User Report: Gebr. Becker GmbH

Change in production of cast housings for vacuum pumps: Simplified processes and increased output

Hainbuch quick change-over system minimizes set-up processes with no compromises in accuracy

Efficient processes combined with consistently high quality – Gebr. Becker GmbH in Wuppertal has started a substantial realignment of the company's production strategy. For example, the manufacturer's vacuum and pneumatic technology now relies on centroteX quick change-over systems from Hainbuch. Rightly so: the systems simplify set-up processes, while guaranteeing repeatability of ≤ 0.003 mm.

Good equipment and joint planning for the production line

To further optimize the company's own production, Gebr. Becker is successively converting to assembly line production. This affects especially the employees of the Mechanical Technology [MT] department. Dirk Schmidt, who is the manager of production technology there, is responsible for the acquisition of new machines. He plans the processes and takes care of equipping the machines with tools, fixtures and clamping devices.

Optimal planning of the processes is achieved by Dirk Schmidt with the SMED method [single minute exchange of die]. This makes it possible to set up a machine or a production line within a production cycle so that it can be reused with only minimal delay. "The most important aspects of the method are accuracy, low-distortion clamping, and set-up minimization," says Dirk Schmidt in describing the clamping device requirements.

Excellent equipment is one thing. But it is just important for the production technology manager to have a competent partner to assist him in analyzing his projects and challenges. This partner is Jörg Fedtke, a field technical consultant at Hainbuch. Together, they implemented a production process to improve efficiency in the machining of pump housings. "Hainbuch is one of the few companies that not only sells products from the catalog, but also helps the customer

to develop solutions. Usually, I first have an idea of what I need, and then discuss it with Jörg Fedtke. We work together to optimize processes and achieve the best possible result for our company," says Dirk Schmidt in describing the close cooperation.

A special challenge: cast parts

Becker manufactures the housings for its vacuum pumps in-house. The cast parts present special challenges for the machining process. "For one thing, cast parts are unshapely, which makes them more difficult to clamp," explains Schmidt. "Also, it is not possible to simulate the casting strain under the skin, which can make it difficult to maintain tolerances when changing the clamping set-up. That is why the machining process always includes a series of tests. This ensures that the process will function properly."

In the planned production line, several different pump housings will be machined. The first clamping set-up will use the Hainbuch centroteX S quick change-over system with different mandrels for I.D. clamping. This means maximum centering accuracy with minimum deformation. The workpiece is removed from the first clamping set-up and equipped with four zero position clamping bolts, which will be used in all subsequent clamping set-ups and potentially also in assembly. Downstream machining steps will then be carried out in a machining center with a rotary table. A Hainbuch quick change-over system mounted on the table generates an additional axis.

Flexible integration of third-party clamping devices

Jörg Fedtke explains: "In this set-up, Becker uses a pallet from another manufacturer on our clamping adapter. We regularly offer this to our customers. "In this way, they benefit from the optimized set-up times and repeatability of our quick change-over system, if their set-ups require clamping devices that are not included in our product range." Schmidt adds: "Such flexibility was also an important aspect for us in making our choice. Once the housings are equipped with the clamping bolts, they are ready for clamping in each step of the entire machining and assembly process. At the same time, we have the advantages of the Hainbuch quick change-over system during the initial machining steps."

In production line planning, every second counts

In choosing the quick change-over system, one aspect was decisive: The centroteX S system, as opposed to the centroteX M, is equipped with a bayonet connection and requires only one actuating screw instead of six. Schmidt explains: “Experienced employees change chucks very quickly, so that the set-up time advantage compared to the centroteX M is not that high, especially with large chucks. But with the centroteX S, which has only one screw, it is enormous! We benefit from the features of centroteX M in other areas of our production. Since the employees no longer have to align by hand, this of course ensures much higher accuracy.”
Fedtke confirms the decision of Dirk Schmidt: “In a production line, all processes have to be perfectly coordinated. If one machining step is a bottleneck, every second saved makes sense and translates into money in the bank for our customers. CentroteX S is a good solution here.”

