INNOVATION:

Innovate and adapt with 3D printing

sculpteo X We Robotics

OVERVIEW

WeRobotics has been working with Flying Labs in Nepal and the Dominican Republic to bring cargo drones that carry essential health services to remote communities. The cargo project aims to provi a low-cost add-on module for off-the-shelf drones, allowing cargo transpdeort purposes.
As cargo transports, the drones would 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 need to 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 drones in small batches.
2. Ensuring robust and lightweight drones.

We Robotics

WeRobotics, established in December 2015 as a not-for-profit organization, is a small and diverse team from six countries, across four continents that work with digital setups. WeRobotic's core focus is to grow the Flying Labs networks by enabling the adoption of the Flying Labs model at scale. This model seeks to shift power to local experts with local knowledge and lived experience to create the leadership opportunities to implement solutions to pursue positive social impact. Flying Labs are regional knowledge hubs led entirely by local experts who leverage robotics solutions for sustainable development in public health, such as cargo drones. Flying Labs are operational in 25+ countries across Africa, Asia, and Latin America.

WeRobotics.com

"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."

- Cameron Dowd, Lead Engineer WeRobotics

Time-To-Market

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

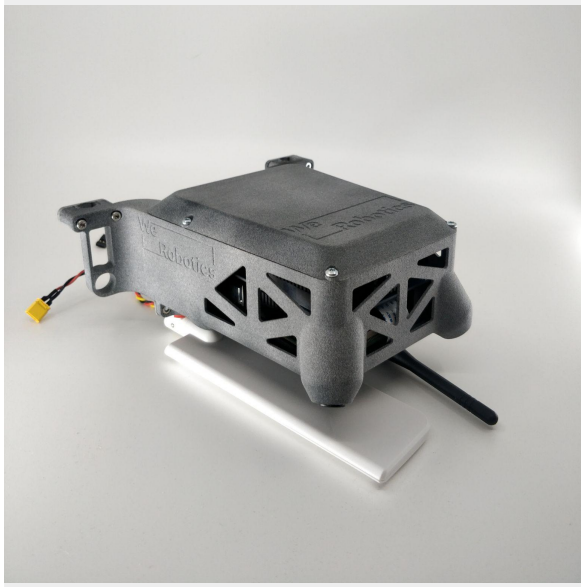
Affordability and speed play equally essential roles in the 3D printing-for-manufacturing numbers. WeRobotics produces about a dozen cargo drones per order, and for it to be economically accessible, they once again turn to additive manufacturing for its cost-effectiveness. Sculpteo offered the affordability 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 cargo drones was by consolidating the number of parts necessary for each cargo drone. With integrated assembly, WeRobotics was able to reduce the number of components by designing accessories such as clips and supports directly into the structure of their drones. Therefore, they were able to shorten their assembly process and effectively the total weight.

WeRobotics cargo drone printed in Nylon PA12.



WeRobotics cargo drone part 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.