

CELANEX® 3216 | PBT | Glass Reinforced

Description

Celanex 3216 is a non-exuding (UL and CSA approved V-0 at 1/32 inch and 5V at 1/8 inch), 15% 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	1540	kg/m ³	ISO 1183
Melt volume rate (MVR)	9	cm ³ /10min	ISO 1133
MVR test temperature	250	°C	ISO 1133
MVR test load	2.16	kg	ISO 1133
Mold shrinkage - parallel	0.3-0.6	%	ISO 294-4
Mold shrinkage - normal	1.1	%	ISO 294-4
Humidity absorption (23°C/50%RH)	0.17	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	6700	MPa	ISO 527-2/1A
Tensile stress at break (5mm/min)	100	MPa	ISO 527-2/1A
Tensile strain at break (5mm/min)	3	%	ISO 527-2/1A
Flexural modulus (23°C)	6000	MPa	ISO 178
Flexural strength (23°C)	155	MPa	ISO 178
Charpy impact strength @ 23°C	28	kJ/m ²	ISO 179/1eU
Charpy impact strength @ -30°C	28	kJ/m ²	ISO 179/1eU
Charpy notched impact strength @ 23°C	6	kJ/m ²	ISO 179/1eA
Charpy notched impact strength @ -30°C	6	kJ/m ²	ISO 179/1eA
Notched impact strength (Izod) @ 23°C	5.5	kJ/m ²	ISO 180/1A
Rockwell hardness	87	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	200	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	217	°C	ISO 75-1/-2
DTUL @ 8.0 MPa	95	°C	ISO 75-1/-2
Vicat softening temperature B50 (50°C/h 50N)	206	°C	ISO 306
Coeff.of linear therm. expansion (parallel)	0.36	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	1	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	27-32	%	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)	3	mm	UL94

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 100 Hz	3.7	-	IEC 60250
Relative permittivity - 1 MHz	3.5	-	IEC 60250
Dissipation factor - 100 Hz	33	E-4	IEC 60250
Dissipation factor - 1 MHz	160	E-4	IEC 60250
Volume resistivity	1E13	Ohm*m	IEC 60093

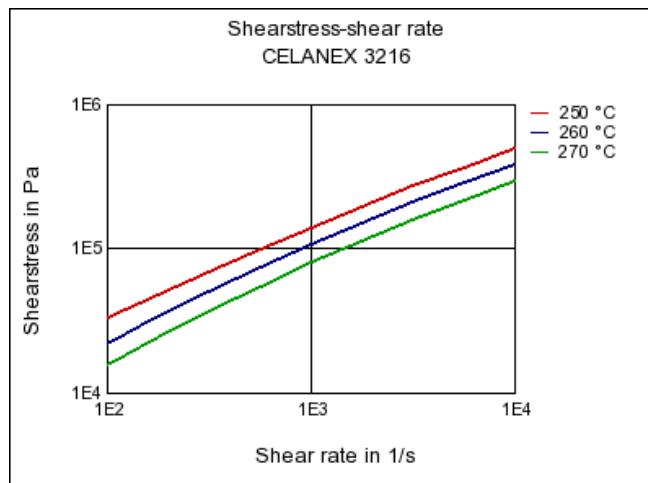
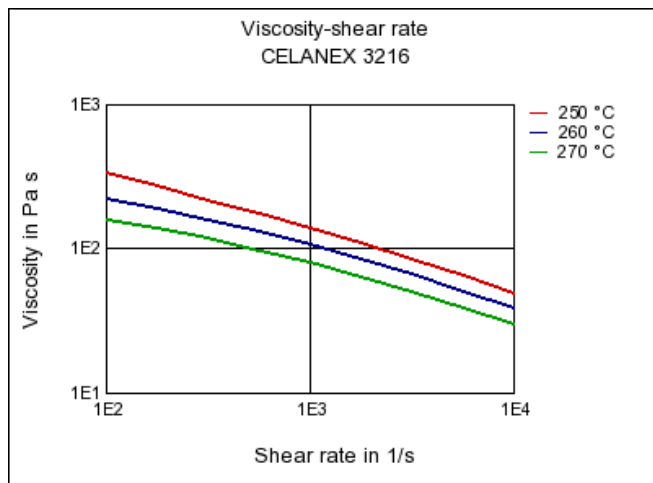
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Electrical properties	Value	Unit	Test Standard
Surface resistivity	1E15	Ohm	IEC 60093
Electric strength	30	kV/mm	IEC 60243-1
Comparative tracking index CTI	250	-	IEC 60112

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

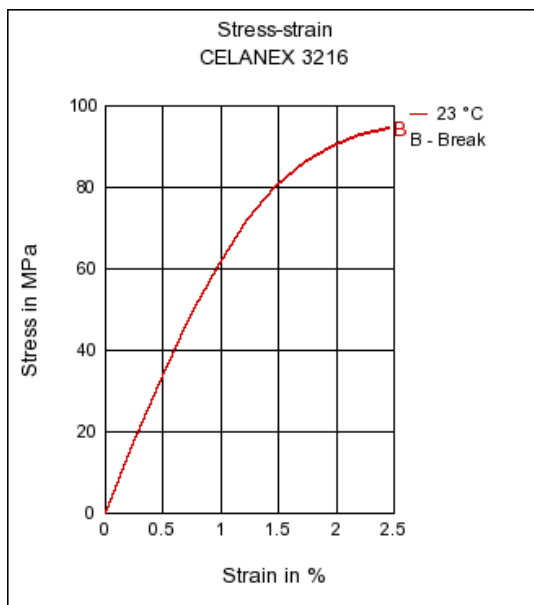
Viscosity-shear rate

Shearstress-shear rate

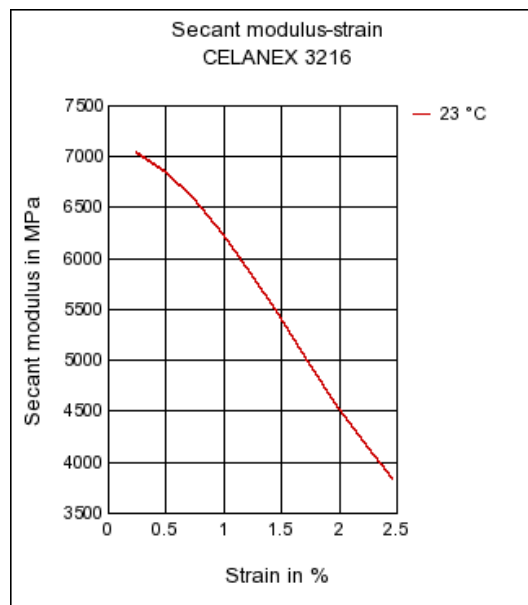


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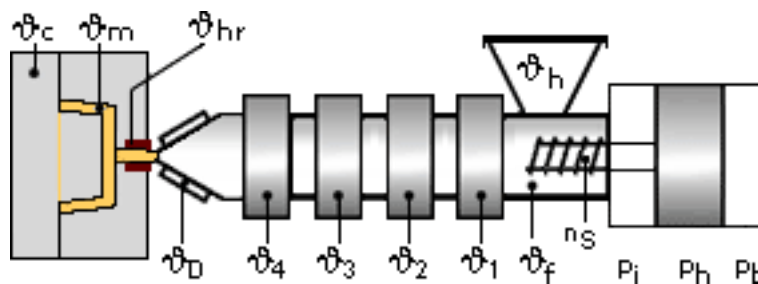
Stress-strain



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 <math><-40^{\circ}\text{F}</math> (-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

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values.

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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