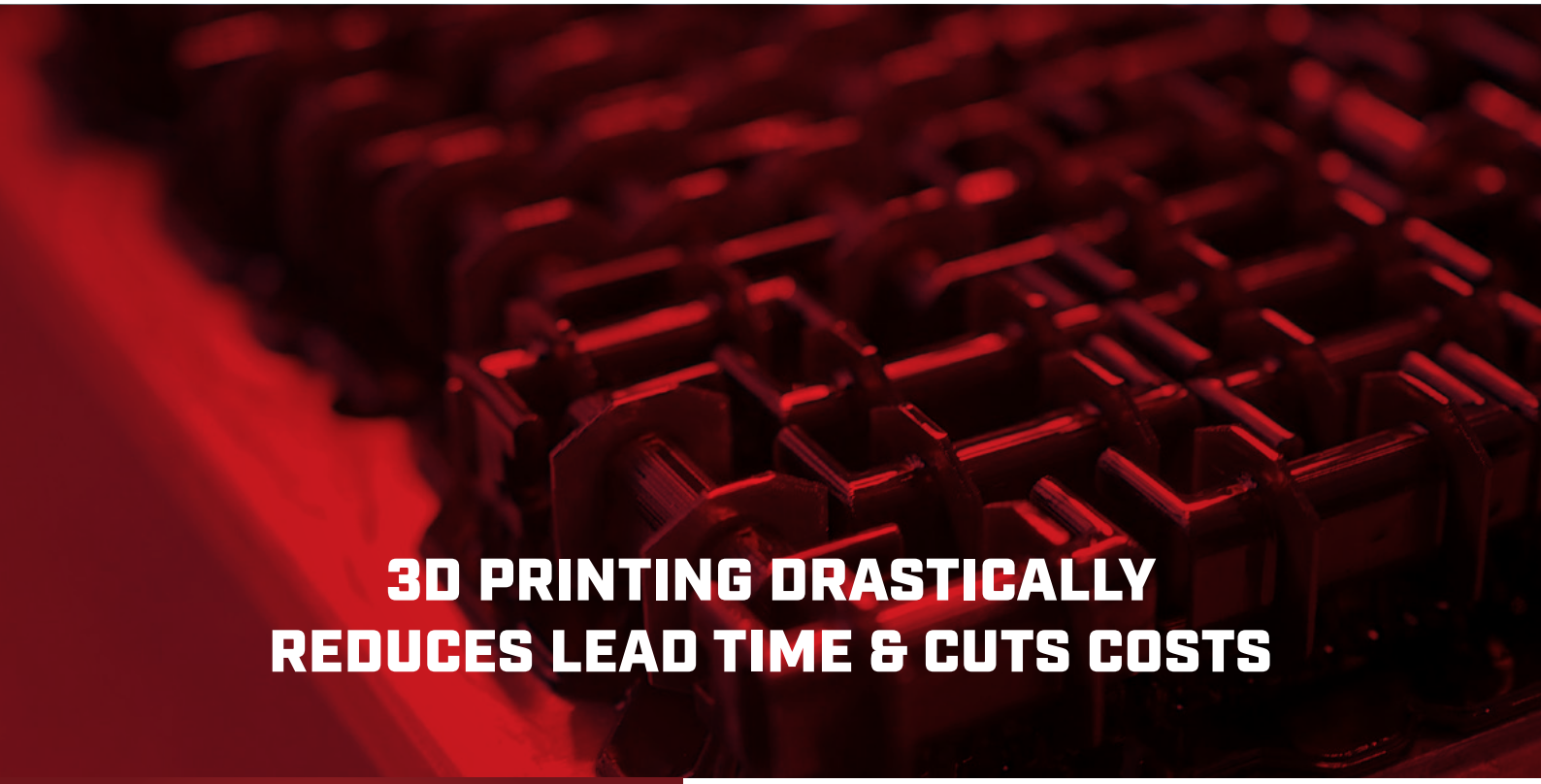
LOCTITE®



3D PRINTING DRASTICALLY REDUCES LEAD TIME & CUTS COSTS

Background

RELMAG electronic s.r.o. is the market leader in the field of reed technology in the Czech Republic, especially due to their 30 years of experience and the base provided by their own production plant. They are a reliable partner for the production and sales of reed relays, sensors, switches and permanent magnets, including customized solutions. With this expertise, the given volume and project requirements from one of their customers, additive manufacturing proved to be the most suitable solution. Using Asiga printing technology and LOCTITE material, both the lead time and costs were reduced significantly.

