

## VECTRA® MT®1335 - LCP

### Description

Glass/PTFE, best High Arc Ignition performance

Vectra® MT1335 VF3001 (natural) is a glass/PTFE filled, tribologically-modified, easy flow LCP grade for injection molding.

Vectra® MT1335 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

Best High Current Arc Ignition (HAI) performance

Chemical abbreviation according to ISO 1043-1 : LCP

Inherently flame retardant

Physical properties	Value	Unit	Test Standard
Density	1620	kg/m <sup>3</sup>	ISO 1183
Molding shrinkage, parallel (flow)	0.1	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	0.4	%	ISO 294-4, 2577

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	11000	MPa	ISO 527-1, -2
Tensile stress at break, 5mm/min	190	MPa	ISO 527-1, -2
Tensile strain at break, 5mm/min	2.3	%	ISO 527-1, -2
Flexural modulus, 23°C	15000	MPa	ISO 178
Flexural strength, 23°C	250	MPa	ISO 178
Charpy notched impact strength, 23°C	40	kJ/m <sup>2</sup>	ISO 179/1eA
Izod impact notched, 23°C	30	kJ/m <sup>2</sup>	ISO 180/1A
Compressive modulus	10500	MPa	ISO 604
Compressive stress at 1% strain	77	MPa	ISO 604
Rockwell hardness (M-Scale)	55	M-Scale	ISO 2039-2

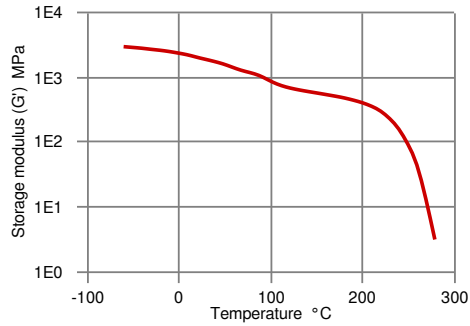
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	280	°C	ISO 11357-1/-3
DTUL at 1.8 MPa	230	°C	ISO 75-1, -2
DTUL at 0.45 MPa	250	°C	ISO 75-1, -2
DTUL at 8.0 MPa	162	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	146	°C	ISO 306
Coeff. of linear therm expansion, parallel	0	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	0.19	E-4/°C	ISO 11359-2
Flammability at thickness h	V-0	class	UL 94

Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	3.5	-	IEC 60250
Dielectric constant (Dk), 1MHz	3.1	-	IEC 60250
Dissipation factor, 100Hz	200	E-4	IEC 60250
Dissipation factor, 1MHz	160	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
Electric strength, 23°C (AC)	32	kV/mm	IEC 60243-1
Comparative tracking index	PLC 3	-	UL 746
Arc resistance	130	s	Internal

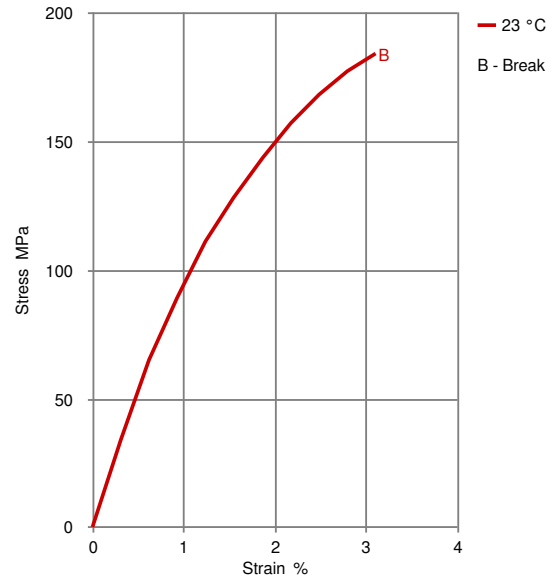
**VECTRA® MT®1335 - LCP**

**Diagrams**

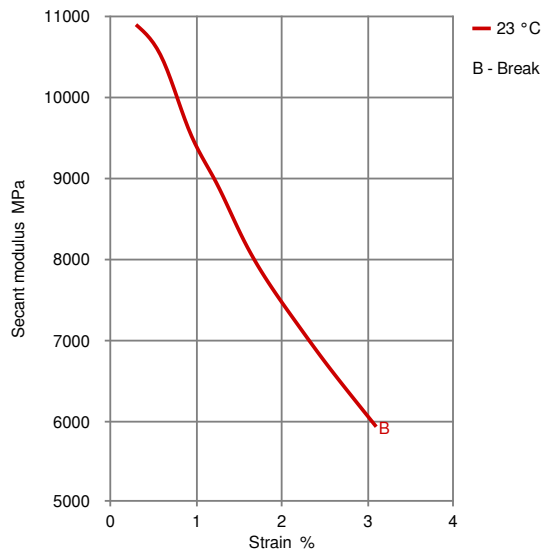
**Dynamic Shear modulus-temperature**



**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
Drying temperature	150	°C

## VECTRA® MT®1335 - LCP

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 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 ( $\leq 24$  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.

#### 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  $150^{\circ}\text{C}$  for a minimum of 4 hours in a desiccant dryer.

### Characteristics

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