Desktop Metal

Fiber™

Strong parts

Fiber™ utilizes Micro Automated Fiber Placement (μAFP™) to produce continuous fiber-reinforced parts stronger than steel and lighter than aluminum.

Wide material range

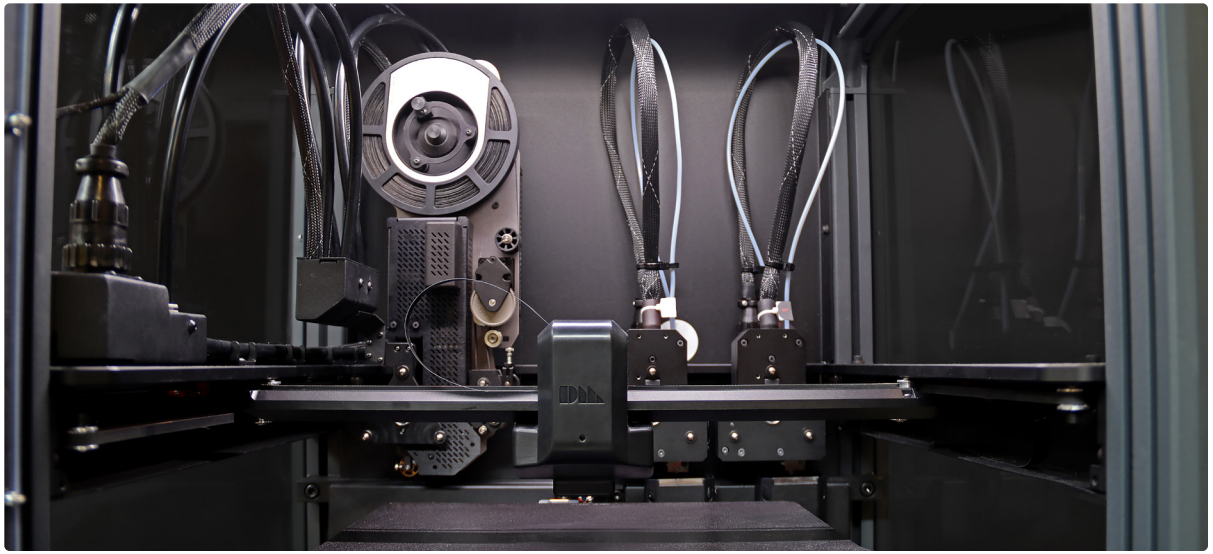
Choose from broad range of continuous fiber composites, including those with PEEK and PEKK matrices, to enable applications from consumer electronics to automotive.

Accessible to all

Print industrial-grade composites from the comfort of your desk at just a third of the cost of competitive systems. With entry prices as low as *$5,495/year (North America), an intuitive software, and easy setup process, Fiber makes composite printing affordable and easy.

**Price may vary by region.*

Fiber™

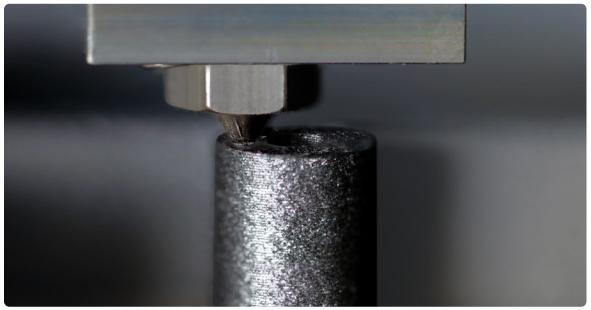


Fiber™ is the only composite 3D printer capable of Micro Automated Fiber Placement (μAFP™) —unlocking exceptional part strength for a desktop printer.

The printer features three printheads:

One dedicated to μAFP continuous fiber tape, which builds a high-strength reinforcement along critical load paths. The other two extrude thermoplastic filaments - the first is used for PA6 nylon, while the second is dedicated to PEEK and PEKK.

