# DuPont™ Delrin® 500TL NC010

## ACETAL RESIN

### Product Information

Common features of Delrin® acetal resins include mechanical and physical properties such as high mechanical strength and rigidity, excellent fatigue and impact resistance, as well as resistance to moisture, gasoline, lubricants, solvents, and many other neutral chemicals. Delrin® acetal resins also have excellent dimensional stability and good electrical insulating characteristics. They are naturally resilient, self-lubricating, and available in a variety of colors and speciality grades.

Delrin® acetal resin typically is used in demanding applications in the automotive, domestic appliances, sports, industrial engineering, electronics, and consumer goods industries.

**Delrin® 500TL is a medium viscosity acetal homopolymer containing 1.5% Teflon® PTFE Micropowder lubricant. It is designed for applications requiring reduced wear and friction against steel, itself, or other plastics.**

| General information | Value | Unit | Test Standard |
|---|---|---|---|
| Resin Identification | POM-SD | - | ISO 1043 |
| Part Marking Code | POM-SD | - | ISO 11469 |
| **Rheological properties** | **Value** | **Unit** | **Test Standard** |
| Melt volume-flow rate | 12 | $cm^3$/10min | ISO 1133 |
| Temperature | 190 | °C | ISO 1133 |
| Load | 2.16 | kg | ISO 1133 |
| Melt mass-flow rate | 14 | g/10min | ISO 1133 |
| Molding shrinkage, parallel | 1.8 | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | 1.7 | % | ISO 294-4, 2577 |
| **Mechanical properties** | **Value** | **Unit** | **Test Standard** |
| Tensile Modulus | 3300 | MPa | ISO 527-1/-2 |
| Yield stress | 71 | MPa | ISO 527-1/-2 |
| Yield strain | 13 | % | ISO 527-1/-2 |
| Nominal strain at break | 20 | % | ISO 527-1/-2 |
| Flexural Modulus | 3100 | MPa | ISO 178 |
| Charpy impact strength | | | ISO 179/1eU |
| 73°F | 170 | kJ/$m^2$ | |
| -22°F | 160 | kJ/$m^2$ | |
| Charpy notched impact strength | | | ISO 179/1eA |
| 73°F | 5 | kJ/$m^2$ | |
| -22°F | 4 | kJ/$m^2$ | |
| Izod notched impact strength | | | ISO 180/1A |
| 73°F | 6 | kJ/$m^2$ | |
| -40°F | 6 | kJ/$m^2$ | |
| **Thermal properties** | **Value** | **Unit** | **Test Standard** |
| Melting temperature, 18°F/min | 178 | °C | ISO 11357-1/-3 |
| Temp. of deflection under load | | | ISO 75-1/-2 |
| 260 psi | 103 | °C | |
| 65 psi | 165 | °C | |
| 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 |
| RTI, electrical | | | UL 746B |
| 60mil | 105 | °C | |
| 120mil | 105 | °C | |
| RTI, impact | | | UL 746B |
| 60mil | 85 | °C | |
| 120mil | 85 | °C | |
| RTI, strength | | | UL 746B |
| 60mil | 90 | °C | |
| 120mil | 90 | °C | |
| **Flammability** | **Value** | **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 |



**To find out more, visit DuPont Performance Polymers or contact nearest DuPont location.**

**North America**
Tel: +1 302 999-4592
Toll-Free (USA): 800 441-0575

**Asia Pacific**
Tel: +81 3 5521 8600

**Europe/Middle East/Africa**
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| | | | |
|---|---|---|---|
| Burning Behav. at thickness h | HB | class | IEC 60695-11-10 |
| Thickness tested | 3 | 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** | **Value** | **Unit** | **Test Standard** |
| Relative permittivity | | | IEC 60250 |
| 100Hz | 3.6 | - | |
| 1MHz | 3.6 | - | |
| Volume resistivity | 1E12 | Ohm*m | IEC 60093 |
| Comparative tracking index | 600 | - | IEC 60112 |
| **Other properties** | **Value** | **Unit** | **Test Standard** |
| Humidity absorption, 80mil | 0.17 | % | Sim. to ISO 62 |
| Water absorption, 80mil | 0.9 | % | Sim. to ISO 62 |
| Density | 1430 | kg/m³ | ISO 1183 |
| **Injection** | **Value** | **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 | 215 | °C | - |
| Min. melt temperature | 210 | °C | - |
| Max. melt temperature | 220 | °C | - |
| Mold Temperature Optimum | 90 | °C | - |
| Min. mold temperature | 80 | °C | - |
| Max. mold temperature | 100 | °C | - |
| Hold pressure range | 80 - 100 | MPa | - |
| Hold pressure time | 8 | s/mm | - |
| Annealing time, optional | 30 | min/mm | - |
| Annealing temperature | 160 | °C | - |

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

### Processing Texts

#### Injection molding

Drying is recommended, but not necessary for newly opened packaging stored in a dry location.

