VECTRA® MT®1335

Liquid Crystal Polymer

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

Product information

Resin Identification	(LCP+PTFE)-GF15	ISO 1043
Part Marking Code	>(LCP+PTFE)-GF15<	ISO 11469

Rheological properties

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

Typical mechanical properties

Tensile modulus	1.6E6	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	27600	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.3	%	ISO 527-1/-2
Flexural modulus	2.18E6	psi	ISO 178
Flexural strength	36300	psi	ISO 178
Compressive modulus	1.52E6	psi	ISO 604
Compressive stress at 1% strain	11200	psi	ISO 604
Charpy notched impact strength, 23°C	19	ftlb/in²	ISO 179/1eA
Izod notched impact strength, 23°C	14.3	ftlb/in²	ISO 180/1A
Hardness, Rockwell, M-scale	55		ISO 2039-2

Tribological properties

Coefficient of dynamic friction, against steel	0.11	ISO 8295
Coefficient of dynamic friction, against brass	0.11	
Coefficient of dynamic friction, against aluminium	0.11	

Thermal properties

Melting temperature, 10°C/min	536	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	446	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	482	°F	ISO 75-1/-2
Temperature of deflection under load, 8 MPa	324	°F	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	295	°F	ISO 306

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Coefficient of linear thermal expansion (CLTE), parallel	0	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.467	E-4/°F	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	3.1		IEC 62631-2-1
Dissipation factor, 100Hz	200	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	160	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	813	kV/in	IEC 60243-1
Comparative tracking index	175		IEC 60112
Arc Resistance	130	s	UL 746B

Physical/Other properties

Density	0.0585	lb/in³	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	302	°F
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.01	%
Melt Temperature Optimum	554	°F
Min. melt temperature	545	°F
Max. melt temperature	563	°F
Max. screw tangential speed	0.2 - 0.3	m/s
Mold Temperature Optimum	212	°F
Min. mold temperature	176	°F
Max. mold temperature	248	°F
Back pressure	435	psi
Ejection temperature	464	°F

Characteristics

Processing	Injection Molding
Special characteristics	Flame retardant, Light stabilized or stable to light, Low wear / Low friction

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 =< - 40° C. The time between drying and processing should be as short as possible.

