



**FLASHFORGE®**  
**3D PRINTER**



**FLASHFORGE**  
*FDM Filament Guide*



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**Zhejiang Flashforge 3D Technology Co., Ltd.**

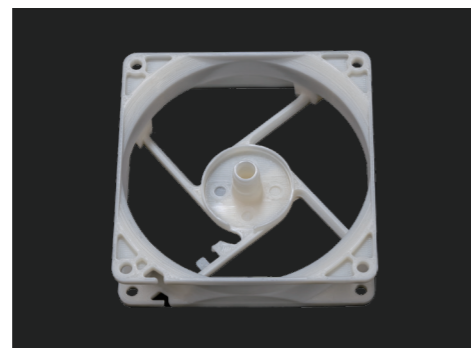
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# Printing parameters of filaments

	Filament	Printing with enclosure	Dry box recommended	Hardened nozzle required	Nozzle temperature (°C)	Bed temperature (°C)	Printable on Flashforge build plate sticker	Printable on glass plate	Printable on PEI sheet	Soluble with common solvents	Pre-print processing	Post-print processing	Key features				
Composite filament	PA12-CF15 (9891BK)	×	√	√	260-280	70-90	√	!(With glue stick)	!(With 80°C heated build plate)	×	Drying	Annealing treatment	Low warping	High tenacity	Temperature resistance	-	-
	PA6-CF10	×	√	√	270-300	90-120	√	!(With glue stick)	-	×	Drying	Annealing treatment	Low warping	High tenacity	Temperature resistance	Impact resistance	High strength
	PA66-CF10	×	√	√	280-300	90-120	√	!(With glue stick)	-	×	Drying	Annealing treatment	Low warping	High tenacity	Temperature resistance	Impact resistance	-
	PET-CF15 (9780BK)	×	√	√	280-300	80-100	√	!(With glue stick)	-	×	Drying	Annealing treatment	Low warping	High strength	Temperature resistance	-	-
	PETG-CF10	×	√	√	230-250	60-80	√	!(With glue stick)	-	×	Drying	-	Low warping	High tenacity	-	-	-
	PLA-CF10	×	√	√	200-230	40-50	√	!(With glue stick)	-	×	Drying	-	Low warping	High tenacity	-	-	-
Engineering filament	PA6/66	√(Recommended)	√	×	230-250	80-90	!(With glue stick)	!(With glue stick)	×	×	Drying	-	Temperature resistance	Chemical resistance	-	-	-
	PA1010	√(Recommended)	√	×	250-270	80-90	!(With glue stick)	!(With glue stick)	×	×	Drying	-	Temperature resistance	Chemical resistance	-	-	-
	PAHT	√(Recommended)	√	×	260-280	80-90	!(With glue stick)	!(With glue stick)	×	×	Drying	Annealing treatment	Temperature resistance	Chemical resistance	-	-	-
	PC	√(Recommended)	√	×	250-270	90-110	√(With glue stick)	!(With glue stick)	!(With 125°C heated build plate)	×	Drying	Annealing treatment	High tenacity	Temperature resistance	Chemical resistance	-	-
	PP	√(Recommended)	×	×	220-240	90-110	!(With glue stick)	!(With glue stick)	×	×	×	×	Food safe	Chemical resistance	-	-	-
	PC-ABS	√(Recommended)	√	×	250-280	90-110	√(With glue stick)	!(With glue stick)	-	×	Drying	Annealing treatment	High tenacity	Temperature resistance	Impact resistance	Chemical resistance	-
	ASA	√(Recommended)	×	×	250-260	80-90	√	!(With glue stick)	-	√	Drying	Annealing treatment	UV resistance	Solubility	Temperature resistance	-	-
	HIPS	√(Recommended)	×	×	230-250	80-90	√	!(With glue stick)	×	Soluble in limonene	Drying	-	Low warping	-	-	-	-
Standard filament	PLA PRO	×	×	×	190-210	50-55	√	√	√	×	×	-	Food safe	Low warping	High tenacity	-	-
	PLA	×	×	×	200-220	50-55	√	√	√	×	×	-	Food safe	Low warping	High tenacity	-	-
	PETG PRO	×	×	×	220-240	70-80	√	√	√	×	Drying	-	Food safe	Low warping	High tenacity	Chemical resistance	-
	PETG	×	×	×	240-250	80-90	√	√	√	×	Drying	-	Food safe	Low warping	High tenacity	Chemical resistance	-
	ABS PRO	√(Recommended)	×	×	230-250	100-110	√	!(With glue stick)	√	Soluble in acetone	Drying	-	Soluble in acetone	-	-	-	-
	ABS	√(Recommended)	×	×	230-250	100-110	√	!(With glue stick)	√	Soluble in acetone	Drying	-	Soluble in acetone	-	-	-	-
Flexible filament	TPU85A-95A	×	×	×	190-210	50-55	×	√	√	×	Drying	×	Chemical resistance	Low warping	-	-	-
	Flexible	×	×	×	190-210	50-55	×	√	√	×	Drying	×	Food safe	Low warping	-	-	-
Support filament	PVA	×	√	×	190-210	40-50	√	!(With glue stick)	-	Soluble in water	Drying	×	Soluble in water	-	-	-	-



