



Delrin® 100 NC010

ACETAL RESIN

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® 100 is a high viscosity acetal homopolymer for use in easy-to-fill moulds. Delrin® 100 provides optimum mechanical performance with its excellent combination of toughness and strength.

Product information

Resin Identification	POM	ISO 1043
Part Marking Code	>POM<	ISO 11469

Rheological properties

Melt volume-flow rate	1.9 cm ³ /10min	ISO 1133
Melt mass-flow rate	2.2 g/10min	ISO 1133
Temperature	190 °C	ISO 1133
Load	2.16 kg	ISO 1133
Melt mass-flow rate, Temperature	190 °C	ISO 1133
Melt mass-flow rate, Load	2.16 kg	ISO 1133
Moulding shrinkage, parallel	2.2 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.9 %	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	3.0 %	ISO 294-4
Moulding shrinkage, normal, annealed	2.4 %	ISO 294-4

Typical mechanical properties

Tensile Modulus	2900 MPa	ISO 527-1/-2
Yield stress	71 MPa	ISO 527-1/-2
Yield strain	26 %	ISO 527-1/-2
Nominal strain at break	45 %	ISO 527-1/-2
Flexural Modulus	2800 MPa	ISO 178
Flexural Strength	93 MPa	ISO 178
Flexural Stress at 3.5%	77 MPa	ISO 178
Compressive strength	110 MPa	ISO 604
Tensile creep modulus, 1h	2900 MPa	ISO 899-1
Tensile creep modulus, 1000h	1600 MPa	ISO 899-1
Charpy impact strength, 23°C	N kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	425 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	15 kJ/m ²	ISO 179/1eA



Delrin[®] 100 NC010

ACETAL RESIN

Charpy notched impact strength, -30°C	13 kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C	14 kJ/m ²	ISO 180/1A
Izod notched impact strength, -40°C	13 kJ/m ²	ISO 180/1A
Hardness, Rockwell, M-scale	90 -	ISO 2039-2
Hardness, Rockwell, R-scale	121 -	ISO 2039-2
Ball indentation hardness, H 358/30	173 MPa	ISO 2039-1
Poisson's ratio	0.37 -	
Abrasion resistance	4 ^[DS] mm ³	ISO 4649

[DS]: Derived from similar grade

Thermal properties

Melting temperature, 10°C/min	178 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	95 °C	ISO 75-1/-2
Temp. of deflection under load, 1.8 MPa, annealed	115 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	160 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	160 °C	ISO 306
Vicat softening temperature, 50°C/h 10N	175 °C	ISO 306
CLTE, Parallel, -40-23°C	100 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	110 E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	100 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	110 E-6/K	ISO 11359-1/-2
Eff. thermal diffusivity	1.0E-7 m ² /s	
Spec. heat capacity of melt	3000 J/(kg K)	
RTI, electrical, 0.75mm	50 °C	UL 746B
RTI, electrical, 1.5mm	105 °C	UL 746B
RTI, electrical, 3mm	105 °C	UL 746B
RTI, electrical, 6mm	105 °C	UL 746B
RTI, impact, 0.75mm	50 °C	UL 746B
RTI, impact, 1.5mm	85 °C	UL 746B
RTI, impact, 3mm	85 °C	UL 746B
RTI, impact, 6mm	85 °C	UL 746B
RTI, strength, 0.75mm	50 °C	UL 746B
RTI, strength, 1.5mm	90 °C	UL 746B
RTI, strength, 3mm	90 °C	UL 746B
RTI, strength, 6mm	90 °C	UL 746B
Temperature index, tensile strength, 20 000h	110 °C	IEC 60216-1
Temperature index, tensile strength, 5000h	125 °C	IEC 60216-1

