

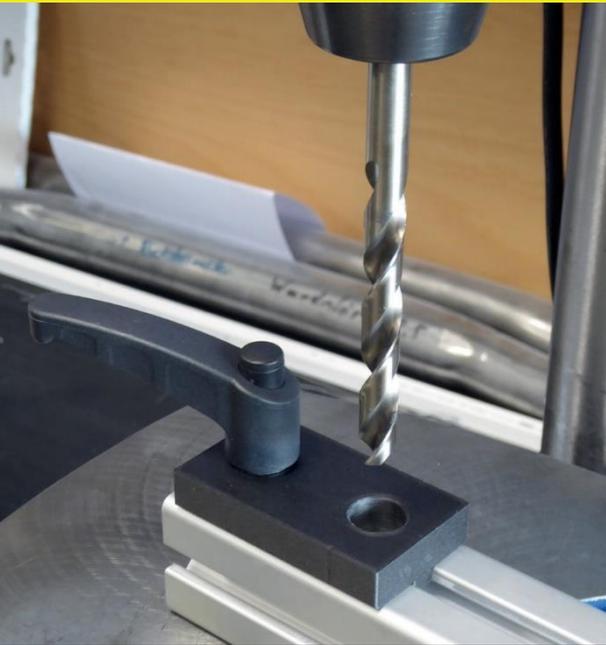


Practical Report Additive Manufacturing

Everything from a Single Source

David Oelschlägel, founder and managing director of DAVOSCAN GmbH, began in 2014 with services in the field of optical 3D scanning and measurement of industrial components. The demand quickly expanded to include reverse engineering and automated robotic measurement technology.

Initially, a 3D printer was purchased for its own auxiliary components. The additive construction and now five Markforged 3D printers round off the range of services professionally today



Project Objectives

Independence through Complete In-House Production

In 2015, David Oelschlägel was looking for a way to be able to manufacture small components for the creation of measurement recordings and “auxiliary components” in-house, so as not to be dependent on a supplier. CNC milling was out of the question for DAVOSCAN for various reasons.

“We can manufacture all contour-bound components that we need for our measurement recordings in-house and are therefore 100% independent!” Says David Oelschlägel happily.

Approach

Fast and Reliable Customer Satisfaction

“Markforged offers hardware, software and material in the quality we need. The system is “round” – we can concentrate fully on our project work and don’t have to “bother” with printer parameters. We now use five Markforged 3D printers and can rely on the fact that, regardless of which 3D printer we use, the result will always be the same. For us, Markforged’s 3D printers are production machines – we concentrate on generating the data required for printing,” reports David Oelschlägel.

The 3D printers are operated by all employees and thus components for measurement recordings (3D scan), “auxiliary production parts”, spare parts, etc. are produced. This allowed the drilling aid for standard aluminum profiles shown above to be designed, printed and used quickly as required.

“Our customers always give us positive feedback that the price and quality are convincing because the” Markforged system “simply works.”

Pictured on the left is a modified cover for a hull thru-hull of a sailing yacht. This should be able to be exchanged quickly and easily for an Atlantic crossing and was converted from a screw solution into a plug connection. The original components were recorded using the 3D scanner, the data were adjusted and 8 modified components made of onyx were printed.

These components withstood the requirements for six weeks in salt water.

Overview

- ✓ Everything From a Single Source
- ✓ Independence
- ✓ Low cost
- ✓ Reliable system
- ✓ Competitiveness
- ✓ Reliable quality
- ✓ Customer satisfaction



Solution

3D printing for Personal Use, and a Service

"Before, we didn't have the opportunity to manufacture parts ourselves. Now it's just great if we can get an idea or a quick job done right away, simply by starting the 3D printers!"

Many components that are manufactured on the Markforged 3D printers are for your own use or to make everyday life easier.

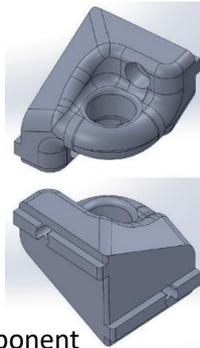
A mounting bracket for a measurement aluminum profile should be light enough to hold the construction with one hand and maintain a right angle. The many rounded edges, holes and screeds could be implemented quickly and easily with additive manufacturing.

Shown on the lower left is a holder for an airbrush gun, which previously had to be put down indiscriminately. The small component has a size of about 5 x 3 cm and could be printed in 1 hour 18 minutes.

The housing component shown below (the original on the left) was scanned 3D and reverse engineered for the 3D printer. The cost of the 3D printed housing (to the right of the original) is 90% cheaper than the original component.

In addition, the 3D printed artificial part is much lighter than the original with almost the same properties.

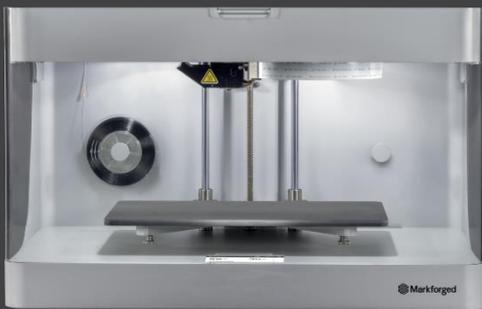
Here you can also very well enjoy the high-quality surface quality recognize. This is the same as injection molded parts!



Materials:

- ✓ Onyx
- ✓ Glass fibre
- ✓ Carbonfaser
- ✓ Kevlarfaser
- ✓ High temperature glass fibre

The Mark Two



The flagpole depicted on the front page was designed as an alternative to a costly procurable flagpole. The upper part has been provided with a ball bearing so that the flag can smoothly adapt to the wind direction. The part was printed without additional continuous fiber reinforcement and serves as a long-term test object. It has been exposed to the sun and various weather conditions there every day for 1.5 years.

DAVOSCAN considers the consideration of "hybrid buildings" to be very useful, since not everything always has to be 3D printed. The use of additive technology also makes sense in conjunction with other technologies.



The Future

High Potential for a Secure Future

"After several years of experience, I fully agree that 3D printing is a real addition to production. Our now 5 production machines from Markforged are indispensable for internal tasks and customer projects. Industrial 3D printing is NO longer a technology of the future!"

*– David Oelschlägel,
Managing Director*

"Hardware, software and material form a well-functioning system. We would like to further expand the potential in the field of 3D printing and, above all, what it brings for us, especially thinking in this direction in advance during the development phase (design).

There are many more examples of how 3D printed building parts make everyday life easier. A holder for roller shutter remote controls was printed on the bottom left, and an adapter for a camera tripod on the right. Because a camera did not fit on the tripod thread, DAVOSCAN quickly designed an adapter into which the two matching threads were inserted during printing.

"We often no longer look for whether there are required parts to buy somewhere on the Internet. After considering the cost-benefit effect, our gaze then goes directly over to the 3D printer."



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