

FIBER™

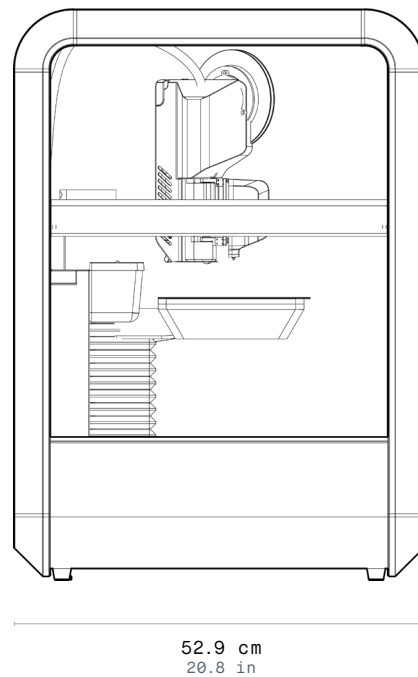
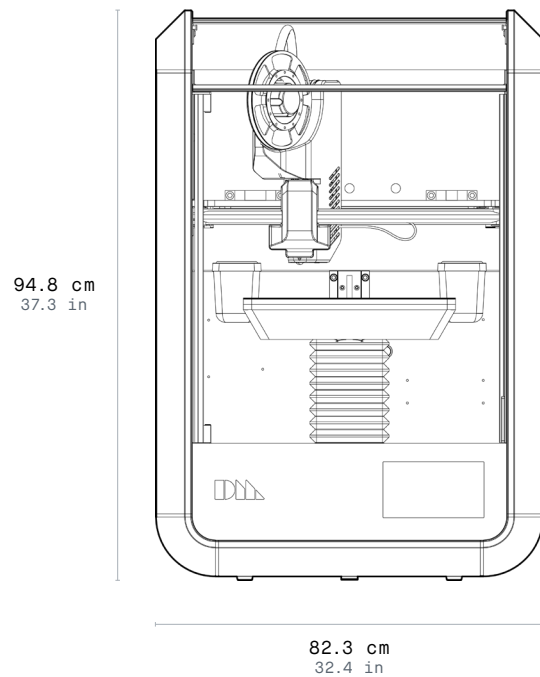
Printer specifications

Fiber™ is the only composite 3D printer to use micro automated fiber placement (μAFP)—unlocking unparalleled composite part strength for a desktop printer. Featuring closed loop heat control, the μAFP head constructs a high-density, continuous fiber reinforcement while the FFF printhead enables a high-resolution exterior shell.

Utilizing tapes made with 12k continuous fiber tows, up to 60% fiber volume fraction, and exceptional resin impregnation, Fiber™ is able to achieve continuous fiber reinforcement with less than 1% porosity—delivering parts with 2x the strength of steel at 1/2 the weight of aluminum.

TECHNOLOGY	Print technologies	Micro Automated Fiber Placement (μAFP) Fused filament fabrication (FFF)
	Print system	CoreXY with automatic tool changer
PERFORMANCE	Max build rate	20 cm³/hr 1.2 in³/hr
	Layer height	<ul style="list-style-type: none"> • 50-200 μm • 100 μm <small>Default</small>
	Max build weight <small>for all parts in job</small>	10 kg 22 lbs
PHYSICAL	External dimensions	586 x 620 x 863 mm 23.0 x 24.4 x 34.0 in
	Weight	60 kg 132 lbs
	Build envelope	310 x 240 x 270 mm 12.2 x 9.4 x 10.6 in (FFF only) 290 x 210 x 270 mm 11.4 x 8.3 x 10.6 in (μAFP-reinforced)
	Build plate	Heated, up to 149 °C 300 °F
	Print sheets	Coated 1075 Spring Steel <small>Magnetic</small> 0.45mm 0.018in
	Nozzle diameter	0.40 mm
	Power requirements	100-120 VAC, 50/60 Hz, 15 A, 1-phase
	Onboard control	7-inch touchscreen display
MEDIA	FFF build media	Thermoplastic filament / Chopped fiber 1.75 mm diameter 0.07 in
	μAFP build media	Thermoplastic μAFP prepreg tape / Continuous fiber 3 mm wide 0.12 in
PLATFORM	Network connectivity	Ethernet, USB
	Software	Fabricate™ software; runs on Windows 8 or 10, Mac OSX 10.11.x or higher, Linux
	Browser requirements	Accessible via any web browser
	Supported file types	STL, IGES, JT, STEP, OB, SAT and native file types (SolidWorks, ProE, Autodesk, CATIA, etc.)

