

**CELANEX® 2001 | PBT | Unfilled**
**Description**

Celanex 2001 is an unreinforced polybutylene terephthalate resin with improved hydrolysis resistance developed for use in fiber optic buffer tube applications. Celanex 2001 exhibits the high melt strength required for profile extrusion.

Physical properties	Value	Unit	Test Standard
Density	1310	kg/m <sup>3</sup>	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)	0.19	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	2600	MPa	ISO 527-2/1A
Tensile stress at yield (50mm/min)	60	MPa	ISO 527-2/1A
Tensile strain at yield (50mm/min)	6	%	ISO 527-2/1A
Nominal strain at break (50mm/min)	>50	%	ISO 527-2/1A
Tensile stress at 50% strain (50mm/min)	33	MPa	ISO 527-2/1A
Tensile stress at break (50mm/min)	37	MPa	ISO 527-2/1A
Tensile strain at break (50mm/min)	200	%	ISO 527-2/1A
Flexural modulus (23°C)	2500	MPa	ISO 178
Flexural strength (23°C)	80	MPa	ISO 178
Charpy impact strength @ 23°C	NB	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength @ -30°C	NB	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength @ 23°C	7.0	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength @ -30°C	4.2	kJ/m <sup>2</sup>	ISO 179/1eA
Notched impact strength (Izod) @ 23°C	5.5	kJ/m <sup>2</sup>	ISO 180/1A
Rockwell hardness	72	M-Scale	ISO 2039-2

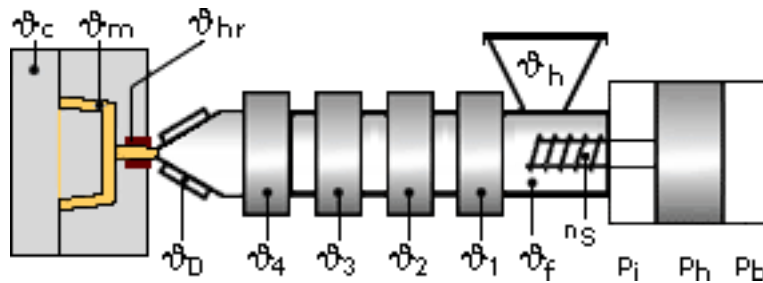
Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	225	°C	ISO 11357-1,-2,-3
Glass transition temperature (10°C/min)	60	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	50	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	150	°C	ISO 75-1/-2
Vicat softening temperature B50 (50°C/h 50N)	185	°C	ISO 306
Coeff.of linear therm. expansion (parallel)	1.3	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	0.88	E-4/°C	ISO 11359-2

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 100 Hz	3	-	IEC 60250
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

Test specimen production	Value	Unit	Test Standard
Processing conditions acc. ISO	7792-2	-	Internal
Injection molding melt temperature	243	°C	ISO 294

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Test specimen production	Value	Unit	Test Standard
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

**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 <math><-40^{\circ}\text{F}</math> (<math>-40^{\circ}\text{C}</math>) at <math>250^{\circ}\text{F}</math> (<math>121^{\circ}\text{C}</math>) for 4 hours.

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

**Drying time: 4 h**
**Drying temperature: 120 - 130 °C**
**Temperature:**

	$\vartheta_{\text{Manifold}}$	$\vartheta_{\text{Mold}}$	$\vartheta_{\text{Melt}}$	$\vartheta_{\text{Nozzle}}$	$\vartheta_{\text{Zone4}}$	$\vartheta_{\text{Zone3}}$	$\vartheta_{\text{Zone2}}$	$\vartheta_{\text{Zone1}}$	$\vartheta_{\text{Feed}}$	$\vartheta_{\text{Hopper}}$
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 is to be avoided. Particular for flame retardant grades. Up to 25% clean and dry regrind may be used.

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**Contact Information**

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**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.com

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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.

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