Flammability

Burning Behav. at 1.5mm 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

Delrin® 100 NC010

ACETAL RESIN

UL recognition	yes -	UL 94
Glow Wire Flammability Index, 1mm	550 °C	IEC 60695-2-12
Glow Wire Flammability Index, 2mm	550 °C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	550 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	550 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	550 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1mm	550 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	550 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2mm	550 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3mm	550 °C	IEC 60695-2-13
FMVSS Class	B -	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	40 mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	3.9 -	IEC 62631-2-1
Relative permittivity, 1MHz	3.8 -	IEC 62631-2-1
Dissipation factor, 100Hz	10 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	55 E-4	IEC 62631-2-1
Volume resistivity	>1E13 Ohm.m	IEC 62631-3-1
Surface resistivity	3E13 Ohm	IEC 62631-3-2
Electric strength	41 kV/mm	IEC 60243-1
Comparative tracking index	600 -	IEC 60112

Other properties

Humidity absorption, 2mm	0.2 %	Sim. to ISO 62
Water absorption, 2mm	0.9 %	Sim. to ISO 62
Density	1420 kg/m ³	ISO 1183
Density of melt	1190 kg/m ³	
Water Absorption, Immersion 24h	0.27 %	Sim. to ISO 62

VDA Properties

Fogging, G-value (condensate)	0.1 mg	ISO 6452
-------------------------------	--------	----------

Injection

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
Max. screw tangential speed	0.2 m/s
Mold Temperature Optimum	90 °C
Min. mould temperature	80 °C

Delrin[®] 100 NC010

ACETAL RESIN

Max. mould temperature	100 °C
Hold pressure range	90 - 110 MPa
Hold pressure time	8 s/mm
Annealing time, optional	30 min/mm
Annealing temperature	160 °C

Extrusion

Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	200 °C
Melt Temperature Range	195 - 205 °C

Characteristics

Additives

Release agent

Additional Information

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:

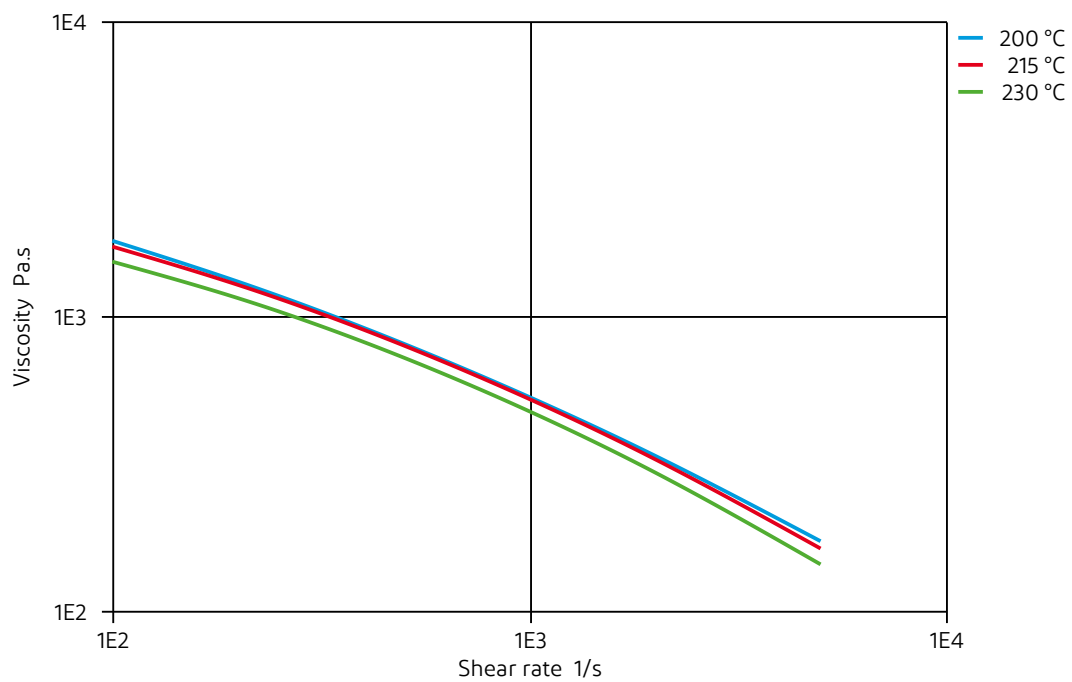
- If moisture is above the Processing Moisture Content recommendation,
- When a resin container is damaged,
- When the material is not properly stored in a dry place at room temperature, or
- When packaging stays open for a significant time.



