

VECTRA® A115

Liquid Crystal Polymer

Provides easier flow than A130. Slightly tougher, but may warp slightly more than A130 in some parts. 15% glass reinforced. Chemical abbreviation according to ISO 1043-1 : LCP Inherently flame retardant UL-Listing V-0 in natural and black at 0.44mm thickness per UL 94 flame testing. Relative-Temperature-Index (RTI) according to UL 746B: electricals 240 °C, mechanicals 220 °C at 0.85mm. UL = Underwriters Laboratories (USA)

Product information

| | | |
|----------------------|------------|-----------|
| Resin Identification | LCP-GF15 | ISO 1043 |
| Part Marking Code | >LCP-GF15< | ISO 11469 |

Rheological properties

| | | |
|------------------------------|-------|-----------------|
| Moulding shrinkage, parallel | 0.1 % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 0.4 % | ISO 294-4, 2577 |

Typical mechanical properties

| | | |
|---------------------------------------|----------------------|--------------|
| Tensile modulus | 12000 MPa | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min | 200 MPa | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min | 3.1 % | ISO 527-1/-2 |
| Flexural modulus | 12600 MPa | ISO 178 |
| Flexural strength | 240 MPa | ISO 178 |
| Compressive modulus | 10000 MPa | ISO 604 |
| Compressive stress at 1% strain | 40.7 MPa | ISO 604 |
| Charpy notched impact strength, 23 °C | 70 kJ/m ² | ISO 179/1eA |
| Izod notched impact strength, 23 °C | 50 kJ/m ² | ISO 180/1A |
| Izod impact strength, 23 °C | 61 kJ/m ² | ISO 180/1U |
| Hardness, Rockwell, M-scale | 80 | 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 | 230 °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 | 157 °C | ISO 75-1/-2 |
| Vicat softening temperature, 50 °C/h 50N | 162 °C | ISO 306 |
| Coefficient of linear thermal expansion (CLTE), parallel | 10 E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal | 18 E-6/K | ISO 11359-1/-2 |

Flammability

| | | |
|-------------------------------|-----------|-----------------|
| Burning Behav. at thickness h | V-0 class | IEC 60695-11-10 |
|-------------------------------|-----------|-----------------|

Electrical properties

| | | |
|------------------------------|------------|---------------|
| Relative permittivity, 100Hz | 3.5 | IEC 62631-2-1 |
| Relative permittivity, 1MHz | 3 | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 200 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 |

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|----------------------------|-----------|---------------|
| Surface resistivity | >1E15 Ohm | IEC 62631-3-2 |
| Electric strength | 34 kV/mm | IEC 60243-1 |
| Comparative tracking index | 200 | IEC 60112 |
| Arc Resistance | 135 s | UL 746B |

Physical/Other properties

| | | |
|--------------------------|------------------------|----------------|
| Humidity absorption, 2mm | 0.003 % | Sim. to ISO 62 |
| Water absorption, 2mm | 0.006 % | Sim. to ISO 62 |
| Density | 1500 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 | 234 °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, High Flow, Chemical resistant, Improved weld line |

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. Vectra A-grades 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

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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.

