

**CELANEX® 2002-2 | PBT | Unfilled**
**Description**

Celanex 2002-2 is a general purpose, unreinforced polybutylene terephthalate with a good balance of mechanical properties and processability. Celanex 2002-2 is a medium flow material that contains an internal lubricant.

Physical properties	Value	Unit	Test Standard
Density	<b>1310</b>	kg/m <sup>3</sup>	ISO 1183
Melt volume rate (MVR)	<b>20</b>	cm <sup>3</sup> /10min	ISO 1133
MVR test temperature	<b>250</b>	°C	ISO 1133
MVR test load	<b>2.16</b>	kg	ISO 1133
Mold shrinkage - parallel	<b>1.8-2.0</b>	%	ISO 294-4

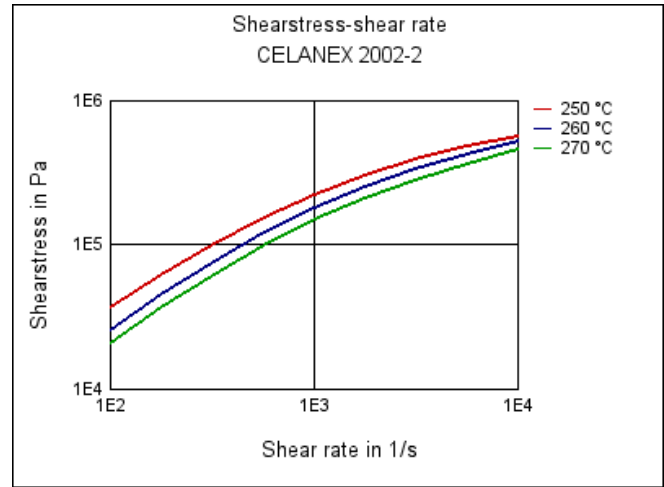
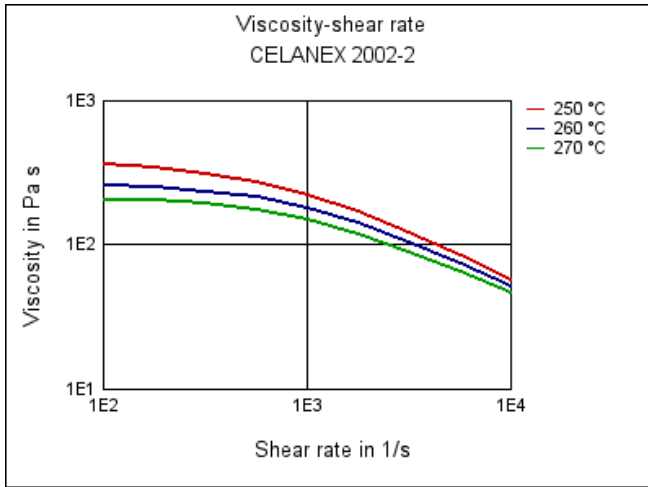
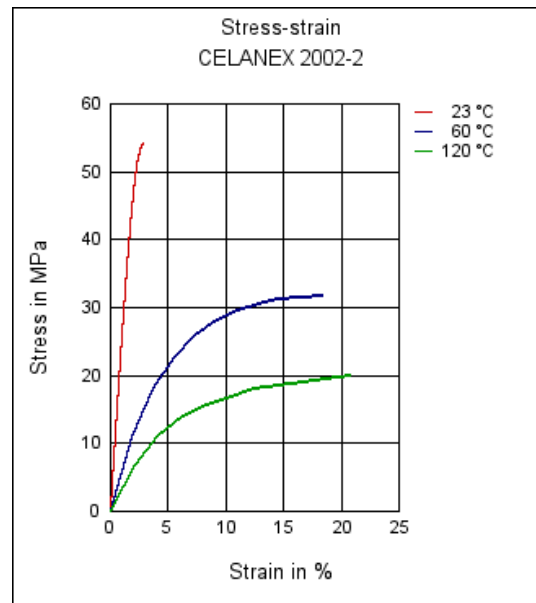
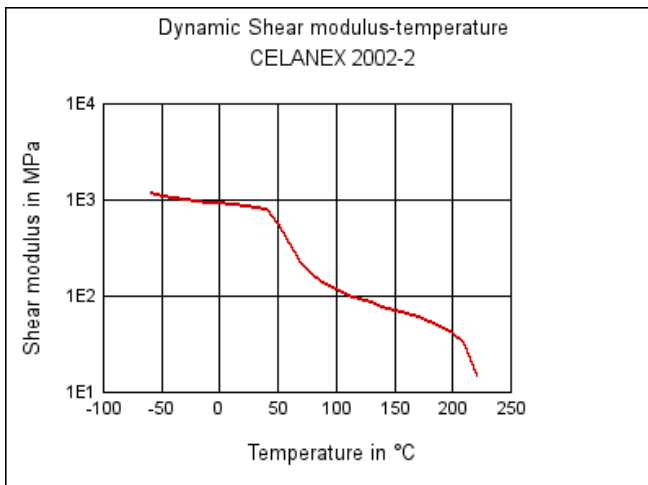
Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	<b>2600</b>	MPa	ISO 527-2/1A
Tensile stress at yield (50mm/min)	<b>60</b>	MPa	ISO 527-2/1A
Tensile strain at yield (50mm/min)	<b>4</b>	%	ISO 527-2/1A
Nominal strain at break (50mm/min)	<b>&gt;50</b>	%	ISO 527-2/1A
Tensile stress at 50% strain (50mm/min)	<b>30</b>	MPa	ISO 527-2/1A
Tensile stress at break (50mm/min)	<b>60</b>	MPa	ISO 527-2/1A
Flexural modulus (23°C)	<b>2500</b>	MPa	ISO 178
Flexural strength (23°C)	<b>80</b>	MPa	ISO 178
Charpy impact strength @ 23°C	<b>NB</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength @ -30°C	<b>190</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength @ 23°C	<b>6</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength @ -30°C	<b>6</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Notched impact strength (Izod) @ 23°C	<b>5.0</b>	kJ/m <sup>2</sup>	ISO 180/1A
Rockwell hardness	<b>78</b>	M-Scale	ISO 2039-2

