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VECTRA® S135

Liquid Crystal Polymer

35% glass reinforced Vectra grade with very low outgassing, very high heat deflection temperature (335 °C) and stiffness. Typical applications are lamp sockets, lens holders for beamers, electrical and electronic parts like connectors, relays, switches, coil bobbins and also under the hood applications.
Chemical abbreviation according to ISO 1043-1 : LCP Inherently flame retardant UL-Listing V-0 in natural at 0.28mm thickness per UL 94 flame testing. Relative-Temperature-Index (RTI) according to UL 746B: electrical 130 °C, mechanical 130 °C. UL = Underwriters Laboratories (USA)

Product information

Resin Identification	LCP-GF35	ISO 1043
Part Marking Code	>LCP-GF35<	ISO 11469

Rheological properties

Moulding shrinkage, parallel	0.1	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.4	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	16000	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	150	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	1.3	%	ISO 527-1/-2
Flexural modulus	16000	MPa	ISO 178
Flexural strength	240	MPa	ISO 178
Flexural strain at failure	2	%	ISO 178
Compressive strength	177	MPa	ISO 604
Compressive stress at 1% strain	114	MPa	ISO 604
Charpy notched impact strength, 23 °C	14	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23 °C	14	kJ/m²	ISO 180/1A
Poisson's ratio	0.33[C]		

[C]: Calculated

Thermal properties

Melting temperature, 10 °C/min	350	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	340	°C	ISO 75-1/-2
Temperature of deflection under load, 8 MPa	267	°C	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	5.8	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	57.5	E-6/K	ISO 11359-1/-2

Flammability

Burning Behav. at thickness h	V-0	class	IEC 60695-11-10

Electrical properties

Relative permittivity, 1MHz	3.5		IEC 62631-2-1
Dissipation factor, 1MHz	90	E-4	IEC 62631-2-1
Volume resistivity	1E15	Ohm.m	IEC 62631-3-1
Surface resistivity	1E17	Ohm	IEC 62631-3-2
Electric strength	37	kV/mm	IEC 60243-1

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Physical/Other properties

Humidity absorption, 2mm	0.002	%	Sim. to ISO 62
Water absorption, 2mm	0.014	%	Sim. to ISO 62
Density	1670	kg/m³	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	150	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.01	%
Melt Temperature Optimum	375	°C
Min. melt temperature	370	°C
Max. melt temperature	380	°C
Screw tangential speed	0.2 - 0.3	m/s
Mold Temperature Optimum	100	°C
Min. mould temperature	80	°C
Max. mould temperature	120	°C
Back pressure	3	MPa
Ejection temperature	268	°C

Characteristics

Processing	Injection Moulding
Special characteristics	Flame retardant, Heat stabilised or stable to heat, High Flow, Lead-free soldering resistant

Additional information

Injection molding

Preprocessing

Vectra resins are well known for their excellent thermal and hydrolytic stability. In order to ensure these properties are optimum, the resin should be dried correctly prior to processing. Vectra S-grades should be dried at 150°C for a minimum of 6 hours or at 170°C for a minimum of 4 hours in a desiccant dryer.

Processing

A three-zone screw evenly divided into feed, compression, and metering zones is preferred. A higher percentage of feed flights may be needed for smaller machines: ½ feed, ¼ compression, ¼ metering.

Vectra LCPs are shear thinning, their melt viscosity decreases quickly as shear rate increases. For parts that are difficult to fill, the molder can increase the injection velocity to improve melt flow.

Processing Notes

Pre-Drying

VECTRA should in principle be predried. Because of the necessary low maximum residual moisture content the use of dry air dryers is recommended. The dew

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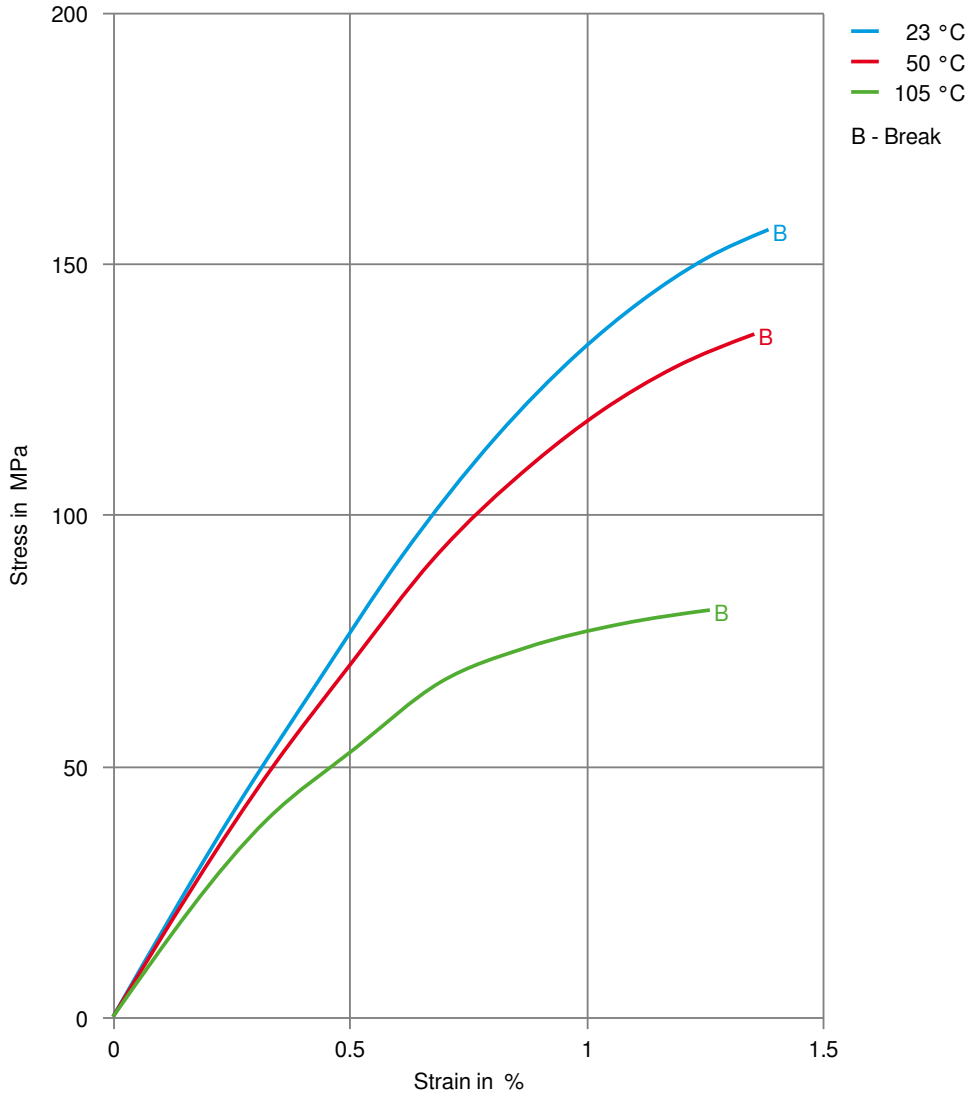
point should be =< - 40° C. The time between drying and processing should be as short as possible.

Storage

For subsequent storage of the material in the dryer until processed the temperature does not need to be lowered for grades A, B, C, D and V (<= 24 h).

Stress-strain



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Secant modulus-strain