



Case Study

Automation as passion

ASS Luippold Automation Systems & Service e.K., based in Keltern, Germany, realises automation and process solutions. From planning and design to the implementation of complete production lines, ASS Luippold accompanies every project with competence and passion.

In this way, the machines are used throughout Europe in a wide variety of industries, mainly in the PCB industry.



Project Goals

Lightweight yet stable components for robotics

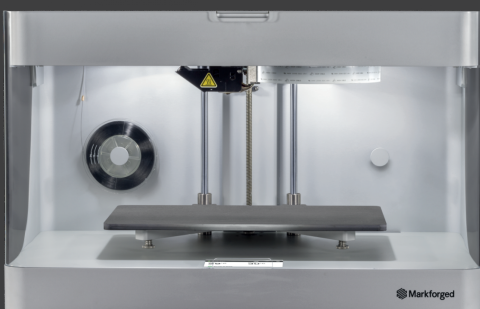
Elmar Daubenmaier, Construction Manager at ASS Luippold, was already able to gain experience with additive manufacturing during his studies and privately. Until now, they had various parts printed by service providers using the SLS process. In order to bring this manufacturing step in-house and thus gain independence, Mr. Daubenmaier looked for a suitable 3D printer for manufacturing and found what he was looking for with Markforged.

The requirements for the printed components were stability and at the same time the lowest possible weight. The robots for printed circuit boards, for example, can only transport a limited amount of weight, of which the printed circuit board sometimes already accounts for half of the weight. To avoid having to switch to the next stronger model, all grippers should be as light as possible without losing stability. In addition, extreme weight savings can be achieved with the Markforged 3D printers compared to aluminium parts.

Materials:

- ✓ Onyx
- ✓ Fibre Glass
- ✓ Carbon Fibre
- ✓ Kevlar Fibre
- ✓ HSHT Fibre Glass

The Mark Two



Implementation

Every company has parts that can be additively manufactured!

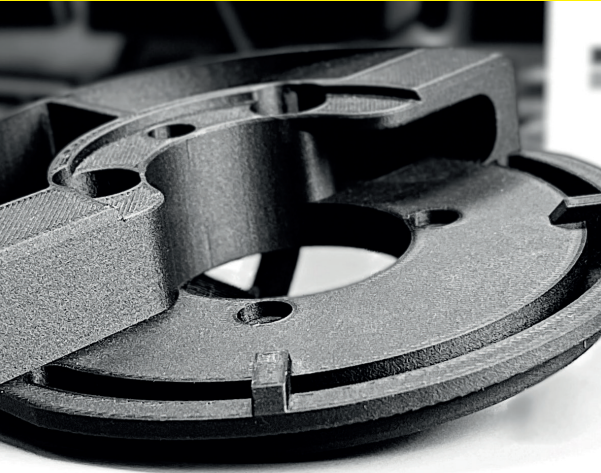
The management could be convinced without any obstacles. Thanks to the sample component that was individually printed especially for ASS Luippold, they were able to test it directly under the real conditions and determine its reliability.

Expectations were even exceeded after installation and the colleagues were positively impressed. The designers developed a completely new, innovative way of thinking due to the new manufacturing freedoms. „The new technology was also no challenge to use, as the printer and software are child’s play to learn and operate. Maintenance is also no problem for us machine builders.

If there were any questions or problems, the fast and competent support from Mark3D always helped us quickly!” says Elmar Daubenmaier with satisfaction.

The Mark Two is used in full production. Design samples, feasibility studies, prototyping, but mainly end applications for robot gripping technology and parts needed for in-house orders. Furthermore, almost all small parts are printed from sheet metal bending parts.

But also as a service provider they print and develop various customer requests from racing parts to forearm prostheses to parts of a small 3D printed combustion engine.



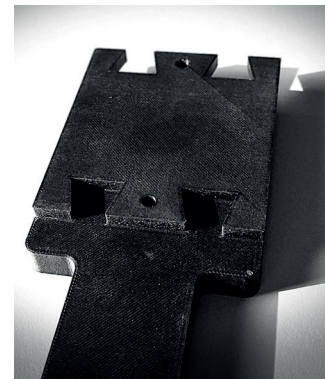
Solution

You have to rethink to use the full potential

In special machine construction, all machines are actually prototypes, but they have to work. If there are design or manufacturing errors, or if the programmer is busy at the machine and needs another part at one point, he only has to wait a few hours instead of several days or even weeks to get the desired part now. This has an immense effect on time-to-market – but also on employee motivation.

The parts have similar properties as carbon parts, but cost only 1/3 and can be produced unmanned overnight or over the weekend. Complicated milled parts and clamping devices for our CNC milling machines are printed overnight. „We also use it to produce spacers and assembly gauges for our employees. This relieves the milling department and allows it to concentrate on its core business,“ says Elmar Daubenmaier, who also holds the position of Technical Manager.

For the vacuum grippers of the PCB robots, larger components are needed than the 3D printer can print in one piece. Here, the design team has found two solutions: Either the part is divided into three smaller pieces and screwed together with a precise fit, or it is inserted into each other like puzzle pieces. „With the form-fitting connections, we were surprised at how precisely they came out of the printer. We rarely need to rework the CAD model here,“ says Elmar Daubenmaier.



„We have developed a welding machine for foam profiles. We printed all the dies needed for these profiles. Conventional production would have been far more expensive.“ Even a mould to coat parts of an extraction unit with synthetic resin was printed completely. In addition, various other highly complex components of a sophisticated machine extraction system are manufactured with HSHT glass fibre reinforcement.

