Celanese
The chemistry inside innovation™

CELANEX® 2016

unreinforced; flame retardant (UL94 V-0); non-exuding PBT grade
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

Part Marking Code	PBT-FR(17)	ISO 11469

Rheological properties

Melt volume-flow rate	18	cm^3/10min	ISO 1133
Melt mass-flow rate	25	g/10min	ISO 1133
Temperature	250	°C	
Load	2.16	kg	
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
Yield stress, 50mm/min	60	MPa	ISO 527-1/-2
Yield strain, 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^2	ISO 179/1eU
Charpy impact strength, -30°C	55	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	4	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -30°C	4.5	kJ/m^2	ISO 179/1eA
Izod notched impact strength, 23°C	4.5	kJ/m^2	ISO 180/1A
Hardness, Rockwell, M-scale	79		ISO 2039-2
Ball indentation hardness, H 358/30	160	MPa	ISO 2039-1
Shore D hardness, 15s	81		ISO 48-4 / ISO 868

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
Temp. of deflection under load, 1.8 MPa	68	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	165	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	190	°C	ISO 306
Coeff. of linear therm. expansion, parallel	63	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	77	E-6/K	ISO 11359-1/-2

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Flammability

Burning Behav. at thickness h	V-0	class	UL 94
Thickness tested	0.75	mm	UL 94
Burning Behav. 5V at thickness h	5VA	class	UL 94
Thickness tested	3.0	mm	UL 94
Oxygen index	30	%	ISO 4589-1/-2

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	PLC 2	PLC	UL 746A
Arc Resistance	117	s	Internal

Other properties

Humidity absorption, 2mm	0.17	%	Sim. to ISO 62
Water absorption, 2mm	0.45	%	Sim. to ISO 62
Density	1440	kg/m³	ISO 1183

Injection

Drying Temperature	120 - 130	°C	
Drying Time, Dehumidified Dryer	4	h	
Processing Moisture Content	0.02	%	
Melt Temperature Optimum	250	°C	Internal
Max. mould temperature	65 - 93	°C	
Injection speed	medium-fast		

Characteristics

Additives	Release agent, Flame retardant

Additional information

Injection molding	Rear Temperature 450-470(230-240) deg F (deg C) Center Temperature 460-480(235-250) deg F (deg C) Front Temperature 470-490(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

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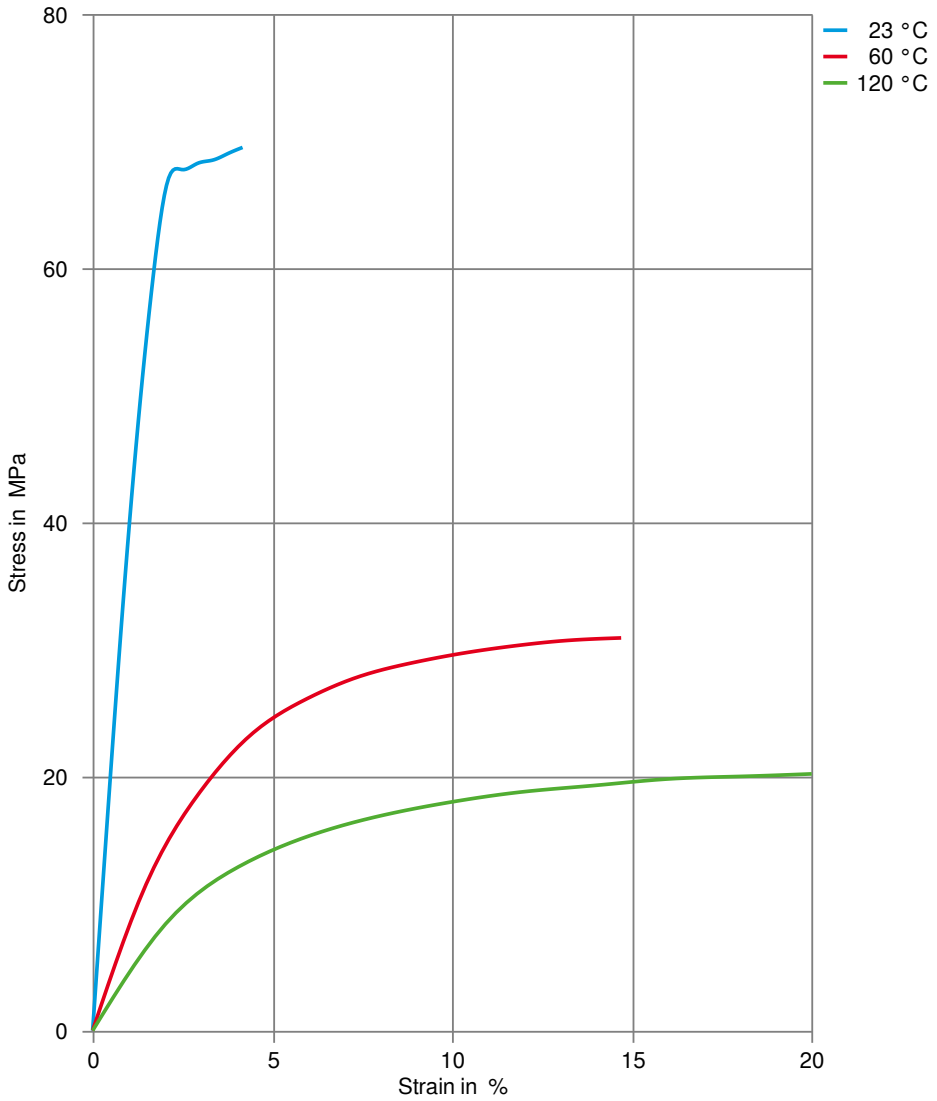
Injection Speed Fast