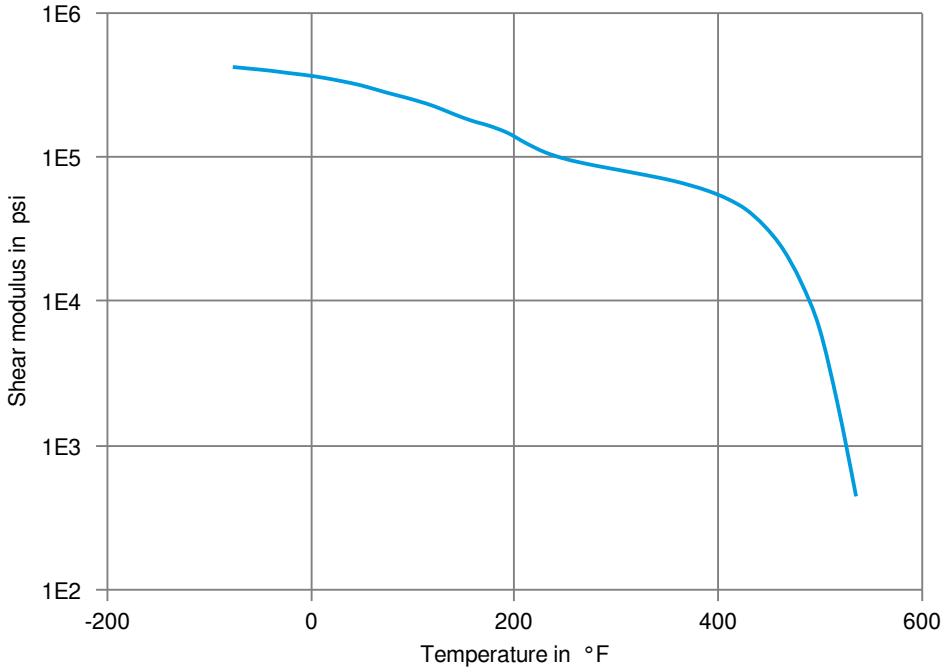
Storage

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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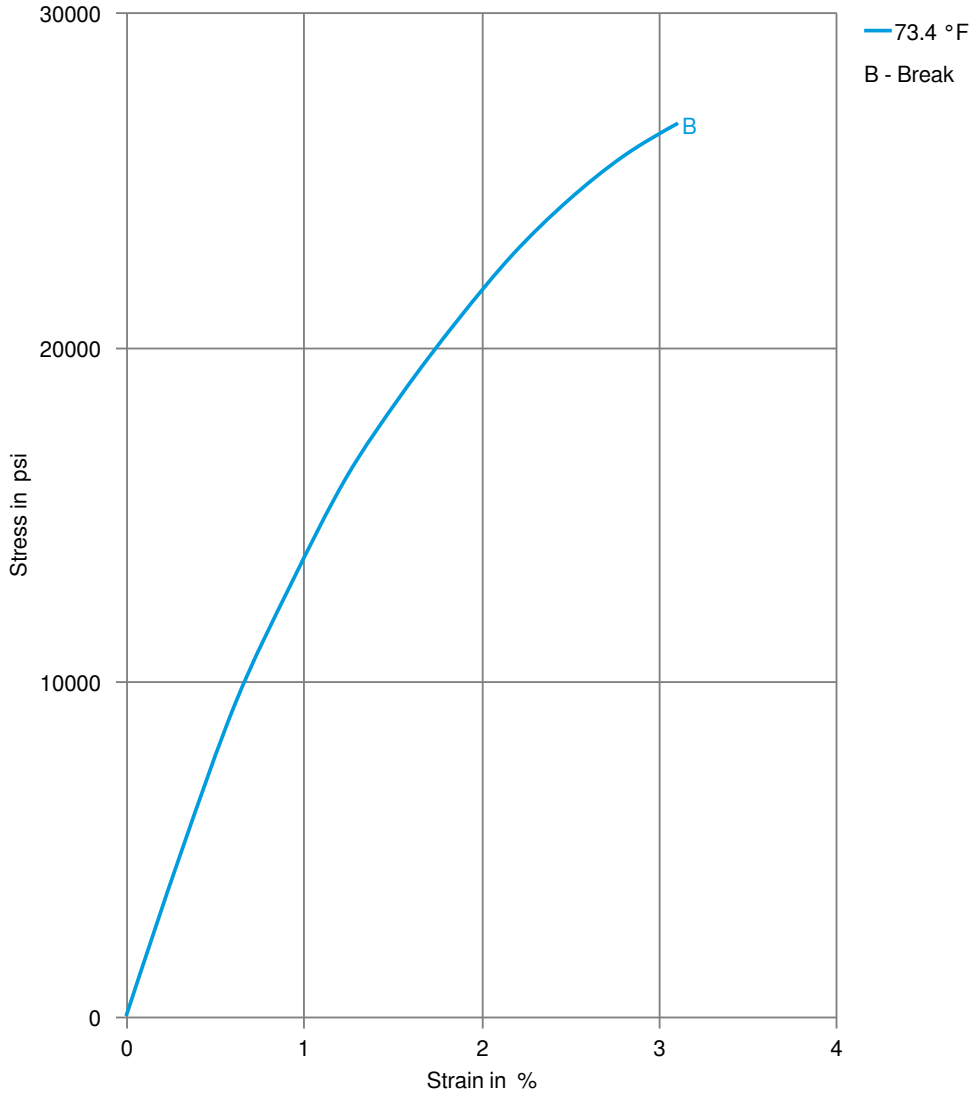
Dynamic Shear modulus-temperature



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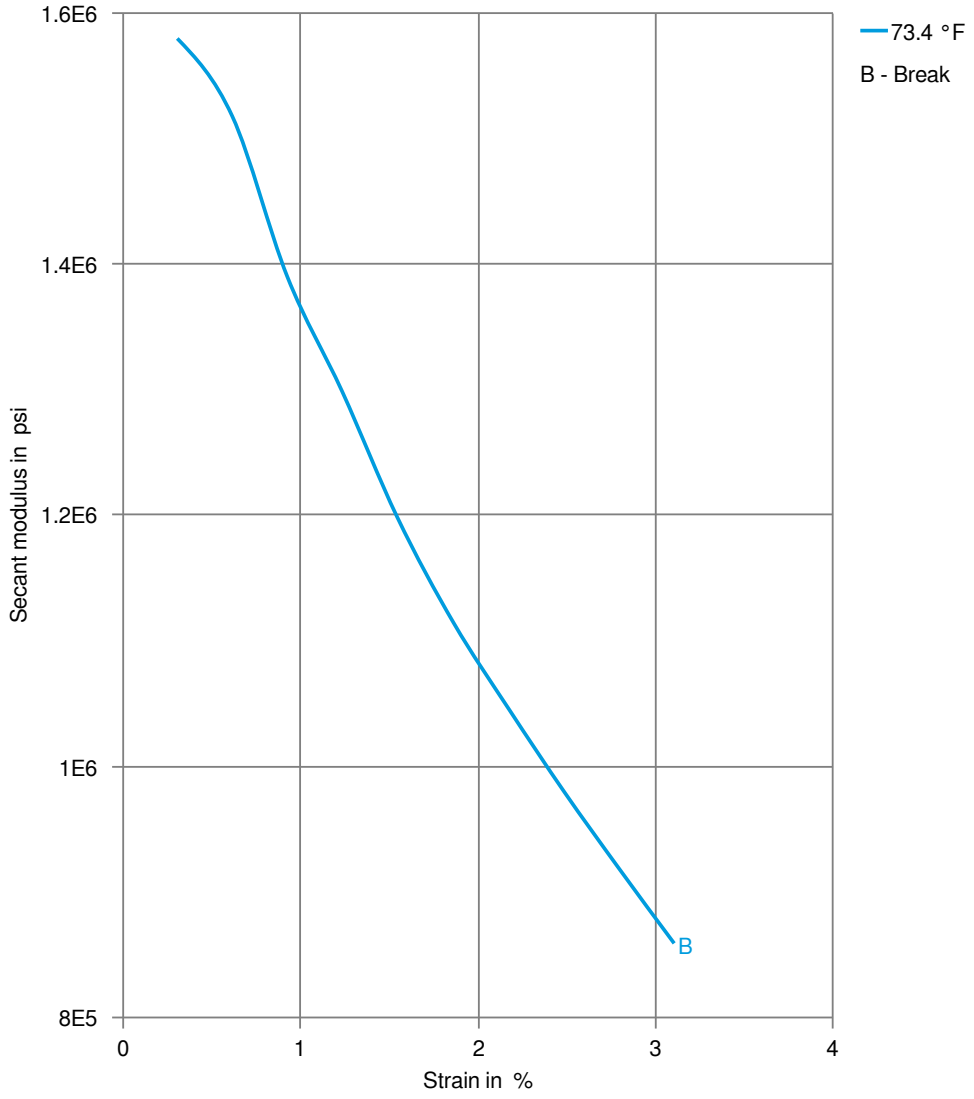
Stress-strain



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Secant modulus-strain



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