

# VECTRA® E130i

## Liquid Crystal Polymer

High temperature capability, easiest flow. Suitable where very thin walls are required. Used for broad range of SMT applications, with minimal dimensional change. 30% glass filled. Chemical abbreviation according to ISO 1043-1 : LCP Inherently flame retardant UL-Listing V-0 in natural and black at .2mm thickness per UL 94 flame testing. Relative-Temperature-Index (RTI) according to UL 746B: electrical 240°C, mechanical 240°C at 0.75mm. UL = Underwriters Laboratories (USA)

### Product information

Resin Identification	LCP-GF30	ISO 1043
Part Marking Code	>LCP-GF30<	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	160 MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	1.6 %	ISO 527-1/-2
Flexural modulus	15000 MPa	ISO 178
Flexural strength	220 MPa	ISO 178
Flexural strain at failure	2.2 %	ISO 178
Compressive modulus	14000 MPa	ISO 604
Compressive stress at 1% strain	93 MPa	ISO 604
Charpy impact strength, 23°C	43 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	38 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	27 kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 23°C	31 kJ/m <sup>2</sup>	ISO 180/1U
Hardness, Rockwell, M-scale	71	ISO 2039-2
Poisson's ratio	0.33 <sup>[C]</sup>	

[C]: Calculated

### Thermal properties

Melting temperature, 10°C/min	335 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	270 °C	ISO 75-1/-2
Temperature of deflection under load, 8 MPa	216 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	195 °C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	7 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	20 E-6/K	ISO 11359-1/-2
Thermal conductivity, flow	0.348 <sup>[OT]</sup> W/(m K)	ISO 22007-2
Specific heat capacity solid	1810 <sup>[OT]</sup> J/(kg K)	ISO 22007-4

[OT]: One time tested

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### Flammability

Burning Behav. at thickness h	V-0 class	IEC 60695-11-10
Oxygen index	45 %	ISO 4589-1/-2

### Electrical properties

Relative permittivity, 100Hz	4	IEC 62631-2-1
Relative permittivity, 1000Hz	4.3 <sup>[OT]</sup>	IEC 62631-2-1
Relative permittivity, 1MHz	3.9 <sup>[OT]</sup>	IEC 62631-2-1
Dissipation factor, 100Hz	100 E-4	IEC 62631-2-1
Dissipation factor, 1000Hz	0 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	360 <sup>[OT]</sup> E-4	IEC 62631-2-1
Dissipation factor, 1GHz	60 E-4	IEC 61189-2-721
Volume resistivity	1E13 Ohm.m	IEC 62631-3-1
Surface resistivity	1E14 Ohm	IEC 62631-3-2
Electric strength	32 kV/mm	IEC 60243-1
Comparative tracking index	175	IEC 60112
Arc Resistance	140 s	UL 746B
Relative permittivity, printed circuits and boards, 2.5 GHz	3.9 <sup>[OT, 1]</sup>	IEC 61189-2-721
Relative permittivity, printed circuits and boards, 10 GHz	3.8 <sup>[2]</sup>	IEC 61189-2-721
Dissipation factor, printed circuits and boards, 2.5 GHz	60 <sup>[OT, 1]</sup> E-4	IEC 61189-2-721
Dissipation factor, printed circuits and boards, 10 GHz	52 <sup>[2]</sup> E-4	IEC 61189-2-721

[OT]: One time tested

[1]: Shifted data from 1.9GHz to 2.0GHz for harmonization purpose, only use 'whole' numbers

[2]: SR00077966, Vectra E130i VF3001 Natural sample thickness 0.5 mm

### Physical/Other properties

Humidity absorption, 2mm	0.03 %	Sim. to ISO 62
Density	1610 kg/m <sup>3</sup>	ISO 1183
Bulk density	710 kg/m <sup>3</sup>	ISO 60

### Injection

Drying Recommended	yes
Drying Temperature	150 °C
Drying Time, Dehumidified Dryer	4 - 6 h
Processing Moisture Content	≤0.01 %
Melt Temperature Optimum	340 °C
Min. melt temperature	335 °C
Max. melt temperature	345 °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	255 °C

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## Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Special characteristics	Light stabilised or stable to light, 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 Ei-grades and Vectra V143XL 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: 1/2 feed, 1/4 compression, 1/4 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 point should be  $\leq -40^{\circ}\text{C}$ . 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 ( $\leq 24$  h).

