TECAFIL PC FR natural - Filament

Chemical Designation
PC (Polycarbonate)

Colour
transparent

Density
1.23 g/cm^3 (*2)

Fillers
flame retardant (halogen free)

Main features
- flame retardant as per FAR 25.853
- flame retardant according to UL94 V-0

Target Industries
- electronics
- mechanical engineering
- aircraft and aerospace interiors
- aircraft and aerospace technology

General material information	parameter	value	unit	norm		comment
Diameter		2,85 +/- 0,05	mm	-		(1) standard spool body (2) Ø 2,85mm
Spool Meassurements	outer diameter	Ø 200	mm	-	1)	
Spool Meassurements	holder	Ø 52	mm	-		
Spool Meassurements	width	55	mm	-		
Spool Material		Polycarbonate		-		
Filament Load per Spool		750	g	-		
Filament Length per Spool		92	m	-	2)	

Mechanical properties	parameter	value	unit	norm		comment
Tensile strength	5mm/min, Orientation XY	69	MPa	DIN EN ISO 527-2	1)	(1) (*5) , (*6) (2) (*5) , (*6) (3) (*5) , (*6) (4) (*5) , (*6) (5) (*5) , (*6) (6) (*5) , (*6) (7) (*5) , (*6) (8) (*5) , (*6) (9) (*5) , (*6) (10) (*5) , (*6) (11) (*5) , (*6) (12) (*5) , (*6)
Tensile strength	5mm/min, Orientation ZX	34	MPa	DIN EN ISO 527-2	2)	
Modulus of elasticity (tensile test)	5mm/min, Orientation XY	2750	MPa	DIN EN ISO 527-2	3)	
Modulus of elasticity (tensile test)	5mm/min, Orientation ZX	2800	MPa	DIN EN ISO 527-2	4)	
Elongation at break (tensile test)	5mm/min, Orientation XY	3,8	%	DIN EN ISO 527-2	5)	
Elongation at break (tensile test)	5mm/min, Orientation ZX	1,4	%	DIN EN ISO 527-2	6)	
Flexural strength	5mm/min, Orientation XY	105	MPa	DIN EN ISO 178	7)	
Flexural strength	5mm/min, Orientation ZX	67	MPa	DIN EN ISO 178	8)	
Modulus of elasticity (flexural test)	5mm/min, Orientation XY	2750	MPa	DIN EN ISO 178	9)	
Modulus of elasticity (flexural test)	5mm/min, Orientation ZX	3300	MPa	DIN EN ISO 178	10)	
Elongation at break (flexural test)	5mm/min, Orientation XY	3,9	%	DIN EN ISO 178	11)	
Elongation at break (flexural test)	5mm/min, Orientation ZX	1,8	%	DIN EN ISO 178	12)	

Thermal properties	parameter	value	unit	norm		comment
Glass transition temperature		80	°C	ASTM D 3418	1)	(1) (*2) (2) (*2) (3) (*5) , (*6) (4) (*2) (5) (*2) (6) (*2)
Melting temperature		-		DIN EN ISO 11357	2)	
Deflection temperature	HDT-A	69	°C	ISO-R 75 Method A	3)	
Service temperature	long term	70	°C	-	4)	
Service temperature	short term	60	°C	-	5)	
Thermal expansion (CLTE)		-	10^{-5} K^{-1}	DIN EN ISO 11359-1;2	6)	

Other properties	parameter	value	unit	norm		comment
Moisture absorption		0,14	%	DIN EN ISO 62		(1) (*5) , (*6) (2) (*5) , (*6) (3) (*5) , (*6) (4) (*5) , (*6) (5) (*5) , (*6)
Flammability (UL94)	125x13x1,5mm, Orientation XY	V0		DIN IEC 60695-11-10;	1)	
Flammability	60 sec. Vertical Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(i)	1,5	mm	FAR 25.853	2)	
Flammability	12 sec. Vertical Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(ii)	1,5	mm	FAR 25.853	3)	
Flammability	15 sec. Horizontal Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(iv)&(v)	1,5	mm	FAR 25.853	4)	
Flammability	Gas Toxicity, as per Boeing BSS 7239	1,5	mm	-	5)	
Melt flow index (MFI)	300°C / 1,2kg	35,3	g/10 min	DIN EN ISO 1133		

Processing parameter	parameter	value	unit	norm		comment
Nozzle temperature		240 - 260	°C	-		(1) not required
Max. melt temperature		300	°C	-		
Print bed temperature		70 - 90	°C	-		
Build chamber temperature		-		-	1)	
Nozzle diameter		0,4	mm	-		
Print speed		30 - 50	mm/s	-		
Fan speed		40	%	-		

Predrying	parameter	value	unit	norm		comment
Drying temperature		60	°C	-	1)	(1) (*4)
Drying time		8	h	-		

- To achieve optimum mechanical properties, it is recommended to pre-dry the material with the above mentioned parameters.
  (*1) Values measured on injection moulded test specimens
  (*2) Values measured on the raw material
  (*3) The exact parameters depend on the printer used.
  (*4) Do not exceed maximum drying temperature of 120°C
  (*5) Properties tested on printed specimens
  (*6) Specimens printed on Ultimaker S5

- The filament should preferably be stored in dry, normal temperature rooms and protected from direct sunlight.

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