CELANEX® 3216HR ED4222 (LM BLK)

CELANEX® PBT

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

Resin Identification	PBT-I-GF15 FR(17)	ISO 1043
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	482	°F	
Melt mass-flow rate, Load	4.76	lb	
Molding shrinkage range, parallel	0.3 - 0.7	%	ISO 294-4, 2577
Molding shrinkage range, normal	1 - 1.3	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	870000	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	11600	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	3	%	ISO 527-1/-2
Flexural modulus	769000	psi	ISO 178
Flexural strength	20300	psi	ISO 178
Charpy notched impact strength, 23°C	3.81	ftlb/in²	ISO 179/1eA

Thermal properties

Melting temperature, 10°C/min	437	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	356	°F	ISO 75-1/-2

Flammability

Burning Behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.0315	in	IEC 60695-11-10
UL recognition	yes		UL 94

Electrical properties

Comparative tracking index	250		IEC 60112

Physical/Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.4	%	Sim. to ISO 62
Density	0.0545	lb/in³	ISO 1183

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Injection

Drying Recommended	yes	
Drying Temperature	248	°F
Drying Time, Dehumidified Dryer	4	h
Processing Moisture Content	≤0.02	%
Melt Temperature Optimum	482	°F
Min. melt temperature	464	°F
Max. melt temperature	500	°F
Max. screw tangential speed	0.1 - 0.3	m/s
Mold Temperature Optimum	176	°F
Min. mold temperature	140	°F
Max. mold temperature	266	°F

Characteristics

Processing	Injection Molding
Additives	Flame retardant
Special characteristics	Flame retardant, Hydrolysis resistant, Laser Markable

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 min. 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 25% clean and dry regrind may be used.

Processing Notes

Pre-Drying

To avoid hydrolytic degradation during processing, CELANEX PBT resins have to

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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.

Storage

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

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. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, 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. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.
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