Celanese
The chemistry inside innovation™

VECTRA® MT®4310 - LCP

Description

30% glass fiber, excellent flow, high temperature capability
Vectra® MT4310 VF3001 (natural) is a 30% glass reinforced high flow, LCP grade for injection molding.

Vectra® MT4310 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

Highest temperature capability
Easiest flow
Suitable where very thin walls are required
Used for broad range of SMT applications, with minimal dimensional change
Chemical abbreviation according to ISO 1043-1 : LCP
Inherently flame retardant

Physical properties	Value	Unit	Test Standard
Density	**1610**	kg/m³	ISO 1183
Molding shrinkage, parallel (flow)	**0.1**	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	**0.5**	%	ISO 294-4, 2577

Mechanical properties	Value	Unit	Test Standard
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, 23°C	**16000**	MPa	ISO 178
Flexural strength, 23°C	**225**	MPa	ISO 178
Charpy notched impact strength, 23°C	**40**	kJ/m²	ISO 179/1eA
Izod impact notched, 23°C	**30**	kJ/m²	ISO 180/1A
Compressive modulus	**14000**	MPa	ISO 604
Compressive stress at 1% strain	**93**	MPa	ISO 604
Rockwell hardness (M-Scale)	**71**	M-Scale	ISO 2039-2

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	**335**	°C	ISO 11357-1/-3
DTUL at 1.8 MPa	**276**	°C	ISO 75-1, -2
DTUL at 8.0 MPa	**216**	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	**195**	°C	ISO 306
Coeff. of linear therm expansion, parallel	**0.07**	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	**0.2**	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	**45**	%	ISO 4589-1/-2
Flammability at thickness h	**V-0**	class	UL 94

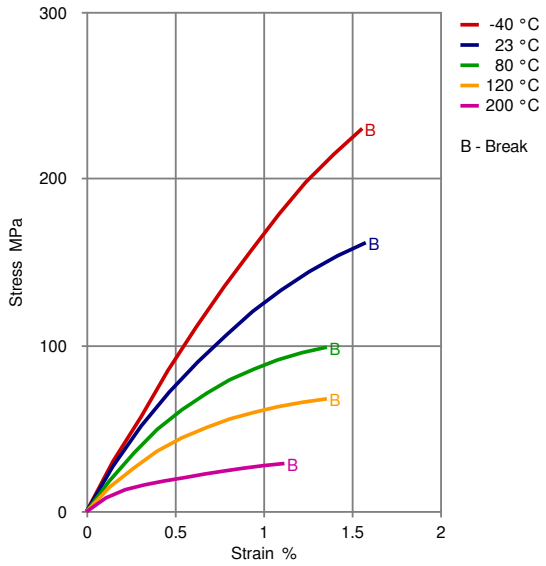
Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	**4**	-	IEC 60250
Dielectric constant (Dk), 1MHz	**3.3**	-	IEC 60250
Dissipation factor, 100Hz	**100**	E-4	IEC 60250
Dissipation factor, 1MHz	**250**	E-4	IEC 60250
Volume resistivity, 23°C	**1E13**	Ohm*m	IEC 62631-3-1
Surface resistivity, 23°C	**1E14**	Ohm	IEC 62631-3-2
Electric strength, 23°C (AC)	**32**	kV/mm	IEC 60243-1
Comparative tracking index	**PLC 3**	-	UL 746

VECTRA® MT®4310 - LCP

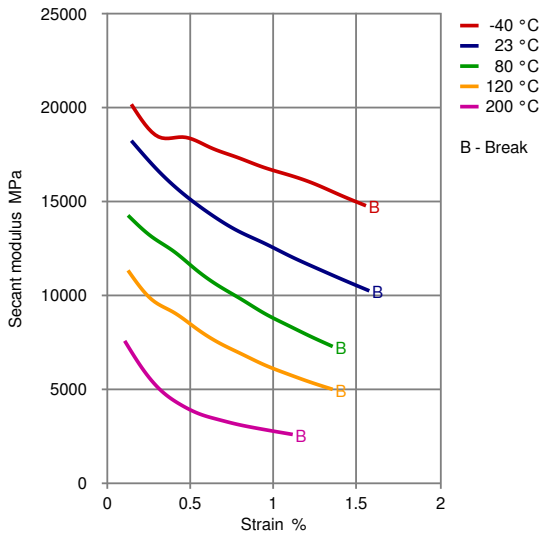
Arc resistance	**140**	s	Internal

Diagrams

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
Drying temperature	**170**	°C

Temperature	Value	Unit
Hopper temperature	**20 - 30**	°C
Feeding zone temperature	**60 - 80**	°C
Zone1 temperature	**315 - 325**	°C
Zone2 temperature	**320 - 330**	°C
Zone3 temperature	**325 - 335**	°C
Zone4 temperature	**330 - 340**	°C
Nozzle temperature	**335 - 345**	°C
Melt temperature	**335 - 345**	°C
Mold temperature	**80 - 120**	°C
Hot runner temperature	**335 - 345**	°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

VECTRA® MT®4310 - LCP

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 =< - 40° 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. Vectra LCP MT4310 and MT4350 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.

Characteristics

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

General Disclaimer

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.

Trademark