Ticona
Performance Driven Solutions™

CELANEX® 3316 | PBT | Glass Reinforced

Description

Celanex 3316 is a non-exuding flame retarded (UL and CSA approved V-0 at 1/32 inch and 5V at 1/16 inch), 30% fiberglass reinforced polybutylene terephthalate which has an excellent balance of mechanical properties and processability. It is well suited for electrical connector applications where its UL approved 50% regrind use capability allows maximum use of purchased product.

Physical properties	Value	Unit	Test Standard
Density	**1660**	kg/m³	ISO 1183
Melt volume rate (MVR)	**7**	cm³/10min	ISO 1133
MVR test temperature	**250**	°C	ISO 1133
MVR test load	**2.16**	kg	ISO 1133
Mold shrinkage - parallel	**0.1 to 0.8**	%	ISO 294-4
Mold shrinkage - normal	**0.8 to 1.3**	%	ISO 294-4
Humidity absorption (23°C/50%RH)	**0.16**	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	**10700**	MPa	ISO 527-2/1A
Tensile stress at break (5mm/min)	**135**	MPa	ISO 527-2/1A
Tensile strain at break (5mm/min)	**2.5**	%	ISO 527-2/1A
Flexural modulus (23°C)	**10300**	MPa	ISO 178
Flexural strength (23°C)	**200**	MPa	ISO 178
Charpy impact strength @ 23°C	**59.0**	kJ/m²	ISO 179/1eU
Charpy impact strength @ -30°C	**42**	kJ/m²	ISO 179/1eU
Charpy notched impact strength @ 23°C	**8.5**	kJ/m²	ISO 179/1eA
Charpy notched impact strength @ -30°C	**8.5**	kJ/m²	ISO 179/1eA
Notched impact strength (Izod) @ 23°C	**7.7**	kJ/m²	ISO 180/1A
Rockwell hardness	**89**	M-Scale	ISO 2039-2

Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	**225**	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	**208**	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	**220**	°C	ISO 75-1/-2
DTUL @ 8.0 MPa	**165**	°C	ISO 75-1/-2
Vicat softening temperature B50 (50°C/h 50N)	**225**	°C	ISO 306
Coeff.of linear therm. expansion (parallel)	**0.25**	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	**0.77**	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	**30**	%	ISO 4589
Flammability at thickness h	**V-0**	class	UL94
thickness tested (h)	**0.38**	mm	UL94
Flammability 5V at thickness h	**5VA**	class	UL94
thickness tested (5V)	**1.5**	mm	UL94

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 100 Hz	**3.6**	-	IEC 60250
Relative permittivity - 1 MHz	**2.9**	-	IEC 60250
Dissipation factor - 100 Hz	**33**	E-4	IEC 60250
Dissipation factor - 1 MHz	**145**	E-4	IEC 60250
Volume resistivity	**1E13**	Ohm*m	IEC 60093
Surface resistivity	**1E15**	Ohm	IEC 60093

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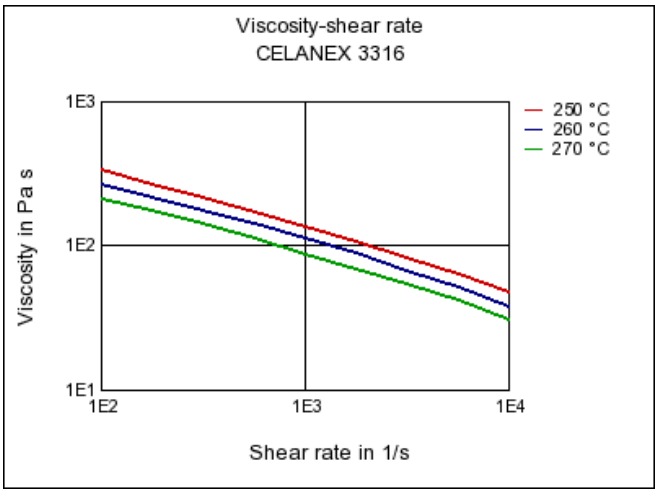
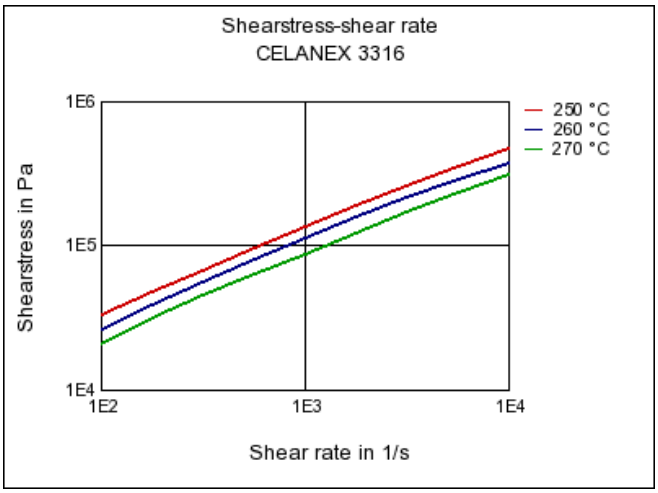
Electrical properties	Value	Unit	Test Standard
Electric strength	**34**	kV/mm	IEC 60243-1
Comparative tracking index CTI	**250**	-	IEC 60112

