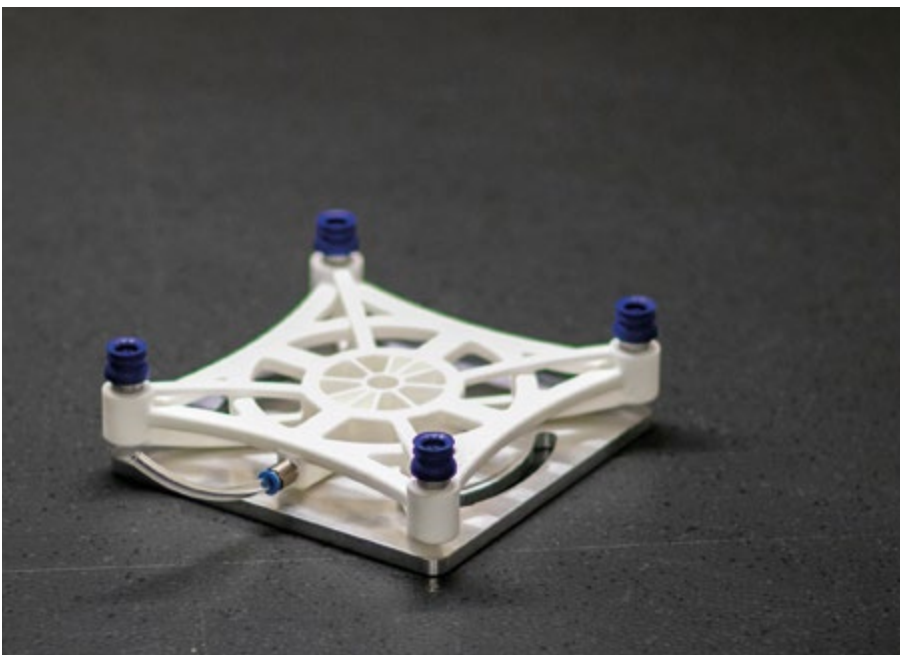


More Reliability with Precisely Fitting Solutions

Source: SSI Schäfer



Individual special gripper from PA 2200 leads to reduction of set-up time and increase of production time while achieving a weight reduction by more than 70 %

Challenge

Manufacturing of individual special grippers with integrated air ducts for product extraction from injection molding machines in the production cycle

Solution

Additive manufacturing of several gripper series from PA 2200 on an EOS P 396

Results

Weight reduction of the grippers by more than 70 %

Reduction of set-up times by 80 %
increase production time by approx. 120 hours per year

Procurement time for grippers shortened from several weeks to just a few days

Function integration reduces assembly effort and number of individual parts from 18 to 6

Additive Manufacturing for Extraction Grippers at SSI Schäfer

Storing, conveying and transporting, order picking, etc. – SSI Schäfer is a specialist when it comes to modular storage and logistics systems and the associated software. For the production process of storage, transport and order picking containers, the company was looking for a more cost-effective and above all more reliable and smoother way to extract containers from its injection molding machines. The solution was the additive manufacturing process.

Challenge

Failure of IT systems, human error... the list of possible reasons for a loss of production is long. Much less exciting, but even more relevant in everyday operations than disaster scenarios, are the pitfalls in the very production-inherent processes. This also applies to SSI Schäfer: for many years, the company used a universally applicable aluminum gripping system to manufacture its storage, picking and transport boxes. These „metal hands“ consisted of aluminum profiles with receptacles for suction cups. This mechanism was adjusted by means of hexagon screws – again and again, depending on the type of container manufactured.

The decisive factor here is precision: the suction cups must be in exactly the right position so that the boxes can be removed from the injection molding machine easily and quickly during the production cycle. If this does not happen, there is a risk of the container tilting, which may result in a shutdown of production. Even without this „worst case“, it is clear that the recurring costs for retooling are significant: „Because of our large product portfolio, we have to change the set-up on one of our many injection molding machines about three times a day,“ explains Michael Zander, Head of Plastics Production in Neunkirchen/

Siegerland (Germany). So far, about ten minutes have been needed only for these conversions, and on top of that were the corresponding lost revenues due to machine and production downtimes.