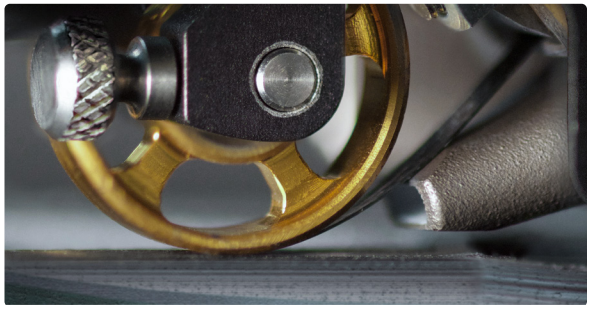
How It Works



Chopped fiber extrusion

Fiber™ begins each print with a chopped fiber-reinforced filament. The printer continues to build the part's geometry in chopped fiber filament up until the point where continuous fiber reinforcement has been defined. Within these sections of FFF-style printing, the part features solid walls and an adjustable infill structure.

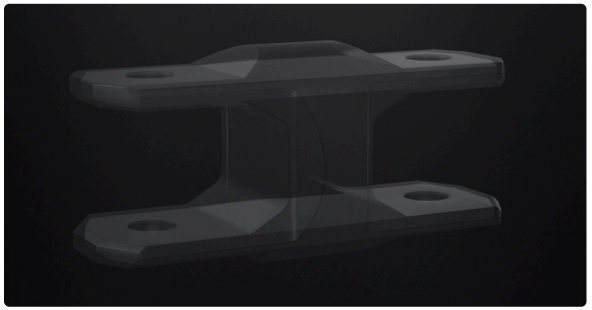
When the print approaches the first layer of targeted continuous fiber reinforcement, the printer builds a fully-dense chopped-fiber top layer. This layer creates a smooth plane upon which the first continuous fiber μAFP™ tape layer is laminated.



Micro Automated Fiber Placement (μAFP™)

Continuous fiber reinforcements are built via a novel process called Micro Automated Fiber Placement (μAFP™).

Within these layers, the μAFP™ tapehead laminates 12k continuous fiber tows to form an exeptionally strong reinforcent with up to 60% fiber volume fraction and less than 1% porosity. Borders around the tape are filled with chopped fiber filament to maintain excellent exterior resolution and surface quality.



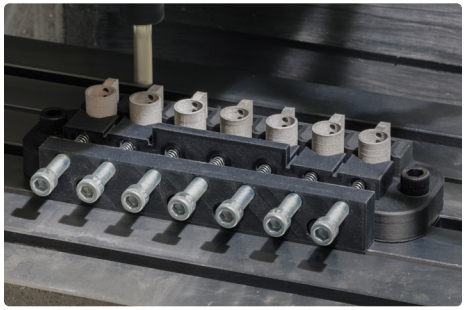
Part anatomy

Parts printed on Fiber™ feature targeted continuous fiber reinforcements within a chopped fiber exterior shell.

Users can automatically optimize fiber orientation for maximum coverage, or enable Expert Mode to tailor orientations for specific loading conditions.

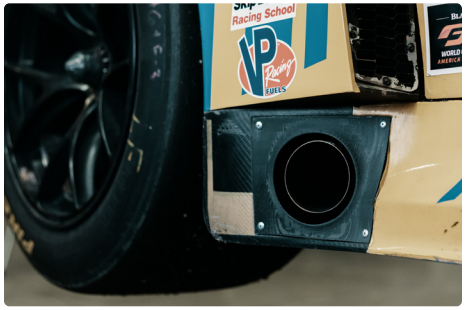
Applications

Designed for versatility, the printer supports a wide range of both filament and fiber composites to enable a broad set of applications from consumer goods to automotive.



01
Manufacturing jigs & fixtures

Boasting exceptional mechanical properties, high resistance to surface abrasion, and a high fatigue level, Fiber™ composites are a great match for high-wear manufacturing jigs and fixtures.



02
Exposure to extreme environments

With flame-retardant materials able to withstand continuous use temperatures above 250 °C, parts printed on Fiber™ are exceptionally durable and well-suited for extreme environments.

03
Replace aluminum or steel components

Fiber™ produces parts 2x stronger than steel, 2x lighter than aluminum, and at a fraction of the cost and time of other composite solutions—making it a great replacement for parts traditionally made from metal.