Delrin[®] 100 NC010

ACETAL RESIN

Viscosity-shear rate

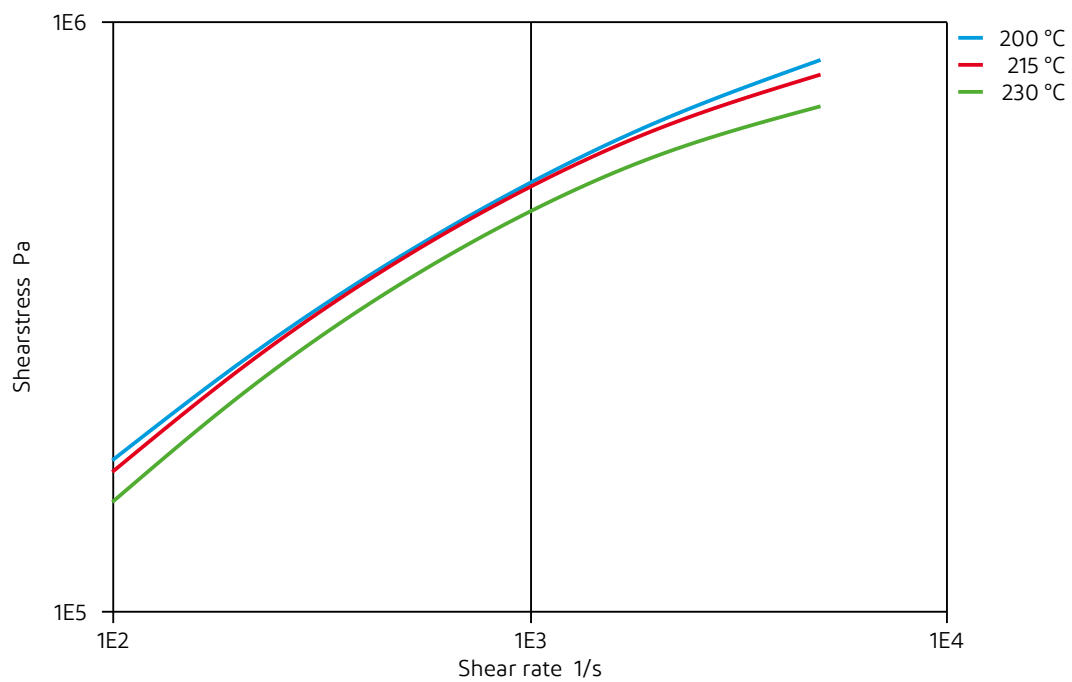




Delrin[®] 100 NC010

ACETAL RESIN

