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Joost Hezemans, head designer, Aerialtronics



Aerialtronics developed this Altura Zenith drone to be customizable yet cost-efficient with a uPrint 3D Printer.

#### CASE STUDY

# Taking Flight

## 3D PRINTERS DECREASE AERIALTRONICS' DESIGN AND DEVELOPMENT COSTS WHILE CATERING TO CUSTOMIZATION

Unmanned aircraft systems (UASs) for civilian commercial applications are one of the most exciting disruptive technologies today. With more than 200 of its aircrafts already in use, Netherlands-based Aerialtronics is poised to offer systems for applications ranging from infrastructure inspection and mapping to livestock monitoring and creative filming for advertising and marketing.

As a small company with only 35 employees, a major challenge for Aerialtronics is to develop systems that could meet the requirements of a variety of industries without spreading its resources too thin between dozens of discrete designs.

“We have developed a concept that uses a standard platform and is customizable to individual customers and applications,” explains Joost Hezemans, head designer at Aerialtronics.

This customizable product became the Altura Zenith, which has specially tailored options, including the number and power of motors, payload capacity, flight times and variations of required software systems. Other customizable pieces include motor housings, different gimbals and boxes and enclosures for hardware and software. “Developing even these limited variations required many design iterations and prototype models,” says Hezemans. “The process was slow and expensive.”

In order to reduce development times and contain its costs, Aerialtronics sought a faster, more cost-effective solution than outsourcing. Working closely with Stratasys®, the company installed a uPrint® SE Plus™ 3D Printer.

### R&D Times Nosedive by 50%

Hezemans says that Aerialtronics taking control of its own 3D printing requirements has drastically reduced lengthy lead times and cut its R&D time by about 50 percent.

“We liked the ease of operation and how CAD designs could be fed into the 3D printer. The ABS*plus*™ material also has the right strength and weight characteristics perfect for us to build a flying prototype.”

Hezemans adds that ABS*plus* works well for customized parts. “The motors, for example, can generate a lot of heat, so it’s critical to have a material that can withstand it while also possessing the right strength and weight characteristics. The ABS*plus* motor mounts have those properties.”

### Soaring with 3D Printed End-Use Parts

While the Altura Zenith’s main platform is made from carbon fiber, the company 3D prints its end-use on-demand parts that vary in size and other specifications. These parts typically include housings for different-sized sensor equipment, video downlink and GPS systems, and various-shaped boxes to accommodate cabling and electronic components.

3D printing also gave designers and engineers more time to refine components. “With the uPrint 3D Printer, we can adjust a design one day and 3D print new parts overnight, test it, tweak it some more, and print another to test the next day,” Hezemans says. “This process means that designs have gone through between five and 10 more iterations than before. We have been able to 3D print more, see more and fly more than previously possible, and thanks to 3D printing, the product is much better.”



Joost Hezemans, head designer at Aerialtronics



Aerialtronics uses a uPrint SE Plus 3D Printer.

“3D printing technology helped us advance the design and development of the Altura Zenith drone far more quickly and at a much lower cost than would have been achievable with conventional methods,” continues Hezemans. He adds that the uPrint 3D Printer allowed them to meet the customization requirements demanded by a diverse range of customers.

### **Applications? The Sky's the Limit**

3D printing makes it possible for a small company like Aerialtronics to compete on an international level by transforming what was previously time-consuming and costly to streamlined and cost-effective. The use of UASs and 3D printing saves customers money, and also makes these customers money through the UASs' deployment.

The scope and benefits of commercially available drones promises an impact far beyond personal delivery systems. Aerialtronics' aircraft are already in use by police and emergency services, utility companies and other organizations.

The company is also working with the U.S. Federal Aviation Administration and Civil Aeronautics Administration to ensure it fully understands the impact remotely piloted aircraft can have on businesses and to help develop regulations and guidelines that enable effective use of drones in as many industries as possible.



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