technical datasheet

F3 PA-CF Lite

February 2021

www.fiberthree.com

General information

Properties

- *Filament for FFF-printers / PA 12 blend*
- *15 weight.-% carbon fiber (ca. 150 µm)*
- *high tensile strength*
- *very low water absoprtion*
- *low warping effect*
- *excellent adhesion to epoxy based fiber plates*
- *chemical resistant to many oils, carburant and chemicals*
- *good hydrolysis resistance*
- *matte black surface finish*
- *good wear resistance*

Mechanical properties	Test methode	Units	Typical value	Quality grade acc. VDI 3405 Part 7
Density	DIN EN ISO 1183	g/ cm³	1,24	
Modulus of Elasticity printed specimen x-y (0°) ***	DIN EN ISO 527-2 Typ 1A *	MPa (N/mm²)	10000	10
Modulus of Elasticity printed specimen x-y (90°) ***	DIN EN ISO 527-2 Typ 1A *	MPa (N/mm²)	--	--
Tensile strength printed specimen x-y (0°) ***	DIN EN ISO 527-2 Typ 1A *	MPa (N/mm²)	90	9
Tensile strength printed specimen x-y (+ 45°/-45°) ***	DIN EN ISO 527-2 Typ 1A *	MPa (N/mm²)	65	7
Tensile strength printed specimen x-y (90°) ***	DIN EN ISO 527-2 Typ 1A *	MPa (N/mm²)	50	5
Tensile stress printed specimen x-y (0°)	DIN EN ISO 527-2 Typ 1A*	MPa (N/mm²)	--	
Elongation printed specimen (0°)	DIN EN ISO 527-2 Typ 1A*	%	--	--
Flexural modulus E_f printed specimen (+ 45°/-45°)	DIN EN ISO 14125 (Method B)**	GPa (kN/mm²)	4,12	
Impact strength printed specimen	DIN EN ISO 179eU	kJ/m²	35	
Impact strength printed specimen (notched)	DIN EN ISO 179eB	kJ/m²	4,03	

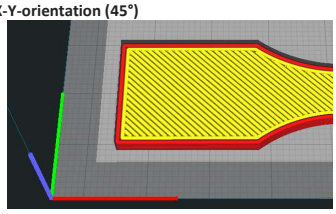
* Testing specimen printed: E3D V6 , 1.75mm filament; 0,4mm nozzle; temp. nozzle 275°C Pro/ 285°C Lite ; build plate temp. 90°C; layer 0.2 mm; v=50 mm/s; conditioned 24h @ 50% rel. humidity / 23°C; layer orientation in °

** Printed: E3D Volcano; 0,6 mm nozzle; temp. nozzle 255°C unfilled /260°C fiber; build plate temp. 75°C; layer 0.3 mm; v=45 mm/s; conditioned 24h @ 50% rel. humidity / 23°C; layer orientation in °

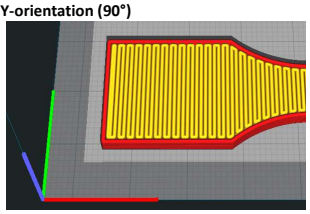
*** Target value for optimal print quality. Values might vary greatly with the same settings, depending on the system Nozzle - Printer - Gcode.

Orientation of printed specimen

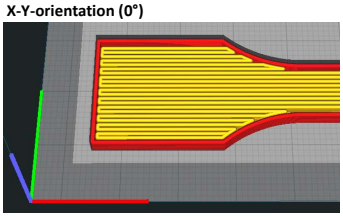
X-Y-orientation (45°)



X-Y-orientation (90°)



X-Y-orientation (0°)



Thermal properties	Test methode	Units	Typical value	notes
Glass transition temp.	DIN ISO 11357	°C	87	
Heat distortion temp. (HDT A@1,8 MPa)	DIN ISO 75	°C	90 °C (Continious service temp. 120°C - IEC 60216)	
Electrical properties	**Test methode**	**Units**	**Typical value**	**notes**
Insulation resistance	IEC 60167	Ohm*m	$>10^{10}$	
Surface resistance	IEC 60093	Ohm	$>10^{10}$	
Other properties	**Test methode**	**Units**	**Typical value**	**notes**
Water absorption (after 24h)	DIN ISO 62	%	< 0,3	
Recommandations	**Test methode**	**Units**	**Typical value**	**notes**
Temperature nozzle	Fiberthree GmbH	°C	260 - 300	
Temperature build plate	Fiberthree GmbH	°C	Max. 90	
Nozzle diameter	Fiberthree GmbH	mm	> 0,25	
Fan cooling	Fiberthree GmbH	%	not recommended	
Layer height	Fiberthree GmbH	mm	starting with 0,10	
Recommended wall thickness to reduce significantly the impact of moisture	Fiberthree GmbH	mm	2,5	
Printing speed	Fiberthree GmbH	mm/s	25	
Infill	Fiberthree GmbH	%	0 - 100	
Retraction (direct drive/ bowden system)	Fiberthree GmbH	mm (@ 50mm/sec)	direct drive min. 2mm / bowden system min. 6mm	
Material build plate	Fiberthree GmbH		carbon fiber, glass fiber or phenolic resins, glass	
Recommended nozzle	Fiberthree GmbH		wear resistant nozzles: hardened steel, tungsten, nozzles with industrial sapphire or ruby or ceramic	
Recommended parts	Fiberthree GmbH		Lightweight parts, parts with low electrical conductivity	

EU & REACH conformity

SVHC > 0,1 % (List dated June 2020)	given	no substances included
Regulated substances acc. 2015/863/EU (RoHS 3)	given	no substances included

Legal disclaimer