

VECTRA® MT® 1310

Liquid Crystal Polymer

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

Product information

| | | |
|----------------------|------------|-----------|
| Resin Identification | LCP-GF30 | ISO 1043 |
| Part Marking Code | >LCP-GF30< | ISO 11469 |

Rheological properties

| | | |
|------------------------------|-------|-----------------|
| Moulding shrinkage, parallel | 0.2 % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 0.4 % | ISO 294-4, 2577 |

Typical mechanical properties

| | | |
|--------------------------------------|----------------------|--------------|
| 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 |
| Flexural modulus | 15000 MPa | ISO 178 |
| Flexural strength | 260 MPa | ISO 178 |
| Compressive modulus | 14500 MPa | ISO 604 |
| Compressive stress at 1% strain | 138 MPa | ISO 604 |
| Tensile creep modulus, 1h | 12600 MPa | ISO 899-1 |
| Tensile creep modulus, 1000h | 10900 MPa | ISO 899-1 |
| Charpy notched impact strength, 23°C | 46 kJ/m ² | ISO 179/1eA |
| Izod notched impact strength, 23°C | 33 kJ/m ² | ISO 180/1A |
| Hardness, Rockwell, M-scale | 85 | ISO 2039-2 |
| Poisson's ratio | 0.33 ^[C] | |

[C]: Calculated

Thermal properties

| | | |
|--|--------|----------------|
| Melting temperature, 10°C/min | 280 °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa | 235 °C | ISO 75-1/-2 |
| Temperature of deflection under load, 0.45 MPa | 250 °C | ISO 75-1/-2 |
| Temperature of deflection under load, 8 MPa | 190 °C | ISO 75-1/-2 |
| Vicat softening temperature, 50°C/h 50N | 160 °C | ISO 306 |

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| | | |
|--|----------|----------------|
| Coefficient of linear thermal expansion (CLTE), parallel | 6 E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal | 23 E-6/K | ISO 11359-1/-2 |

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 | 4.2 | IEC 62631-2-1 |
| Relative permittivity, 1MHz | 3.7 | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 160 E-4 | IEC 62631-2-1 |
| Dissipation factor, 1MHz | 180 E-4 | IEC 62631-2-1 |
| Volume resistivity | 1E13 Ohm.m | IEC 62631-3-1 |
| Surface resistivity | >1E15 Ohm | IEC 62631-3-2 |
| Electric strength | 31 kV/mm | IEC 60243-1 |
| Comparative tracking index | 175 | IEC 60112 |
| Arc Resistance | 140 s | UL 746B |

Physical/Other properties

| | | |
|--------------------------|------------------------|----------------|
| Humidity absorption, 2mm | 0.04 % | Sim. to ISO 62 |
| Density | 1610 kg/m ³ | ISO 1183 |

Injection

| | |
|---------------------------------|---------------|
| Drying Recommended | yes |
| Drying Temperature | 150 °C |
| Drying Time, Dehumidified Dryer | 4 - 6 h |
| Processing Moisture Content | ≤0.01 % |
| Melt Temperature Optimum | 290 °C |
| Min. melt temperature | 285 °C |
| Max. melt temperature | 295 °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 | 225 °C |

Characteristics

| | |
|-------------------------|---|
| Processing | Injection Moulding |
| Delivery form | Pellets |
| Special characteristics | Flame retardant, Light stabilised or stable to light, U.V. stabilised or stable to weather, Heat stabilised or stable to heat |

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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. 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.

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.

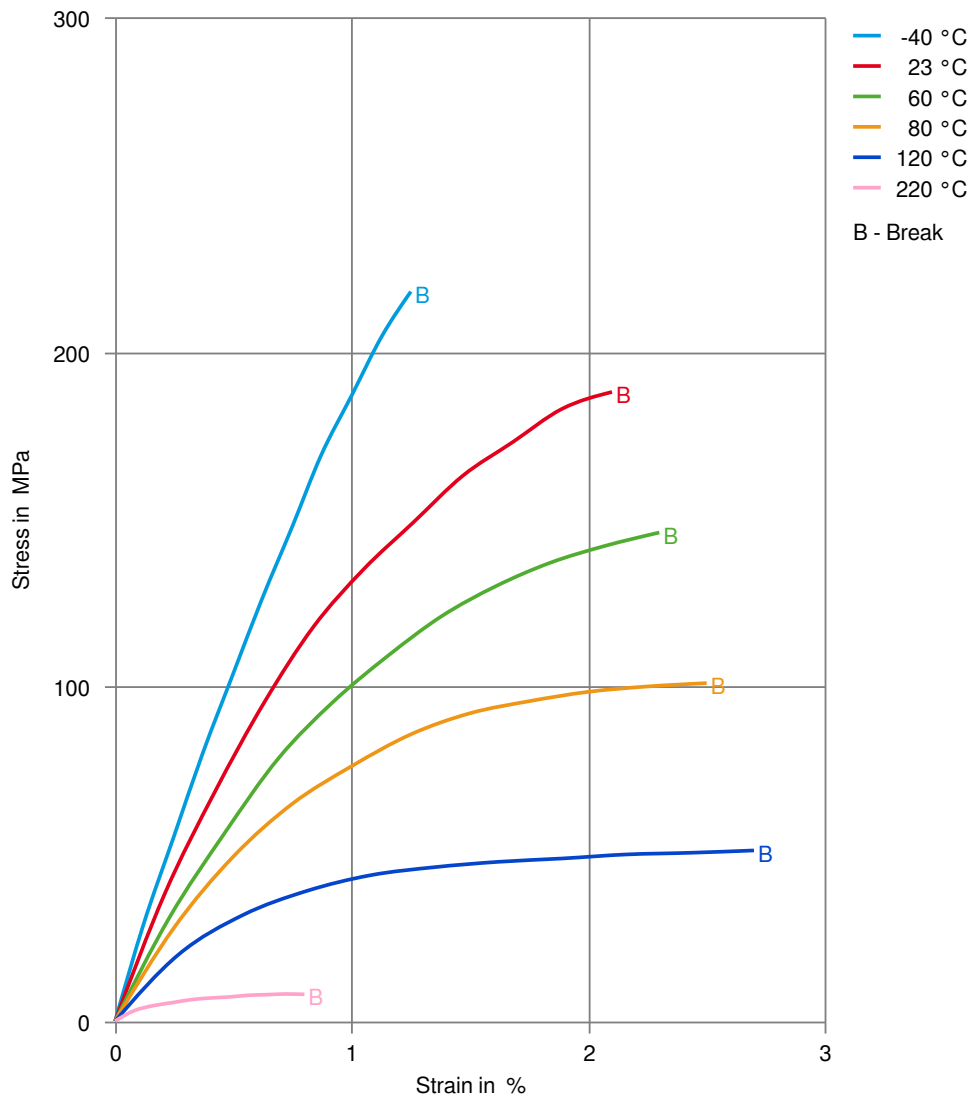
Storage

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 (≤ 24 h).

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Stress-strain



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Secant modulus-strain