04
ESD management

Print ESD-compliant parts from PEKK + Carbon Fiber. With superior mechanical and thermal properties, the material is ideal for electronics manufacturing or end use parts.

Materials Library

The Fiber™ materials library is categorized by family, or thermoplastic material. Our current library features three material families: PEEK, PEKK, Nylon 6 (PA6). Within each family, there are a breadth of fiber-reinforced filaments and µAFP™ tapes.

Nylon 6 (PA6) + Carbon Fiber

Nylon 6 (PA6) with carbon fiber reinforcement is suitable for a wide range of applications. With a tensile strength 30x higher than ABS, PA6 + CF is an excellent material for jigs, fixtures, and end-of-arm tooling.

- Continuous µAFP™ tape
- Chopped FFF filament

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.

- Continuous µAFP™ tape
- Chopped FFF filament

PEKK + Carbon Fiber

PEKK with carbon fiber reinforcement is ideal when ESD compliance is needed. With high tensile and compression strength, resistance to chemical abrasion, and the ability to withstand high temperatures (above 250 °C), parts printed using PEKK reinforced with carbon fiber are exceptionally durable and well-suited for extreme environments.

- Continuous µAFP™ tape
- Chopped FFF filament

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.

- Continuous µAFP™ tape
- Chopped FFF filament

_Matrix materials

Nylon 6 (PA6)

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

PEKK

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

PEEK

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

_Materials formats

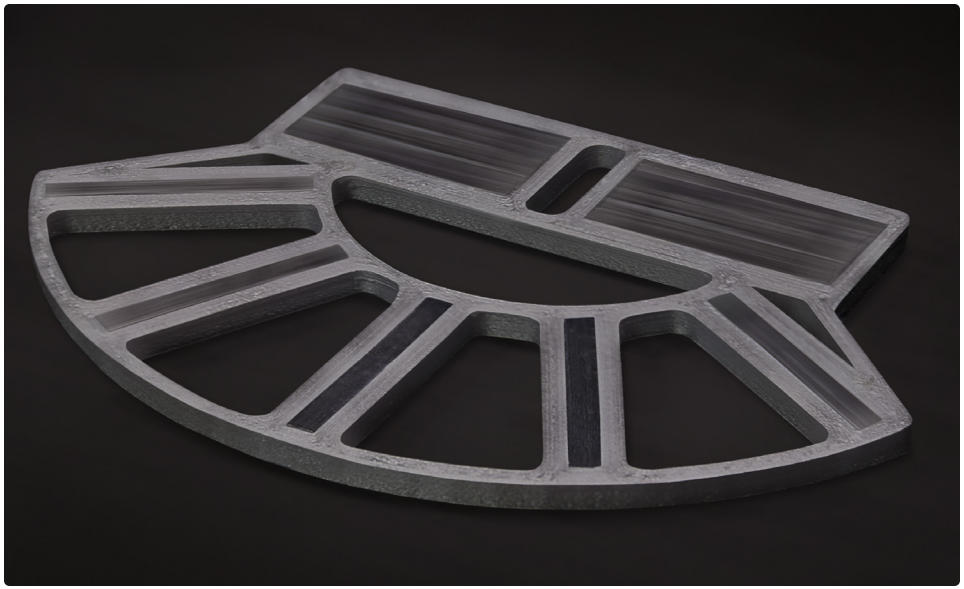
Continuous fiber tape (µAFP™)

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)

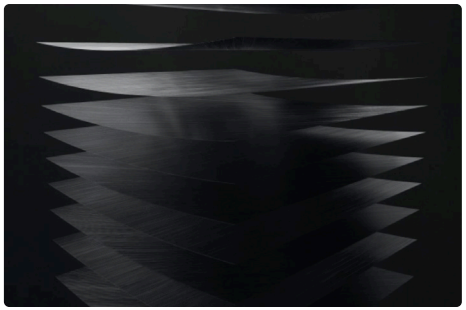
Chopped fiber filaments offer good dimensional stability, up to 30% fiber volume fraction and improved mechanical properties when compared to standard thermoplastics. The FFF printhead heats and extrudes a chopped fiber-reinforced filament to form a high-resolution exterior shell, resulting in parts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

