INNOVATION:

Innovate and adapt with 3D printing

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We Robotics

OVERVIEW

WeRobotics has been working with Flying Labs in Nepal and the Dominican Republic to deploy cargo drones that carry essential medical supplies and services to remote communities. The cargo drone project aims to provide a low-cost add-on module for consumer drones for cargo transport purposes.

As cargo transports, these drones need a robust mount for the cargo box and electronic enclosures, including antennas for communication and a camera for precision landing. In addition, all the parts must be lightweight, sturdy, reliable, able to withstand tropical environments, and economically accessible in production runs of a dozen per order. Although WeRobotics has in-house 3D printers for prototyping and development, parts produced are not consistent or reliable enough for field use. This is where Sculpteo's online service was the best solution; with minimal time investment and a professional quality and surface finish, WeRobotics could meet all of its manufacturing requirements and still be cost-effective.

The Challenges:

1. Quickly manufacturing cargo drone add-on modules in small batches.
2. Ensuring robust and lightweight drones.

We Robotics

WeRobotics, established in December 2015 as a nonprofit organization, is a small and diverse team from six countries across four continents working with digital setups. WeRobotics' core focus is co-creating and scaling the Flying Labs network, which shifts power back to local experts who lead local solutions for positive social impact. Flying Labs are independent, locally-led, and demand-driven knowledge hubs in more than 25 countries across Africa, Asia, Latin America, and beyond that leverage robotics for sustainable development in public health, such as using cargo drones for medical deliveries.

WeRobotics.org

"At the small scale of the cargo projects we run, 3D printing is the only economical production method for the geometries we need. Using Sculpteo's service allows us to produce a much more professional quality product than we could achieve in-house, at a much lower time investment."

- Jürg Germann, Head of Engineering WeRobotics

Time-To-Market

With the urgent need for these cargo drones to carry essential health services to remote communities, WeRobotics must produce these add-on modules quickly and effectively. With traditional injection molding, production can take months and doesn't leave room for reactivity to the modules' specifications depending on the region's use. Additive manufacturing allows WeRobotics to maintain the flexibility they need to improve or update the modules quickly and efficiently by manufacturing the components they need at high speed, allowing for testing and modifications if necessary.

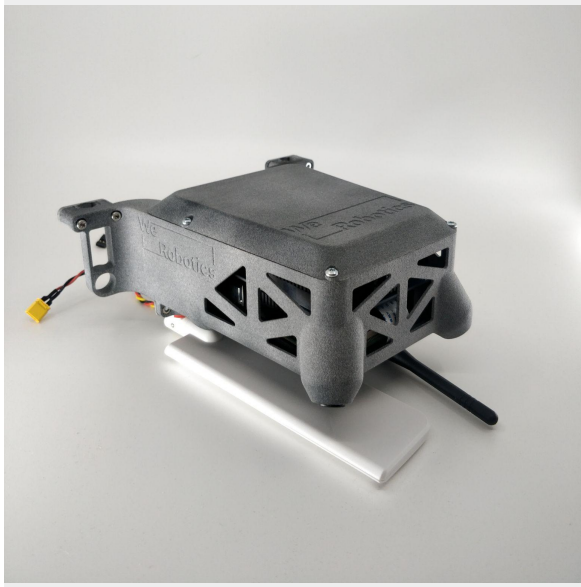
Affordability and speed play equally essential roles in the 3D printing-for-manufacturing numbers. WeRobotics produces about two to three modules per project, and for it to be economically accessible, they once again turn to additive manufacturing for its cost-effectiveness. Sculpteo offered the affordability and quickness that WeRobotics needed.

Materials and Weight

WeRobotics chose the Selective Laser Sintering (SLS) technology and Nylon PA 12 material to produce certain drone parts that required them to be lightweight. Achieving an aerodynamic minimum operational weight is necessary for cargo drones. With additive manufacturing, WeRobotics could print parts with complex geometries, such as a lattice design, which dramatically reduced the weight of the 3D printed components and still maintained their structural integrity.

Another way WeRobotics reduced the weight of their add-on module was by consolidating the number of parts necessary. With integrated assembly, WeRobotics reduced the number of components by designing accessories such as clips and supports directly into the module's structure. Therefore, they were able to shorten their assembly process and effectively the total weight.

WeRobotics cargo drone with add on module printed in Nylon PA12.



WeRobotics cargo drone module printed in Nylon PA12.

Material Spotlight: PA12

PA12 is the most used 3D printing material for scaled production. As a powder based technology, the surface finish is uniform and smooth to the touch without visible layers. Available in unfinished form in both white (SLS technology) and grey (Jet Fusion technology), PA12 is the most versatile polymer with good all-around mechanical properties.

Both SLS and Jet Fusion PA12 varieties offer a variety of finishing options from dying to chemical smoothing, giving the quality and aesthetics of injection molded plastics.

Learn more about PA12.