Celanese
The chemistry inside innovation™

CELANEX® 3216HR ED4222 (LM blk)

15% glass-fiber reinforced; hydrolysis resistant; flame retardant and laser markable black PBT grade
Celanex 3216HR ED4222 (LM black) is a flame retarded, hydrolysis resistant, 15% fiberglass reinforced polybutylene terephthalate that is enhanced for improved laser marking graphics. It is a lasermarkable grade available in an anthrazite color to mark light-colored / white. The grade is specially formulated to yield crisp marks when subjected to a Nd:YAG laser or equivalent lasers operated at 1064nm or 532nm. Lasers operating in the UV region (355nm) may yield different results.

Product information

Part Marking Code	PBT-I-GF15 FR(17)	ISO 11469

Rheological properties

Melt mass-flow rate	9	g/10min	ISO 1133
Melt mass-flow rate, Temperature	250	°C	
Melt mass-flow rate, Load	2.16	kg	
Moulding shrinkage range, parallel	0.3 - 0.7	%	ISO 294-4, 2577
Moulding shrinkage range, normal	1.0 - 1.3	%	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	6000	MPa	ISO 527-1/-2
Stress at break, 5mm/min	80	MPa	ISO 527-1/-2
Strain at break, 5mm/min	3	%	ISO 527-1/-2
Flexural Modulus	5300	MPa	ISO 178
Flexural Strength	140	MPa	ISO 178
Charpy notched impact strength, 23°C	8	kJ/m²	ISO 179/1eA

Thermal properties

Melting temperature, 10°C/min	225	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	180	°C	ISO 75-1/-2

Flammability

Burning Behav. at thickness h	V-0	class	UL 94
Thickness tested	0.80	mm	UL 94

Electrical properties

Comparative tracking index	PLC 2	PLC	UL 746A

Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.4	%	Sim. to ISO 62
Density	1510	kg/m³	ISO 1183

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Injection

Drying Temperature	120 - 130	°C	
Drying Time, Dehumidified Dryer	4	h	
Processing Moisture Content	0.02	%	
Melt Temperature Optimum	245	°C	Internal
Max. mould temperature	65 - 96	°C	
Injection speed	medium-fast		

Characteristics

Additives	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
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 Texts

Pre-drying

To avoid hydrolytic degradation during processing, CELANEX PBT 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 min. 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

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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 min. 4 hours.