

ADDITIVE MANUFACTURING

3D printer

RED SERIES

RED SERIES® is the Additive Manufacturing solution developed by 9T Labs in order to produce parts in composite materials. The Additive Fusion Technology (AFT) offers an all-in-one solution of producing highly optimized, small- to middle-sized structural parts. The two-stage, highly-automated production process ensures part quality and reproducibility.

The AFT consists of three main distinctive pillars:

1) Design - fibrify Design Suite

The fiber layout is designed on fibrify Design Suite, the proprietary software, integrated into ANSYS.

Spaceclaim, enabling full control of selective fibers placement throughout the part.

2) Additive Manufacturing - Build Module

The 3D printing dual-deposition system with 4-axis creates hybrid composite parts by repetitively adding single layers of material. The thermoplastic and the continuous carbon fiber-reinforced thermoplastic-filaments can be independently deposited

from different outputs on a vertically moving build plate. In addition, the fourth axis of motion allows the rotation of the deposition head and increases the versatility of fiber placement around tight geometries.

3) Consolidation - Fusion Module

The additive manufactured parts are positioned into a rigid closed metallic mold, where high pressure and temperature are applied to remove the entrapped air and consolidate the layers together. Consequently, the resulting parts can demonstrate optimal structural ability and surface quality. Various sub-parts can be mechanically assembled by mechanical interlocking and positioned into the mold to be fused together, giving a final part with a 3D-fiber configuration.

The manufacturing process for both the Build and the Fusion Modules is coordinated by using the fibrify Production software which offers full control and monitoring of the fabrication process as well as a retrospective assessment of the manufacturing record.

Benefits:

- High production volume: ideal for serial production of end-use parts.
- Optimized design: quickly create highly optimized designs.
- Strong and lightweight parts: suitable for extreme conditions.

Applications:

- Replace heavy metal parts with lightweight fiber composites without compromising strength.
- Industrial: any component that is subjected to heavy static/cyclic loads.
- Medical: X-ray translucent surgical instruments.
- Aerospace: lightweight mechanical parts such as helicopter door hinge.

Build module specifications

Print volume	350x270x250 mm (XYZ)
Printing temperature	up to 400°C
Material storage	up to 100°C
Bed temperature	up to 180°C
Build chamber temperature	up to 100°C
Nozzle	0.7 mm
Build speed	Polymer: up to 95mm/s Fiber: up to 20mm/s
Maximum layer resolution	0.015mm
Layer thickness	Polymer: 0.05mm Hybrid: 0.2mm
Main software	fibrify Design Suite

Materials

PEEK	•
PEKK	•
PA12	•
Bio-based PA	•

Continuous fibers:

Carbon	•
Glass	•
Basalt	•

Fusion module specifications

Fusion volume	350x270x250 mm (XYZ)
Fusion temperature	up to 400°C
Active pressure regulation	>20 bar
Pressing force	50kN max
Main software	fibrify Design Suite