# Description of filament properties



PLA base material	Properties
PLA	Easy to print, standard filament, wide variety of colors, environmental friendliness, biodegradability
PLA SE	High cost performance, high glossiness, easy support removal, good tenacity, wide variety of colors
PLA PRO	Better tenacity (compared with PLA), not easy to crack, neat arrangement, no knotting, wide variety of colors
PLA HS	Higher fluidity (compared with PLA), fast printing
PLA-A	Indoor advertising material; It offers two printed effects: translucent and opaque effects. The temperature range for printing advertising words is -20 to 50°C.
PLA SILK	Silk texture, ultra-high glossiness, wide variety of colors
PLA METAL	It is infused with metal powder, and offers metallic texture.
PLA MARBLE	It is typically regular PLA speckled with different colors to look like real marble. The printed model possesses a marble-like finish and appearance.
PLA COLOR CHANGE	PLA thermochromic material; The color can change based on temperature (33°C as the limit).
PLA-CF	It is a composite material with 10% carbon fiber added in PLA, and therefore the strength, rigidity and temperature resistance of the material are improved. The printed model features a bright luster, and the support is easier to remove.
PLA MATTE	Matte texture, less layer lines, easy support removal, good tenacity, wide variety of colors
PLA RAINBOW	A roll of this filament has multiple color segments, and multiple colors can appear on the printed model.
ABS base material	Properties
ABS	High tenacity, good temperature resistance, heated bed required (> 100°C), delicate appearance of the printed model
ABS MATTE	High tenacity, good temperature resistance, heated bed required (> 100°C), low odor, matte texture of the printed model
ABS PRO	High tenacity, good temperature resistance, heated bed required (> 80°C), lower shrinkage, less warping and cracking
PETG base material	Properties
PETG	High tenacity, high rigidity, temperature resistance, easy-to-print, low shrinkage, no warping and cracking, food-grade material
PETG PRO	High tenacity, high rigidity, easier-to-print, lower printing temperature (220°C), low shrinkage, no warping and cracking, food-grade material
PETG-A	Outdoor advertising material; It offers two printed effects: translucent and opaque effects. The temperature range for printing advertising words is -35 to 65°C.
PETG-CF	It is a composite material with 10% carbon fiber added in PETG, and therefore the strength, rigidity and temperature resistance of the material are improved. The printed model features a delicate appearance, and the support is easier to remove.
Support filament	Properties
PVA	Polyvinyl alcohol modified material, eco-friendly material; water solubility, high tenacity, easy-to-print, low shrinkage; It can be used as the support material for PLA series filaments.