DIMENSIONS



Fiber™

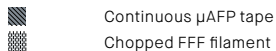
Material data sheet

Fiber™ prints with two printheads—one dedicated to a continuous fiber prepreg tape; one dedicated to chopped fiber-reinforced filament. Designed for versatility, the printer supports a wide range of both chopped fiber filament and continuous fiber composites to enable a broad set of applications from consumer electronics to automotive.

MATERIALS

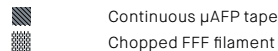
PEKK + Carbon Fiber

PEKK is characterized by its high tensile and compression strength, resistance to chemical abrasion, and ability to withstand high temperatures (above 250 °C). When reinforced with carbon fiber, resulting parts are exceptionally durable and well-suited for extreme environments including high-temperature applications.



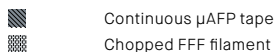
PEEK + Carbon Fiber

PEEK is characterized by exceptional mechanical properties, high resistance to surface abrasion, and is inherently flame retardant. When combined with continuous carbon fiber, the resulting composite is strong, stiff, and boasts a high fatigue level—making it great for high-wear manufacturing jigs and fixtures.



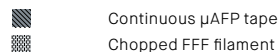
Nylon 6 (PA6) + Carbon Fiber

Our Nylon 6 (PA6) with carbon fiber reinforcement is safe for operations where ESD compliance is required. With a tensile strength 30x stronger than ABS, PA6 + CF is an excellent material for jigs, fixtures, and end-of-arm tooling, including those used in electronics manufacturing.



Nylon 6 (PA6)+ Fiberglass

Fiberglass-reinforced nylon is a low-cost material which renders lightweight, high-strength and corrosion-resistant parts—making it a great match for sporting goods or marine applications, where parts are exposed to the elements and have a low target cost per part.



MATRIX MATERIALS

PEKK

- Excellent mechanical properties, chemical resistance, and surface abrasion
- Flame retardant
- High compression strength
- ESD-Safe
- Continuous Use Temperature above 250 °C

PEEK

- Excellent mechanical properties, chemical resistance and surface abrasion
- Flame retardant
- Continuous Use Temperature between 200-250 °C

Nylon 6 (PA6)

- Low cost
- High mechanical strength
- Continuous Use Temperature ~ 100 °C

FIBER REINFORCEMENTS

Carbon Fiber (CF)

- High strength & stiffness
- Low coefficient of thermal expansion
- High fatigue level
- Somewhat brittle

Fiberglass (FG)

- Low-cost
- Corrosion resistant
- Non-conductive (insulator)
- No radio-signal interference

MATERIAL FORMAT



Continuous fiber tape (μAFP)

With up to 12K continuous fiber tows and a fiber volume fraction of up to 60%, the μAFP printhead prints fully-dense, continuous-fiber reinforcements. The 3 mm wide tapes are heated and deposited by a compaction roller with closed-loop thermal controls, resulting in reinforcements that display less than 1% porosity.



Chopped fiber filament (FFF)

Chopped fiber filaments offer good dimensional stability, up to 30% fiber volume fraction and improved mechanical properties when compared to standard thermoplastics. The FFF printhead heats and extrudes a chopped fiber-reinforced filament to form a high-resolution exterior shell, resulting in parts with excellent surface finish and mechanical strength.

MATERIAL PERFORMANCE

Material Composition	FFF Chopped Fiber Filaments				μAFP Continuous Fiber Tapes				Reference		
	PA6 + Carbon	PA6 + Glass	PEEK + Carbon	PEKK + Carbon	PA6 + Carbon	PA6 + Glass	PEEK + Carbon	PEKK + Carbon	ABS	Aluminum (6061)	Steel (4140)
Tensile Modulus (GPa)	3.8	4.2	8.1	7.9	117	30	145	139	2.3	70	200
Tensile Strength (MPa)	63	63	105	110	1416	900	2400	2300	39	310	655
Tensile Strain at Break (%)	3	6	3	3	1.3	2.4	0.8	0.8	24	17	25
Flexural Modulus (GPa)	3.7	3.6	8.3	8.1	71	29	124	124	2.4	70	200
Flexural Strength (MPa)	84	72	136	129	660	750	2000	2000	74	310	655
Density (g/cm3)	1.17	1.35	1.39	1.38	1.73	1.45	1.57	1.57	1.06	2.70	7.85



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