

# Maximizing production efficiency with 3D printed tools, jigs, and fixtures



*"3D printing developments result in a 91% cost reduction and 95% reduction in tool development time. Ultimaker makes it possible to improve tool ergonomics by 28% and the final product quality by 35%."*

— Helena Trincheiras,  
Pilot Plant Engineer at Volkswagen Autoeuropa

By using 3D printed tools, jigs, and fixtures, Volkswagen Autoeuropa reduces cycle time operation, labor, and the need for reworking, while improving tool ergonomics. Furthermore, they achieve this at a tenth of the usual cost. The company estimates that they are on track to save €250,000 by the end of 2017.



Volkswagen

## Company

Volkswagen Autoeuropa

## Industry

Automotive

## Challenge

Develop customized solutions to address specific problems, re-engineer application of concepts applied on auxiliary assembly, get rid of paperwork, and shrink implementation time.

## Solution

The initial concept is converted to a digital file, then sent to a 3D printer. Afterwards, the part is post-processed and evaluated through functional testing, saving both money and time.

## Results

- Cost optimization
- Time optimization
- Robustness and process flexibility
- Innovation

## Volkswagen Autoeuropa - Introduction

Traditionally, subtractive processes focus on manufacturing tools for mass production or production of stringent requirement components. In contrast, the additive approach dominates rapid prototyping processes – providing much greater flexibility in the necessary construction time.

With Ultimaker's 3D printers, Volkswagen Autoeuropa could test solutions without having to contact suppliers, saving considerable time. As a result, purchasing costs were reduced (by 91% when compared to working with external suppliers), implementation time cut (95%), ergonomic improvements were made, assembly processes and quality indices improved, and potential problems were easily anticipated at the concept stage.

The company's short-term goal is to create more prototypes, gauges, tools, and spare parts in-house, reducing development time and acceptance testing even further. Ultimaker provides the flexibility and autonomy for continuous improvement, with a direct impact on ergonomics and quality. In the future, they look to further expand on these benefits – with the production of large series which will be applied to the final product.

### Challenge

Before working with Ultimaker, Volkswagen Autoeuropa used third-party suppliers to manufacture their tools. The process took several weeks, especially when multiple designs or assemblies were required. It also meant more paperwork, quotations, and the adoption of a trial-and-error approach, all of which were holding up the tool manufacturing process – at additional cost.

### Solution

After validating the concept in 2014, Volkswagen Autoeuropa now has seven Ultimaker 3D printers in operation, with 93% of manufactured tools previously made externally now created in-house. Within two years, their assembly-tooling cost savings rose – from 70% to 95%. Ultimaker enabled Volkswagen Autoeuropa to test solutions without having to contact suppliers, reducing the time taken by an average of eight weeks.

### Results

Volkswagen Autoeuropa can now avoid processes that waste the company’s time and money, which benefits the team and improves the final product. As Luis Pascoa, Pilot Plant Manager at Volkswagen Autoeuropa, told us: “It’s a simple process – we just convert our idea to a 3D file, send to the 3D printer, post-process the part, evaluate with functional testing, and finish by implementing the idea.”

Ultimaker enabled Volkswagen Autoeuropa to:

- Make even complex concepts a reality
- Develop ideas quickly and easily
- 3D print concepts on the same day as design – shrinking the development process from months to a matter of days
- Reduce costs by testing prototypes, rather than redesigning or altering an existing mold

### Costs

The reduction in time taken and cost to produce prototypes led to a higher ROI, a better quality product, and more customer satisfaction. Innovative 3D printed products of Volkswagen Autoeuropa are being used in several applications and are considered best practices in the Volkswagen group.

3D printing enabled them to test construction and assembly tools, reduce their development times by 95%, and avoid the bureaucratic process of dealing with suppliers. By printing prototypes in-house, Volkswagen Autoeuropa achieved a 91% cost reduction (approximately €150,000 per year).



Printing parts on-demand in-house accelerates the build and delivery process. Manufacturers using Ultimaker 3D printers often see a 40% to 90% lead time reduction.



A previously impractical jig or fixture design is now a viable option; function and performance become the main drivers of design, not cost or time.



No tooling or machining is required to build a model. The cost is far less than traditional manufacturing methods, and the results can be tailored to match exact requirements.

### 2.0 TDI liftgate badge

	External suppliers	Ultimaker 3D printers
<b>Cost</b>	€400/part	€10/part
<b>Project</b>	35 days	4 days

### About 3D GB IRE

In 2015 UltimakerGB Ltd took responsibility for the warranty and technical support for all Ultimaker products in GB & Ire. To ensure we looked after our community to the highest standards we created a webshop and formed a dedicated service team who can respond to customer requests within 24 hours. Our team is trained directly by the manufacturer as well as via our in-house training program ensuring top quality advise and support.

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