Follow the drying guidelines above in the following cases:
· If moisture is above the Processing Moisture Content recommendation,
· When a resin container is damaged,
· When the material is not properly stored in a dry place at room temperature, or
· When packaging stays open for a significant time.



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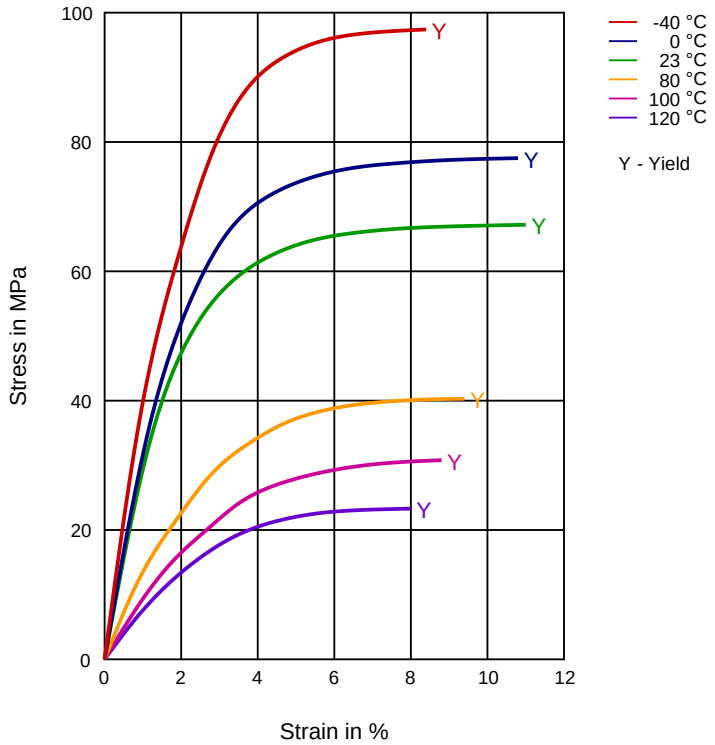
### Diagrams

#### Stress-strain



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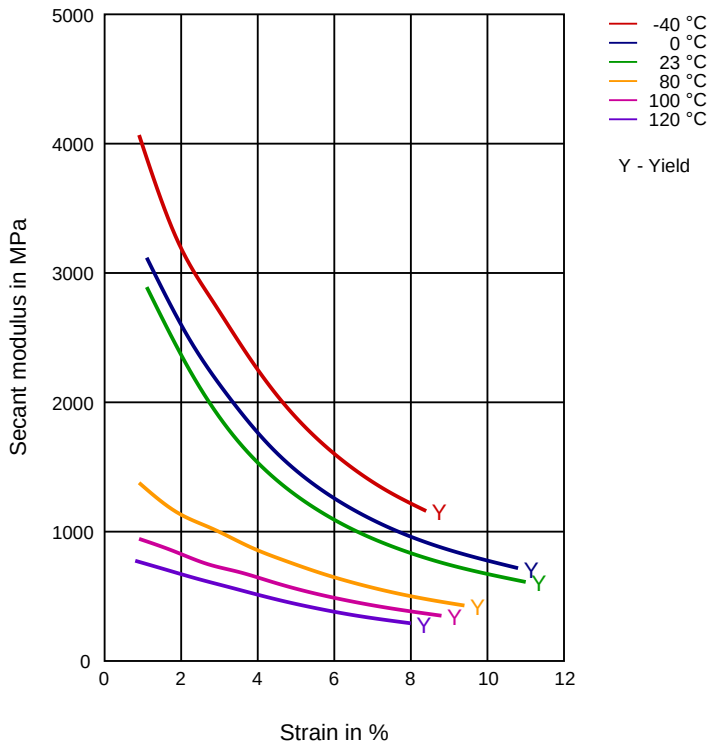
Secant modulus-strain



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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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