

CASE STUDY



 sculpteo x 
REF Bikes

AN EXCLUSIVE BIKE PART,
FOR AN ORIGINAL
MODULAR BIKE
ASSEMBLY SYSTEM.

CHALLENGES

- 1 Create an exclusive connective part for a new bike assembly technology.
- 2 Optimize the part so it's technically efficient and aesthetic pleasing.
- 3 Quickly get the part available for small production batches.

Main information

Company	REF Bikes
Industry	Sport
Product	Made-to-measure protective tube connector
Technology	SLS
Material	Nylon PA12
Finishing options	None
Challenge	Design an aesthetic and technical bike part for Plug&Go® bike assembly technology

COMPANY INTRODUCTION



ABOUT THE COMPANY:

REF Bikes is a French start-up founded in Lyon, specializing in the French manufacture of **modular bicycles**. REF Bikes invented the Plug&Go® bicycle frame assembly technology.

CONCEPT PRESENTATION:

This ingenious technology makes it possible to obtain a bike that is **100% repairable** and **infinitely transformable**, making it upgradeable and adaptable to all types of use.

In this way, it's possible to gradually upgrade the bike and navigate through the range of bikes offered by the brand, moving from a **muscle bike** to an **electric bike**, for example, with just a few changes of parts.



Although founded only recently, in 2020, REF Bikes' innovative approach to bike design has already set them apart in the cycle industry. Thanks to the modular aspect of its frame system, the company has made significant progress in extending the life of bicycles.

By introducing this technology, REF Bikes aims to solve the problem of bicycle obsolescence and contribute to a more sustainable future for cyclists and the environment.

SUSTAINABLE DESIGN:

Indeed, REF Bikes bikes are first and foremost designed for durability:

1- By acting against obsolescence:

Frame components can be changed for repair.

2- By being designed for evolution:

Thanks to their modular nature, frame components can be changed to evolve from one riding style to another. This means you can switch from an Essential to an Urban model, and electrify the models according to your needs, or, for example, transform it into a longtail for riding with the kids.



FLEXIBLE DESIGN:

The spirit at the heart of Plug&Go® technology enables your bike to accompany you on all your adventures, and to evolve with you, adapting to your every move.

Although it's not advisable to make changes yourself, you can easily have your bike modified in our partner stores. This is a very practical solution for today's **urban nomads**.



THEIR CHALLENGE:

For REF Bikes, the challenge was to design a very specific part, which could be made to measure and produced in small series, to meet the particular needs of the modular bicycle frames designed by the company.

The part in question had to meet both technical and aesthetic requirements.

REF Bikes was looking for a solution that would enable them to simultaneously cover the machined areas of various sections of the bicycle frame, thus protecting both the user and the machined areas of the parts, while retaining the clean, smooth, minimalist curves of the **original design**.

The challenge was to find a part with a dual function, acting as both a **safety cover** and an **aesthetic cover**.



With the unprecedented nature of the REF Bikes concept in the cycle industry, it seemed highly unlikely that we would be able to find factory parts that matched the specifications, since these were developed in-house.

The choice of 3D printing therefore seemed to be the ideal solution, but the part still had to be designed according to the particular constraints of additive manufacturing.

REF Bikes therefore turned to **Sculpteo's Design Studio**, so that they could work together on a manufacturing solution, as well as on **optimizing the part**.

The part was created according to additive manufacturing's design specificities, and as a result, was produced at the lowest possible cost, and with the best possible rendering, both visually and qualitatively.



SOLUTION PROVIDED:

As the parts had to be strong, flexible, easy to produce and economically viable, the choice naturally fell on **PA12**, for its great versatility.

As a result, Sculpteo is able to supply REF Bikes with black PA12 parts on demand, with a high degree of possible customization, should the need arise. For example, it would be possible to produce these parts in different colors, or even to inscribe personalized branding for customers.

RESULTS ACHIEVED:

With the use of 3D printing, REF Bikes is able to obtain a perfectly customized part, thanks to the high degree of **personalization** enabled by additive manufacturing.

The company has also been able to reduce production costs, avoiding the need to invest in the tooling required for injection production. What's more, thanks to a shorter production lead time compared with traditional production methods, the customer was able to gain easier access to parts, and thus reduce the lead time for the production of its parts.



Conclusion:

In a case study like this, it becomes clear that additive manufacturing is an ideal solution for many companies with distinct needs. Indeed, with possibilities for flexibility, design and customization still unmatched by other manufacturing industries, 3D printing is solidifying its position as a major industry of the future day by day.

* Do you have specific requirements for your project? Need help designing a customized solution? Don't hesitate to contact our [sales teams](#), who will be delighted to help you.

"Sculpteo succeeded in supporting REF Bikes not only as a supplier, but also as an expert. They guided us right from the start of the manufacturing process, in order to achieve the best possible result. They managed to understand the whole point of the part and act as a consultant, without distorting our intention, or the desired aesthetic."


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