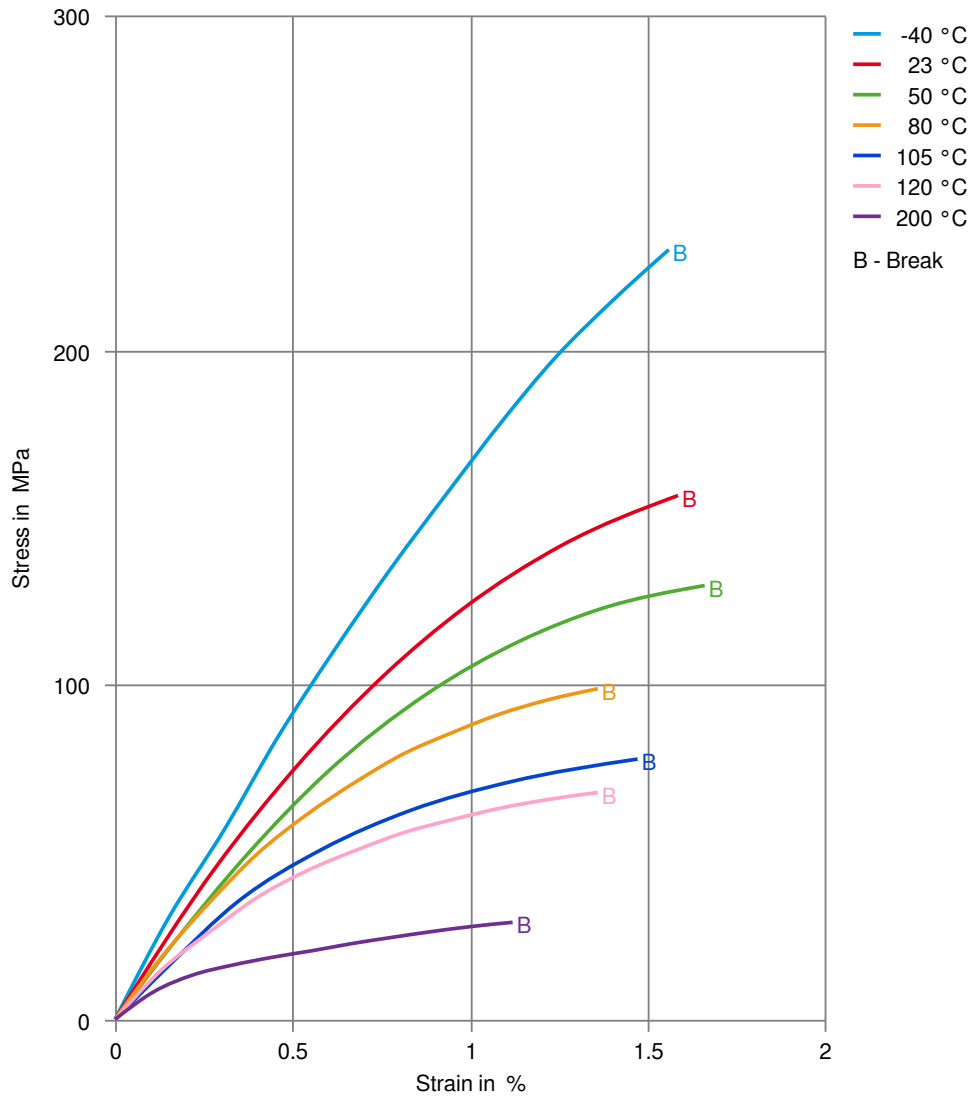
## Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Bosch	N28 BN35-X001	Black
Bosch	N28 BN35-X001	Natural
Hyundai	MS941-03 Type P-2 FRVO	
Stellantis	B62 0300 / 61/223E/221M/C4	01378_20_03233

