



Case Study: 3D printing industrial equipment from prototypes to high volume parts

The company BMF – (Bernstein Mechanischefertigung GmbH) was founded in 2007 by Ronny Bernstein and is based in the Grüna district of Chemnitz. BMF started life as a service provider that specialized in individual CNC parts, small batch work and prototypes for customers from the medical, automotive, and mechanical engineering industries, amongst others.

With the development and manufacture of a new type of blasting technology for homogeneous and reproducible surfaces, this small service provider has now grown from two initial employees into a global operating company in the mechanical and plant engineering sector.

The Challenge

The high functionality of the Smart Surface Control technology developed by BMF GmbH means a large inventory of different components are used for each machine build. Some of these are complex parts with high manufacturing costs. Until now, this has required a long production lead time and costly warehousing.

It also meant that Customer requests regarding special equipment, could only be realized to a limited extent. The aim was to replace the largest possible proportion of machined components with additively manufactured components, to minimize warehousing and to streamline (or shorten) manufacturing processes.



“ We only manufacture what is needed immediately. Our warehouse is now on a spool! ”
Chris Tettalowsky
Head of Blasting Systems

Implementation

BMF GmbH opted for a Markforged Mark Two 3D printer. In the first step, only components without mechanical stress were printed, these were such items as a status light holder or the frame parts for viewing windows.

Intensive tests, including specific long-term testing, showed that the Markforged base material ‘Onyx’ is also suitable for components with high mechanical loads, such as the machines beam area.

When combined with Markforged’s unique fiber reinforcement, known as CFF (continuous fibre filament) BMF soon realized the scope of use for printed parts was bigger than expected.

Workpiece carriers, covers, and a wide variety of workpiece holders are now manufactured using 3D printing. One difficulty overcome early on was a need to change the component design, to suit 3D printing. This places completely different demands on the way the part is designed and can be very different than ‘normally’ manufactured parts. It is also possible to realize geometries that cannot be produced conventionally or can only be produced with great effort.

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The Solution

The implementation of the Markforged technology in the production process enables a significant number of the parts that were previously made by conventional methods to be transferred to 3D printing.

Due to the targeted use and a close working relationship with the assembly team, part storage could be significantly reduced, the manufacturing effort minimized, and the functionality increased.

Why Markforged?

The ease-of-use of the Markforged Mark Two 3D printer, coupled with the impressive Eiger software were the main reasons for choosing the technology. Of course, this was in addition to great value for money.

Originally intended as an introduction to 3D printing technology, it is now used in many areas of the company ranging from one-off's through to end use parts.



“Special customer requests can be realized in the shortest possible time and at low costs.”

Marc Krause
Technical Sales

Markforged 3D printers now make a variety of different parts for the Twister and Tornado range of machines.

The components made of the base material Onyx have proven themselves to be very wear-resistant and almost unbreakable even under extreme loads. This means that they can be used in the beam area without hesitation. In comparison to milled components, a weight reduction of over 60% was achieved and the lead time for production is only hours.

In Conclusion

3D printing has become an integral part of manufacturing our systems. In the future there will be other fields of application that we will be using the technology for.

The relatively low investment costs in 3D printing have proven to be a big and successful step into the future for BMF GmbH.



“3D printing saves resources and creates capacity in conventional manufacturing.”

Ronny Bernstein
M.D. BMF GmbH