Test specimen production	Value	Unit	Test Standard
Processing conditions acc. ISO	**7792-2**	-	Internal
Injection molding melt temperature	**260**	°C	ISO 294
Injection molding mold temperature	**82**	°C	ISO 294
Injection molding flow front velocity	**300**	mm/s	ISO 294
Injection molding hold pressure	**48**	MPa	ISO 294

Viscosity-shear rate



Shearstress-shear rate



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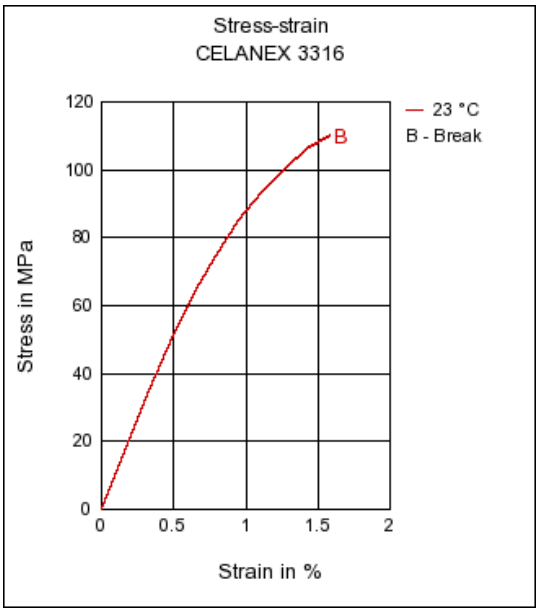
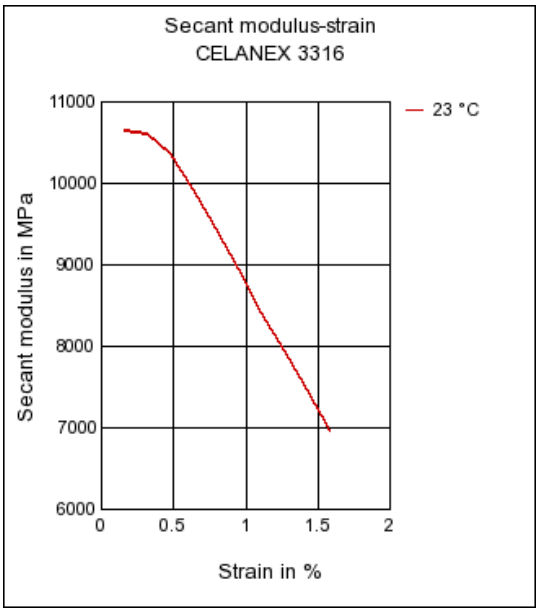
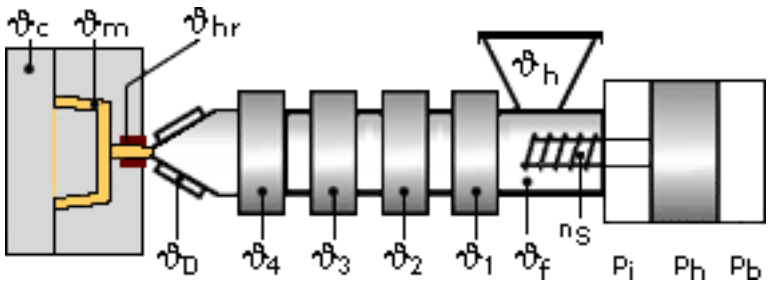
Stress-strain



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°F (-40°C) at 250°F (121°C) for 4 hours.

For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature to 100° C.

Drying time: 4 h

Drying temperature: 120 - 130 °C

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Temperature:

	Manifold	Mold	Melt	Nozzle	Zone4	Zone3	Zone2	Zone1	Feed	Hopper
min (°C)	250	65	235	250	240	235	235	230	230	20
max (°C)	260	93	255	255	255	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	470-490(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.

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General Disclaimer

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