

CELANEX® 2302 GV1/15 - PBT
Description

PBT + PET, 15% glass fiber reinforced, high gloss

Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT+PET, MGHR, 08-060N, GF15; Polybutylene terephthalate polymer blend with PET, 15 % glass fibre reinforced, injection molded parts with superior gloss. Flammability UL 94 HB minimum thickness 0.85 mm. Recognition by Underwriters Laboratories, USA (UL)

Physical properties	Value	Unit	Test Standard
Density	89.3	lb/ft ³	ISO 1183
Melt volume rate, MVR	20	cm ³ /10min	ISO 1133
MVR temperature	509	°F	ISO 1133
MVR load	4.76	lb	ISO 1133
Molding shrinkage, parallel (flow)	0.4 - 0.6	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	0.8 - 1.0	%	ISO 294-4, 2577
Water absorption, 23°C-sat	0.45	%	Sim. to ISO 62
Humidity absorption, 23°C/50%RH	0.15	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	899236	psi	ISO 527-1, -2
Tensile stress at break, 5mm/min	16700	psi	ISO 527-1, -2
Tensile strain at break, 5mm/min	3.5	%	ISO 527-1, -2
Tensile creep modulus, 1h	769000	psi	ISO 899-1
Tensile creep modulus, 1000h	624000	psi	ISO 899-1
Flexural strength, 23°C	23200	psi	ISO 178
Charpy impact strength, 23°C	16.6	ft-lb/in ²	ISO 179/1eU
Charpy impact strength, -30°C	16.6	ft-lb/in ²	ISO 179/1eU
Charpy notched impact strength, 23°C	3.09	ft-lb/in ²	ISO 179/1eA
Charpy notched impact strength, -30°C	3.09	ft-lb/in ²	ISO 179/1eA
Ball indentation hardness, 30s	27600	psi	ISO 2039-1

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	491	°F	ISO 11357-1/-3
DTUL at 1.8 MPa	374	°F	ISO 75-1, -2
DTUL at 8.0 MPa	149	°F	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	410	°F	ISO 306
Coeff. of linear therm expansion, parallel	0.194	E-4/°F	ISO 11359-2
Limiting oxygen index (LOI)	19	%	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)	0.0335	in	UL 94
UL recognition (h)	UL	-	UL 94

Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 100Hz	4.1	-	IEC 60250
Dielectric constant (Dk), 1MHz	4	-	IEC 60250
Dissipation factor, 100Hz	12	E-4	IEC 60250
Dissipation factor, 1MHz	180	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)	711	kV/in	IEC 60243-1
Comparative tracking index	PLC 2	-	UL 746
CTI 50 drops	250	V	IEC 60112

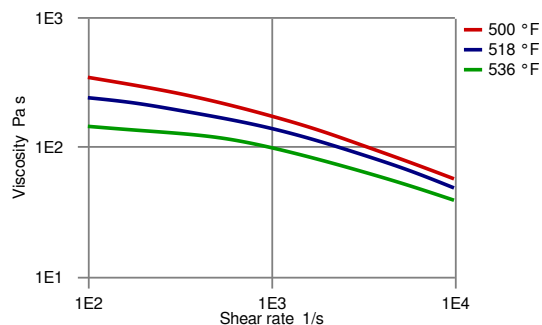
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Rheological calculation properties

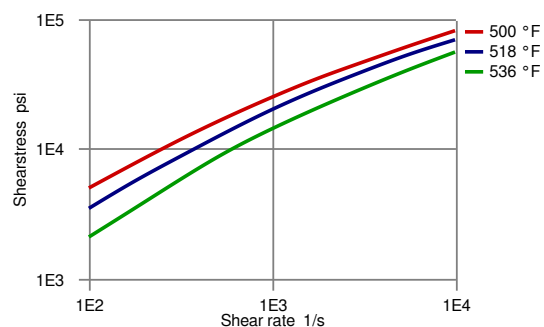
	Value	Unit	Test Standard
Density of melt	76.2	lb/ft ³	Internal
Thermal conductivity of melt	0.15	W/(m K)	Internal
Spec. heat capacity melt	1820	J/(kg K)	Internal
Ejection temperature	424	°F	Internal

