

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 |

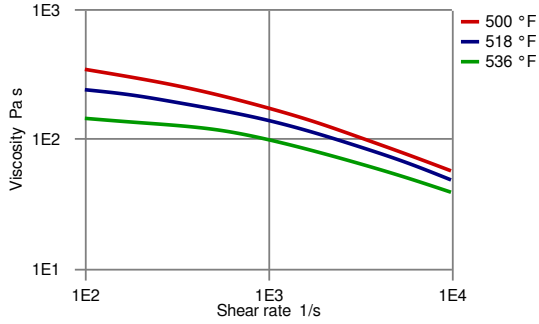
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Rheological calculation properties

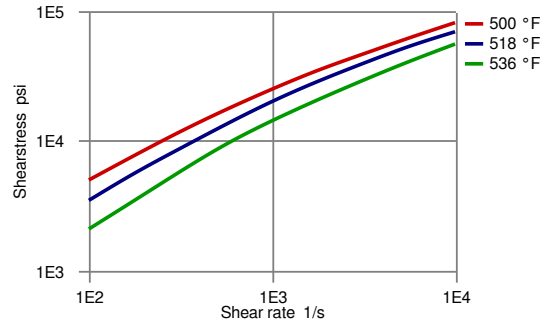
| | Value | Unit | Test Standard |
|------------------------------|--------------|--------------------|----------------------|
| Density of melt | 76.2 | lb/ft ³ | Internal |
| Thermal conductivity of melt | 0.15 | W/(m K) | Internal |
| Spec. heat capacity melt | 1820 | J/(kg K) | Internal |
| Ejection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

Diagrams

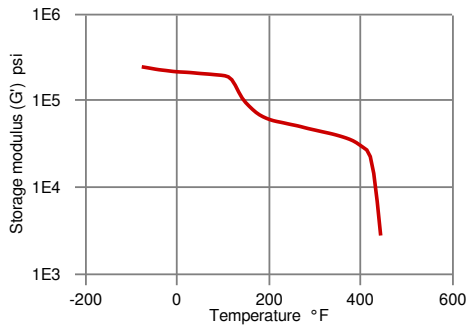
Viscosity-shear rate



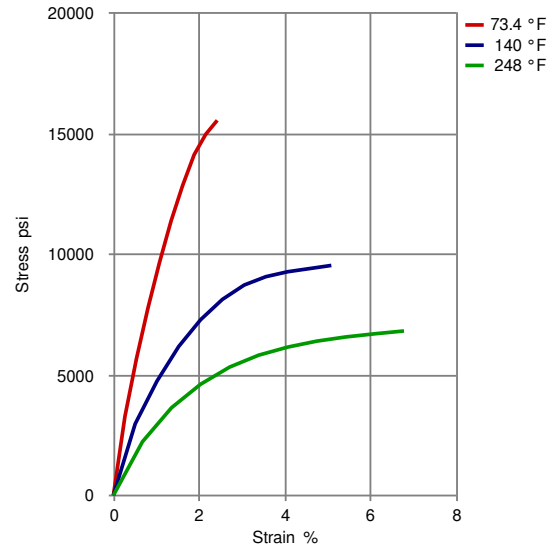
Shear stress-shear rate



Dynamic Shear modulus-temperature

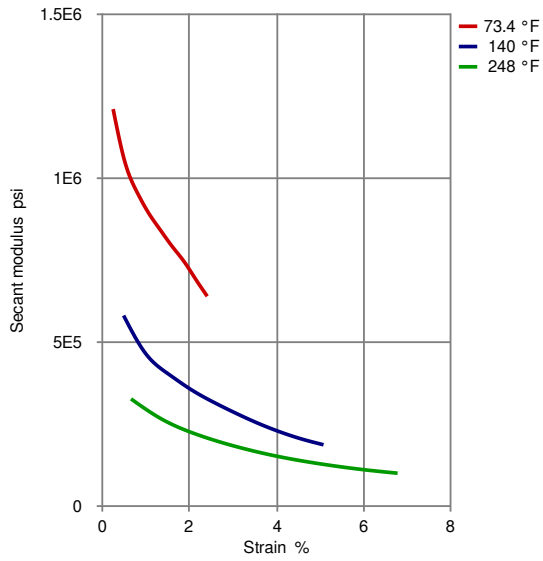


Stress-strain

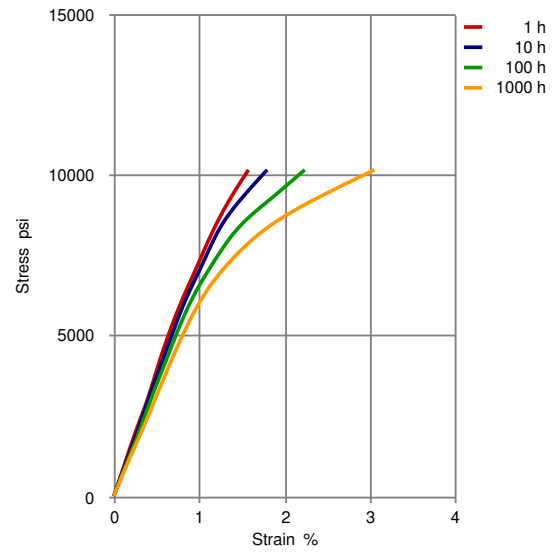


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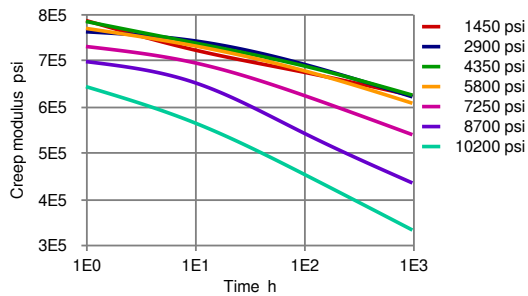
Secant modulus-strain



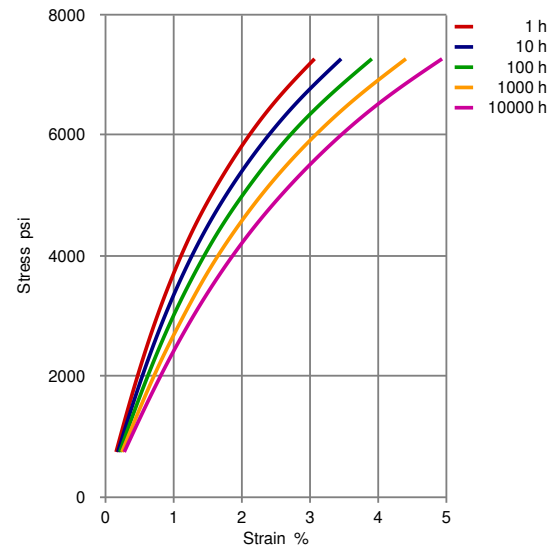
CAMPUS Stress-strain (isochronous) 73.4 °F



CAMPUS Creep modulus-time 73.4 °F

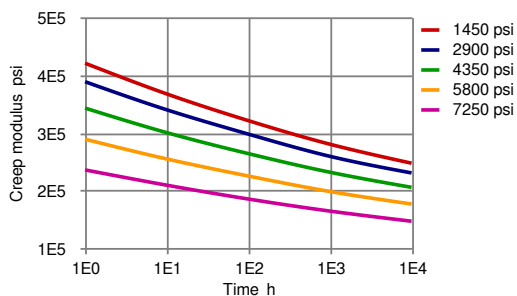


CAMPUS Stress-strain (isochronous) 140 °F



CELANEX® 2302 GV1/15 - PBT

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 =< - 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.

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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 |