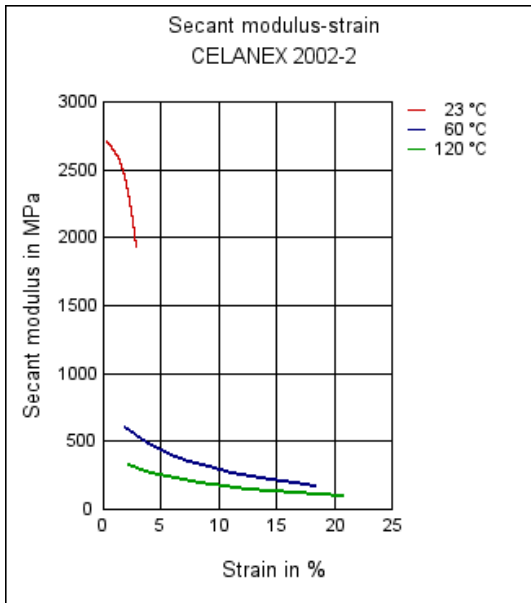
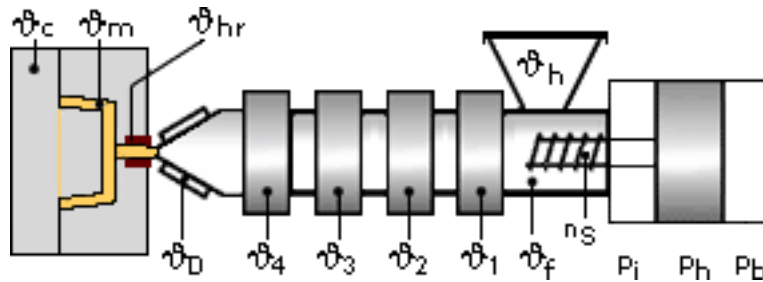
Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	<b>225</b>	°C	ISO 11357-1,-2,-3
Glass transition temperature (10°C/min)	<b>60</b>	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	<b>55</b>	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	<b>150</b>	°C	ISO 75-1/-2
Vicat softening temperature B50 (50°C/h 50N)	<b>190</b>	°C	ISO 306
Coeff.of linear therm. expansion (parallel)	<b>1.1</b>	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	<b>1.27</b>	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	<b>22</b>	%	ISO 4589
Flammability at thickness h	<b>HB</b>	class	UL94
thickness tested (h)	<b>0.71</b>	mm	UL94