Mr. Daubenmaier is often asked how 3D printing could be implemented at the company. They think of a 1-to-1 implementation. „But sometimes you just have to rethink so that you can use the full potential of additive manufacturing!“ ASS Luippold was also able to refute the prejudice that plastic parts are not stable enough with a spontaneous experiment: Spare gear parts were needed for a machine. These could not be procured so quickly, so they printed them and reinforced them with continuous carbon fiber. The gears were installed in December 2018 and the machine has been running with plastic gears without failures ever since!

At a glance

- ✓ 66 % cost saving compared to carbon production parts
- ✓ faster time-to-market
- ✓ unmanned production
- ✓ 6000 hours of successful printing
- ✓ CNC milling department can concentrate on core business
- ✓ Extreme weight saving
- ✓ Short waiting time for spare parts





„The gears were installed in December 2018 and the machine has been running with the same plastic gears since then without any failures!“

*– Elmar Daubenmaier,
Design and Technical Manager
at ASS Luippold*

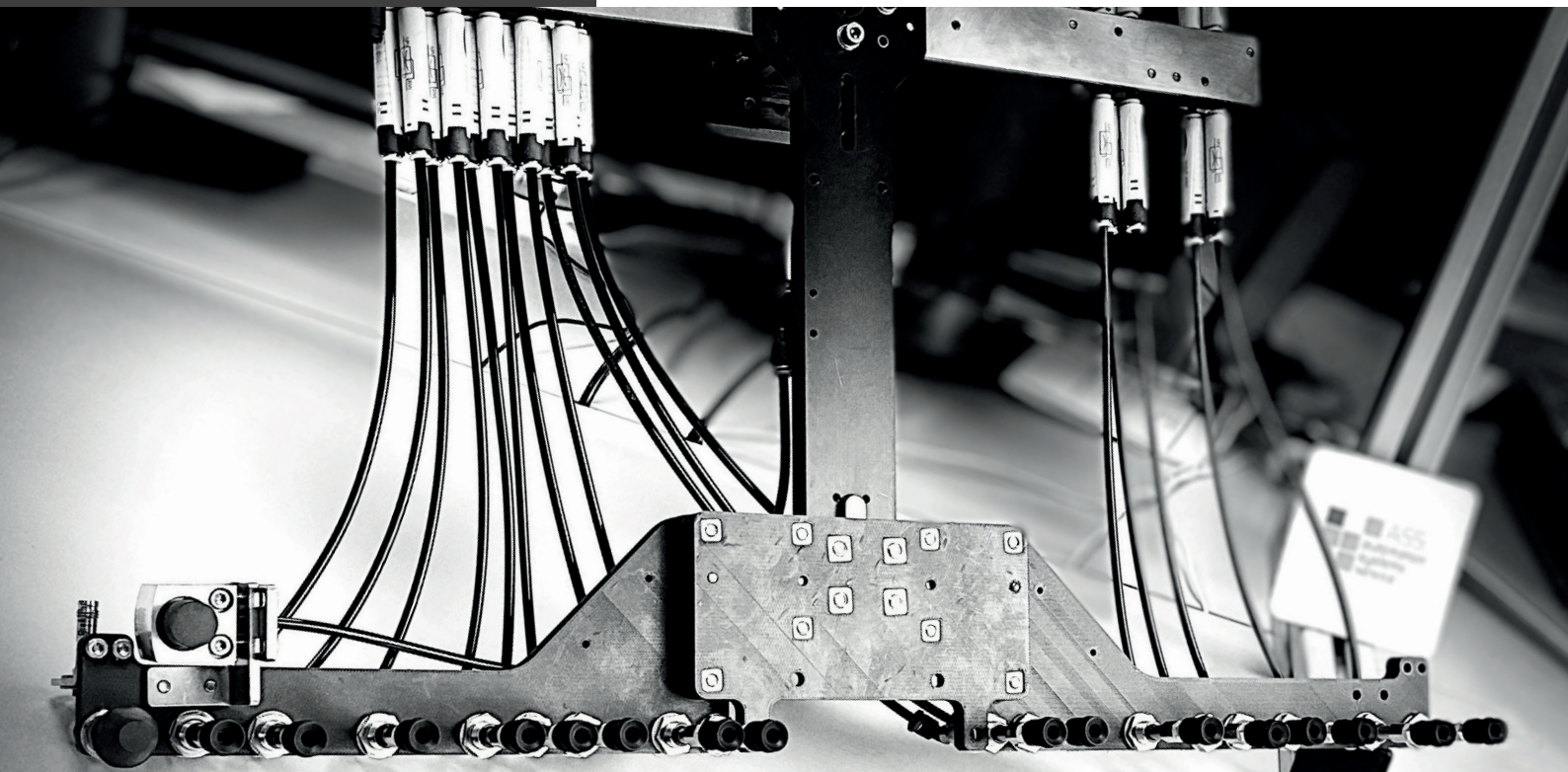
The Future

Service with construction portfolio

Every company has the potential to use additive manufacturing successfully. Once you start, you can think of more and more possibilities for applications. It is important that the whole company is integrated so that all departments can work hand in hand with this innovation.

At ASS Luippold, the near future will not only see further development of robotic grippers, but also the replacement of even more sheet metal and milled parts with 3D printing.

„Further we want to expand the area of service and competently advise our customers with a construction offer specialised in additive manufacturing. Then we will also acquire more 3D printers to be even more broadly positioned for contract orders.“



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