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**CELANEX® 3200 | PBT | Glass Reinforced**

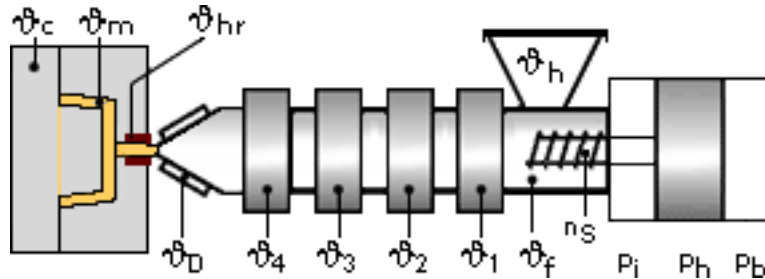

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**Description**


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Celanex 3200 is a general purpose, 15% glass reinforced polybutylene terephthalate with a good balance of mechanical properties and processability.

| <b>Physical properties</b>           | <b>Value</b>       | <b>Unit</b> | <b>Test Standard</b> |
|--------------------------------------|--------------------|-------------|----------------------|
| Melt flow rate (MFR)                 | <b>26</b>          | g/10 min    | ASTM D1238           |
| Specific gravity                     | <b>1.41</b>        | -           | ASTM D792            |
| Mold shrinkage - flow direction      | <b>0.005-0.007</b> | mm/mm       | ASTM D955            |
| <b>Mechanical properties</b>         | <b>Value</b>       | <b>Unit</b> | <b>Test Standard</b> |
| Elongation @ break (176°F)           | <b>6.3</b>         | %           | ASTM D638            |
| Elongation @ break (250°F)           | <b>6.3</b>         | %           | ASTM D638            |
| Elongation @ break (32°F)            | <b>2</b>           | %           | ASTM D638            |
| Elongation @ break (-40°F)           | <b>1.9</b>         | %           | ASTM D638            |
| Elongation @ break (73°F)            | <b>3</b>           | %           | ASTM D638            |
| Tensile modulus (-40°F)              | <b>9.30E5</b>      | psi         | ASTM D638            |
| Tensile modulus (32°F)               | <b>9E5</b>         | psi         | ASTM D638            |
| Tensile modulus (73°F)               | <b>8E5</b>         | psi         | ASTM D638            |
| Tensile modulus (176°F)              | <b>3.55E5</b>      | psi         | ASTM D638            |
| Tensile modulus (250°F)              | <b>3E5</b>         | psi         | ASTM D638            |
| Tensile strength @ break (-40°F)     | <b>15700</b>       | psi         | ASTM D638            |
| Tensile strength @ break (32°F)      | <b>15200</b>       | psi         | ASTM D638            |
| Tensile strength @ break (73°F)      | <b>13500</b>       | psi         | ASTM D638            |
| Tensile strength @ break (176°F)     | <b>8000</b>        | psi         | ASTM D638            |
| Tensile strength @ break (250°F)     | <b>6500</b>        | psi         | ASTM D638            |
| <b>Thermal properties</b>            | <b>Value</b>       | <b>Unit</b> | <b>Test Standard</b> |
| Melting point                        | <b>225</b>         | °C          | ASTM D3418           |
| Heat deflection temperature @264 psi | <b>192</b>         | °C          | ASTM D648            |
| Heat deflection temperature @66 psi  | <b>213</b>         | °C          | ASTM D648            |
| <b>Electrical properties</b>         | <b>Value</b>       | <b>Unit</b> | <b>Test Standard</b> |
| Dielectric constant - 1MHz           | <b>3.5</b>         | -           | ASTM D150            |
| Dissipation factor - 1MHz            | <b>0.02</b>        | -           | ASTM D150            |
| Volume resistivity                   | <b>1E16</b>        | ohm-cm      | ASTM D257            |
| Dielectric strength - short term     | <b>460</b>         | v/mil       | ASTM D149            |
| Comparative tracking index           | <b>250</b>         | volts       | ASTM D3638           |
| Arc resistance                       | <b>125</b>         | s           | ASTM D495            |
| <b>UL properties</b>                 | <b>Value</b>       | <b>Unit</b> | <b>Test Standard</b> |
| UL94 flame class                     | <b>HB</b>          | -           | UL94                 |

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**Typical injection moulding processing conditions**

**Pre Drying:**
**Necessary low maximum residual moisture content: 0.02%**

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0.02%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints  $<-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) at  $250^{\circ}\text{F}$  ( $121^{\circ}\text{C}$ ) for 4 hours.

For subsequent storage of the material in the dryer until processed ( $\leq 60$  h) it is necessary to lower the temperature to  $100^{\circ}\text{C}$ .

**Drying time: 4 h**

**Drying temperature: 120 - 130 °C**

**Temperature:**

|          | $\varnothing_{\text{Manifold}}$ | $\varnothing_{\text{Mold}}$ | $\varnothing_{\text{Melt}}$ | $\varnothing_{\text{Nozzle}}$ | $\varnothing_{\text{Zone4}}$ | $\varnothing_{\text{Zone3}}$ | $\varnothing_{\text{Zone2}}$ | $\varnothing_{\text{Zone1}}$ | $\varnothing_{\text{Feed}}$ | $\varnothing_{\text{Hopper}}$ |
|----------|---------------------------------|-----------------------------|-----------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|-------------------------------|
| min (°C) | 250                             | 65                          | 235                         | 250                           | 240                          | 235                          | 235                          | 230                          | 230                         | 20                            |
| max (°C) | 260                             | 93                          | 260                         | 260                           | 260                          | 250                          | 250                          | 240                          | 240                         | 50                            |

**Speed:**

**Injection speed: medium-fast**

**Injection Molding**

|                    |                   |               |
|--------------------|-------------------|---------------|
| Rear Temperature   | 450-470 (230-240) | deg F (deg C) |
| Center Temperature | 460-480 (235-250) | deg F (deg C) |
| Front Temperature  | 470-500 (240-260) | deg F (deg C) |
| Nozzle Temperature | 480-500 (250-260) | deg F (deg C) |
| Melt Temperature   | 460-500 (235-260) | deg F (deg C) |
| Mold Temperature   | 150-200 (65-93)   | deg F (deg C) |
| Back Pressure      | 0-50              | psi           |
| Screw Speed        | Medium            |               |
| Injection Speed    | Fast              |               |

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, in particular for flame retardant grades. Up to 25% clean and dry regrind may be used.

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