FORTIFY

3D PRINTERS FOR FILLED PHOTOPOLYMERS

EXPANDING THE LIMITS OF PHOTOPOLYMER ADDITIVE MANUFACTURING

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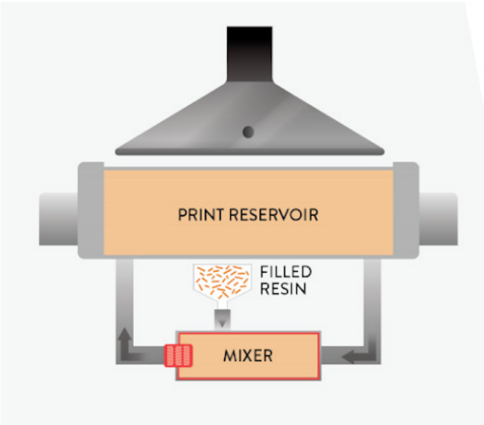
HARDWARE

CKM™ Module - Continuous Kinetic Mixing

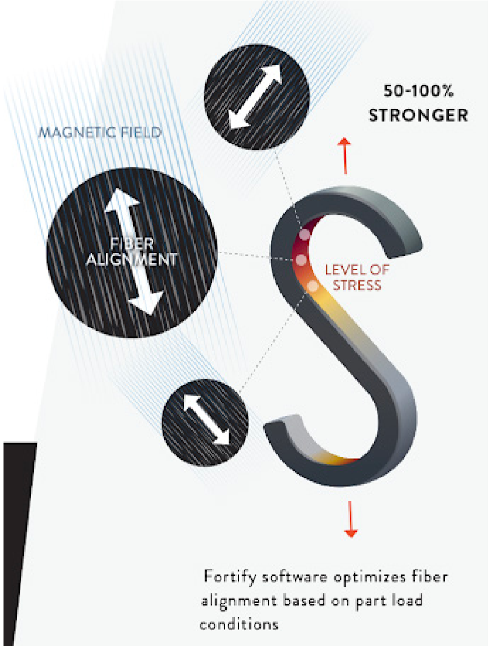
Reinforced fiber and particles have enhanced material properties in traditional plastic manufacturing processes for decades. Fortify now brings this proven approach to additive manufacturing. CKM enables printing of photopolymer resins with uniformly distributed functional additives. The system ensures that particles stay in suspension instead of agglomerating or settling to the bottom of the vat. CKM allows for an expanded processing window compared to other photopolymer DLP or SLA systems, processing much higher viscosity materials.



Fluxprint™ Magnetic Alignment Module

Magnetic Alignment
Fluxprint is a breakthrough technology that aligns reinforcing fiber within a photopolymer resin during fabrication. Fibers undergo a proprietary treatment to make them magnetically responsive. Magnetic fields then align fibers throughout the build to optimize strength, stiffness, and other characteristics of the part. This controlled approach to fiber alignment is unprecedented in both 3D printing and traditional manufacturing.

Optimized Microstructures
As 3D printing applications become more demanding, users are seeking higher performing materials. Photopolymers alone cannot meet these requirements. Fluxprint combines proven fiber reinforcement strategies with high resolution DLP printing. Users can now optimize fiber orientation based on load conditions of their parts.



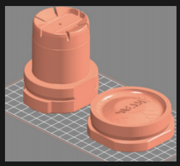
SOFTWARE

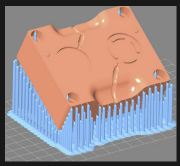
COMPASS Build preparation software enables seamless conversion from design to print file.

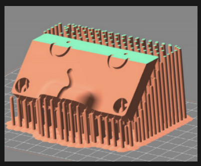
Prepare
Compass build preparation software allows users of the Flux Series 3D printers to easily position and arrange multiple parts to take full advantage of the printer's build platform. CKM and Fluxprint settings are also established at this step.

Support
Compass allows users to support an entire tray of parts in a single build in minutes. The support profiles are fully customizable and can be saved and shared for later use. Why use third party software?

Slice
The Compass proprietary slicing engine gives users the ability to quickly and easily view individual slices of every part in your build.





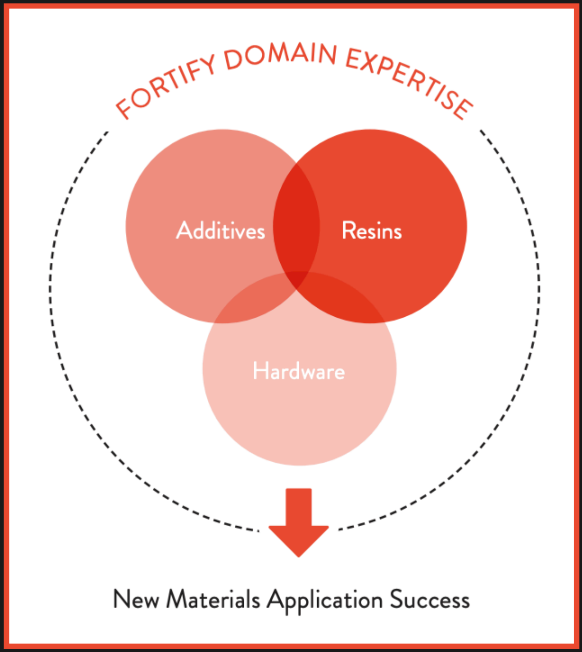


Flux Developer

Open materials platform with assisted development tools
Fortify's FLUX Developer platform gives users the ability to push the limits of material properties for additive manufacturing applications through software and consulting services. Developer is built for Fortify's FLUX Series 3D printers, the only photopolymer DLP system that can print and process fiber-filled and highly viscous resins. Too often, high performance material formulations are shelved due to the limited processing windows of traditional DLP platforms. The Flux Developer platform accelerates the development of new, high value materials.