Shearstress-shear rate

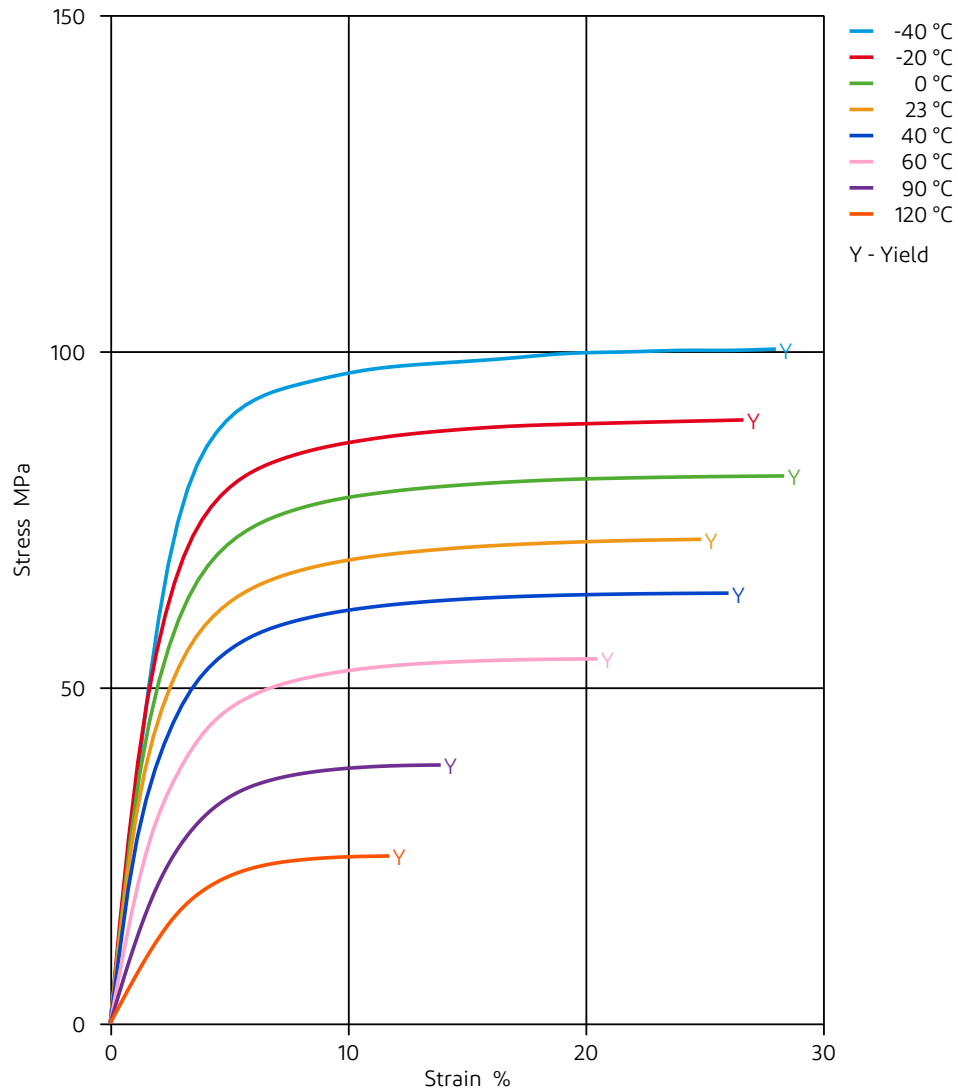




Delrin[®] 100 NC010

ACETAL RESIN

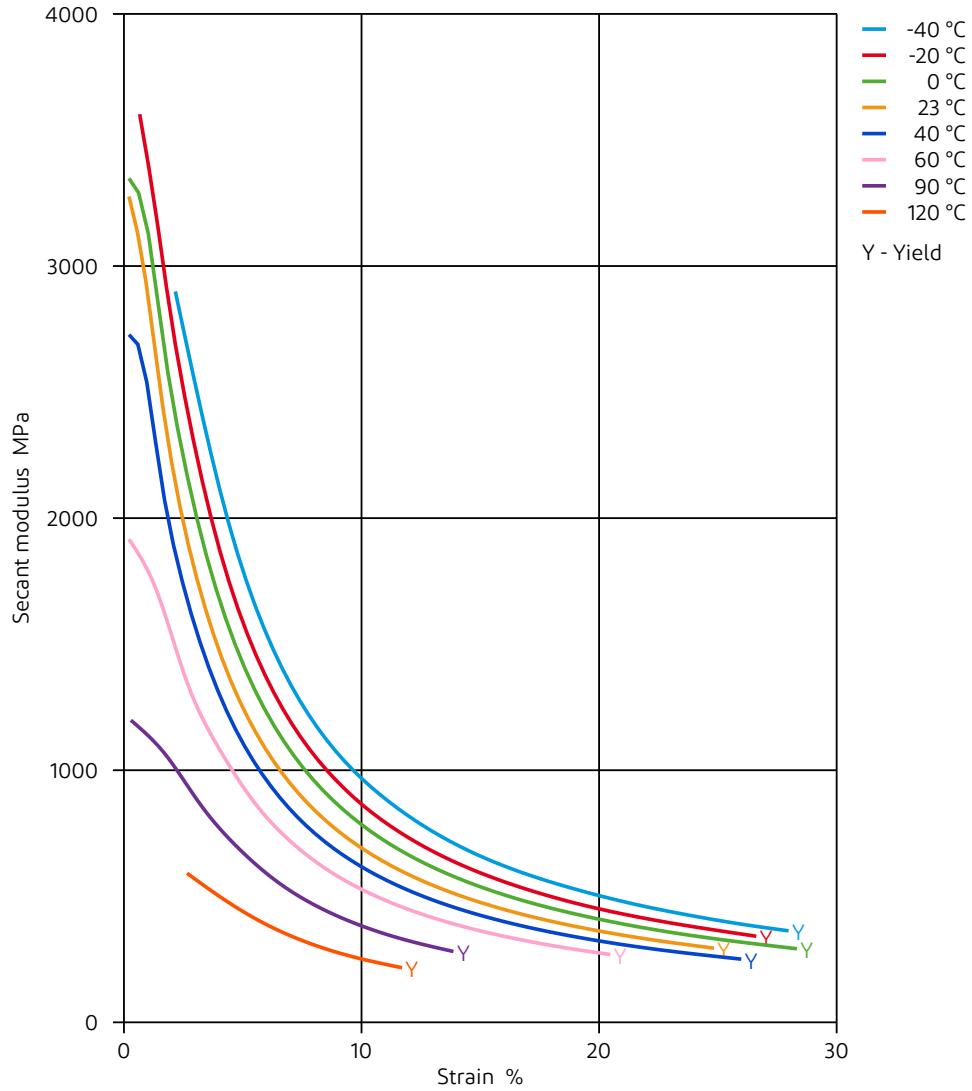
Stress-strain