# Description of filament properties

<p><b>Flexible filament</b></p> <p>TPU85A-95A Flexible</p>	<p><b>Properties</b></p> <p>Soft, high resilience, high wear resistance, high interlayer adhesion Soft, high interlayer adhesion, food-grade material</p>
<p><b>Engineering filament</b></p> <p>PA6/66 PA1010 PC PP PC-ABS PBT HIPS</p>	<p><b>Properties</b></p> <p>Copolymer nylon, high tenacity, high impact resistance, easy-to-print, easy moisture absorption, higher temperature resistance than PA1010 Long-chain nylon, lower temperature resistance than PA6/66, higher light transmittance (&gt; 88%), lower hygroscopicity The printed model is not easy to warp, and can work for a long time in the environment above 100°C. It has good interlayer adhesion, high impact strength and high heat deflection temperature. It has excellent tenacity, elongation at break up to 500%, higher impact resistance and corrosion resistance; PP is one of the lightest plastics with low relative density, good mechanical and chemical properties and high heat resistance. It has high impact strength, high heat resistance, and can be electroplated; It not only has the high impact resistance and high temperature resistance of PC, but also has excellent electrochemical characteristics of ABS. PBT has good interlayer adhesion, low water absorption and excellent electrical properties. HIPS has similar properties to ABS. It has good tenacity and impact resistance and can be used as the support material for ABS. It dissolves in limonene.</p>
<p><b>Fiber composite filament</b></p> <p>PA12-CF15 (9891BK) PA6-CF10 PA66-CF10 PETG-CF10 PET-CF15 (9780BK) PLA-CF10</p>	<p><b>Properties</b></p> <p>It is a polylaurylamide based formulation containing 15% carbon fiber, with the ability to be printable on non-heated chamber 3D printers. It has excellent dimensional stability and strength, low hygroscopicity and allows continuous use up to 150°C for a long time. It is a polycaprolactam based formulation containing 10% carbon fiber. It has excellent dimensional stability, strength and excellent rigidity, with the ability to be printable on non-heated chamber 3D printers. It allows continuous use up to 180°C for a long time. PA6CF is harder than PA66CF. It is a polyamide 66 based formulation containing 10% carbon fiber. It has excellent dimensional stability, strength, better tenacity and impact resistance, excellent interlayer adhesion, with the ability to be printable on non-heated chamber 3D printers. The printed model surface is smooth. PA66-CF10 is easier to absorb water (it requires high pre- and post-treatment of the filament), and the interlayer adhesion is higher than that of PA6CF. It has glossy surface, certain mechanical strength and temperature resistance, and also possesses ease of printing and low warping. It is a polyester based formulation containing 15% carbon fiber, characterized by excellent dimensional stability and rigidity, with the ability to be printable on non-heated chamber 3D printers. It allows continuous use up to 120°C for a long time. It has bright luster, and its tensile strength and impact strength are 1.3-1.5 times that of PLA.</p>



# Main property parameters of filaments



Fiber composite filament

Filament	Water absorption(%) (Equilibrium in water, 23°C)	Tensile strength (MPa)	Flexural strength (MPa)	Modulus of elasticity (MPa)	Izod notched impact (kg/m2) strength (IZOD,23°C)	Elongation at break (%)	Heat deflection temperature (°C) (HDT@ 0.455 MPa(66 psi)
PA12-CF15 (9891BK)	0.3	50-55	90-96	1300-1500	3.5-5	3.5-4.5	90
PA6-CF10	0.6	63-67	140-145	4300-4800	11.5-13.5	16.5-17.5	200
PA66-CF10	<1	83.5-88.5	140-145	1500-1600	25-35	20-21	150
PET-CF15 (9780BK)	<0.3	45-50	/	3600-4000	6.0-6.0	6.0-7.0	100
PETG-CF10	0.8	40-43	75-85	2100-2400	3-3.5	7.5-8.5	70
PLA-CF10	0.5	40-45	85-95	1100-1300	8.5-9.5	11.5-13.5	60



Engineering filament

PA6/66	3.2	55-58	84-87	1350-1450	88.5-97	32-36	85
PA1010	0.3	38-40	72.4-76.5	1200-1300	3.5-6.5	8-10	90
PAHT	0.5	66.5-68	75-80	2400-2500	5.5-6	12.5-14	120
PC	0.8	40-45	83-87	1800-1950	4-5.5	7-9	123
PC-ABS	0.8	43.5-45.5	71.5-74.5	800-950	43.5-44.5	24-26	123
ASA	1	42-45	75-79	1200-1400	19-20	9-12	88
HIPS	1	28.5-29.5	46.5-49	1500-1650	7-8	6-6.5	88



Standard filament

PLA PRO	<0.3	45.5-49	73-76	950-1050	9.5-10.5	14.5-16.5	53
PLA	<0.3	45-49	69-75	1000-1100	4.5-5	13.5-15.5	53
PETG PRO	<0.2	35-40	45-50	1100-1200	6.0-8.0	6.0-8.0	68
PETG	<0.2	40-45	50-55	1000-1100	4.5-5	6.0-8.0	74
ABS PRO	1	33-37	65-67	1500-1650	12-13.5	9-15	85
ABS	1	35-40	65-70	1500-1650	7-10.5	12-17	88

