



# INNOVATION:

Innovate and adapt with 3D printing



## OVERVIEW

For the last four years, Hexadrome has been developing its aircraft, the TUNDRA, a customizable drone for all types of usage. With its unique configuration, it is possible to add many complementary features to meet the needs of all kinds of applications.

Hexadrome produces two types of Tundra models; the first is the *Ready to Develop* (RTD) model, which features an already mounted drone with integrated flight controller and electronic wiring. This model comes in two terrain sizes, "Urban use" and "Endurance use." The second model is the *Almost Ready to Fly* (ARF), an entirely customizable drone that needs to be mounted and configured by the client to meet their needs. Hexadrome realized very quickly when designing their drone the necessity for customization, functionality, and fast time-to-market were essential features for the success of their drones. They also wanted to partner with a French company since their aim is to manufacture Tundra locally. Sculpteo was the partner that helped Hexadrome meet their challenges.

### The Challenges:

1. Rapidly develop and test prototypes to create a frame that can be easily customizable.
2. On-demand manufacturing of Tundra's open-ended frame for clients when ordered.



Hexadrome is a french company specializing in the development of mechatronic systems for civilian and military UAVs. Hexadrome also offers more than 3000 products, OEM parts, and RTF drones via their online platform.

Hexadrome TUNDRA® is a unique 100% modular air vector, configurable using customizable parts to meet every desired application's needs and adapt to rapid changes in in-flight electronics. Hexadrome has also developed a range of equipment and accessories easily installed on the Tundra as desired.

[Hexadrome.fr](https://www.hexadrome.fr)

*“Sculpteo was the partner we needed for producing Tundra, being able to 3D print parts made it possible to create a customizable drone. Our partnership with Sculpteo was an essential part in the creation of this machine.”*

- **Alexandre Labesse, Hexadrone CEO**

## Prototyping and Innovation

When Hexadrone was getting ready to manufacture their initial Tundra design. They quickly realized that injection molding would have been cost-prohibitive and not allow for any iterations to their original design. Hexadrone turned to 3D printing to create the initial prototypes of Tundra; with 3D printing technology, it was possible to create **several iterations** of their design without much cost impact and save time to mature their prototypes. 3D printing allowed them to produce according to their needs, gather feedback from their clients, and, if necessary, make adjustments to the design. After 10 iterations Hexadrone had perfected their design.

During the prototyping phase, Hexadrone was also able to take advantage of **integrated assembly** in designing and testing their prototypes. By integrating rotating mechanisms, clips, hinges, and brackets into the design, they were able to reduce the number of parts, simplify their assembly processes and optimize the overall weight of their drones.

Hexadrone chose to work with Sculpteo, a leader in digital manufacturing, because of the accessibility to its sales representative and the simplicity of engaging across its digital manufacturing services. The quality of materials and printed parts enables Sculpteo to consistently and quickly deliver countless numbers of prototypes which were precisely what Hexadrone needed in the development of Tundra.

## Materials and Weight

Rather than maintaining an inventory of Tundra and its mechanical components, Hexadrone relies on **on-demand manufacturing** to fulfill customer orders. With a digital inventory system of Tundra and its accompanying accessories, they can simply upload their existing STL file into Sculpteo’s accessible end-to-end digital manufacturing services and produce any number of parts when they need them. Not only do they save on inventory costs, since Tundra is a highly customizable drone, on-demand production also eliminates issues of damaged components, oversupply, and obsolescence.

With Tundra, Hexadrone needs to be reactive to customers’ unique requests since its frame is open-ended for **customization**. Using 3D printing technology, Hexadrone can produce parts with multiple finishings for different complex parts simultaneously. On-demand manufacturing allows them to meet the needs of their customers quickly, efficiently, and economically.



*Tundra drone printed in Nylon PA12.*



*Tundra model 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 dyeing to chemical smoothing, giving the quality and aesthetics of injection molded plastics.