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^3/10min	ISO 1133
Temperature	190	°C	ISO 1133
Load	2.16	kg	ISO 1133
Melt mass-flow rate	25	g/10min	ISO 1133
Moulding shrinkage, parallel	1.9	%	ISO 294-4, 2577
Moulding 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
23°C	200	kJ/m^2	
-30°C	200	kJ/m^2	
Charpy notched impact strength			ISO 179/1eA
23°C	8	kJ/m^2	
-30°C	7	kJ/m^2	
Izod notched impact strength			ISO 180/1A
23°C	7	kJ/m^2	
-40°C	8	kJ/m^2	
Hardness, Rockwell, M-scale	92	-	ISO 2039-2
Hardness, Rockwell, R-scale	120	-	ISO 2039-2
Thermal properties	**Value**	**Unit**	**Test Standard**
Melting temperature, 10°C/min	178	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	94	°C	
0.45 MPa	162	°C	
Vicat softening temperature, 50°C/h, 50N	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
Tel: +1 302 999-4592
Toll-Free (USA): 800 441-0575

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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
0.75mm	50	°C	
1.5mm	110	°C	
3mm	110	°C	
RTI, impact			UL 746B
0.75mm	50	°C	
1.5mm	85	°C	
3mm	90	°C	
RTI, strength			UL 746B
0.75mm	50	°C	
1.5mm	90	°C	
3mm	95	°C	
Flammability	**Value**	**Unit**	**Test Standard**
Oxygen Index	23	%	ASTM D 2863
Hot Wire Ignition, 0.75mm	8[1]	s	UL 746A

1: 0.75mm

Electrical properties	**Value**	**Unit**	**Test Standard**
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

Other properties	**Value**	**Unit**	**Test Standard**
Humidity absorption, 2mm	0.3	%	Sim. to ISO 62
Water absorption, 2mm	1.4	%	Sim. to ISO 62
Density	1420	kg/m³	ISO 1183

VDA Properties	**Value**	**Unit**	**Test Standard**
Emissions	<8	mg/kg	VDA 275
Fogging, F-value (refraction)	95	%	ISO 6452
Fogging, G-value (condensate)	0.2	mg	ISO 6452

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. mould temperature	80	°C	-
Max. mould 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 Moulding	
Delivery form	• Pellets	
Additives	• Lubricants	• Release agent

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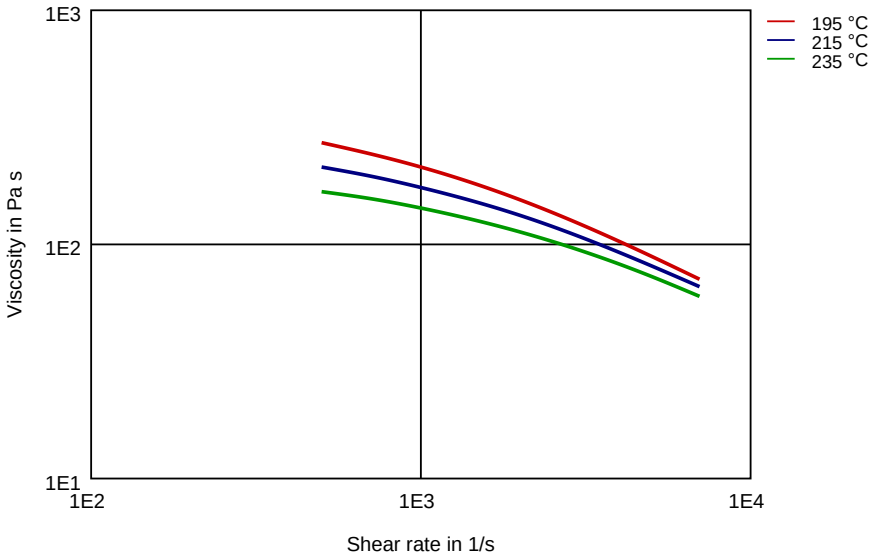
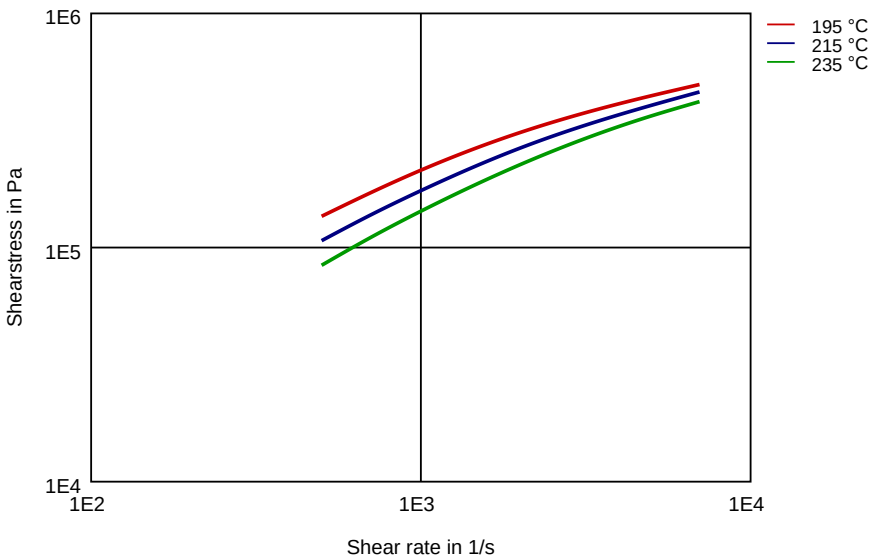
Diagrams