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Liquid Crystal Polymer

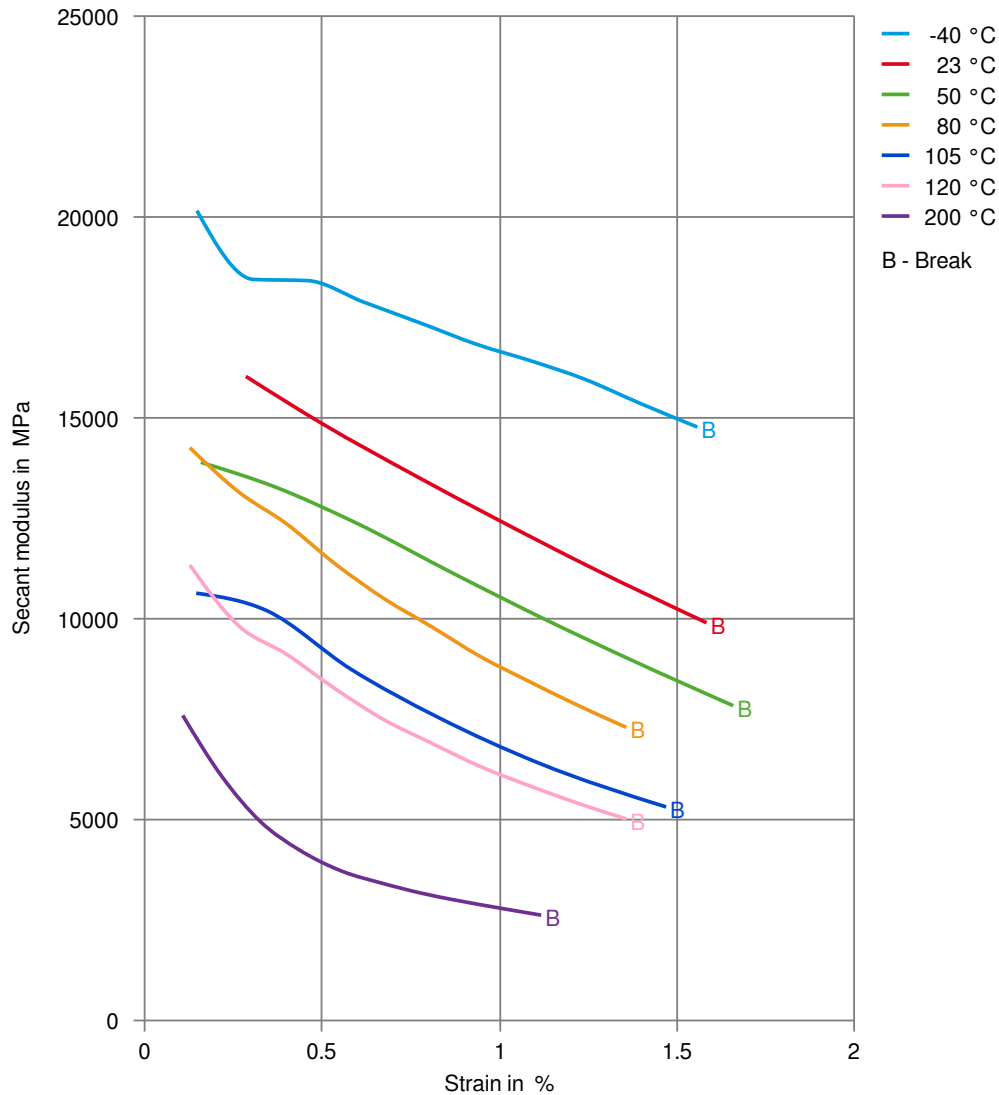
## Stress-strain



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## Secant modulus-strain



NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.