



Delrin® 51HSE NC010 (PRELIMINARY)

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® 51HSE is a Nucleated Very High Viscosity Acetal Homopolymer with Improved Processing, Excellent Creep Resistance and Very Low Emissions for applications in automotive interiors.

Rheological properties

Melt mass-flow rate	1.2 g/10min	ISO 1133
Melt mass-flow rate, Temperature	190 °C	ISO 1133
Melt mass-flow rate, Load	2.16 kg	ISO 1133
Moulding shrinkage, parallel	2.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.8 %	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	3.0 %	ISO 294-4
Moulding shrinkage, normal, annealed	2.3 %	ISO 294-4

[1]: Annealed 1h at 140°C

Typical mechanical properties

Tensile Modulus	3000 MPa	ISO 527-1/-2
Yield stress	73 MPa	ISO 527-1/-2
Yield strain	26 %	ISO 527-1/-2
Stress at break	71 MPa	ISO 527-1/-2
Nominal strain at break	36 %	ISO 527-1/-2
Strain at break	>50 %	ISO 527-1/-2
Charpy impact strength, 23°C	N kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	300 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	8 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	7 kJ/m ²	ISO 179/1eA
Poisson's ratio	0.37	

Thermal properties

Melting temperature, 10°C/min	178 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	99 °C	ISO 75-1/-2



Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

Flammability

FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80 mm/min	ISO 3795 (FMVSS 302)

Other properties

Density	1420 kg/m ³	ISO 1183
---------	------------------------	----------

VDA Properties

Emissions	<2 mg/kg	VDA 275
-----------	----------	---------

Injection

Drying Recommended	yes
Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	210 °C
Min. melt temperature	205 °C
Max. melt temperature	215 °C
Mold Temperature Optimum	100 °C
Min. mould temperature	80 °C
Max. mould temperature	120 °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	75 - 85 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	200 °C
Melt Temperature Range	195 - 205 °C

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



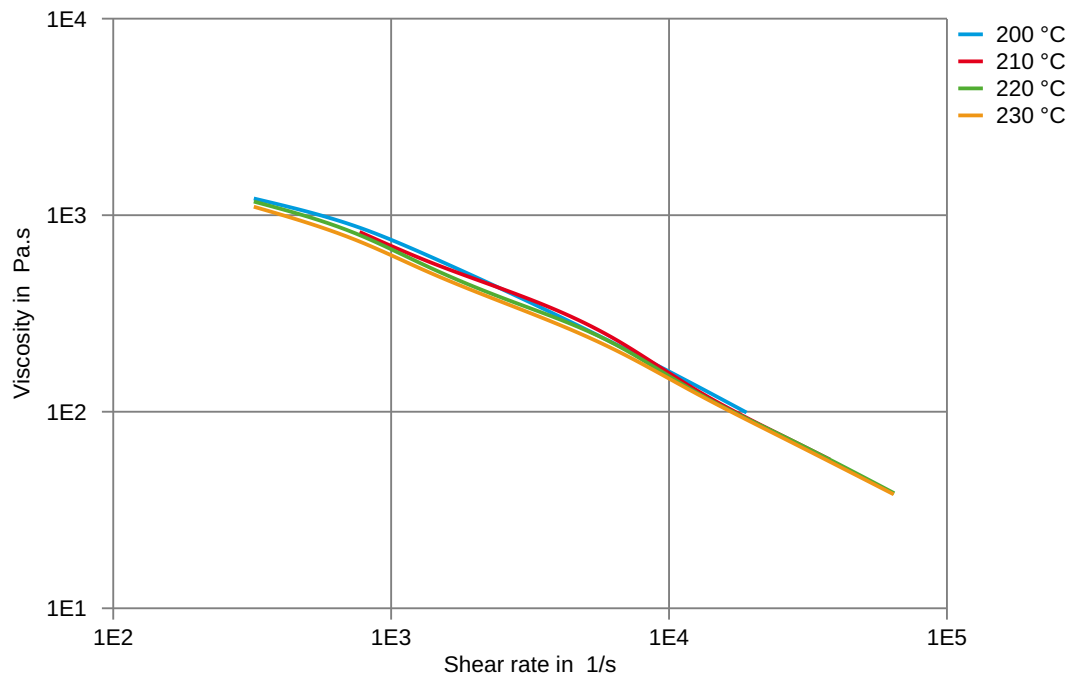
Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

temperature, or

- When packaging stays open for a significant time.