The software allows you to
- Expand your processing window
- Develop new material profiles
- Conduct working curve tests

Enabling quick-turn material onboarding for unique applications.



MATERIALS

Fortify partners with leading global materials suppliers for a range of applications.

ROGERS CORPORATION TĒTHON 3D Henkel

QUALIFIED MATERIALS AND APPLICATIONS	
Digital Tooling // DT	High HDT and high stiffness ceramic-fiber reinforced photopolymer tuned for use in tooling applications such as injection molding or thermoforming. Exhibiting an HDT greater than 300°C, this material can withstand shots of aggressive plastics such as polycarbonate or Ultem®.
Low Loss 2.8 // LL 2.8 **Low Loss 4.9 // LL 4.9**	Low-loss dielectric materials for printing components and devices used in wide bandwidth, high frequency communication and sensing systems. Specifically tailored for microwave and mmWave applications.
Low Shrink Aluminum Silicate // LS-AS	Mid-grade ceramic material for general industrial use. This ceramic material exhibits a remarkably low 4.7% shrink upon sintering to deliver high tolerance parts across various size scales and complexities.
High Purity Alumina (99.8%) // HP-A 99.8	Alumina material that sinters to a final part purity of 99.8% alumina exhibiting only 12% shrinkage. This material is targeted towards applications that require high reliability, high temperature requirements, dielectric strength, thermal conductivity, or corrosion resistance.
ESD-Safe, High Temp Photoresin // ESD-HT	Fortify's ESD-HT photoresin brings static dissipative solutions to many applications including explosion and fire prevention, electrostatic protection, and electrostatic attraction.
Loctite 3843	Durable parts with outstanding surface finish and HDT 60°C. Attributes are similar to ABS.
Loctite IND-406	Tough, rigid, and durable 3D printing resin that performs well in industrial applications requiring high temperature use. The material offers all-round strength, good impact resistance, and high elongation.
Loctite IND-147	High temperature resistant resin for use in prototyping and production applications that require an elevated operating temperature.

	FLUX CORE	FLUX ONE	FLUX 3D
Build Volume	8 in (x) x 4.5 in (y) x 13 in (z) 203.7 mm x 114.6 mm x 330 mm	8 in (x) x 4.5 in (y) x 13 in (z) 203.7 mm x 114.6 mm x 330 mm	8 in (x) x 4.5 in (y) x 13 in (z) 203.7 mm x 114.6 mm x 330 mm
Resolution Z (layer height) XY (pixel pitch)	25 - 150 µm 75 µm	25 - 250 µm 75 µm	25 - 150 µm 75 µm
Electrical Requirements	208 VAC 50/60 Hz three-phase 20 A breaker	208 VAC 50/60 Hz three-phase 20 A breaker	208 VAC 50/60 Hz three-phase 20 A breaker
Dimensions			
Installed Size	22.8 in (W) x 33.4 in (D) x 70/81 in (H) door closed/open 579 mm x 848 mm x 1727/2032 mm	24 in (W) x 38 in (D) x 70/81 in (H) door closed/open 579 mm x 848 mm x 1727/2032 mm	34 in (W) x 39.5 in (D) x 71.75 /84.75 in (H) door closed open // 865 mm x 1000 mm x 1820/2150mm door closed/open
Minimum Spacing	Minimum ceiling height: 82 in (2083 mm) Sides: 1 in (25.4 mm) Back: 10 in (254 mm)	Minimum ceiling height: 85 in (2083 mm) Sides: 1 in (25.4 mm) Back: 10 in (254 mm)	Minimum ceiling height: 86 in (2185 mm) Sides: 12 in (305 mm) // Back: 12 in (305mm)
Weight	550 lbs (158.8 kg)	750 lbs (226.8 kg)	1000 lbs (453 kg)
Ventilation	4” duct exhaust connection Optional: External Carbon/Hepa filtration unit	Carbon / Hepa filter	4” duct exhaust connection Optional: External Carbon/Hepa filtration unit
Control	10” LCD touch screen display	10” LCD touch screen display	10” LCD touch screen display
Connectivity	USB, Wi-fi, Ethernet	USB, Wi-fi, Ethernet	USB, Wi-fi, Ethernet
HVAC Thermal Load	1700 BTU/hr (active)	5200 BTU/hr (active), < 1800 BTU/hr (idle)	5200 BTU/hr (active), < 1800 BTU/hr (idle)
CKM* CKM LV Max Volume CKM Standard Max Volume Resin Temperature in Reservoir	6L 2L 25 - 70 C	6L 2 L 25 - 70 C	6 L 2 L 25 - 70 C
Magnetics Flux density within 6” of printer Flux density inside build area		<20 gauss 500 gauss	Up to 600 Gauss 600 Gauss
Projector Technology Light Source Wavelength	Digital Light Projection (DLP) LED 405 nm standard	Digital Light Projection (DLP) LED 405 nm standard	Digital Light Projection (DLP) LED 405 nm standard

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