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 100 Hz	<b>4</b>	-	IEC 60250
Relative permittivity - 1 MHz	<b>3.5</b>	-	IEC 60250
Dissipation factor - 100 Hz	<b>14</b>	E-4	IEC 60250
Dissipation factor - 1 MHz	<b>220</b>	E-4	IEC 60250
Volume resistivity	<b>1E13</b>	Ohm*m	IEC 60093
Surface resistivity	<b>1E15</b>	Ohm	IEC 60093
Electric strength	<b>23</b>	kV/mm	IEC 60243-1
Comparative tracking index CTI	<b>600</b>	-	IEC 60112

**CELANEX® 2002-2 | PBT | Unfilled**

Test specimen production	Value	Unit	Test Standard
Processing conditions acc. ISO	<b>7792-2</b>	-	Internal
Injection molding melt temperature	<b>243</b>	°C	ISO 294
Injection molding mold temperature	<b>82</b>	°C	ISO 294
Injection molding flow front velocity	<b>300</b>	mm/s	ISO 294
Injection molding hold pressure	<b>48</b>	MPa	ISO 294

**Viscosity-shear rate**
**Shearstress-shear rate**

**Dynamic Shear modulus-temperature**
**Stress-strain**


**CELANEX® 2002-2 | PBT | Unfilled**
**Secant modulus-strain**

**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**

---

**CELANEX® 2002-2 | PBT | Unfilled**


---

**Temperature:**

	ϑ <sub>Manifold</sub>	ϑ <sub>Mold</sub>	ϑ <sub>Melt</sub>	ϑ <sub>Nozzle</sub>	ϑ <sub>Zone4</sub>	ϑ <sub>Zone3</sub>	ϑ <sub>Zone2</sub>	ϑ <sub>Zone1</sub>	ϑ <sub>Feed</sub>	ϑ <sub>Hopper</sub>
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**


---

**Americas**

8040 Dixie Highway, Florence, KY 41042 USA

Product Information Service

t: +1-800-833-4882 t: +1-859-372-3244

Customer Service

t: +1-800-526-4960 t: +1-859-372-3214

e: info-engineeredmaterials-am@celanese.com

**Asia**

4560 Jinke Road, Zhang Jiang Hi Tech Park

Shanghai 201203 PRC

Customer Service

t: +86 21 3861 9266 f: +86 21 3861 9599

e: info-engineeredmaterials-asia@celanese.com

**Europa**

Am Unisys-Park 1, 65843 Sulzbach, Germany

Product Information Service

t: +(00)-800-86427-531 t: +49-(0)-69-45009-1011

e: info-engineeredmaterials-eu@celanese.co

---

**General Disclaimer**


---

This publication was printed based on Celanese's present state of knowledge, and Celanese undertakes no obligation to update it. Because conditions of product use are outside Celanese's control, Celanese makes no warranties, express or implied, and assumes no liability in connection with any use of this information. Nothing herein is intended as a license to operate under or a recommendation to infringe any patents.

**NOTICE TO USERS:** Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values.

Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use.

To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication.

Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards.

---

**CELANEX® 2002-2 | PBT | Unfilled**

---

We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed (+49 (0) 69 30516299 for Europe, +1 859-372-3244 for the Americas and +86 21 3861 9266 for Asia) for additional technical information. Visit our web site for the appropriate Safety Data Sheets (SDS) before attempting to process our products. Feel free to call Customer Services for additional assistance.

The products mentioned herein are not intended for use in medical or dental implants.

© 2014 Celanese or its affiliates. All rights reserved. (Published 25.November.2014)

Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates. Fortron is a registered trademark of Fortron Industries LLC.