Diagrams

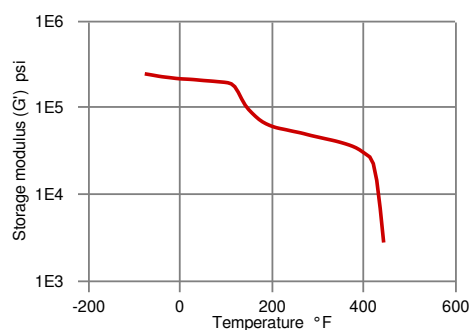
Viscosity-shear rate



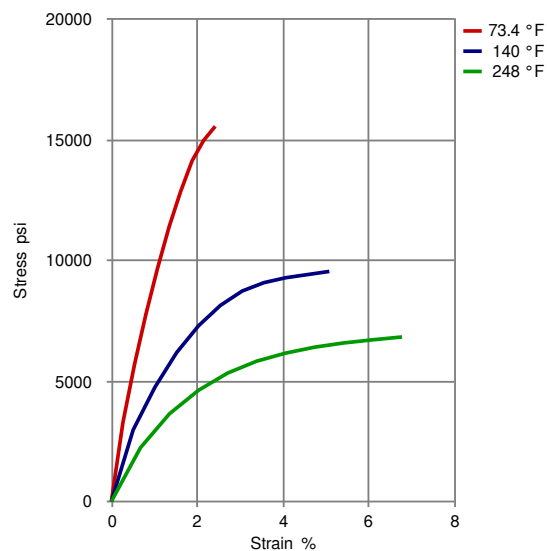
Shear stress-shear rate

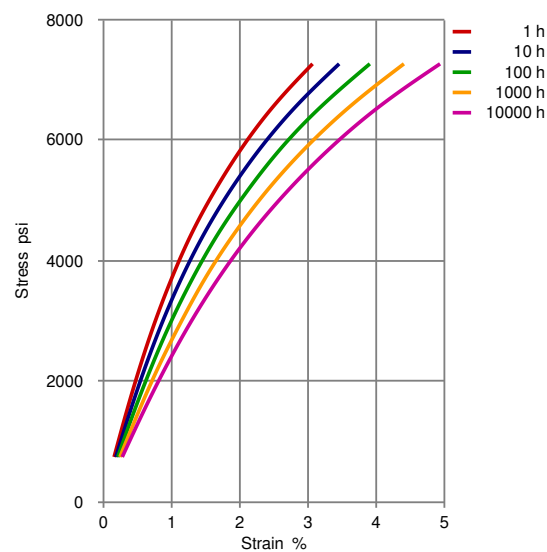
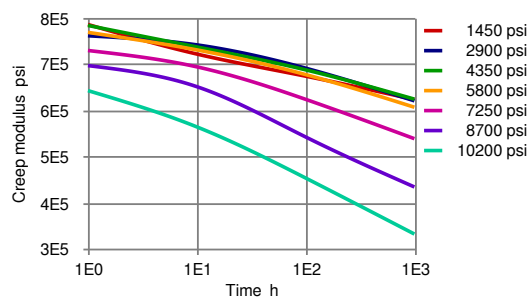
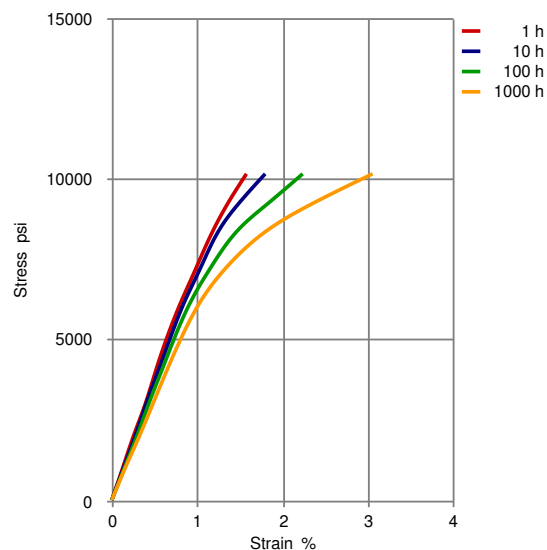
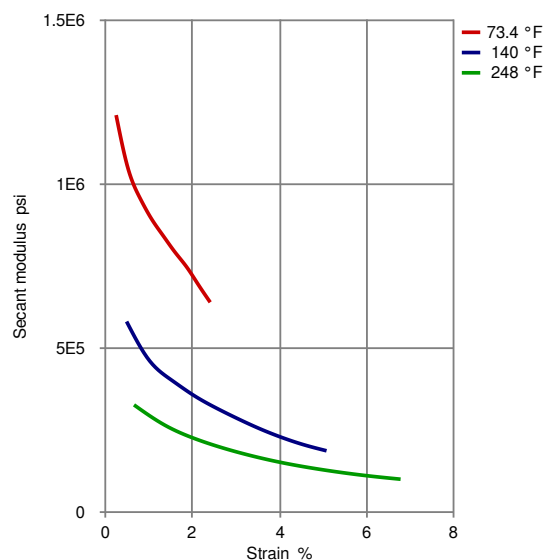


Dynamic Shear modulus-temperature



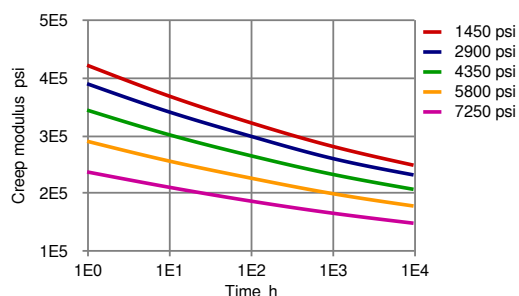
Stress-strain





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CAMPUS Creep modulus-time 140°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
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	500 - 518	°F
Zone4 temperature	500 - 518	°F
Nozzle temperature	509 - 527	°F
Melt temperature	509 - 527	°F
Mold temperature	194 - 212	°F
Hot runner temperature	509 - 527	°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 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 $\leq -30^{\circ}\text{C}$. 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 (≤ 60 h) it is necessary to lower the temperature to 100°C .

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Injection molding

Melt Temperature 265-275 °C
Mold Temperature *) 90-100 °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.

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 2 to 4 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.

Characteristics

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

Other Approvals

OEM	Specification	Additional Information
Bosch	N28 BN08-GF009	Natural & Black