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.

Stress-strain



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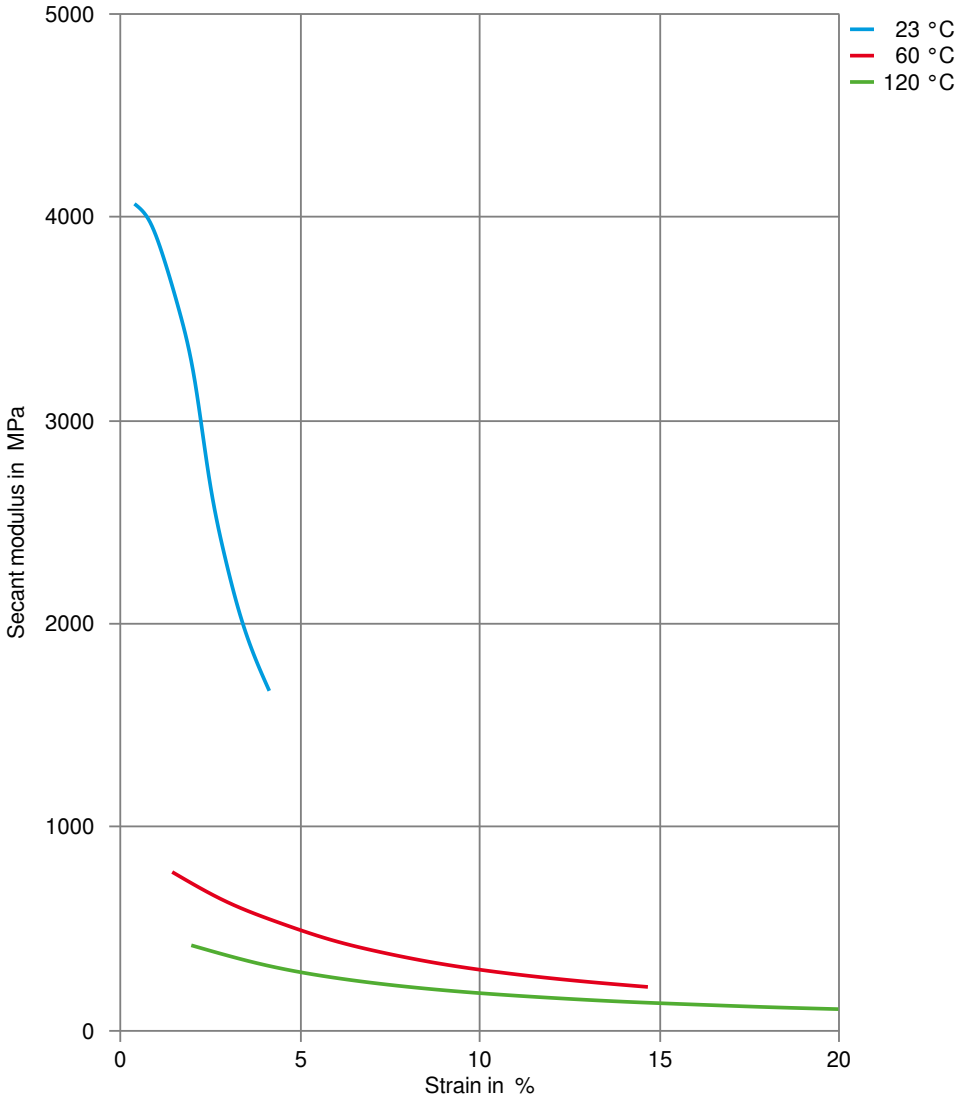
Secant modulus-strain



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Processing Texts

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.
Longer pre-drying times/storage	For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature to 100° C.
Injection molding	Rear Temperature 450-470(230-240) deg F (deg C) Center Temperature 460-480(235-250) deg F (deg C) Front Temperature 470-490(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.
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..

Other Approvals

Other Approvals

OEM	Specification	Additional Information
Stellantis - Chrysler	CPN 3945	CANOD