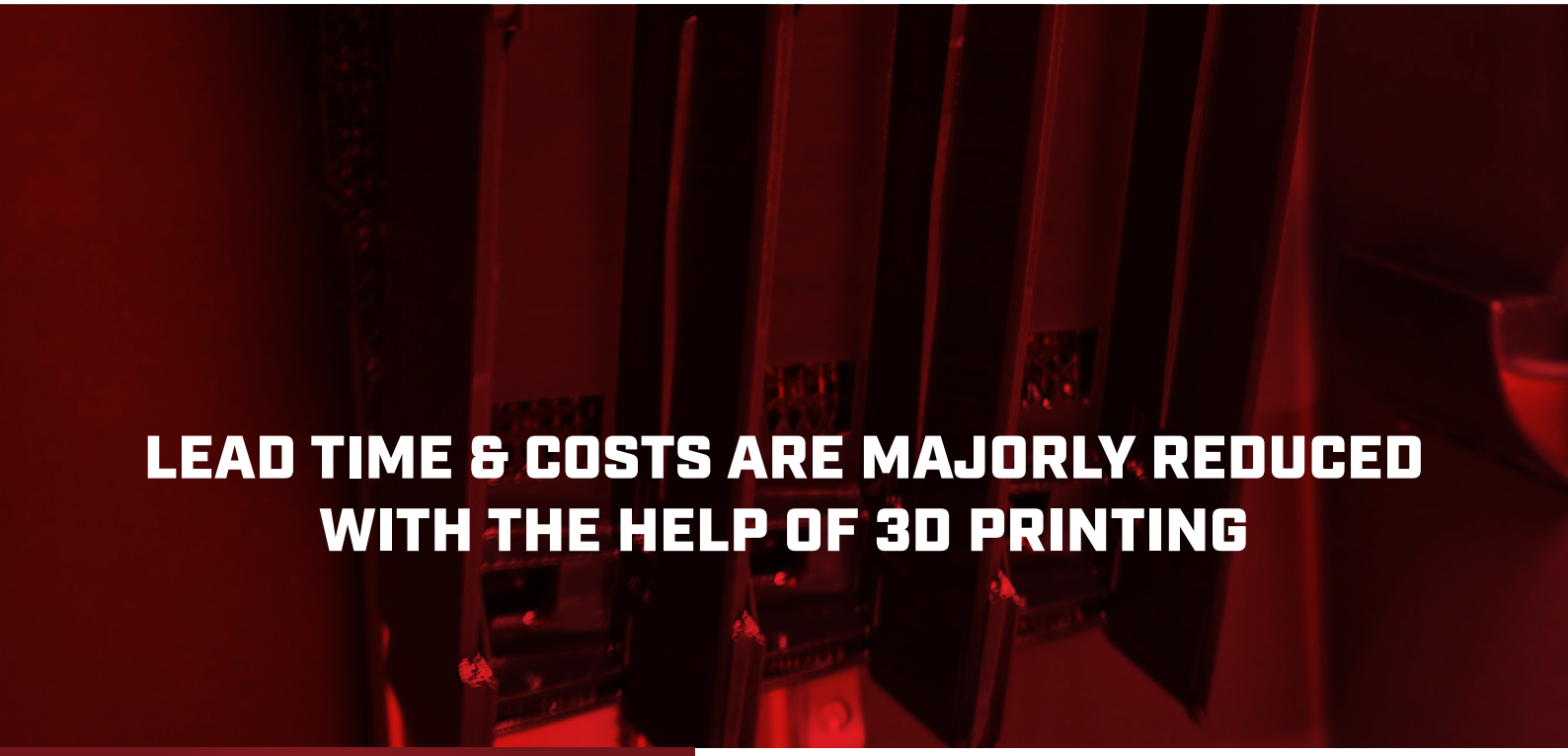
3D PRINTING END USE PARTS: CUSTOMIZED TEST BENCHES FOR AUTOMOTIVE COMPONENT CLIMATIC TESTS

LOCTITE®



LEAD TIME & COSTS ARE MAJORLY REDUCED WITH THE HELP OF 3D PRINTING

Background

Valeo is a French global automotive supplier and partner to automakers worldwide. As an automotive technology company, Valeo designs innovative solutions for smart mobility, focusing on intuitive driving and reducing CO_2 emissions. Valeo also provides and distributes spare parts for automakers and independent aftermarket operators.

Valeo sought a new alternative technology to create customized test benches for climatic tests for automotive components. They turned to the service bureau, Cotu, who leveraged the DLP printing process in conjunction with LOCTITE materials, which drastically reduced lead times and cut costs by 50%.

APPLICATION:
Customized Test Benches for Automotive Components Climatic Tests

MATERIAL:
LOCTITE 3D 3843 HDT60 High Toughness Matte Black

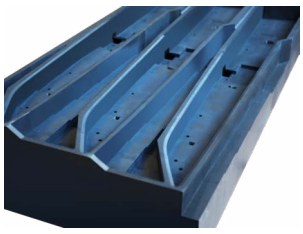
TECHNOLOGY:
DLP 3D Printer

The Challenge

Valeo requires test benches for automotive component climatic tests. The test benches are holders for car interior parts that stay in the orientation needed under tough conditions to aid in testing car components against extreme weathering conditions, such as wind, humidity, dust, and temperatures. Valeo tried CNC machining these test benches, but they found this process far too expensive. Valeo also tried SLS 3D printing in-house, but it was ruled out as it was costly and time-consuming.

