DuPont™ Delrin® SC699 NC010 (Preliminary Data) 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® SC699 is a lubricated low viscosity acetal homopolymer, developed for thin-walled parts requiring low wear and low friction and high precision moulding in the healthcare industry.

SPECIAL 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. For details, individual compliance statements are available from your DuPont representative.

The below datasheet is a condensed version. For a complete datasheet, please contact your DuPont representative.

Resin Identification	General information	Value	Unit	Test Standard
Rheological properties Value Unit Test Standard	Resin Identification	POM	-	ISO 1043
Melt volume-flow rate 21 cm²/10min 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 1.8 % ISO 294-4, 2577 Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-17-2 Yield stress 63 MPa ISO 527-17-2 Yield strain at break 30 % ISO 527-17-2 Nominal strain at break 30 % ISO 527-17-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23°C -30°C 175 kJ/m² ISO 179/1eA 23°C 6.5 kJ/m² ISO 179/1eA 23°C 6.5 kJ/m² ISO 179/1eA 23°C 15 S J/m² ISO 2039-2 Hardness, Rockwell, M-scale 91 - ISO 2039-2 ISO 2039-2 <td>Part Marking Code</td> <td>POM</td> <td>-</td> <td>ISO 11469</td>	Part Marking Code	POM	-	ISO 11469
Temperature	Rheological properties	Value	Unit	Test Standard
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 1.8 % ISO 294-4, 2577 Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Yield strain at break 30 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23°C 160 kJ/m²	Melt volume-flow rate	21	cm ³ /10min	ISO 1133
Melt mass-flow rate 25 g/10min ISO 1133 Moulding shrinkage, parallel 1.9 % ISO 294-4, 2577 Moulding shrinkage, normal 1.8 % ISO 294-4, 2577 Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23 °C 160 kJ/m² -30 °C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 91 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties	Temperature	190		ISO 1133
Moulding shrinkage, parallel 1.9 % ISO 294-4, 2577 Moulding shrinkage, normal 1.8 % ISO 294-4, 2577 Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 178 23°C 160 kJ/m² ISO 179/1eU 23°C 6.5 kJ/m² ISO 179/1eA 23°C 6.5 kJ/m² ISO 179/1eA 23°C 7.5 kJ/m² ISO 2039-2 Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard	Load	2.16	kg	ISO 1133
Moulding shrinkage, normal 1.8 % ISO 294-4, 2577 Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-1/-2 ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23 °C 160 kJ/m² -30 °C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 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	Melt mass-flow rate	25	g/10min	ISO 1133
Mechanical properties Value Unit Test Standard Tensile Modulus 3100 MPa ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Plexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU ISO 179/1eU 23 °C 160 kJ/m² -30 °C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 ISO 2039-2 Hardness, Rockwell, M-scale 91 ISO 2039-2 Hardness, Rockwell, R-scale 119 ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 ASTM 1894 Thermal properties Value Unit Test Standard	Moulding shrinkage, parallel	1.9		ISO 294-4, 2577
Tensile Modulus 3100 MPa ISO 527-1/-2 Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Nominal strain at break 305 MPa ISO 178 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23 °C 160 kJ/m² -30 °C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 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	Moulding shrinkage, normal	1.8	%	ISO 294-4, 2577
Yield stress 63 MPa ISO 527-1/-2 Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23 °C 160 kJ/m² -30 °C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 91 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 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 100 °C	Mechanical properties	Value		Test Standard
Yield strain 15 % ISO 527-1/-2 Nominal strain at break 30 % ISO 527-1/-2 Flexural Modulus 3050 MPa ISO 178 Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU ISO 179/1eU 23°C 160 kJ/m² KJ/m² Charpy notched impact strength ISO 179/1eA ISO 179/1eA 23°C 6.5 kJ/m² KJ/m² Hardness, Rockwell, M-scale 91 ISO 2039-2 Hardness, Rockwell, R-scale 91 ISO 2039-2 Hardness, Rockwell, R-scale 119 ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10°C/min 178°C ISO 11357-1/-3 ISO 75-1/-2 1.8 MPa 100°C C	Tensile Modulus	3100	MPa	ISO 527-1/-2
Nominal strain at break 30 % ISO 527-1/-2	Yield stress	63	MPa	ISO 527-1/-2
Flexural Modulus 3050 MPa ISO 178	Yield strain	15		ISO 527-1/-2
Flexural Stress at 3.5% 82 MPa ISO 178 Charpy impact strength ISO 179/1eU 23°C 160 kJ/m² -30°C 175 kJ/m² Charpy notched impact strength ISO 179/1eA 23°C 6.5 kJ/m² -30°C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 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 100 °C	Nominal strain at break	30	%	ISO 527-1/-2
Charpy impact strength 23°C 30°C 160 kJ/m² -30°C 175 kJ/m² Charpy notched impact strength 23°C -30°C 6.5 kJ/m² -30°C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10°C/min 178 °C ISO 179/1eU ISO 179/1eU ISO 2079-1eA ISO 2079-1eA ISO 2039-2 I	Flexural Modulus	3050	MPa	ISO 178
23°C -30°C 175 kJ/m² Charpy notched impact strength 23°C -30°C 6.5 kJ/m² -30°C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10°C/min 178 °C ISO 11357-1/-3 Temp. of deflection under load 1.8 MPa 100 °C	Flexural Stress at 3.5%	82	MPa	ISO 178
-30 °C Charpy notched impact strength 23 °C -30 °C 6.5 kJ/m² -30 °C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10 °C/min 178 °C ISO 11357-1/-3 Temp. of deflection under load 1.8 MPa 100 °C	Charpy impact strength			ISO 179/1eU
Charpy notched impact strength 23°C -30°C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10°C/min 178 °C ISO 11357-1/-3 Temp. of deflection under load 1.8 MPa	23°C	160	kJ/m²	
23°C -30°C 7.5 kJ/m² Hardness, Rockwell, M-scale 91 - ISO 2039-2 Hardness, Rockwell, R-scale 119 - ISO 2039-2 Coefficient of sliding friction, 1h against itself 0.1 - ASTM 1894 Thermal properties Value Unit Test Standard Melting temperature, 10°C/min 178 °C ISO 11357-1/-3 Temp. of deflection under load 1.8 MPa 100 °C	-30°C	175	kJ/m²	
-30°C Hardness, Rockwell, M-scale Hardness, Rockwell, R-scale Hardness, Rockwell, R-scale Coefficient of sliding friction, 1h against itself Thermal properties Value Melting temperature, 10°C/min Temp. of deflection under load 1.8 MPa 7.5 kJ/m² 150 2039-2 150 203				ISO 179/1eA
Hardness, Rockwell, M-scale Hardness, Rockwell, R-scale Hardness, Rockwell, R-scale Coefficient of sliding friction, 1h against itself Thermal properties Walue Unit Test Standard Melting temperature, 10°C/min Temp. of deflection under load 180 75-1/-2 180 2039-2 ASTM 1894 Test Standard ISO 75-1/-3 ISO 75-1/-2	23°C	6.5	kJ/m²	
Hardness, Rockwell, R-scale Coefficient of sliding friction, 1h against itself Thermal properties Walue Unit Test Standard Melting temperature, 10°C/min Temp. of deflection under load 1.8 MPa No C ISO 2039-2 ASTM 1894 Test Standard ISO 75-1/-3 ISO 75-1/-3 ISO 75-1/-2	-30°C	7.5	kJ/m²	
Coefficient of sliding friction, 1h against itself Thermal properties Walue Unit Melting temperature, 10°C/min Temp. of deflection under load 1.8 MPa ASTM 1894 Test Standard ISO 1357-1/-3 ISO 75-1/-2	Hardness, Rockwell, M-scale	91	-	ISO 2039-2
Thermal properties Melting temperature, 10°C/min Temp. of deflection under load 1.8 MPa Value Unit Test Standard ISO 11357-1/-3 ISO 75-1/-2	Hardness, Rockwell, R-scale	119	-	ISO 2039-2
Melting temperature, 10°C/min 178 °C ISO 11357-1/-3 Temp. of deflection under load ISO 75-1/-2 1.8 MPa 100 °C	Coefficient of sliding friction, 1h against itself	0.1	-	ASTM 1894
Temp. of deflection under load ISO 75-1/-2 1.8 MPa 100 °C		Value		Test Standard
1.8 MPa 100 °C	Melting temperature, 10°C/min	178	°C	ISO 11357-1/-3
	Temp. of deflection under load			ISO 75-1/-2
0.45 MPa 160 °C	1.8 MPa	100	°C	
0.15 711 4	0.45 MPa	160	°C	
Coeff. of linear therm. expansion, parallel 100 E-6/K ISO 11359-1/-2	Coeff. of linear therm. expansion, parallel			
Coeff. of linear therm. expansion, normal 105 E-6/K ISO 11359-1/-2	Coeff. of linear therm. expansion, normal	105	E-6/K	ISO 11359-1/-2
Flammability Value Unit Test Standard	Flammability	Value	Unit	Test Standard
Burning rate, Thickness 1 mm 28 mm/min ISO 3795 (FMVSS 302)	Burning rate, Thickness 1 mm	28	mm/min	ISO 3795 (FMVSS 302)
Other properties Value Unit Test Standard	Other properties	Value	Unit	Test Standard
Humidity absorption, 2mm 0.24 % Sim. to ISO 62	Humidity absorption, 2mm	0.24		Sim. to ISO 62
Water absorption, 2mm 1 % Sim. to ISO 62	Water absorption, 2mm	1	%	Sim. to ISO 62

