

Mini factories in containers help reduce mask shortages

Decentralised systems from Mikron ensure supply in times of a pandemic

Protective masks are in short supply in these times of coronavirus so why not just produce some yourself?! With a system from Mikron, this is almost within everyone's reach. This scalable system produces 50-100 face masks per minute, depending on the version. With engineering support from Festo, Mikron managed to develop the system in just six weeks.

"Normally you'd need six months for systems of this size", explains Nils Rödel, General Manager of Mikron Berlin. But this is time you don't have in the current coronavirus pandemic. "So 20 of our designers and fitters spent a week concentrating fully on this project and came up with a 3D model as the basis for this scalable system", says Rödel.

Festo as a project accelerator

The project was accelerated by the engineering support provided by Festo. "Even in this period of crisis, the electric and pneumatic components we needed were available quickly. The fact that integrating and commissioning the electric drive solutions in the system as well as connecting them to the Beckhoff PLC was so quick and easy was also helpful", says Rödel, adding: "the Festo Automation Suite software made integrating and commissioning the servo drive CMMT child's play, and we were able to quickly make decisions about the correct sizes."

Mini factories in containers

The beauty of Mikron's system is that it fits in a 20-foot shipping container, which can also act as a clean room. For example in front of a hospital. Or next to a shopping centre. Or behind a school. The integrated air-conditioning system with air purification filters means that production is even possible in places with high risk of viral contamination. Depending on the raw materials, the system can operate autonomously for more than two hours. "This reduces the number of people required, and as a result the risk of infection", explains Rödel. This means that the mini factory can also produce protective masks in remote areas or even in crisis zones where meeting hygiene standards is more challenging.

It would, in effect, be possible to produce two million protective mouth-nose masks each month with just one system. The masks are based on meltblown non-woven fabric which is made up of many layers of fine fibres, and thus filter out even the smallest particles such as bacteria and viruses from the air being breathed in. "Using official statistics, we calculated that medical personnel in Germany alone need at least 50 million protective mouth-nose masks per month", reports Rödel. "We could meet this demand with 25 containers."

10. June 2020

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Factory where the consumers are

Most of the time, when we talk about factories we think of huge buildings far away from where the people who need the product live. Possibly even on faraway continents, thousands of miles away from the hospitals that urgently need protective masks. This has been precisely the problem during the coronavirus pandemic: when demand skyrocketed, global supply chains were revealed to be less robust – and prone to corruption. When it comes to medical protective equipment, the failure of a delivery can cost human lives.

Eliminating the need for transport makes the end product cheaper, especially when it is possible to sell the masks to individual end consumers right where they are produced. The system, depending on how it is configured, can make packs of ten masks or individual ones, shrink-wrapped for cleanliness and in printed bags and boxes if required. “This involves docking an automated packaging station developed by our project partner pi4_robotics GmbH to the scalable system”, says Rödel.

Reliable supply of system components

Electric and pneumatic components from Festo ensure the reliable transport of the parts or perform clamping tasks in all process steps from the three-layer unwinding station, the shaping and folding station for the non-woven fabric, the ultrasonic sealing station for sealing the edges to attaching the earloops. The servo drives CMMT from Festo for controlling the electric drives EMMT are used in the application, since they can be easily connected to PLCs from other manufacturers such as Beckhoff, Siemens and Rockwell.

The pneumatic components from the Festo core product range installed in the system, such as the compact cylinder ADN, the guided drive DFM or the round cylinder DSNU are attractively priced, in stock worldwide and available within 24 hours. These are the best conditions for quickly and reliably building systems for producing masks within the shortest possible time. The pneumatic drives are actuated by MPA valves. The safety valve MS6-SV-E ensures that safety-critical system components are exhausted and de-energised as quickly as possible in the event of a sudden emergency stop.

Thanks to its international production and sales network, products from Festo are quickly available in 176 countries and enable systems to be built decentrally at locations around the world. This is entirely in keeping with the global open-source approach of the Carola project, which provided the impetus for designing the system.

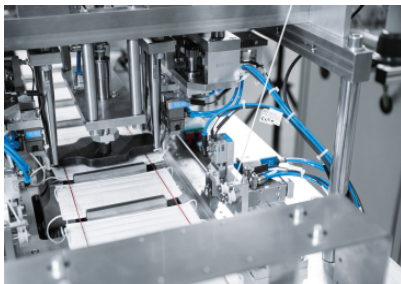
Independent, decentralised and ... virtual

The system needs to be as easy to commission as it is to build. “The current travel restrictions make it extremely difficult for commissioning technicians to get to where the systems are to be built”, says Rödel. So Mikron came up with a digitised solution: “We use the HoloLens, which enables commissioning to also be done virtually using an interactive 3D projection.”



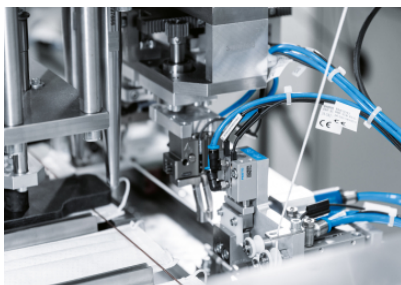
Mikron system for mask production 1

Fits in a 20-foot shipping container: Mikron's system for producing 50-100 protective masks a minute.



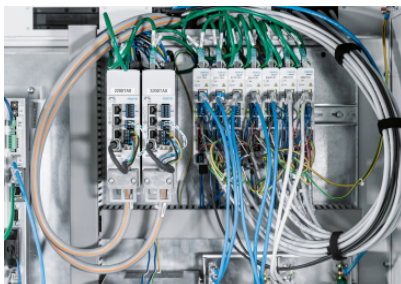
Mikron system for mask production 2

Earloops added and done: Mikron's scalable system produces 50-100 masks a minute depending on the version.



DFM guided drive in Mikron system for mask production

Globally and fast available: Products from the Festo core product range like the guided drive DFM shown here preparing the earloops.



CMMT-ST/AS servo drive in Mikron system for mask production

Compatible with higher-level controllers from Beckhoff, Siemens or Rockwell: the servo drive CMMT-ST/AS from Festo.



Nils Rödel, Mikron Berlin

Nils Rödel, General Manager of Mikron Berlin.