CELANEX® 2001

CELANEX® PBT

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.

Product information

Resin Identification	PBT		ISO 1043
Part Marking Code	>PBT<		ISO 11469

Rheological properties

Melt volume-flow rate	6.5	cm^3/10min	ISO 1133
Temperature	482	°F	
Load	4.76	lb	
Melt mass-flow rate	7.5	g/10min	ISO 1133
Melt mass-flow rate, Temperature	482	°F	
Melt mass-flow rate, Load	4.76	lb	
Molding shrinkage range, parallel	1.6 - 2	%	ISO 294-4, 2577
Molding shrinkage range, normal	1.6 - 2	%	ISO 294-4, 2577

Typical mechanical properties

Shore D hardness, 15s	79		ISO 48-4 / ISO 868
Tensile modulus	377000	psi	ISO 527-1/-2
Tensile stress at yield, 50mm/min	8700	psi	ISO 527-1/-2
Tensile strain at yield, 50mm/min	5	%	ISO 527-1/-2
Tensile stress at 50% strain	4790	psi	ISO 527-1/-2
Tensile stress at break, 50mm/min	5370	psi	ISO 527-1/-2
Nominal strain at break	>50	%	ISO 527-1/-2
Tensile strain at break, 50mm/min	200	%	ISO 527-1/-2
Flexural modulus	363000	psi	ISO 178
Flexural strength	11600	psi	ISO 178
Charpy impact strength, 23°C	N	$ftlb/in^2$	ISO 179/1eU
Charpy impact strength, -30°C	N	$ftlb/in^2$	ISO 179/1eU
Charpy notched impact strength, 23°C	3.33	$ftlb/in^2$	ISO 179/1eA
Charpy notched impact strength, -30°C	2.14	$ftlb/in^2$	ISO 179/1eA
Izod notched impact strength, 23°C	2.62	$ftlb/in^2$	ISO 180/1A
Hardness, Rockwell, M-scale	72		ISO 2039-2

Thermal properties

Melting temperature, 10°C/min	437	°F	ISO 11357-1/-3
Glass transition temperature, 10°C/min	140	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	122	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	302	°F	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	365	°F	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	0.72	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.556	E-4/°F	ISO 11359-1/-2

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Electrical properties

Relative permittivity, 100Hz	3		IEC 62631-2-1
Relative permittivity, 1MHz	3.2		IEC 62631-2-1
Dissipation factor, 1MHz	200	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	>1E15	Ohm	IEC 62631-3-2
Electric strength	381	kV/in	IEC 60243-1

Physical/Other properties

Humidity absorption, 2mm	0.19	%	Sim. to ISO 62
Water absorption, 2mm	0.45	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.08	%	Sim. to ISO 62
Density	0.0473	lb/in^3	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	248	°F
Drying Time, Dehumidified Dryer	4	h
Processing Moisture Content	≤0.02	%
Melt Temperature Optimum	482	°F
Min. melt temperature	464	°F
Max. melt temperature	500	°F
Max. screw tangential speed	0.1 - 0.3	m/s
Mold Temperature Optimum	176	°F
Min. mold temperature	140	°F
Max. mold temperature	266	°F

Characteristics

Processing	Injection Molding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Extrusion - Wire and Cable
Special characteristics	High viscosity, Hydrolysis resistant

Additional information

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%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints <-30°F (-34°C) at 250°F (121°C) for 4 hours.

Processing

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)

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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.

Processing Notes

Pre-Drying

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.

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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