Delrin[®] 100 NC010

ACETAL RESIN

Secant modulus-strain

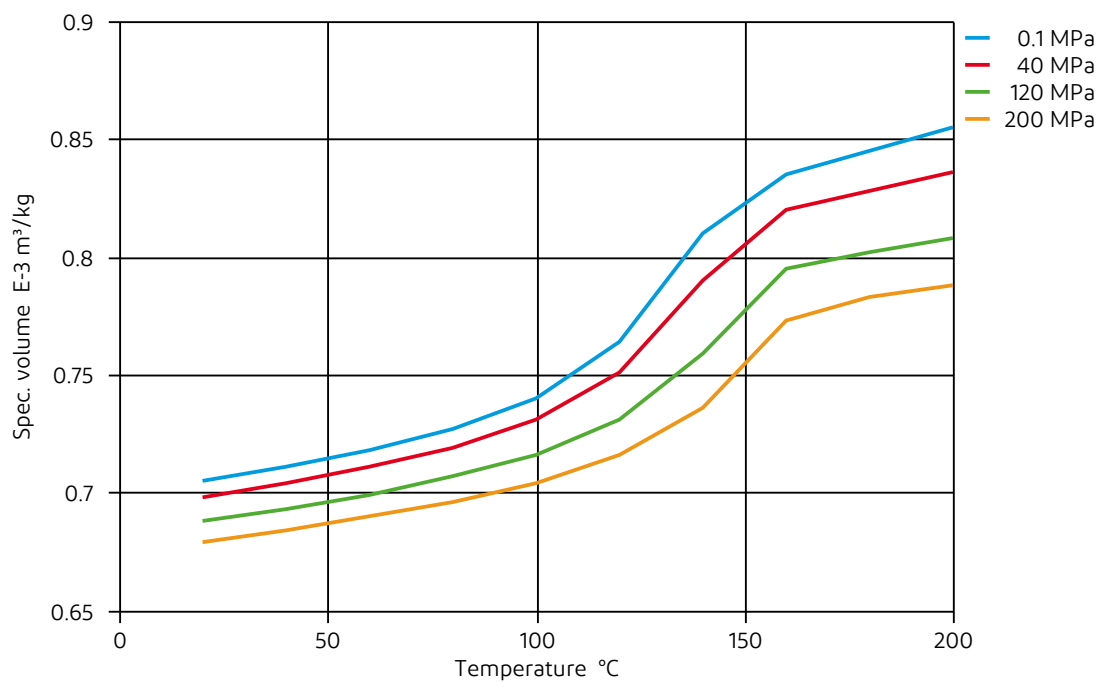




Delrin[®] 100 NC010

ACETAL RESIN

