

# DuPont™ Delrin® PC690 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® PC690 is a low viscosity acetal homopolymer, developed for thin-walled parts requiring high precision moulding in the healthcare industry.**

### PREMIUM CONTROL for HEALTHCARE APPLICATIONS

This product is manufactured according to Good Manufacturing Practice (GMP) principles and generally accepted in food contact applications in Europe and the USA when meeting applicable use conditions. This product is also tested against ISO 10993-5 and -11 and selected parts of USP Class VI and US FDA drug and device master files (DMF and MAF) have been established. For details, individual compliance statements are available from your DuPont representative.

General information	Value	Unit	Test Standard
Resin Identification	POM	-	ISO 1043
Part Marking Code	POM	-	ISO 11469
Rheological properties	Value	Unit	Test Standard
Melt volume-flow rate	21	cm <sup>3</sup> /10min	ISO 1133
Temperature	190	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	25	g/10min	ISO 1133
Molding shrinkage, parallel	1.9	%	ISO 294-4, 2577
Molding shrinkage, normal	1.9	%	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	12	%	ISO 527-1/-2
Nominal strain at break	23	%	ISO 527-1/-2
Flexural Modulus	3000	MPa	ISO 178
Tensile creep modulus			ISO 899-1
1h	2800	MPa	
1000h	1500	MPa	
Charpy impact strength			ISO 179/1eU
73°F	200	kJ/m <sup>2</sup>	
-22°F	200	kJ/m <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	8	kJ/m <sup>2</sup>	
-22°F	7	kJ/m <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
73°F	7	kJ/m <sup>2</sup>	
-40°F	8	kJ/m <sup>2</sup>	
Hardness, Rockwell, M-scale	92	-	ISO 2039-2
Hardness, Rockwell, R-scale	120	-	ISO 2039-2
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	94	°C	
65 psi	162	°C	
Vicat softening temperature, 90°F/h, 11 lbf	160	°C	ISO 306
Coeff. of linear therm. expansion, parallel	120	E-6/K	ISO 11359-1/-2

To find out more, visit [DuPont Performance Polymers](#) or contact nearest DuPont location.

North America

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Coeff. of linear therm. expansion			
normal	120	E-6/K	ISO 11359-1/-2
Parallel, 23-55°C (73-130°F)	104	E-6/K	ASTM E 831
RTI, electrical			UL 746B
30mil	50	°C	
60mil	110	°C	
120mil	110	°C	
RTI, impact			UL 746B
30mil	50	°C	
60mil	85	°C	
120mil	90	°C	
RTI, strength			UL 746B
30mil	50	°C	
60mil	90	°C	
120mil	95	°C	
<b>Flammability</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Oxygen Index	23	%	ASTM D 2863
Hot Wire Ignition, 30mil 1: 0.75mm	8 <sup>[1]</sup>	s	UL 746A
<b>Electrical properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity			IEC 62631-2-1
100Hz	3.8	-	
1MHz	3.8	-	
Dissipation factor, 1MHz	50	E-4	IEC 62631-2-1
Volume resistivity	1E12	Ohm*m	IEC 62631-3-1
Surface resistivity	>1E15	Ohm	IEC 62631-3-2
Comparative tracking index	600	-	IEC 60112
<b>Other properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 80mil	0.3	%	Sim. to ISO 62
Water absorption, 80mil	1.4	%	Sim. to ISO 62
Density	1420	kg/m <sup>3</sup>	ISO 1183
<b>VDA Properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Emissions	<8	mg/kg	VDA 275
Fogging, F-value (refraction)	95	%	ISO 6452
Fogging, G-value (condensate)	0.2	mg	ISO 6452
<b>Injection</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
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	-
<b>Characteristics</b>			
Processing		• Injection Molding	
Delivery form		• Pellets	
Additives		• Lubricants	• Release agent