After searching for alternative technologies, they found an experienced and local service bureau, Cotu, a 3D printing service bureau with expertise in photopolymer 3D printing for industrial end-use parts. Cotu attempted to produce the parts with MultiJet Fusion (MJF) technology. However, the bigger parts took very long to manufacture while also warping under the testing conditions required for the weathering application. These issues prolonged delivery and resulted in long lead times.

The main challenge was to find a material that could withstand the application requirements. The application required sufficient toughness to keep parts in position at -40 to +85C, minimal water absorption, resistance to humidity level 95+/-4%, and UV stability. Cotu continued to look to Additive Manufacturing, this time, the DLP 3D printing process, as they felt it was the right fit to satisfy the customer's needs.



Customized Test Benches

Henkel

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The Solution

Technology: DLP 3D Printer
Material Selection: LOCTITE 3D 3843 HDT60 High Toughness Matte Black
Cleaner: IPA

LOCTITE 3D 3843 HDT60 High Toughness Matte Black				
43 %	**1806 MPa**	**51 MPa**	**53 J/m**	**63°C**
Elongation at Break	*Young's Modulus*	*Ultimate Tensile Strength*	*Impact Strength (Notched)*	*Heat Deflection Temperature*

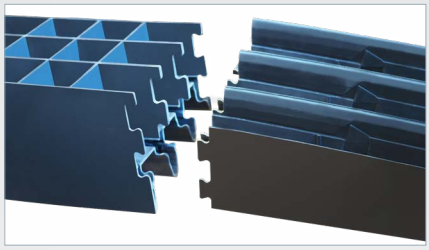
Cotu looked to the Loctite 3D printing materials portfolio to meet the customer's needs. Loctite 3D printing offers a diverse portfolio of engineering-grade resins for various DLP printer platforms. Cotu determined that Loctite 3D 3843 HDT60 High Toughness in Matte Black was the best material solution for this project. This material is a high-strength engineering plastic with good impact resistance and an excellent surface finish. The new and improved custom-designed test benches were created by leveraging LOCTITE 3D 3843 HDT60 High Toughness on a DLP 3D printer. Using the DLP process instead of MultiJet Fusion (MJF), the printed parts could better match application tolerances, have a smoother surface finish, a higher chemical resistance, and low shrinkage or deformation during the print.

Loctite 3D 3843 HDT60 High Toughness also meets material requirements such as sufficient toughness to keep automotive components parts stable between -40 to +85C, minimal water absorption, resistance to humidity level 95+/-4%, and sufficient UV stability.

BENEFITS

By utilizing LOCTITE 3D 3843 HDT60 High Toughness and the DLP printing process, Cotu was able to create a cost-effective solution for Valeo. 3D printing with LOCTITE 3D 3843 HDT60 High Toughness delivers outstanding mechanical properties, high durability, and excellent surface finish.

The cost of these end-use parts was reduced by up to 50% in comparison to the multijet fusion process. Printing in-house resulted in a lead time reduction of several months in comparison to traditional manufacturing methods and the old process of part production in the Valeo headquarters then shipping the parts.



Customized Test Benches

''We are surprised what benefits 3D printing using photopolymers brings.'' explains David Váňa, Laboratory Leader, VALEO TCE Prague. ''It is significantly quicker, cheaper in comparison to methods we used previously, and the materials fulfill the mechanical parameter requirements needed. It's great that this technology has moved so far forward and is applicable for functional parts production already. It saved us a lot of development time.''

Want to learn more about Henkel's unique material solutions for the additive manufacturing industry?
Visit Henkel's LOCTITE 3D Printing at **LoctiteAM.com** or reach out to us via **loctite3dp@henkel.com**

About LOCTITE

LOCTITE Additive Manufacturing delivers unique photopolymers with production capability, customized resins and engineering services to identify the best application to address your needs. With a constantly growing portfolio of high-performance materials, specialized equipment and post-processing solutions, LOCTITE overcomes the limitations of conventional 3D printing to enable additive manufacturing for the production of durable, functional parts. Through its strategic partnership with technology leaders for specialized equipment, LOCTITE is driving the adoption of 3D printing beyond prototyping and toward the production of final parts. **(www.LoctiteAM.com)**

About cotu

Cotu was established in 2015 reaching across the European Union primarily the Czech and Slovak market. Cotu is a 3D printing integrator with expertise in 3D printing with photopolymers within industrial segments such as automotive, consumer electronics, manufacturing, defense, stomatology, jewelry, plastic models, and advertisement. We utilize 3D printing at a stage where others fail. We provide 3D printing services, having experienced product designers help customers through all phases of the product development process. We replace conventional manufacturing technologies with the use of 3D printing to continue moving this technology forward and increase its applicability by developing new workflows and tuning materials in order to fit customized applications. We can 3D print final products in a series without the need for further surface post-processing or corrections. We cooperate with market leaders such as Henkel LOCTITE on 3D printing materials development and perform real end-use application tests. **(www.cotu.cz)**

About Valeo

Valeo has been present in the Czech Republic since 1995 with the first production plant in Rakovník, followed by two other production site openings in Žebrák (2001) and Humpolec (2002) manufacturing air conditioning systems, exhaust gas recirculation systems, interior control panels and front-end modules. The factory in Podbořany (2006) manufactures hydraulic clutch and brake actuators. The Development activity was established in 2002 in Prague, initially as an engineering office focused on mechanical design of air conditioning units and interior control panels. In 2013 the activity was extended by the development of sensors, software and systems for automated driving and automated parking, followed by the opening of a test track in Milovice enabling high and low-speed maneuvers. In 2019 Valeo carried out its two biggest investments in the country: the extension of the Žebrák plant to launch the production of battery coolers for electric vehicles and the opening of a second factory in Rakovník dedicated to sensors and interior control panels. **(www.valeo.com/en/czech-republic/)**