Celanese
The chemistry inside innovation™

CELANEX® XFR 6842 GF10

CELANEX® PBT

Celanex XFR 6842 GF10 is a halogen and antimony free flame retardant (V-0 @ 0.4 mm) 10% glass reinforced PBT grade with good processability and no corrosive emissions during processing. It is suitable for parts requiring enhanced tracking resistance, toughness, and flame retardancy at < 0.75 mm wall thickness. The product is WEEE and RoHS compliant.

Product information

Resin Identification	PBT-GF9 FR(40+30)	ISO 1043
Part Marking Code	>PBT-GF9 FR(40+30)<	ISO 11469

Rheological properties

Melt volume-flow rate	10	cm^3/10min	ISO 1133
Temperature	482	°F	
Load	4.76	lb	
Molding shrinkage range, parallel	1.1 - 1.3	%	ISO 294-4, 2577
Molding shrinkage range, normal	1 - 1.2	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	798000	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	10200	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2	%	ISO 527-1/-2
Flexural strength	17400	psi	ISO 178
Charpy impact strength, 23°C	14.3	$ftlb/in^2$	ISO 179/1eU
Charpy notched impact strength, 23°C	2	$ftlb/in^2$	ISO 179/1eA
Izod notched impact strength, 23°C	2.14	$ftlb/in^2$	ISO 180/1A
Hardness, Rockwell, M-scale	81		ISO 2039-2

Thermal properties

Melting temperature, 10°C/min	437	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	343	°F	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	401	°F	ISO 306
Ball pressure test	392	°F	IEC 60695-10-2

Flammability

Burning Behav. at 1.5mm nom. thickn.	V-0	class	IEC 60695-11-10
Thickness tested	0.0591	in	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.0157	in	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. 5V at thickness h	5VA	class	IEC 60695-11-20
Thickness tested	0.0591	in	IEC 60695-11-20
UL recognition	yes		UL 94
Glow Wire Flammability Index, 0.4mm	1560	°F	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	1760	°F	IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	1760	°F	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	1760	°F	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	1760	°F	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	1760	°F	IEC 60695-2-12

CELANEX® XFR 6842 GF10

CELANEX® PBT

Hot Wire Ignition, 0.75mm	PLC 2	s	UL 746A
Hot Wire Ignition, 1.5mm	PLC 1	s	UL 746A
Hot Wire Ignition, 3mm	PLC 0	s	UL 746A
FMVSS Class	SE/NBR		ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 1MHz	2.9		IEC 62631-2-1
Dissipation factor, 1MHz	140	E-4	IEC 62631-2-1
Volume resistivity	3E14	Ohm.m	IEC 62631-3-1
Surface resistivity	3E15	Ohm	IEC 62631-3-2
Electric strength	584	kV/in	IEC 60243-1
Comparative tracking index	450		IEC 60112
Comparative tracking index, 23 °C	1	PLC	UL 746A

Physical/Other properties

Humidity absorption, 2mm	0.15[DS]	%	Sim. to ISO 62
Water absorption, 2mm	0.25	%	Sim. to ISO 62
Density	0.0505	lb/in³	ISO 1183

[DS]: Derived from similar grade

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
Ejection temperature	369	°F

Characteristics

Processing	Injection Molding
Additives	Release agent, Flame retardant, Non-halogenated/Red phosphorus free flame retardant
Special characteristics	Flame retardant, Heat stabilized or stable to heat, Colorable

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 <-40 °F (-40 °C) at 250-285 °F (120-140 °C) for 4-6 hours.

CELANEX® XFR 6842 GF10

CELANEX® PBT

Processing

Melt Temperature. 250-265 °C
Mold Temperature *): 75-90 °C
Maximum Barrel Residence Time **): 5-10 min
Injection Speed: high
Peripheral screw speed: max.0,25 m/sec
Back Pressure: 10-30 bar
Injection Pressure: 600-1000 bar
Holding Pressure: 400-800 bar

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. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded.

Celanese recommends only externally heated hot runner systems.

*) For moulded parts with especially high requirements to the surface quality or dimensional stability, a mold temperature of up to 100 °C can be advantageous.

**) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

Processing Notes

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 250-285°F (120 - 140°C) for 6 - 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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