APPLICATION:
3D Printed Relay Component

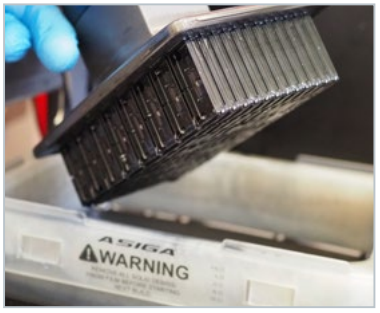
MATERIAL:
LOCTITE 3D 3843 HDT60 High Toughness Matte Black

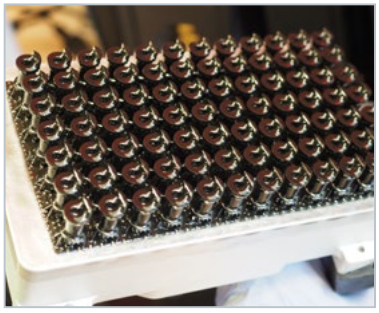
TECHNOLOGY:
Asiga PRO 4K

The Challenge

RELMAG's customer required a very specific and custom-designed purpose relay. Due to its economic inefficiency, the injection molding process is not practical for smaller projects. As well as that, the lead time for injection molded parts was six weeks which also posed some challenges. The main challenge, however, was the need for an affordable custom-designed product that could support multiple iterations, including any change requests, and the guarantee that the application would meet all electronic properties, such as dielectric strength.

RELMAG decided to turn to Service Bureau, Cotu and move away from traditional manufacturing methods to solve their problems. They looked to Additive Manufacturing, specifically the DLP 3D printing process, as they felt this process was the right fit to satisfy the customer's needs.





3D Printed Relay Components

Henkel

3D PRINTING END USE PARTS: CUSTOMIZED RELAY COMPONENTS

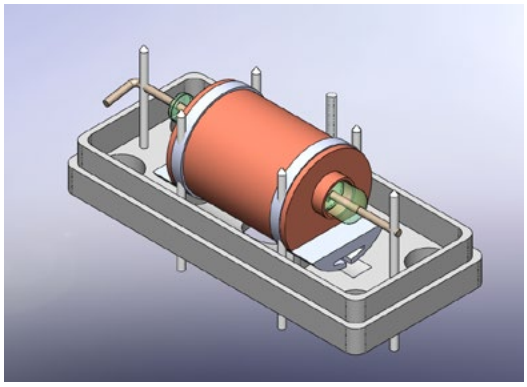
The Solution

Technology: Asiga PRO 4K
Material Selection: LOCTITE 3D 3843 HDT60 High Toughness Matte Black
Cleaner used: 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*

After evaluating the LOCTITE 3D printing materials portfolio, Cotu determined that LOCTITE 3D 3843 HDT60 High Toughness Matte Black was the best solution to meet part requirements. This material offers the characteristics of high-strength engineering plastic, similar to ABS, with good impact resistance and excellent surface finish.



3D printed relay component

The new and improved custom-designed relay components were created by leveraging LOCTITE 3D 3843 and the DLP printing process on the Asiga PRO 4K printer. The 3D printing process allowed them to quickly go through all the development phases, from prototyping to final part production, by producing 250 parts in a single print job. Ultimately, this proved Cotu's theory that photopolymers are much more efficient than other technologies while still providing the excellent surface finish and dimensional accuracy requred for these custom-designed relay components.

BENEFITS

By leveraging 3D printing and the additive process, Cotu could create a cost-effective solution using LOCTITE 3D 3843 HDT60 High Toughness for RELMAG. Printing with this material ensures outstanding mechanical properties, high durability and excellent surface finish.

The cost of these end use parts was significantly reduced as there was no need for injection molding. Manufacturing smaller batches using mold injection would incur a huge cost per part. The lead time was also reduced dramatically. Previously, it took around 6 weeks to manufacture the mold. By using Asiga 3D printing technology and LOCTITE material, these parts could be printed in a single 90-minute print job. The main benefit, however, was to fulfil requirements of such an individual project while keeping in mind its economical aspect and still guaranteeing that all electronic properties are met.

> ***''3D printing has opened a new door for us - to develop and produce smaller batches of products that are far from any default of the shelf solutions. Thus, we now have the capability to serve customers running smaller and completely specific projects from now on,'' explains Zdeněk Zamrzla, Product Manager, RELMAG electronic. ''We are amazed, how accurate and precise 3D printing can be and how we can use this technology for final products production as well. Based on that we now consider integrating 3D printing into our production process.''***

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 ASIGA

In 2011, Asiga launched the world's first LED based DLP 3D printer and started the affordable desktop stereolithography revolution which changed digital manufacturing forever. Asiga gained international recognition for the innovations contained within their precise and repeatable 3D printers. These technologies continue to lead their respective categories to this day. Asiga designs and manufactures all products at their headquarters in Sydney, Australia. For more information and a list of Asiga resellers, please visit **www.asiga.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 RELMAG electronic

RELMAG electronic s.r.o. has been operational in the Czech Republic since 1991. RELMAG electronic s.r.o. is the market leader in the field of reed technology in the Czech Republic, especially due to our 30 years of experience and the base provided by our own production plant. We are a reliable partner for the production and sales of reed relays, sensors, switches and permanent magnets, including customized solutions. RELMAG electronic s.r.o., thanks to a cooperation agreement with StandexMeder Electronics GmbH, is a producer of the reed products of StandexMeder Electronics and the sales representative of StandexMeder Electronics in the Czech Republic, Slovakia, Poland and other countries of Central and Eastern Europe. **(www.relmag.cz)**