WHITE PAPER

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Drone Design and Manufacturing Case Studies With Formlabs SLA and SLS 3D Printers

Drone manufacturing requires speed, reliability, and consistent part quality. In the diverse landscape of businesses manufacturing unmanned systems — both underwater and aerial — accessibility and affordability need to be high priority as well, to ensure that their products can be functionally tested and reach market before their many competitors.

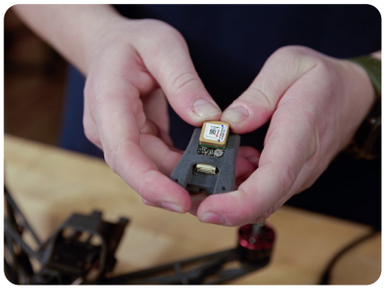
Formlabs' drone manufacturing and design customers leverage Form Series SLA and Fuse Series SLS 3D printers to create unmanned systems for specific markets. The speed and reliability of the printers, as well as the functionality and versatility of the materials, make Formlabs' ecosystems indispensable tools for these companies. The following case studies highlight just some of Formlabs' customers making waves in the drone industry.

Contents

US Armed Forces and Building Momentum

Building Momentum, a contractor for the US Armed Forces, provides drone building bootcamps for deployed divisions.

They recommend the Fuse Series SLS 3D printers for producing rugged, weather-resistant drones that can be designed and built with modular components. When one part breaks in the field, replacing the modular base, cover, arms, or propellers is fast.



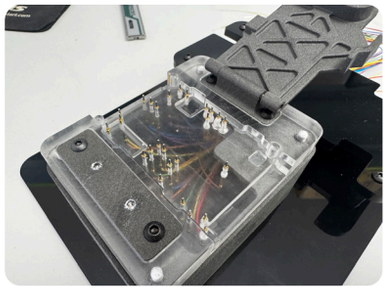
ORQA FPV

ORQA FPV provides European-made drone components as an alternative to Chinese manufacturers for those concerned with sourcing and security concerns.

ORQA uses SLA and SLS 3D printers for prototyping, functional testing, and end-use components on a range of drone body styles. For SLS 3D printing, they've used both rigid Nylon 12 Powder and elastomeric TPU 90A Powder.

"We've been so surprised at how much the Fuse 1+ 30W has had an impact. It's so fast and the whole system is so very well designed. We're really satisfied with it and expanding to a fleet is in our future."

Antonio Kovac
Lead Mechanical Design Engineer



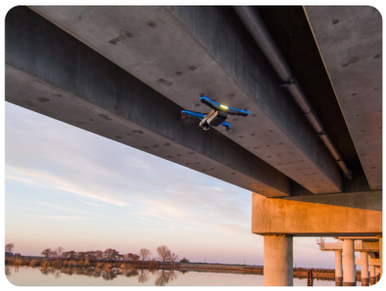
Skydio

Skydio's line of unmanned aerial systems (UASs) and Dock products open up new opportunities in industries like energy utilities, transportation, public safety, environmental research, and more.

Skydio's product teams use Formlabs SLA 3D printers to rapidly prototype, keeping pace with their lightning-fast software team's development schedule.

"It was super critical we develop the hardware and software together. The lead times for getting production parts made were most limiting to us. The Form Series was instantly running nonstop, and then it was very easy, the hardware we needed to change was right there."

Eric Weinhoffer
Senior Hardware Development Specialis.

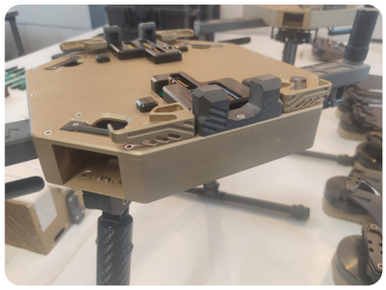


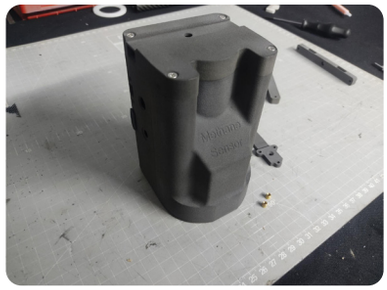
Nextech

Nextech, a drone manufacturer based in South Africa, uses the Formlabs Fuse Series to fabricate high-performance customized UAVs for their customers in a wide range of industries. The rugged, end-use qualities of SLS parts enable Nextech to design, prototype, and manufacture with one streamlined workflow.

