MARKFORGED

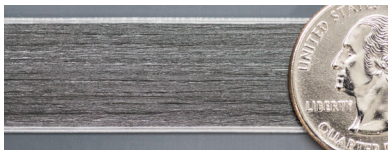
PRINT STRONGER

Designed to print parts with the strength of metal, the Mark One Composite 3D Printer™ is the world's first 3D printer capable of printing continuous carbon fiber, Kevlar®, and fiberglass. Using a patent pending Continuous Filament Fabrication (CFF™) print head along side a Fused Filament Fabrication (FFF) print head, the Mark One can create functional parts by combining our specially tuned nylon with continuous fiber filaments.

3D Print parts:

- With a higher strength-to-weight than 6061-T6 Aluminum.
- Up to 27x stiffer than ABS.
- Up to 24x stronger than ABS.

One part.
Thousands of Continuous Fibers.



7mm x 3mm x 100mm
3D Printed beam is packed with tens of thousands of full length, continuous carbon fiber strands.

Mechanical Properties

Property	Test Standard	Nylon FFF	Carbon Fiber CFF	Kevlar® CFF	Fiberglass CFF
Tensile Strength (MPa)	ASTM D3039	56	700	610	590
Tensile Modulus (GPa)	ASTM D3039	0.38	50	26	20
Tensile Strain at Break (%)	ASTM D3039	>50	1.5	5.5	5.5
Flexural Strength (MPa)	ASTM D790	No Break	470	190	210
Flexural Modulus (GPa)	ASTM D790	0.4	48	24	21
Flexural Strain at Break (%)	ASTM D790	No Break	1.2	2.1	2.1
Compressive Strength (MPa)	ASTM D6641	N/A	320	97	140
Compressive Modulus (GPa)	ASTM D6641	N/A	50	26	20
Compressive Strain at Break (%)	ASTM D6641	N/A	0.7	1.5	0.7
Heat Deflection Temperature (C°)	ASTM D648	44-50	105	105	105

Dimensions and construction of test specimens

- Test plaques used in this data are fiber reinforced unidirectionally (0° Plies).
- Tensile test specimens: 9.8 in (L) x 0.5 in (H) x 0.048 in (W) (CF composites), 9.8 in (L) x 0.5 in (H) x 0.08 in (W) (GF and aramid composites),
- Compressive test specimens: 5.5 in (L) x 0.5 in (H) x 0.085 in (W) (CF composites), 5.5 in (L) x 0.5 in (H) x 0.12 in (W) (aramid and GF composites)
- Flexural test specimens: 3-pt. Bending, 4.5 in (L) x 0.4 in (W) x 0.12 in (H)
- Heat-deflection temperature at 0.45 MPa, 66 psi (ASTM D648-07 Method B)

The Mark One Composite 3D Printer is capable of printing a wide variety of fiber reinforcement patterns creating both anisotropic and quasi-isotropic ply constructions. This data sheet gives reference and comparison material properties using one possible set of standards-compliant ASTM plaques printed with a production Mark One Composite 3D Printer. However, part and material performance will vary by ply design, part design, end-use conditions, test conditions, build conditions, and the like.

Tensile, Compressive, Strain at Break, and Heat Deflection Temperature data were provided by an accredited 3rd party test facility. Flexural data was prepared by MarkForged, Inc. The above specifications were met or exceeded.

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