Viscosity-shear rate



Shearstress-shear rate



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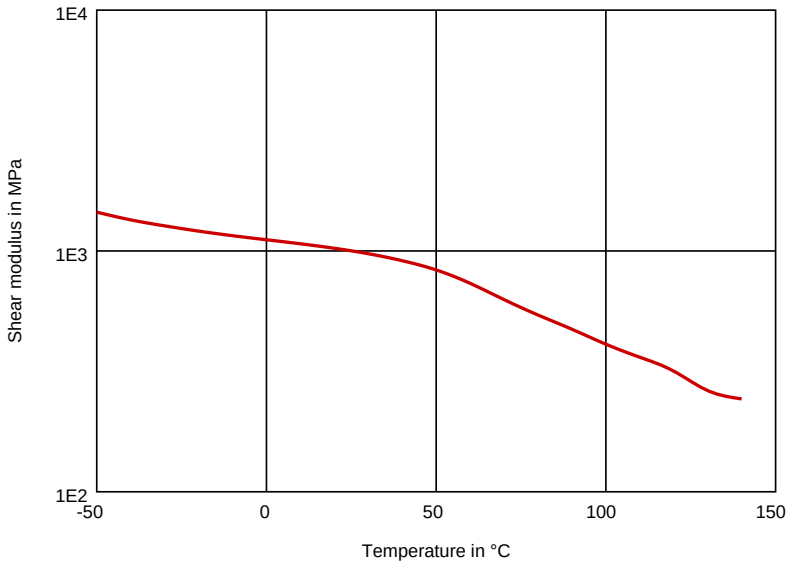
Dynamic Shear modulus-temperature



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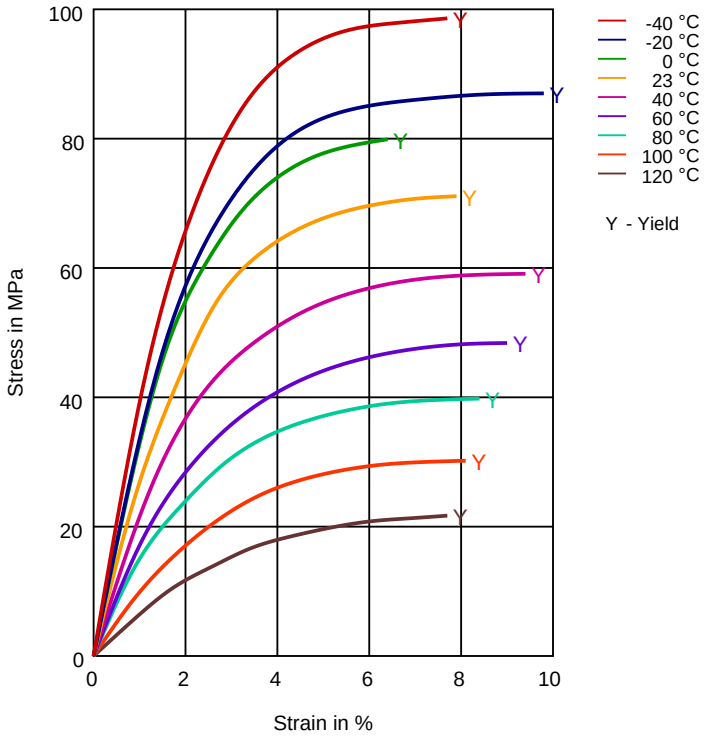
Stress-strain



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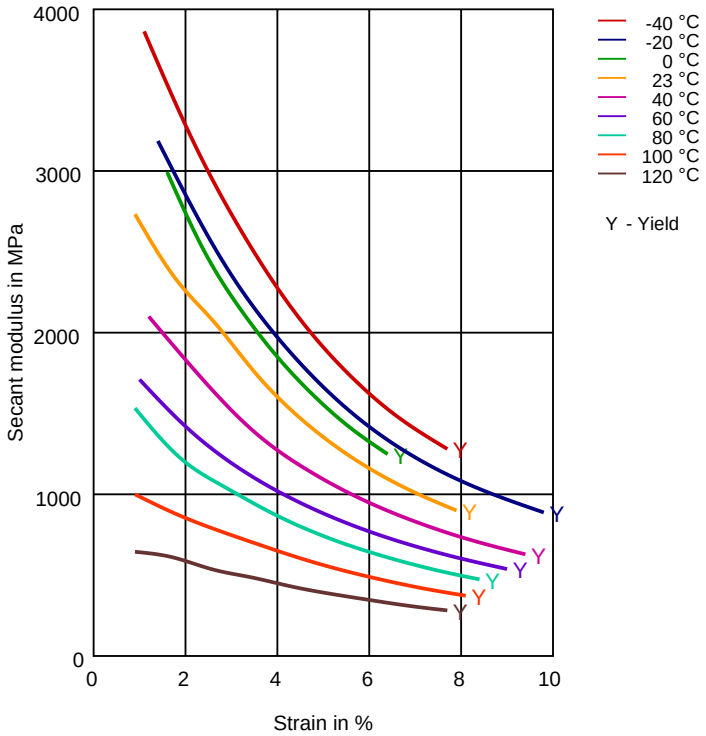
Secant modulus-strain



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Chemical Media Resistance

Sterilisation methods

✓ Ethylene Oxyde

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 4mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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