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

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DuPont™ Delrin® SC699 NC010 (Preliminary Data) ACETAL RESIN

Density	1400	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	≤0.05	%	-
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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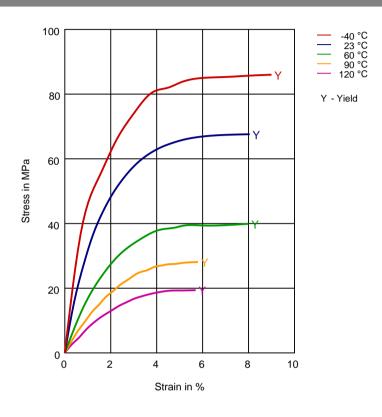
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DuPont™ Delrin® SC699 NC010 (Preliminary Data) ACETAL RESIN

Diagrams

Stress-strain



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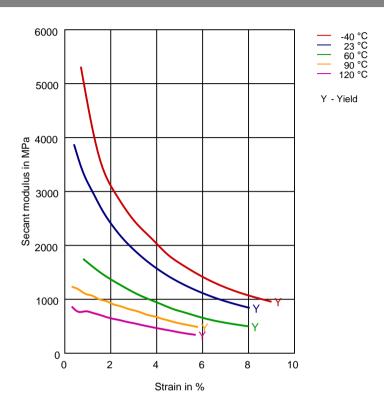
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DuPont[™] Delrin[®] SC699 NC010 (Preliminary Data) **ACETAL RESIN**

Secant modulus-strain



The above data are preliminary and are subject to change as additional data are developed on subsequent lots.

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 4.0mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2.0mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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