Celanese
The chemistry inside innovation™

CELANEX® 2300 GV1/50 - PBT

Description

General purpose, 50% glass fiber reinforced PBT
Chemical abbreviation according to ISO 1043: PBT GF50. Moulding compound ISO 7792-1 PBT, MGAR, 08-160, GF50. Polybutylene terephthalate, 50 % glass fiber reinforced. Flammability UL 94 HB minimum thickness 0.82 mm. Recognition by Underwriters Laboratories, USA (UL)

Physical properties	Value	Unit	Test Standard
Density	**107**	lb/ft³	ISO 1183
Melt volume rate, MVR	**5**	cm³/10min	ISO 1133
MVR temperature	**482**	°F	ISO 1133
MVR load	**4.76**	lb	ISO 1133
Molding shrinkage, parallel (flow)	**0.3 - 0.4**	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	**0.7 - 0.9**	%	ISO 294-4, 2577
Water absorption, 23°C-sat	**0.35**	%	Sim. to ISO 62
Humidity absorption, 23°C/50%RH	**0.15**	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	**2.47E6**	psi	ISO 527-1, -2
Tensile stress at break, 5mm/min	**23900**	psi	ISO 527-1, -2
Tensile strain at break, 5mm/min	**1.6**	%	ISO 527-1, -2
Tensile creep modulus, 1h	**1.81E6**	psi	ISO 899-1
Tensile creep modulus, 1000h	**1.38E6**	psi	ISO 899-1
Flexural strength, 23°C	**34800**	psi	ISO 178
Charpy impact strength, 23°C	**33.3**	ft-lb/in²	ISO 179/1eU
Charpy impact strength, -30°C	**30.9**	ft-lb/in²	ISO 179/1eU
Charpy notched impact strength, 23°C	**5.47**	ft-lb/in²	ISO 179/1eA
Charpy notched impact strength, -30°C	**5.47**	ft-lb/in²	ISO 179/1eA
Ball indentation hardness, 30s	**34100**	psi	ISO 2039-1

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	**437**	°F	ISO 11357-1/-3
DTUL at 1.8 MPa	**419**	°F	ISO 75-1, -2
DTUL at 0.45 MPa	**442**	°F	ISO 75-1, -2
DTUL at 8.0 MPa	**365**	°F	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	**437**	°F	ISO 306
Coeff. of linear therm expansion, parallel	**0.0833**	E-4/°F	ISO 11359-2
Limiting oxygen index (LOI)	**20**	%	ISO 4589-1/-2
Flammability @1.6mm nom. thickn.	**HB**	class	UL 94
thickness tested (1.6)	**0.1**	in	UL 94
Flammability at thickness h	**HB**	class	UL 94
thickness tested (h)	**0.0323**	in	UL 94
UL recognition (h)	**UL**	-	UL 94

Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	**4.4**	-	IEC 60250
Dielectric constant (Dk), 1MHz	**4.1**	-	IEC 60250
Dissipation factor, 100Hz	**16**	E-4	IEC 60250
Dissipation factor, 1MHz	**190**	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)	**889**	kV/in	IEC 60243-1

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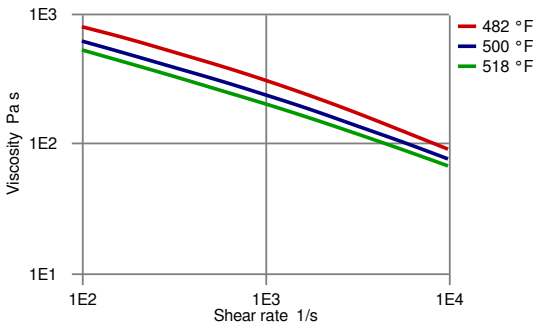
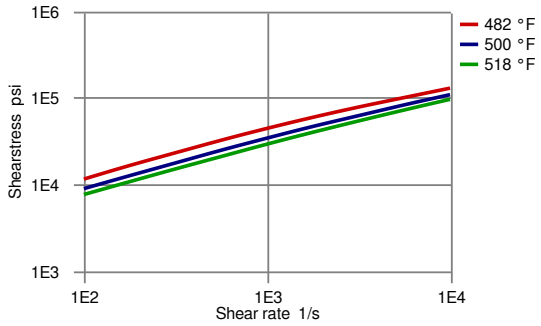
Diagrams