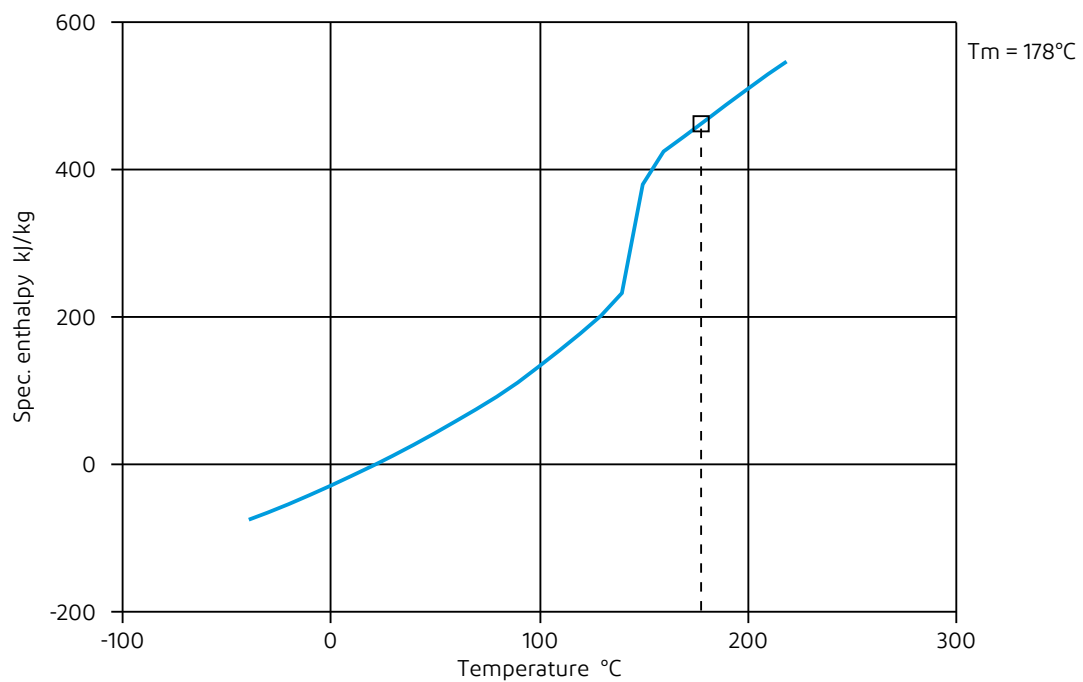
Specific volume-temperature (pvT)



Delrin[®] 100 NC010

ACETAL RESIN

Spec. enthalpy/mass-temp. (DSC)