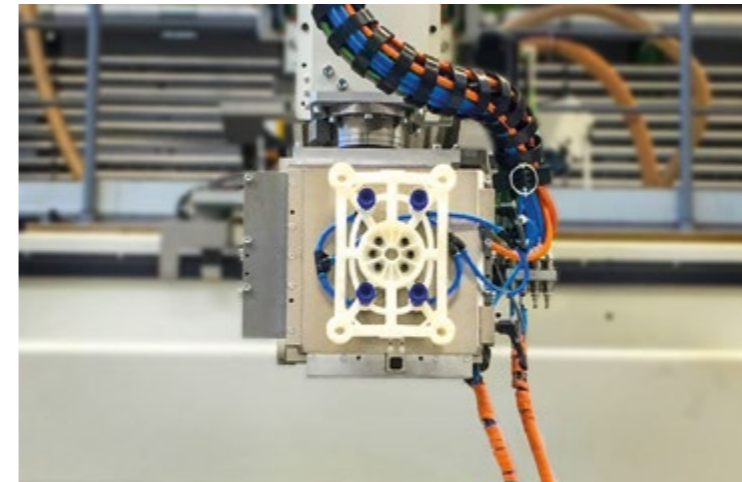
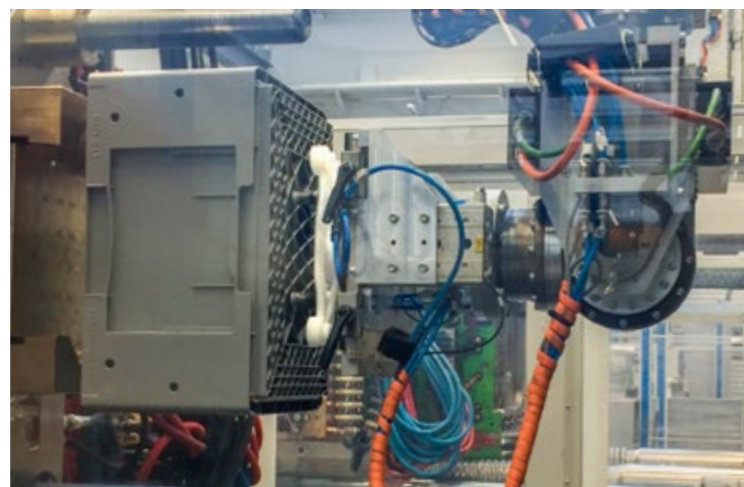
In view of this fact, it is easy to understand why the company wanted to improve the process. There was another reason for this: with a better solution, it was possible to reduce costs not only indirectly but also directly. In fact, by fundamentally reducing the set-up times and downtimes of the injection molding machines.

Short Profile

The SSI Schäfer Group is the world's leading solution provider of modular storage and logistics systems. The company employs more than 10,500 people at its international headquarters in Neunkirchen, Germany, in 70 operating companies and at eight production sites in Germany and abroad.

For more information
www.ssi-schaefer.com

Small gripper, big effect: The individual fit guarantees a perfect extraction.
(Source: SSI Schäfer)



Easy to recognize: The suction cups, which are controlled via integrated air ducts.
(Source: SSI Schäfer)

Solution

With the support of the technical consultants from EOS Additive Minds, the team from SSI Schäfer was able to build up knowledge within a short period of time and specifically found this potential for improvement: the error-prone aluminum gripper was to be replaced by several dedicated grippers, each of them individually adapted to the respective box sizes and shapes. These had to be durable, quick to replace and optimally adapted to the respective requirements. The basic idea is therefore similar to that of sport: a decathlete is certainly an impressive athlete, but the experts in their individual disciplines are usually noticeably superior to him. Following this concept, EOS and SSI Schäfer set to work on the project.

The design of the suitable grippers was relatively simple, as all data on the containers were available in-house. It was also important to leave old design paths behind and make optimum use of the special capabilities of 3D printing: the integration of the air ducts in the gripper, which in turn form the basis for the pneumatic gripping mechanism for extracting the containers, is one of the specialties of additive manufacturing. It was also necessary to design the components in such a way that stability and function harmonize with one another because of the compact size and low weight of the gripper.

„Ultimately, such a design is always a compromise,“ explains Toolmaking Manager Torsten Kosiahn. Thanks to its balanced property profile, the PA 2200 material selected for this purpose has proven itself in thousands of applications: solid, stiff, resistant to chemicals, durable. In addition, it enables a high level of detail and comprehensive post-processing options – in short, ideal for functional parts and movable connections. The grippers were produced in an EOS P 396.

Results

In this way, SSI Schäfer was able to design and build quite a multitude of grippers in just a few days. And they have dramatically reduced retooling times: a few clicks are now all it takes to get a gripper that is

perfectly matched to the particular euro container. This is also noticeable in figures. The approach reduced set-up times by 80 % and gained approx. 120 hours of production time per year.

Hardly to express in figures are the possible consequential expenses if a serious error in gripper setting would have led to a prolonged failure, because with manual fine tuning of the old grippers, the danger of operating errors was always present in the background. By redesigning the grippers accordingly, this is virtually impossible – the suction cups are now always reliably in the right position.

The new grippers are also more than half lighter than the old ones because of their material. This weight saving of more than 70 % and the increased user-friendliness naturally also appeal to the personnel who carry out the changeovers. SSI Schäfer has achieved all its goals: greater reliability, lower costs and weight savings, as well as an increase in productivity.

„Our requirements were very clear: reliability and speed had to increase with the conversion of the grippers. With the additive manufacturing of our gripper systems, we were able to solve this problem and reduce costs. I'm very pleased with the result and with the support from the EOS Additive Minds Team.“

Kasim Mohamed, Product- and Innovation Manager, SSI Schäfer

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