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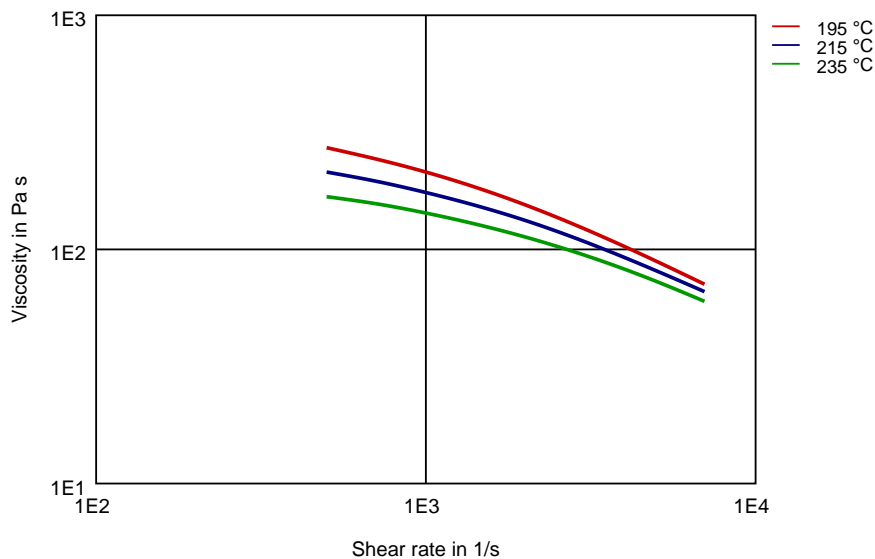


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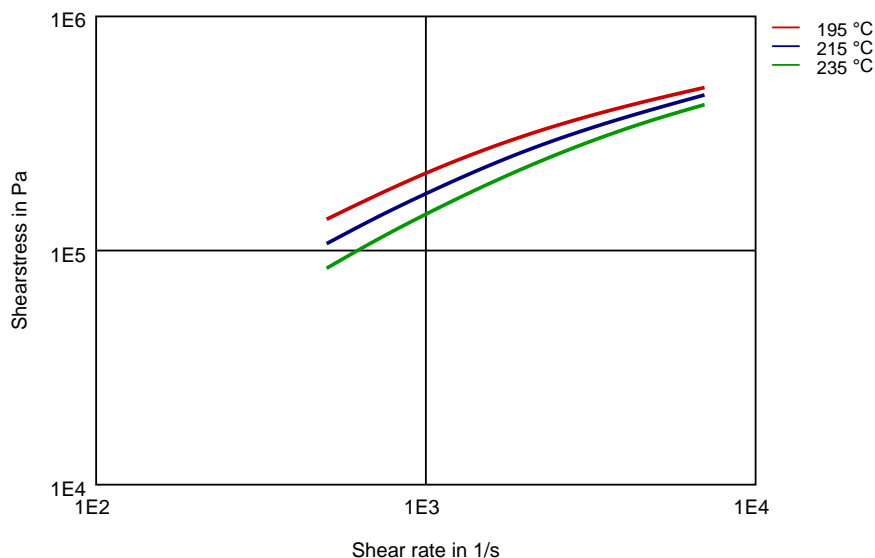
## ACETAL RESIN

### Diagrams

#### Viscosity-shear rate



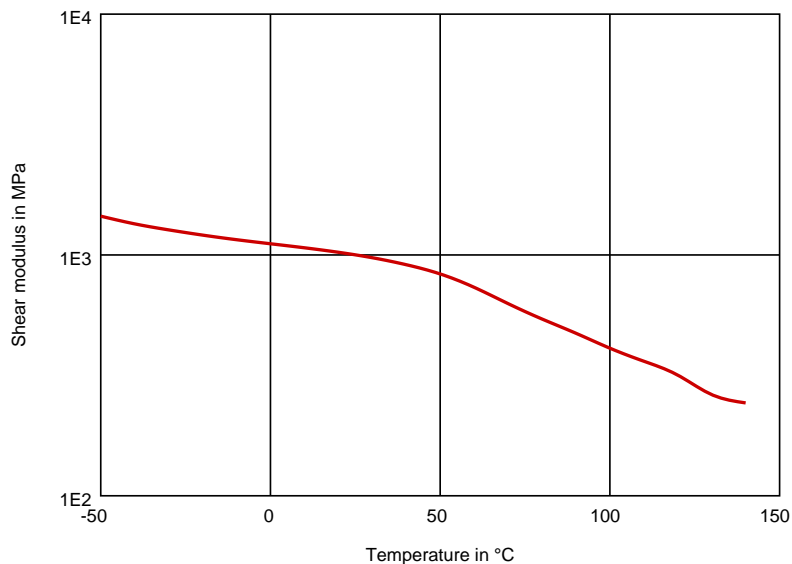
#### Shearstress-shear rate



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Dynamic Shear modulus-temperature