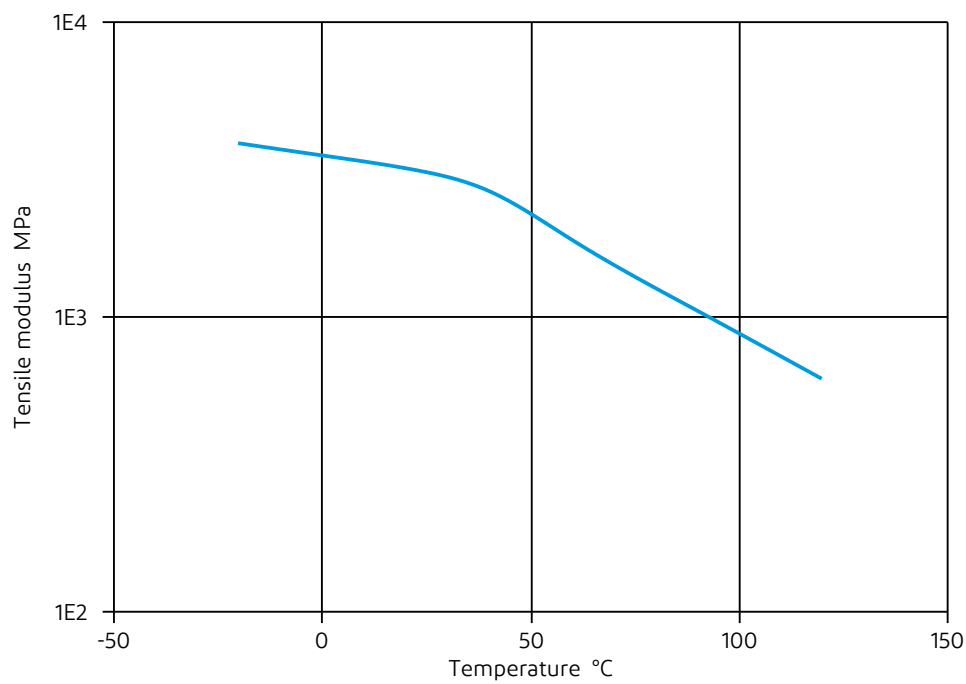




Delrin[®] 100 NC010

ACETAL RESIN

Tensile modulus-temperature

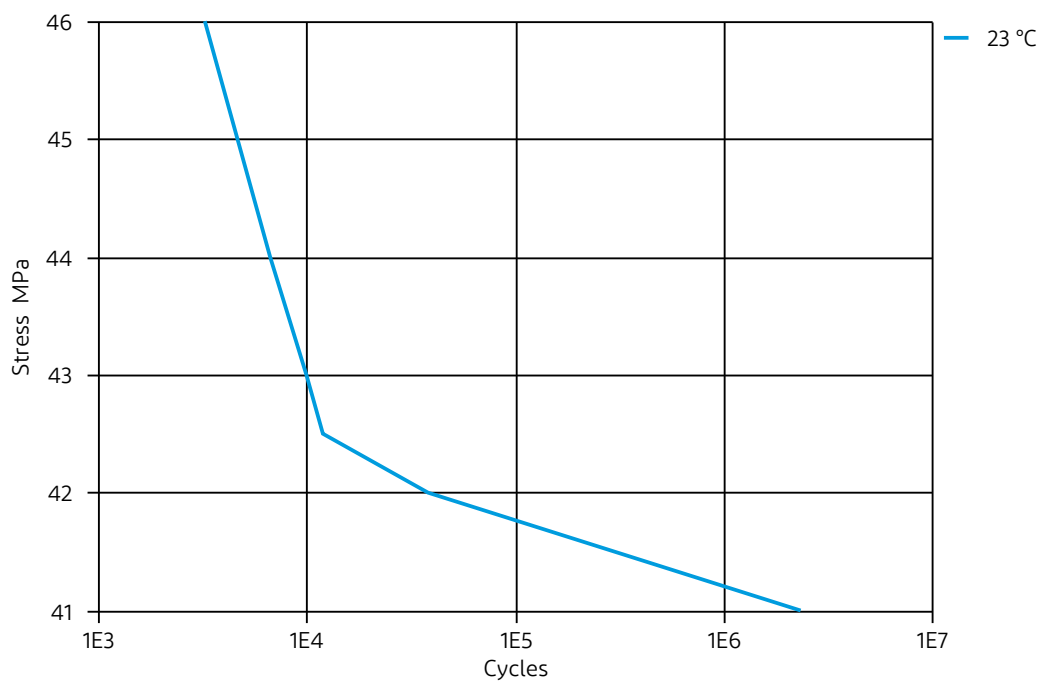




Delrin[®] 100 NC010

ACETAL RESIN

Tensile Fatigue, 10Hz, R=0.1 @ mm



Delrin[®] 100 NC010

ACETAL RESIN

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
- ✓ 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

Delrin[®] 100 NC010

ACETAL RESIN

- ✓ 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
- ✗ Diesel EN 590, 100°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
- ✗ DOT No. 4 Brake fluid, 120°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

Sterilisation methods

- ✓ Ethylene Oxide

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).

The information set forth herein is furnished free of charge, is based on technical data that DuPont believes to be reliable, and represents typical values that fall within the normal range of properties. This information relates only to the specific material designated and may not be valid for such material used in combination with other materials or in other processes. It is intended for use by persons having technical skill, at their own discretion and risk. This information should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards and comply with applicable law. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents.

CAUTION: Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract or other acknowledgement that is consistent with the DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative.

DuPont's sole warranty is that our products will meet our standard sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DUPONT SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR NON-INFRINGEMENT. DUPONT DISCLAIMS LIABILITY FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.