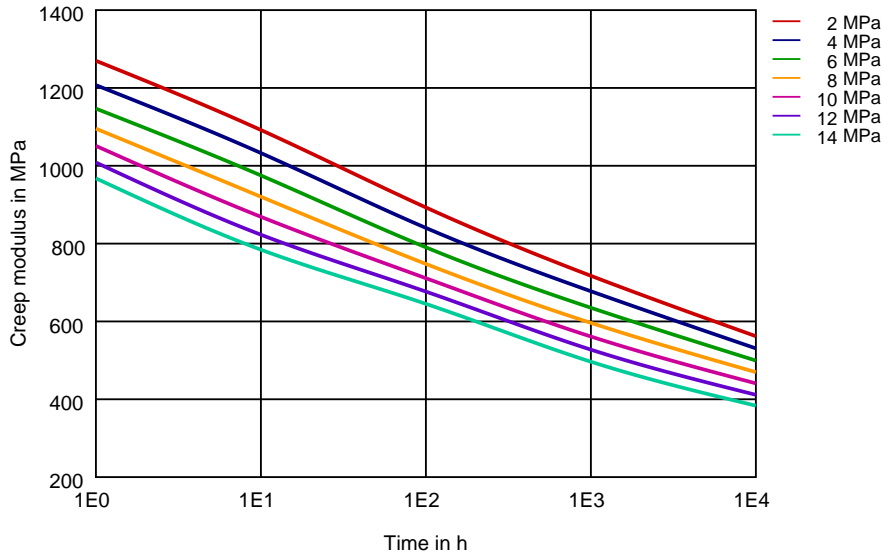
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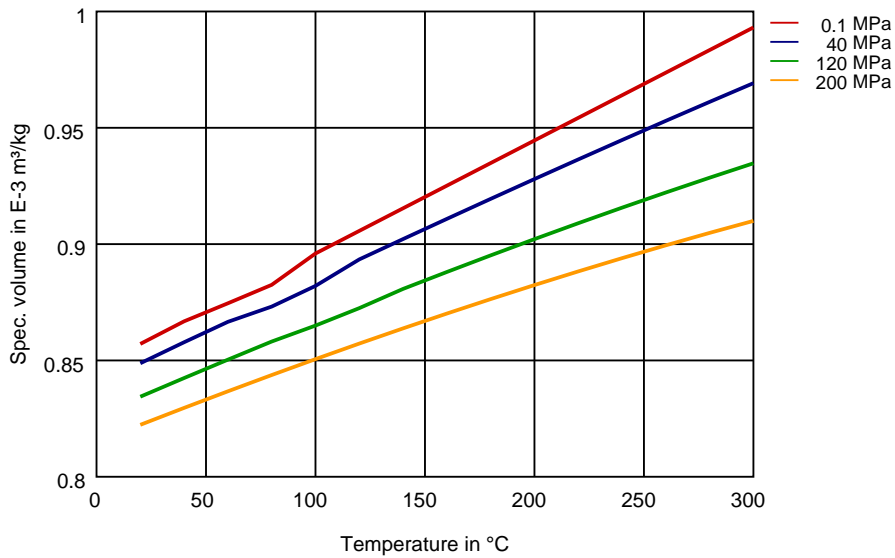
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Creep modulus-time 23 °C (cond.)



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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