

VECTRA® MT®1310 - LCP

Description

30% glass fiber, exc. bal. of properties

Vectra® MT1310 VF3001 (natural) is a 30% glass reinforced, easy flow LCP grade for injection molding.

Vectra® MT1310 VF3001 (natural) is a special grade developed for medical industry applications and complies with:

- Food Contact Substance Notification (FCN) No. 742 of the Food and Drug Administration (FDA) and is listed in the Drug Master File (DMF 8464) and the Device Master File (MAF 315)
- the corresponding EU and national registry regulatory requirements
- biocompatibility in tests corresponding to USP 23 Class VI/ISO 10993
- low residual monomers
- no animal products

The Standard for the Industry. Excellent balance of properties, including easy flow, easy processing, thermal stability, chemical resistance, mechanical and electrical properties. Suitable for vapor phase surface mount electrical and electronic devices.

Chemical abbreviation according to ISO 1043-1 : LCP

Inherently flame retardant

Physical properties	Value	Unit	Test Standard
Density	1620	kg/m ³	ISO 1183
Molding shrinkage, parallel (flow)	0.2	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	0.4	%	ISO 294-4, 2577
Humidity absorption, 23°C/50%RH	0.04	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	15000	MPa	ISO 527-1, -2
Tensile stress at break, 5mm/min	190	MPa	ISO 527-1, -2
Tensile strain at break, 5mm/min	2.1	%	ISO 527-1, -2
Tensile creep modulus, 1h	12600	MPa	ISO 899-1
Tensile creep modulus, 1000h	10900	MPa	ISO 899-1
Flexural modulus, 23°C	15000	MPa	ISO 178
Flexural strength, 23°C	260	MPa	ISO 178
Charpy notched impact strength, 23°C	46	kJ/m ²	ISO 179/1eA
Izod impact notched, 23°C	33	kJ/m ²	ISO 180/1A
Compressive modulus	14500	MPa	ISO 604
Compressive stress at 1% strain	100	MPa	ISO 604
Rockwell hardness (M-Scale)	85	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	235	°C	ISO 75-1, -2
DTUL at 0.45 MPa	250	°C	ISO 75-1, -2
DTUL at 8.0 MPa	190	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	160	°C	ISO 306
Coeff. of linear therm expansion, parallel	0.06	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	0.23	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	45	%	ISO 4589-1/-2
Flammability at thickness h	V-0	class	UL 94

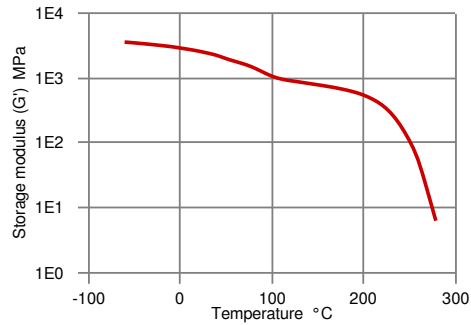
Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	4.2	-	IEC 60250
Dielectric constant (Dk), 1MHz	3.7	-	IEC 60250
Dissipation factor, 100Hz	160	E-4	IEC 60250
Dissipation factor, 1MHz	180	E-4	IEC 60250
Volume resistivity, 23°C	1E13	Ohm*m	IEC 62631-3-1
Surface resistivity, 23°C	>1E15	Ohm	IEC 62631-3-2

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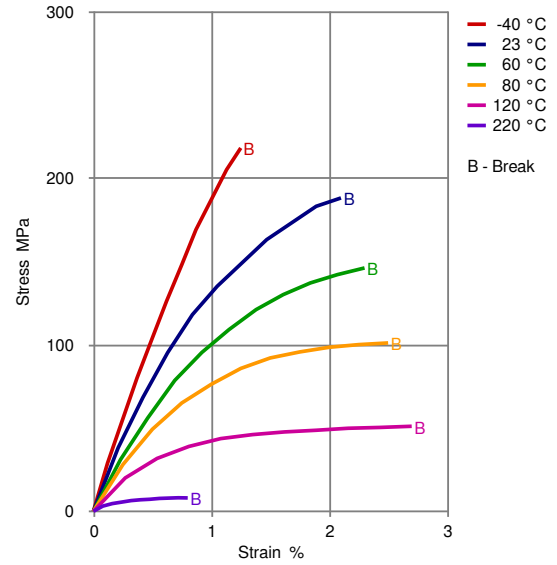
Electric strength, 23 °C (AC)	31	kV/mm	IEC 60243-1
Comparative tracking index	PLC 3	-	UL 746
Arc resistance	140	s	Internal

Diagrams

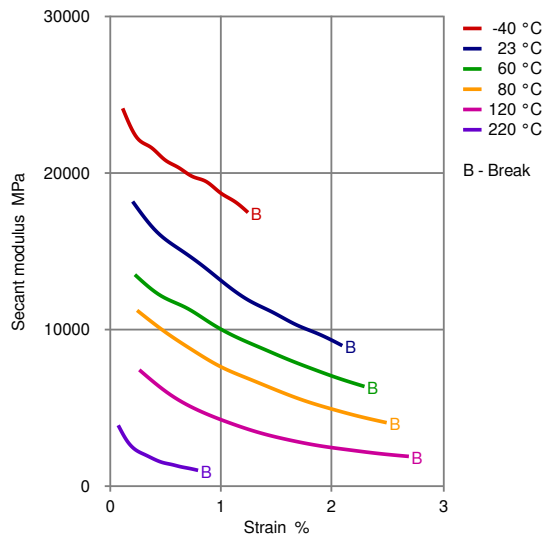
Dynamic Shear modulus-temperature



Stress-strain



Secant modulus-strain



Typical injection moulding processing conditions

Pre Drying	Value	Unit
Necessary low maximum residual moisture content	0.01	%
Drying time	4 - 6	h

VECTRA® MT®1310 - LCP

Drying temperature	150	°C	
Temperature	Value	Unit	
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	
Pressure	Value	Unit	
Injection pressure	500 - 1500	bar	
Hold pressure	500 - 1500	bar	
Back pressure max.	30	bar	
Speed	Value		
Injection speed	very fast		
Screw Speed	Value	Unit	
Screw speed diameter, 16mm	200	RPM	
Screw speed diameter, 25mm	140	RPM	
Screw speed diameter, 40mm	80	RPM	
Other	Value	Unit	Test Standard
Specimen thickness (shrinkage)	3.18	mm	Internal

Other text information

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.

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 (≤ 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.

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. The Vectra MT-grades MT1300, MT1305, MT1310, MT1335, MT1340 and MT1345 should be dried at 150°C for a minimum of 4 hours in a desiccant dryer.

Characteristics

Special Characteristics	Flame retardant, Light stabilized
Product Categories	Medical technology
Processing	Injection molding

General Disclaimer

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.

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