# CELANEX® 2003HR | PBT | Unfilled

## Description

Celanex 2003HR is an unfilled polybutylene terephthalate which has an excellent hydrolysis resistance, mechanical properties and processability

| Physical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Density | **1310** | kg/m³ | ISO 1183 |
| Mold shrinkage - parallel | **1.8-2.0** | % | ISO 294-4 |
| Mold shrinkage - normal | **1.8-2.0** | % | ISO 294-4 |
| Humidity absorption (23°C/50%RH) | **0.14** | % | ISO 62 |

| Mechanical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Tensile modulus (1mm/min) | **2700** | MPa | ISO 527-2/1A |
| Tensile stress at yield (50mm/min) | **60** | MPa | ISO 527-2/1A |
| Tensile strain at yield (50mm/min) | **4** | % | ISO 527-2/1A |
| Nominal strain at break (50mm/min) | **40** | % | ISO 527-2/1A |
| Tensile stress at break (50mm/min) | **55** | MPa | ISO 527-2/1A |
| Tensile strain at break (50mm/min) | **25** | % | ISO 527-2/1A |
| Flexural modulus (23°C) | **2550** | MPa | ISO 178 |
| Flexural strength (23°C) | **80** | MPa | ISO 178 |
| Charpy impact strength @ 23°C | **111.0** | kJ/m² | ISO 179/1eU |
| Charpy impact strength @ -30°C | **35.0** | kJ/m² | ISO 179/1eU |
| Charpy notched impact strength @ 23°C | **4.3** | kJ/m² | ISO 179/1eA |
| Charpy notched impact strength @ -30°C | **4.3** | kJ/m² | ISO 179/1eA |
| Unnotched impact str (Izod) @ 23°C | **31** | kJ/m² | ISO 180/1U |
| Unnotched impact str (Izod) @-30°C | **33** | kJ/m² | ISO 180/1U |
| Notched impact strength (Izod) @ 23°C | **4.0** | kJ/m² | ISO 180/1A |

| Thermal properties | Value | Unit | Test Standard |
|---|---|---|---|
| Melting temperature (10°C/min) | **225** | °C | ISO 11357-1,-2,-3 |
| DTUL @ 1.8 MPa | **55** | °C | ISO 75-1/-2 |
| DTUL @ 0.45 MPa | **150** | °C | ISO 75-1/-2 |
| Vicat softening temperature B50 (50°C/h 50N) | **190** | °C | ISO 306 |
| Coeff.of linear therm. expansion (parallel) | **1.2** | E-4/°C | ISO 11359-2 |
| Coeff.of linear therm. expansion (normal) | **1.1** | E-4/°C | ISO 11359-2 |

| Electrical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Relative permittivity - 1 MHz | **3.2** | - | IEC 60250 |
| Dissipation factor - 1 MHz | **200** | E-4 | IEC 60250 |
| Volume resistivity | **>1E13** | Ohm*m | IEC 60093 |
| Surface resistivity | **>1E15** | Ohm | IEC 60093 |
| Electric strength | **15** | kV/mm | IEC 60243-1 |
| Comparative tracking index CTI | **600** | - | IEC 60112 |

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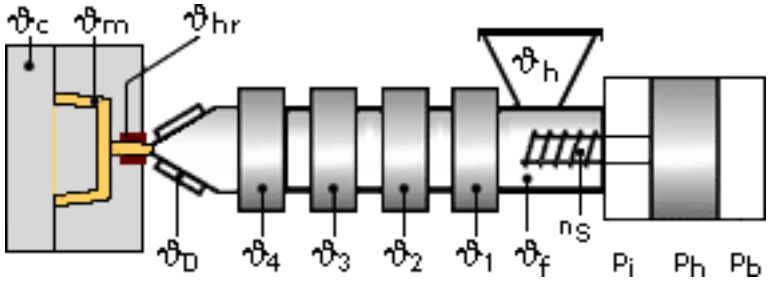
## Typical injection moulding processing conditions




**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°F (-40°C) at 250°F (121°C) for 4 hours.

For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature to 100° C.

**Drying time: 4 h**

**Drying temperature: 120 - 130 °C**

**Temperature:**

| | ϑManifold | ϑMold | ϑMelt | ϑNozzle | ϑZone4 | ϑZone3 | ϑZone2 | ϑZone1 | ϑFeed | ϑHopper |
|---|---|---|---|---|---|---|---|---|---|---|
| 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.

## Contact Information

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