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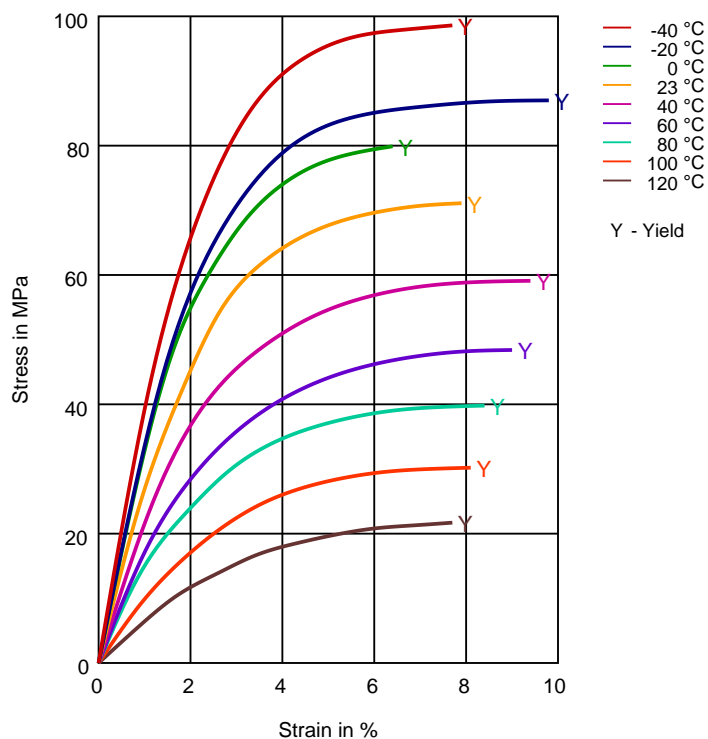
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## ACETAL RESIN

Stress-strain



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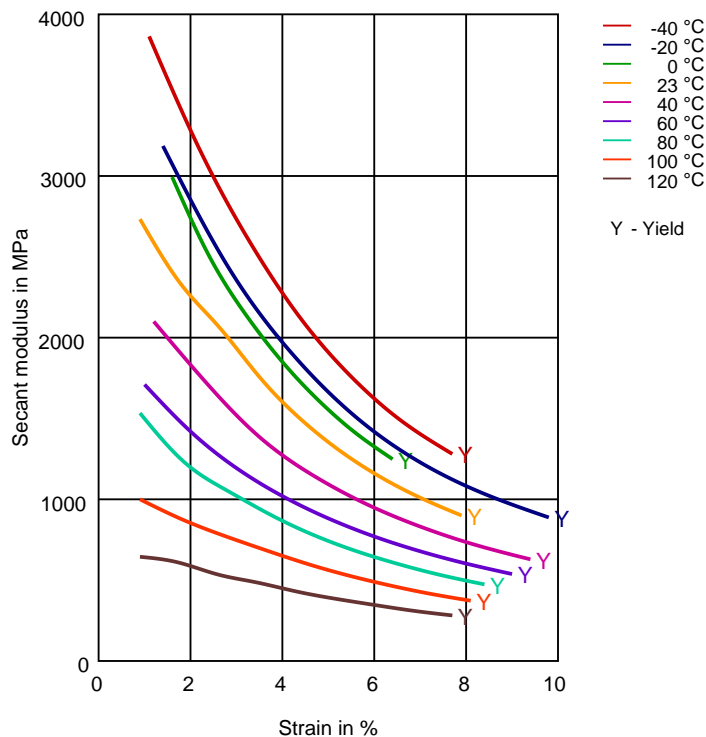
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## ACETAL RESIN

Secant modulus-strain



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### Chemical Media Resistance

#### Sterilization 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).

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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