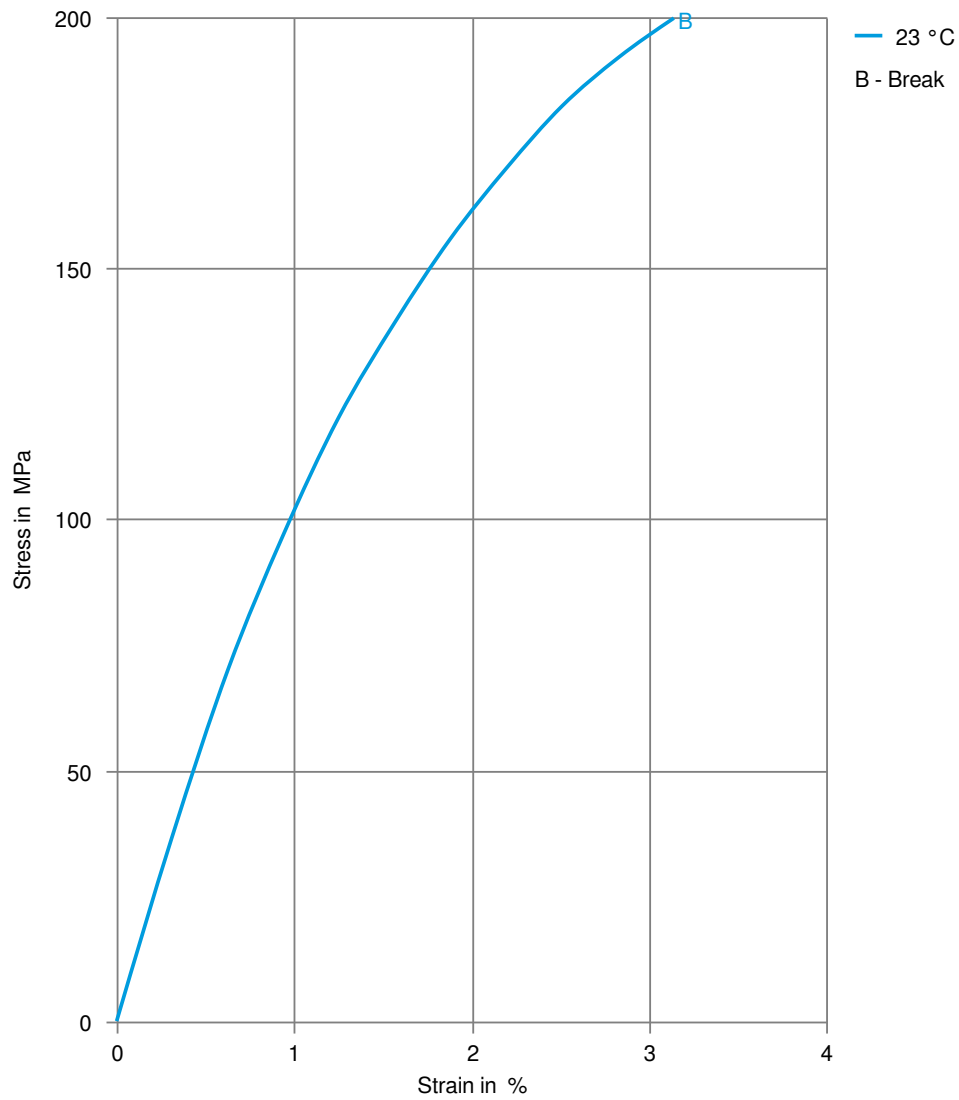
Storage

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 ($\leq 24\text{ h}$).

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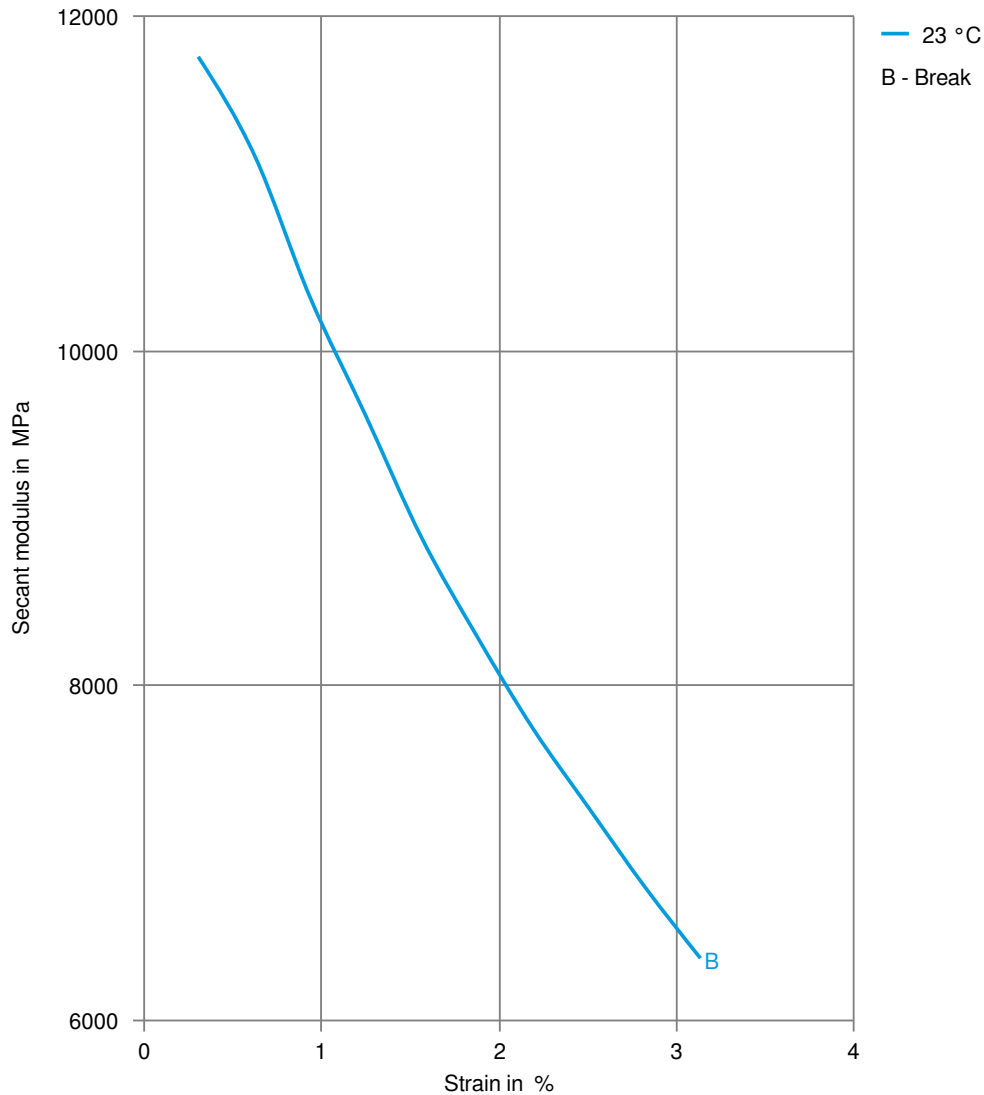
Stress-strain



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Secant modulus-strain



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