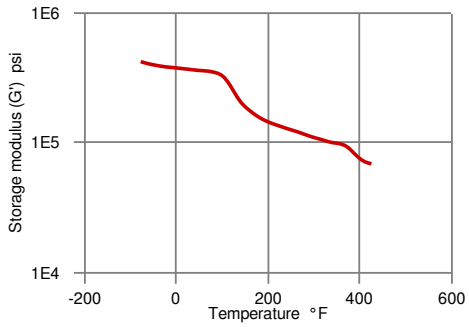
Viscosity-shear rate



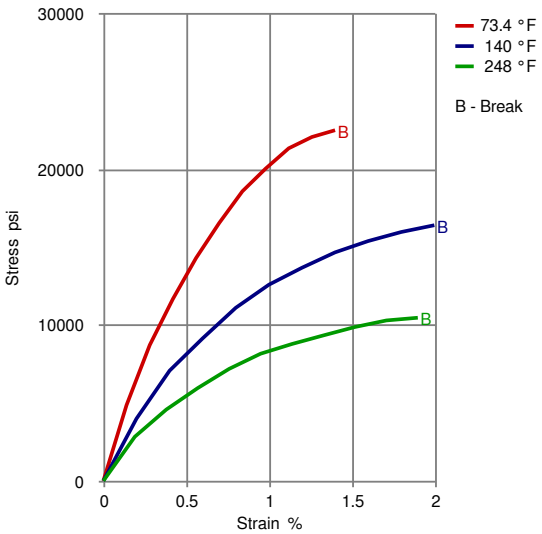
Shear stress-shear rate



Dynamic Shear modulus-temperature



Stress-strain



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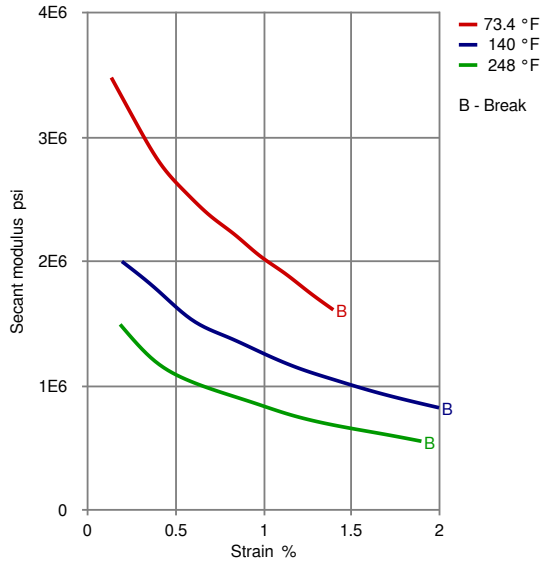
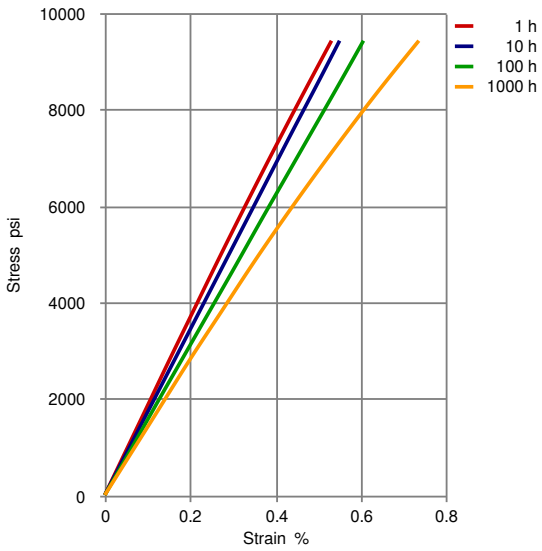
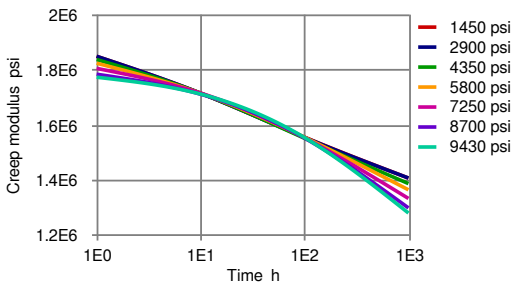
Secant modulus-strain



CAMPUS Stress-strain (isochronous) 73.4°F



CAMPUS Creep modulus-time 73.4°F



Typical injection moulding processing conditions

Pre Drying	Value	Unit
Necessary low maximum residual moisture content	**0.02**	%
Drying time	**2 - 4**	h
Drying temperature	**248 - 284**	°F

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Temperature	Value	Unit
Hopper temperature	**68 - 122**	°F
Feeding zone temperature	**374 - 392**	°F
Zone1 temperature	**482 - 500**	°F
Zone2 temperature	**482 - 500**	°F
Zone3 temperature	**491 - 509**	°F
Zone4 temperature	**491 - 509**	°F
Nozzle temperature	**500 - 518**	°F
Melt temperature	**500 - 518**	°F
Mold temperature	**167 - 212**	°F
Hot runner temperature	**500 - 518**	°F

Speed	Value
Injection speed	**fast**

Screw Speed	Value	Unit
Screw speed diameter, 25mm	**90**	RPM
Screw speed diameter, 40mm	**75**	RPM
Screw speed diameter, 55mm	**60**	RPM

Other text information

Pre-drying

CELANEX should always be dried before processing. Because of the necessary low maximum residual moisture content, the use of dry air dryers is recommended. The dew point should be =< - 30° 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 (<= 60 h) it is necessary to lower the temperature to 100° C.

Injection molding

Melt Temperature 260-270 °C
Mold Temperature *) 75-85 °C
Maximum Barrel Residence Time **) 5-10 min
Injection Speed fast
Peripheral screw speed max.0,3 m/sec
Back Pressure 10-30 bar
Injection Pressure 600-1000 bar
Holding Pressure 400-800 bar
Nozzle Design open design preferred

Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded.

Celanese recommends only externally heated hot runner systems.

*) For moulded parts with especially high requirements to the surface quality or dimensional stability, a mold temperature of up to 110 °C can be advantageous.

**) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

Injection Molding Preprocessing

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0,02%. The drying should be done in a dry-air dryer (dew point < -30°C) with a temperature of 120 to 140 °C and a drying time of 4 to 6 hours. In case of longer residence times in the dry-air dryer, the temperature should be reduced to 100°C.
The time between drying and processing should be kept as short as possible. The processing machine feed hopper should be closed during the processing operation.

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Special Characteristics	Auto spec approved, Heat resistant
Product Categories	Glass reinforced
Processing	Injection molding
Delivery Form	Pellets
Additives	Release agent

Other Approvals

OEM	Specification	Additional Information
VW Group		NATURAL, no spec, special part approval