

# CELANEX® 2016

## CELANEX® PBT

Celanex 2016 is a non-exuding flame retarded (UL and CSA approved V-0 at 1/32 inch and 5V at 1/8 inch), unreinforced polybutylene terephthalate which has an excellent balance of mechanical properties and processability. It is well suited for electrical connector applications where UL approved 50% regrind use capability makes maximum use of purchased product.

### Product information

Resin Identification	PBT-FR(17)	ISO 1043
Part Marking Code	>PBT-FR(17)<	ISO 11469

### Rheological properties

Melt volume-flow rate	18 cm <sup>3</sup> /10min	ISO 1133
Temperature	250 °C	
Load	2.16 kg	
Melt mass-flow rate	25 g/10min	ISO 1133
Melt mass-flow rate, Temperature	250 °C	
Melt mass-flow rate, Load	2.16 kg	
Moulding shrinkage range, parallel	1.7 - 2.1 %	ISO 294-4, 2577
Moulding shrinkage range, normal	1.6 - 1.9 %	ISO 294-4, 2577

### Typical mechanical properties

Tensile modulus	3000 MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	60 MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	3 %	ISO 527-1/-2
Nominal strain at break	10 %	ISO 527-1/-2
Flexural modulus	3100 MPa	ISO 178
Flexural strength	95 MPa	ISO 178
Charpy impact strength, 23°C	55 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	55 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	4 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	4.5 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	4.5 kJ/m <sup>2</sup>	ISO 180/1A
Hardness, Rockwell, M-scale	79	ISO 2039-2
Ball indentation hardness, H 961/30	160 MPa	ISO 2039-1
Poisson's ratio	0.37 <sup>[C]</sup>	
Shore D hardness, 15s	81	ISO 48-4 / ISO 868

[C]: Calculated

### Thermal properties

Melting temperature, 10°C/min	225 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	60 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	68 °C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	165 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	190 °C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	63 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	77 E-6/K	ISO 11359-1/-2

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### Flammability

Burning Behav. at thickness h	V-0 class	IEC 60695-11-10
Thickness tested	0.75 mm	IEC 60695-11-10
Burning Behav. 5V at thickness h	5VA class	IEC 60695-11-20
Thickness tested	3 mm	IEC 60695-11-20
Oxygen index	30 %	ISO 4589-1/-2
Glow Wire Flammability Index, 0.75mm	960 °C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	960 °C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	960 °C	IEC 60695-2-12

### Electrical properties

Relative permittivity, 100Hz	3.6	IEC 62631-2-1
Relative permittivity, 1MHz	3.5	IEC 62631-2-1
Dissipation factor, 100Hz	47 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	185 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	25 kV/mm	IEC 60243-1
Comparative tracking index	250	IEC 60112
Arc Resistance	117 s	UL 746B

### Physical/Other properties

Humidity absorption, 2mm	0.17 %	Sim. to ISO 62
Water absorption, 2mm	0.45 %	Sim. to ISO 62
Water absorption, Immersion 24h	0.07 %	Sim. to ISO 62
Density	1440 kg/m <sup>3</sup>	ISO 1183

### Injection

Drying Recommended	yes
Drying Temperature	120 °C
Drying Time, Dehumidified Dryer	4 h
Processing Moisture Content	≤0.02 %
Melt Temperature Optimum	250 °C
Min. melt temperature	240 °C
Max. melt temperature	260 °C
Screw tangential speed	0.1 - 0.3 m/s
Mold Temperature Optimum	80 °C
Min. mould temperature	60 °C
Max. mould temperature	130 °C
Ejection temperature	190 °C

### Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent, Flame retardant
Special characteristics	Flame retardant

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## 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 470-490(240-255) deg F (deg C)  
Nozzle Temperature 480-490(250-255) deg F (deg C)  
Melt Temperature 460-490(235-255) 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 50% clean and dry regrind may be used for the '16 series' flame retardant grades.

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.

## Automotive

OEM  
Stellantis - Chrysler

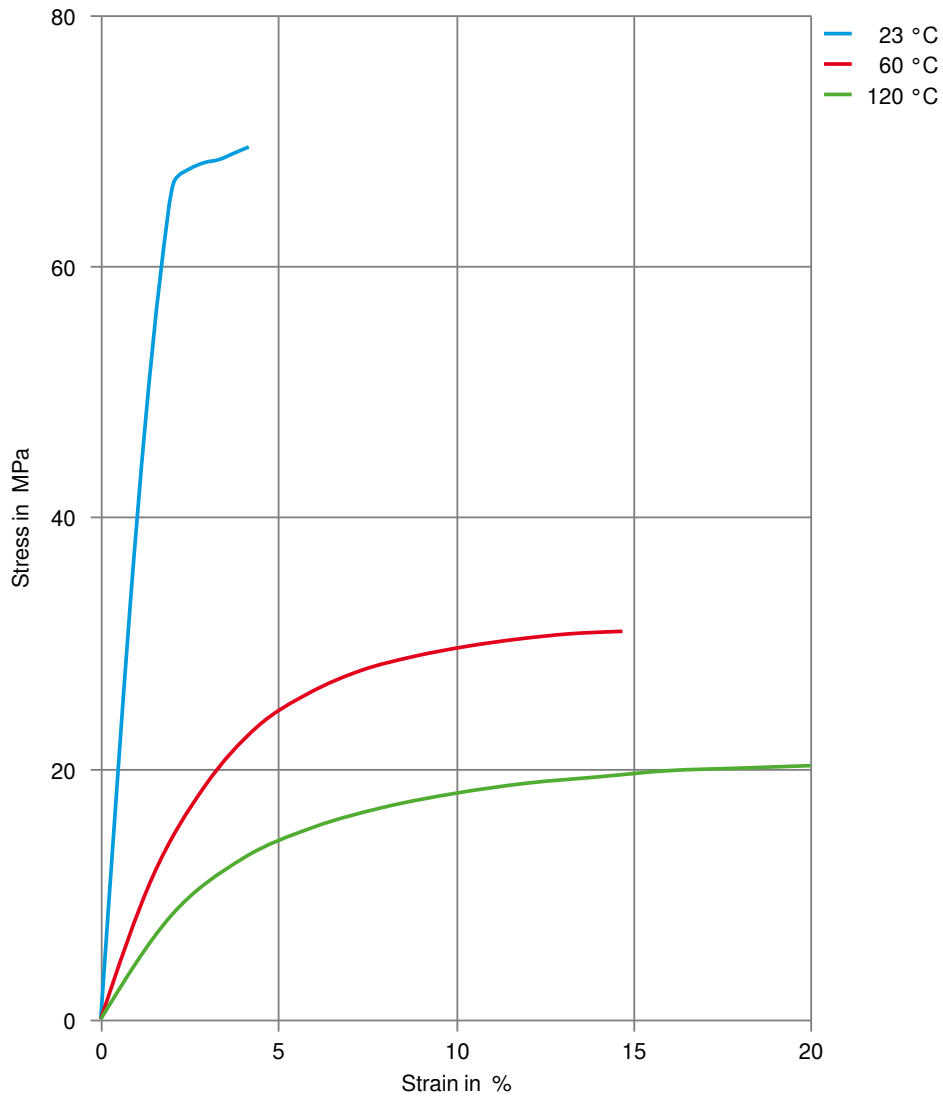
STANDARD  
MS.50103 / CPN-3945

ADDITIONAL INFORMATION  
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## Stress-strain



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## Secant modulus-strain