Printer Features



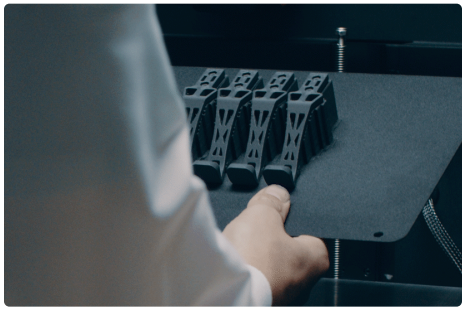
01
Micro Automated Fiber Placement

Continuous fiber reinforcement is applied along critical load paths in a process called Micro Automated Fiber Placement (µAFP™) wherin layers of highly-loaded continuous fiber tape are laminated to build fully-dense reinforced section with up to 60% fiber volume fraction.



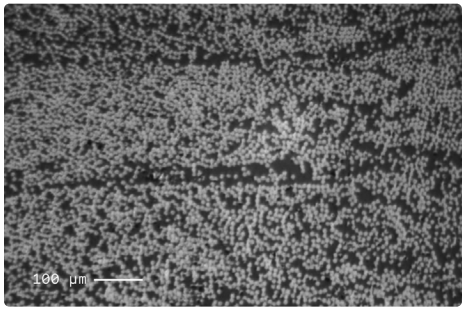
02
Multidirectional reinforcement

Layers of continuous fiber are laminated in varying angles to produce quasi-isotropic properties throughout. Users can automatically optimize fiber orientation for maximum coverage, or enable Expert Mode to tailor orientations for specific loading conditions.



03
Easy to use

Get set up in a matter of minutes. With entry-level user settings and opt-in advanced controls, Fiber™ allows users to choose to either fully automate or fine tune each and every print setting.



04
Low porosity

Utilizing tapes made with 12k continuous fiber tows, high fiber volume fraction, and exceptional resin impregnation, Fiber™ is able to print continuous fiber reinforcement with less than 1% porosity. Resulting in parts with exceptional strength.

05
Closed-loop thermal control

The µAFP™ tape head closely monitors and regulates temperatures in a closed-loop process to maintain an optimal build zone and enable high-quality lamination within each layer of continuous fiber.

06
Affordable

Print industrial-grade composites from the comfort of your desk at just a third of the cost of competitive systems. With entry prices as low as *$5,495/year (North America), an intuitive software, and easy setup process, Fiber makes composite printing affordable and easy.

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Fiber™ Printer Specification

TECHNOLOGY	Print technology	Micro Automated Fiber Placement (µAFP™) Fused filament fabrication (FFF)
	Print system	CoreXY with robotic tool changer
PERFORMANCE	Max build rate	20 cm^3/hr (1.2 in^3/hr)
	Layer height	130 µm - 250 µm
PHYSICAL	External dimension	586 x 620 x 939 mm (23.1 x 24.4 x 37.0 in)
	Weight	68 kg (150 lbs)
	Build envelope	FFF: 305 x 245 x 270 mm (12.0 x 9.6 x 10.6 in) µAFP™: 230 x 230 x 270 mm (9.0 x 9.0 x 10.6 in)
	Build plate	Heated up to 149 °C (300 °F)
	Print Sheet	Magnetically coupled, flexible spring steel sheet, double-sided, reusable
	Nozzle diameter	0.40 mm
	Onboard controls	7-inch touchscreen display
ELECTRICAL	Power requirements	100(-0%) to 240 VAC, 50/60 Hz, 15 A, 1-phase
MEDIA	FFF build media	Thermoplastic filament + chopped fiber Diameter: 1.75 mm (0.07 in)
	µAFP™ build media	Thermoplastic µAFP™ prepreg tape + continuous fiber Width: 3 mm (0.12 in)
	Compatible material systems	Nylon(PA6)+Carbon Fiber Nylon(PA6)+Fiberglass PEEK+Carbon Fiber PEKK+Carbon Fiber
PLATFORM	Network connectivity	Ethernet, USB
	Software	Fabricate® Cloud (desktop options also available)