"The mixture of traditional machining and SLS 3D printing has created what I feel is the next generation of how we're going to manufacture everything."

Liam Kroone
Mechanical Design Engineer at Nextech



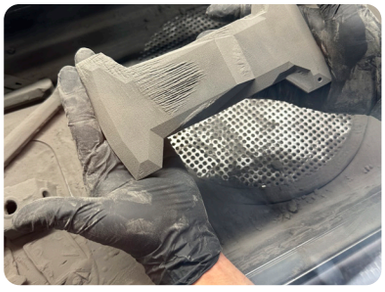


Boresight

Boresight, an Australian drone manufacturer, sets itself apart in a crowded industry by delivering high-quality, reliable, target drones for extremely low costs, as well as more technically advanced tactical drones commissioned by the Australian Strategic Capability Accelerator (ASCA) program.

"This drone is intended for military organizations, which aren't known for treating things kindly. They need things to be simple, light, and strong, which are generally conflicting requirements. But by using the Fuse, we can do that."

Justin Olde
Boresight CEO



ION Mobility

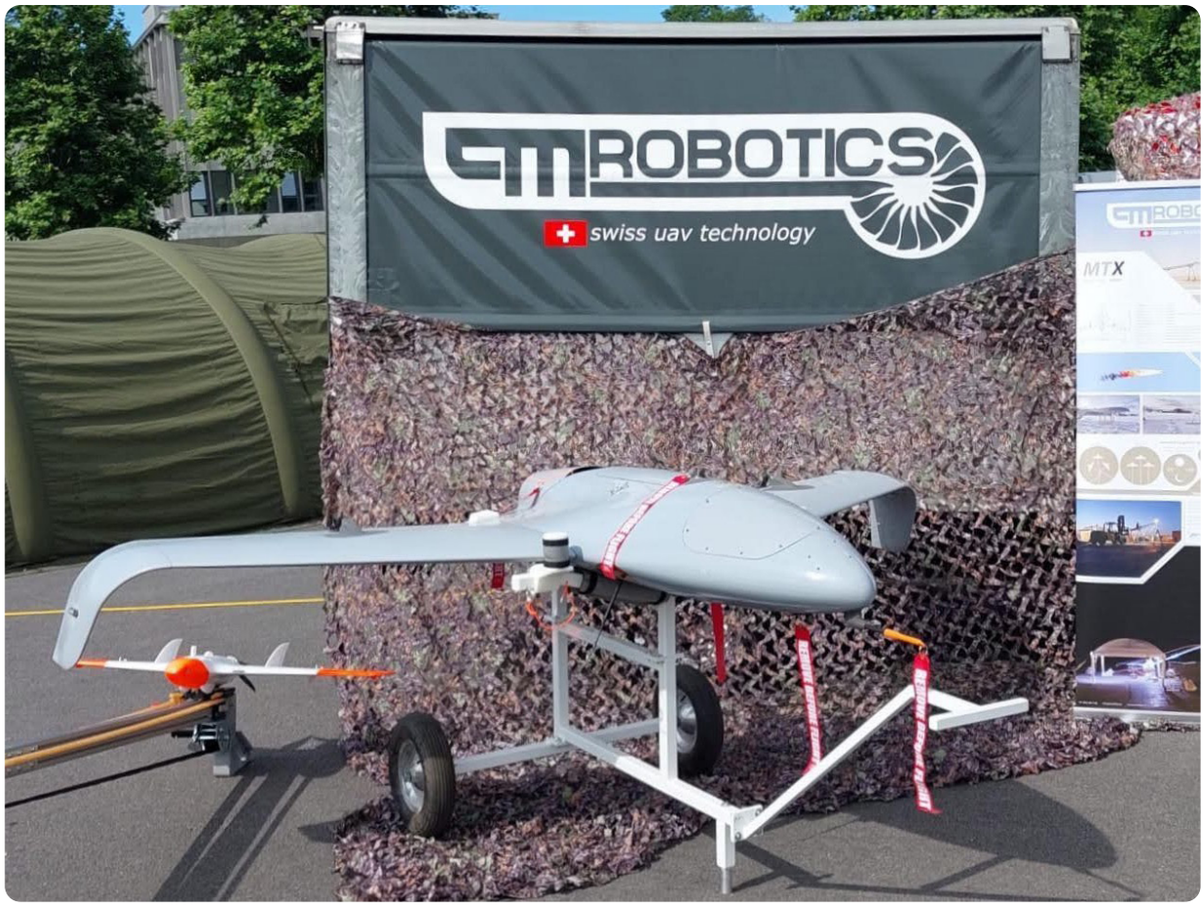
ION Mobility is a South Korea-based drone manufacturer that designs and builds advanced UAV systems tailored for public safety, defence, logistics, and industrial use.

