INNOVATION:

Innovate and adapt with 3D printing

Sculpteo X KOOVEA

OVERVIEW

Koovea K-TAG temperature sensor is a compact enclosure designed to fit any space in trucks or storage units. The sensor itself includes many applications: an LED display, a Bluetooth router, a battery, and a data storage unit, among other electronic components. The main challenges were to ensure the electronic components fit in the compact enclosure, maintain communication between the sensor and the remote monitoring app, and be durable enough to endure any voyage.

Koovea explored 3D printing to enter the market with high-quality products and technologies. Koovea developed their temperature sensors through an intense iteration process to create a reliable solution for their products.

The Challenges:

1. Rapidly develop a sensor resistant to extreme temperatures which can protect the internal electronic components.

2. Respond to their client's needs quickly by offering customized versions of their products.

KOOVEA

Koovea is a startup based in Montpellier, south of France, that is specialized in connected temperature monitoring for the logistics of temperature-sensitive products.

These temperature sensors are remotely connected to their application to supervise the transportation of temperature- sensitive products. Koovea's products monitor the storage and transportation of health and food products all over the globe.

After three years of research and development, the company was born in 2018, with the commercialization of their product range: K-TAG wireless temperature sensors, K-HUB smart routers, and K-APP data monitoring web application.

KOOVEA.COM

> *"With 3D printing we were looking to develop our product with iterations without having to restrict creativity because of material costs and long lead and production times."*
>
> **- Romain Penot, R&D Manager**

Rapid Prototyping and Innovation

Koovea's main interest in using of 3D printing was rapid prototyping, which they use at two different stages of their product development.

This technology helped them to design their sensors making sure that all the electronics components fit and worked efficiently without any design issues. These sensor enclosures had to be quite compact to fit wherever needed. Koovea worked their way through finding the right design to make all of the various components fit: not only the sensor, but the communication routers, the battery, etc.

The prototyping process lasted 3 months. During these 3 months, Koovea came up with 4 different versions of their temperature sensor. The two first versions were only to see from a visual standpoint if all the different components fit in the enclosure. The two last versions were tested according to their applicable standards: they tested the parts in their real-life environment from -40°C to +60°C with a high presence of humidity.

On-demand features addition

Once their K-TAG sensor was on the market, they had specific queries from customers and this is where 3D printing was once again a huge advantage for them. While working on their existing product they were able to add on-demand features to create tailor-made products for their clients needs.

For instance, they were able to add to their product range a custom magnet holder. Using Design for Additive Manufacturing and functional integration, Koovea designed a one-piece holder for the magnet. The use of 3D printing facilitated the production of the sensor's new version. Producing this magnet holder at scale would cost a lot in terms of time and money with injection molding since it would require a mold with removable parts and therefore a multiplication of production costs.

Adding features to their existing product range, Koovea needed to find a materials that could compete with injection molding. This is why they chose to use Nylon PA12 for its robustness. They also wanted to work with a white material to compete with the final rendering of injection molding. PA12's price was also an important consideration in making their choice: they needed an inexpensive material to innovate quicker and more efficiently while monitoring their expenses.

K-TAG prototype printed in Nylon PA12.

Koovea's magnet holder 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.