

100,000 masks per day and 150 new jobs

The Lower Saxony-based automotive supplier Zender Group, Osnabrück, specializes in carbon and textile products. The company recognized the need for personal protective equipment at an early stage and started to set up a mask production facility in record time. A visit by Prime Minister Stephan Weil accelerated the momentum. The goals for masks made in Germany are high - Zender is supported in their implementation by technology supplier Herrmann Ultraschalltechnik from Karlsbad.

"Nonwovens made of PP and PE for the filtration of viruses are new territory for us," says Business Unit Manager Lena Guth, who has been with the company since April to establish the new field of personal protective equipment (PPE). But the company benefits here from its experience with textile automotive products, says Guth. 150 new employees have been hired since March to implement the ambitious plans. The company's medium-term goal is the automated production of 800,000 to one million foldable duck masks with FFP2 protective filters per week. The company has invested heavily in this.

When Lower Saxony's Prime Minister Stephan Weil heard about the plans of the automaker, he visited Zender on 6 April 2020, where Weil said he was very grateful to the company for making a major contribution to improving the supply situation. The conversion of production is a wonderful example of the positive things that are possible in Corona times. Zender intends to invest further in order to be able to fulfil another medium-term major order from the Federal Ministry of Health for 4 million flat surgical masks per week in addition to the foldable FFP2 masks.

Own FFP2 design

To meet the high demand for the so-called FFP2 masks, Zender has designed its own model. After initial prototypes, the final design was quickly developed and approved. Due to the acute supply shortage, the Federal Ministry for Drugs and Medical Devices had issued a special approval procedure for respiratory protection masks in accordance with § 11 Paragraph 1 of the Medical Devices Act.

All outer seams, middle seams and the welding on of the elastic band are produced by using ultrasonic technology. The Zender mask is designed with two horizontal cross seams so that it can be unfolded to provide more room to breathe. In the medium term, the FFP2 respirator will be produced in an automatic flow production line. This means that every single process step such as welding several steps, folding over, fitting, gluing, assembling and marking will be fully automated "inline".



Fig. 01 Prime Minister of Lower Saxony Stephan Weil wearing the FFP2 mask developed by Zender during an on-site visit

Step-by-step plan for full automation with ultrasonic technology

In the first step, the masks were initially manufactured by hand on existing ultrasonic sewing machines. In the second stage, the company Herrmann Ultraschall from Karlsbad supported the production after establishing contact shortly before Easter. With the help of four stand-alone ultrasonic welding machines an intermittent semi-automated production was set up. The two middle seams are now produced on these new machines. The accuracy of the seams and the speed are thus significantly increased.

Robin Mohr is head of the Tech Center North of Herrmann Ultraschall in Walsrode. He spent almost a whole day with Zender managing director Norbert Borner to demonstrate the ultrasonic basics and to create a concept for faster production. "I was able to negotiate with another customer and retrieve an already delivered machine to supply to Zender," says Mohr, "and I removed a special welding tool, called a sonotrode, from my laboratory." After the changeover, the output in the first week of May is 250,000 units, already a tenfold increase in the number of units compared to the start of production.

The third step will be a fully automated line, in order to quickly reach the final production figures. Zender will implement the line supported by Herrmann Ultraschall, who supply the necessary ultrasonic stations.

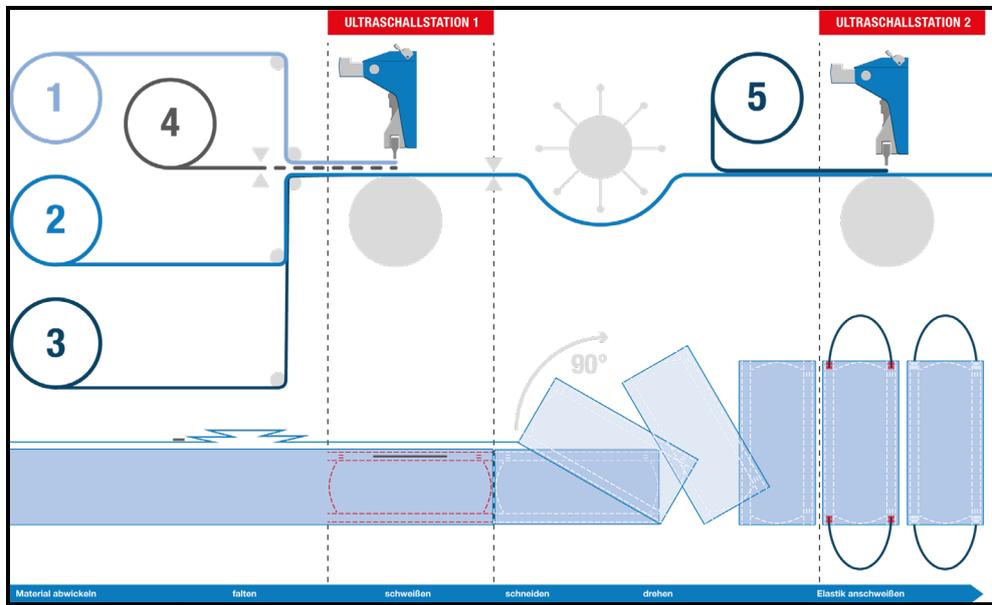


Figure 02: Functional principle of a fully automatic mask machine for flat surgical masks

Ultrasonic welding for every mask type

Ultrasonic welding is a preferred technology for the production of respiratory masks made of nonwovens. For the different basic mask types, the technological ultrasonic solutions range from a complex high-speed system to simple synchronized manual welding. Herrmann Ultraschall supports manufacturers and machine builders who lack the know-how for the mask machines. The company has decades of experience and can provide support in different approaches, explains CEO Thomas Herrmann, thus making it possible to shorten the construction time for a machine. The so-called triangle between manufacturer, machine builder and ultrasonic supplier now functions faster and better in times of crisis. Material manufacturers are also becoming increasingly involved and want to support. Picture 03

Caption:

Picture 01 Prime Minister of Lower Saxony Stephan Weil wearing the FFP2 mask developed by Zender during a visit to the site (Copyright: Zender Germany GmbH)

Figure 02: Operating principle of a line for the fully automatic production of flat surgical masks (Copyright: Herrmann Ultraschalltechnik GmbH & Co.KG)

03: CEO Thomas Herrmann, Herrmann Ultraschalltechnik GmbH & Co.KG (Copyright: Herrmann Ultraschalltechnik GmbH & Co.KG)

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