

## VECTRA® A230 - LCP

### Description

Exceptional stiffness. Electrically conductive. 30% carbon fiber reinforced. Chemical abbreviation according to ISO 1043-1 : LCP Inherently flame retardant UL-Listing V-0 at 0.43mm thickness per UL 94 flame testing. Relative-Temperature-Index (RTI) according to UL 746B: electrical 130°C, mechanical 130°C. UL = Underwriters Laboratories (USA)

Physical properties	Value	Unit	Test Standard
Density	1500	kg/m <sup>3</sup>	ISO 1183
Molding shrinkage, parallel	0,1	%	ISO 294-4, 2577
Molding shrinkage, normal	0,3	%	ISO 294-4, 2577
Humidity absorption, 23°C/50%RH	0,06	%	ISO 62

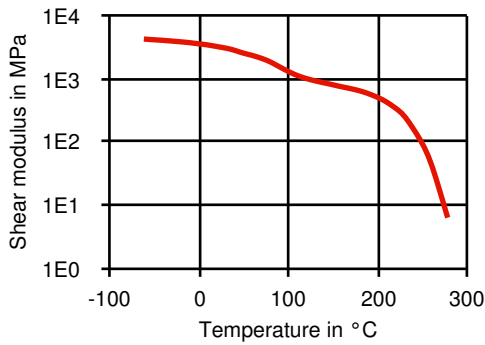
Mechanical properties	Value	Unit	Test Standard
Tensile modulus	23500	MPa	ISO 527-2/1A
Tensile stress at break, 5mm/min	149	MPa	ISO 527-2/1A
Tensile strain at break, 5mm/min	1,1	%	ISO 527-2/1A
Tensile creep modulus, 1h	19600	MPa	ISO 899-1
Tensile creep modulus, 1000h	15800	MPa	ISO 899-1
Flexural modulus, 23°C	26000	MPa	ISO 178
Flexural strength, 23°C	228	MPa	ISO 178
Charpy impact strength, 23°C	13	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	7	kJ/m <sup>2</sup>	ISO 179/1eA
Izod impact notched, 23°C	7	kJ/m <sup>2</sup>	ISO 180/1A
Izod impact unnotched, 23°C	18	kJ/m <sup>2</sup>	ISO 180/1U
Compressive modulus	23500	MPa	ISO 604
Compressive stress at 1% strain	136	MPa	ISO 604
Rockwell hardness	83	M-Scale	ISO 2039-2

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	280	°C	ISO 11357-1/-3
DTUL at 1.8 MPa	233	°C	ISO 75-1, -2
DTUL at 0.45 MPa	250	°C	ISO 75-1, -2
DTUL at 8.0 MPa	193	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	179	°C	ISO 306
Coeff. of linear therm expansion, parallel	0,02	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	0,06	E-4/°C	ISO 11359-2
Flammability at thickness h	V-0	class	UL 94

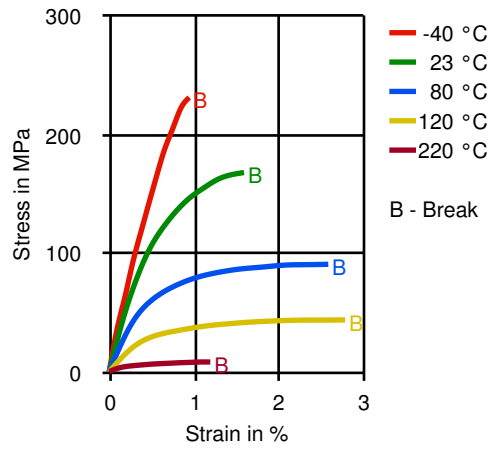
Electrical properties	Value	Unit	Test Standard
Volume resistivity	1	Ohm*m	IEC 60093
Surface resistivity	10	Ohm	IEC 60093

**Diagrams**

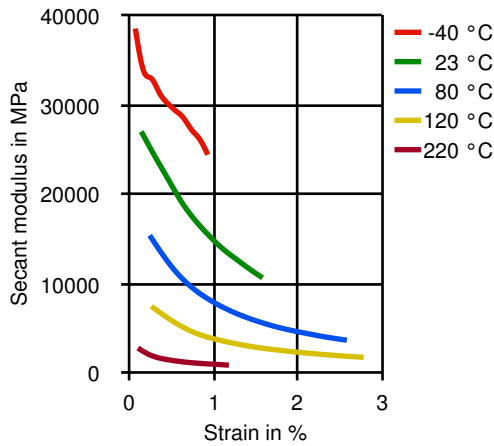
**Dynamic Shear modulus-temperature**



**Stress-strain**



**Secant modulus-strain**



**Typical injection moulding processing conditions**

	Value	Unit	Test Standard
<b>Pre Drying</b>			
Necessary low maximum residual moisture content	0,01	%	-
Drying time	4 - 6	h	-
Drying temperature	150	°C	-
<b>Temperature</b>			
Hopper temperature	20 - 30	°C	-
Feeding zone temperature	60 - 80	°C	-
Zone1 temperature	270 - 280	°C	-
Zone2 temperature	275 - 285	°C	-
Zone3 temperature	280 - 290	°C	-
Zone4 temperature	285 - 295	°C	-
Nozzle temperature	290 - 300	°C	-
Melt temperature	285 - 295	°C	-
Mold temperature	80 - 120	°C	-
Hot runner temperature	285 - 295	°C	-
<b>Pressure</b>			
Injection pressure	500 - 1500	bar	-
Hold pressure	500 - 1500	bar	-
Back pressure max.	30	bar	-
<b>Speed</b>			
Injection speed	very fast	-	-
<b>Screw Speed</b>			
Screw speed diameter, 16mm	200	RPM	-
Screw speed diameter, 25mm	140	RPM	-
Screw speed diameter, 40mm	80	RPM	-

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Other	Value	Unit	Test Standard
Specimen thickness (shrinkage)	3,18	mm	Internal

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### Other text information

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#### 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  $\leq -40^{\circ}$  C. The time between drying and processing should be as short as possible.

#### Longer pre-drying times/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).

#### Injection molding

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.

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### Characteristics

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#### Special Characteristics

Anti-static, Electrostatic dissipation, Flame retardant, Light stabilized

#### Processing

Injection molding

#### Product Categories

Specialty

#### Delivery Form

Pellets

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### Contact Information

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### General Disclaimer

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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. Colorants or other additives may cause significant variations in data values. Properties of molded 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. 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. The products mentioned herein are not intended for use in medical or dental implants.

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## **VECTRA® A230 - LCP**

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