Viscosity-shear rate

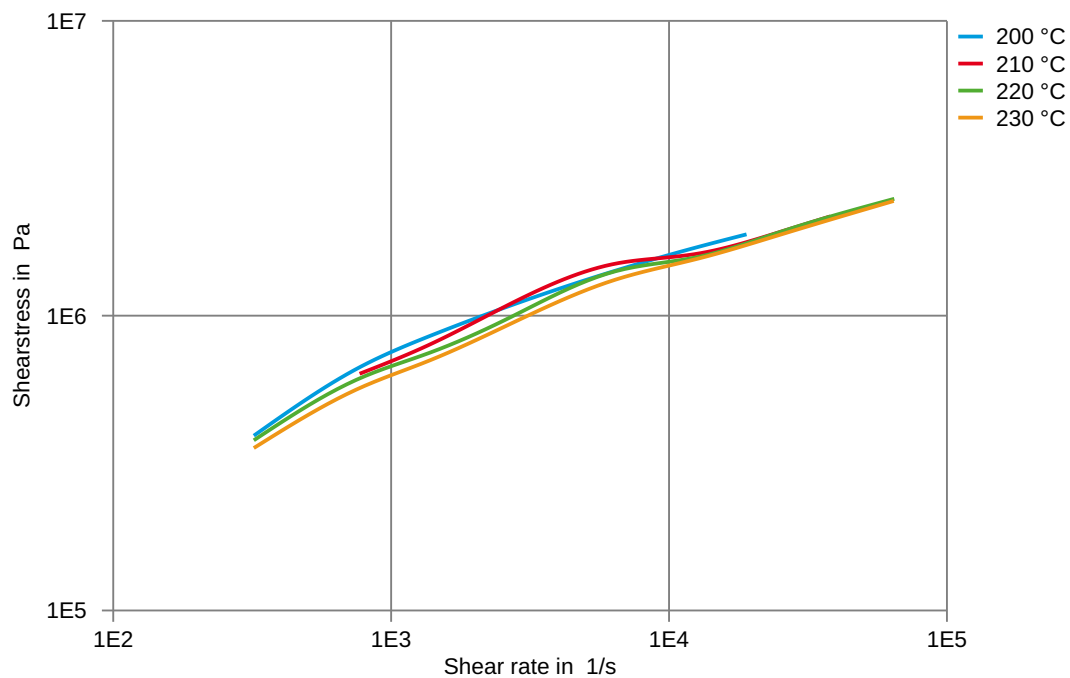




Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

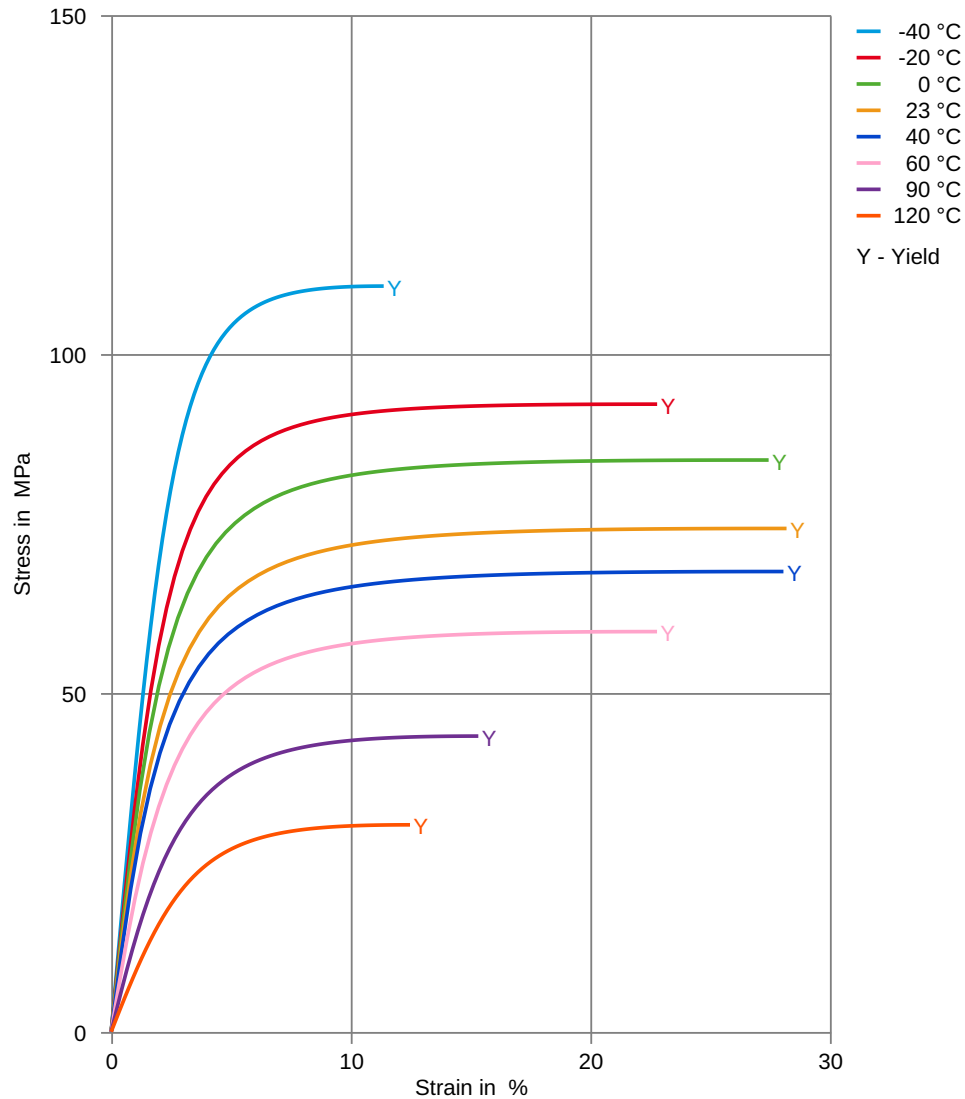
Shearstress-shear rate



Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