Since implementing the Fuse 1+ 30W into their workflow, ION Mobility has reduced development costs by 60% and improved turnaround speed by 70%.

"With traditional methods, production timelines were long, and design changes came with high costs. Now, even the most complex parts are printed in half a day at a lower cost even."

Sukchun Son
Senior Manager at ION Mobility.

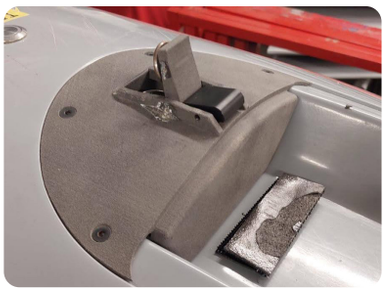
PMRobotics

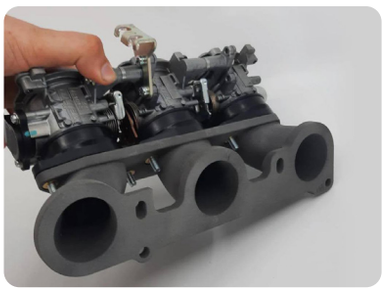


PMR Robotics, a Swiss drone manufacturer, uses SLS 3D printing and stiff, strong Nylon 12 GF Powder to develop prototypes and end-use components for their range of high-performance drones, as well as manufacturing aids and EOAT for their robotic systems.

"In the same time it takes others to order and receive a part, I have already fitted it perfectly with the Fuse. Others need six or seven weeks for this and I'm done in a week, thanks to the in-house workflow. In total, I've saved three quarters of a year in development time compared to external deliveries."

Niklaus Hagen
Co-Owner, PMRobotics



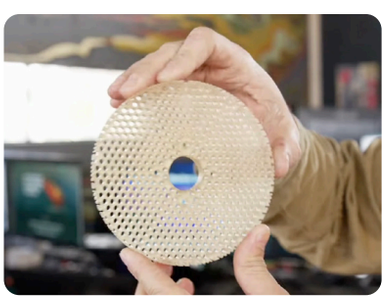


Nakai Robotics

Nakai's robots are autonomous cleaning vehicles that remove biofouling — a buildup of algae, vegetation, and animal life — on ships, helping them run more efficiently. The Nakai robots include 1,500 different components, and 300 of them are 3D printed for end-use on the Fuse Series and Form Series. Their SLS components are coated in ceramic to keep them waterproof.

"We chose Nylon 12 GF Powder for its excellent tensile strength. That was the biggest driver. We needed something that could mimic steel or other metals, in a way."

Yair Tamir
Nakai Robotics Co-Founder



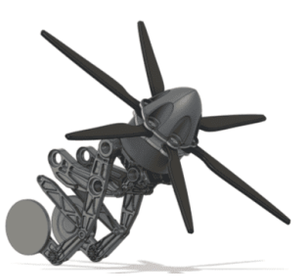
Teranova

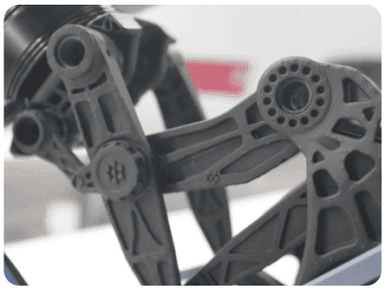
Teranova, based in Incheon, South Korea, develops and services unmanned systems for logistics delivery, relying on 3D printing to produce prototypes and develop advanced motor technologies.

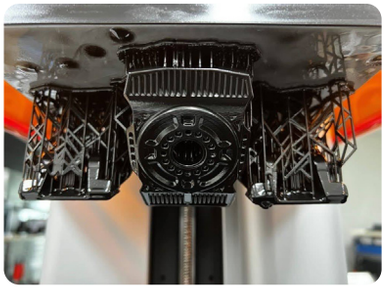
Teranova has set its sights on delivering up to one ton of cargo via UAM vehicles by 2026, a goal that demands constant prototyping and iteration. By embracing in-house 3D printing as a critical tool, Teranova has lowered costs and decreased times.

"LFD technology has been a game-changer for us, delivering stable and reliable performance. In aircraft manufacturing, where precision is everything, it ensures error-free production every time."

Kim Ji Hwan
CTO, Teranova







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