Continuous further development and a new perspective

As a production technology manager, Dirk Schmidt is constantly concerned with improving production processes. His future plans – as those of many others – include considerations for automation. In meetings with Jörg Fedtke, he is therefore discussing potential solutions with the centroteX AC automated quick change-over system. Schmidt also received new inspiration for his production processes at the Hainbuch technology forum on automation. “The forum always gives me new perspectives and ideas – and exchanging ideas with other companies is also very interesting and enriching.”

User: Gebr. Becker GmbH in Wuppertal

Gebr. Becker was established in 1885 as a machine factory in Wuppertal-Barmen. Today, Becker, a fourth-generation owner operated company, is an international leading manufacturer of vacuum and pneumatic technology. Around the world and in numerous application markets, Becker’s vacuum pumps, compressors and air supply systems have earned the company a reputation as a supplier of products and systems in the machine and plant engineering sector. Every year, the company dispatches about 140,000 components and systems.

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Photos:

01_ Gehäuse auf Spanndorn_erste Bearbeitung.jpg

In the first clamping set-up, the pump housing is clamped on a Hainbuch mandrel with the centroteX S quick change-over system.

02_ centroteX S mit Spannmitteladapter mit Fremdspannmittel.jpg

The centroteX S quick change-over system allows adaptation of existing clamping devices from other manufacturers.

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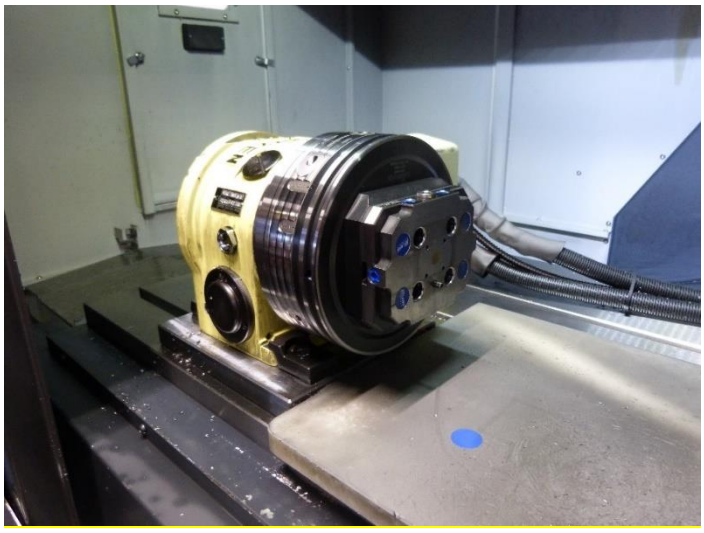
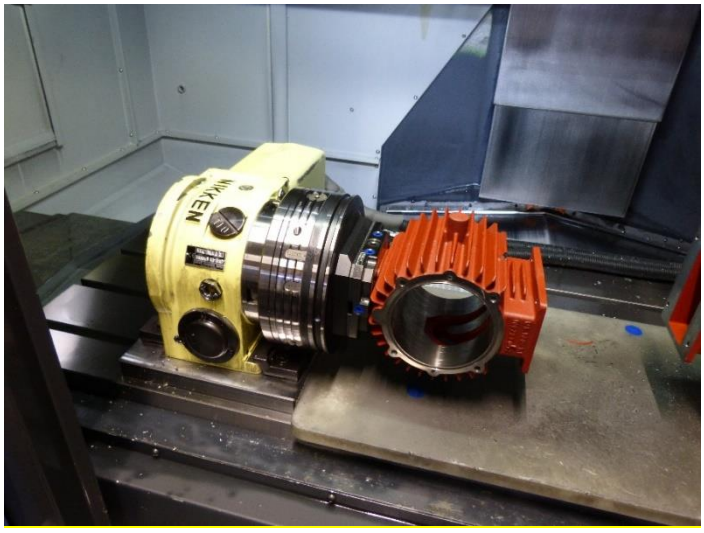


03_ Gehäuse auf Palette_zweite Bearbeitung.jpg

On the centroteX S quick change-over system, there is an additional zero-point clamping system for direct workpiece clamping using draw bolts.



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04_ Hainbuch_Partner Becker.jpg

Dirk Schmidt [left] and Jörg Fedtke [right] discuss the jointly developed clamping solution.

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