Stress-strain

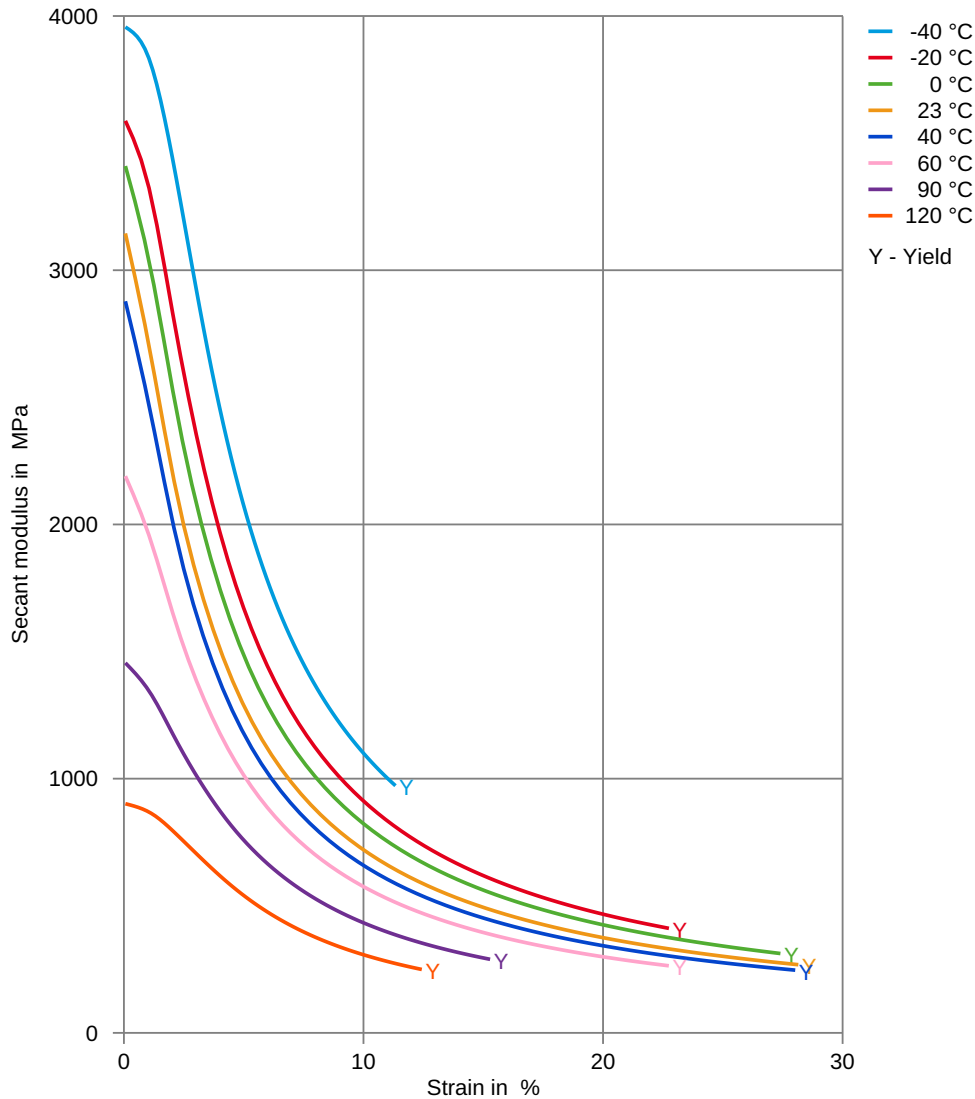




Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

Secant modulus-strain





Delrin® 51HSE NC010 (PRELIMINARY)

ACETAL RESIN

Specific volume-temperature (pvT)

