

Arburg manufactures high-tech masks

- **Multifunctional: Face mask for employees, doctors and nursing staff**
- **High-tech: Sophisticated LSR product developed and produced in-house in Lossburg**
- **Cooperative: Numerous partners participate with mould technology, material and automation**

Lossburg, 12/05/2020

After Arburg started producing protective glasses on Allrounder injection moulding machines at its headquarters in Lossburg (Germany) in mid-April, the mechanical engineering company has now launched an additional project to combat the spread of the coronavirus: Since 11 May, face masks are injection moulded from LSR (liquid silicone rubber) and PP (polypropylene). About 3,500 of these multifunctional high-tech masks are expected to be produced daily under series production conditions. The product will initially be used to protect the company's own employees worldwide and will then be distributed as quickly as possible via the district of Freudenstadt to hospitals and care facilities.

"We are involved in various aid initiatives and are also push internal company projects such as this face mask. The demand is enormous. We are receiving specific requests from hospitals and nursing homes from all over the region," says Gerhard Böhm, Arburg Managing Director Sales, regarding the current situation. "We developed the high-quality and sustainable masks made of

flexible LSR and PP ourselves and additively manufactured the first prototypes with our Freeformers. The LSR component and mould simulation was carried out using the Sigmasoft software from Sigma Engineering. In a record time of only around five weeks, our partners Polar-Form and Foboha built the corresponding injection moulds for the LSR and PP components. This means that we can now start series production in Lossburg." The companies Ewikon (cold runner) and Männer (hot runner) were also involved in the implementation of the mould technology. Other partners were Barth Mechanik (gripper) and Packmat (packaging technology), the raw material for several 10,000 masks was sponsored by the chemical group Wacker and Borealis.

Multifunctional face mask

The flexible masks do much more than act as a simple fabric mouthguard: The multifunctional product consists of a soft LSR mask that is put over the nose and mouth and a firm PP shield with eyelets for attaching elastic bands. In the middle there is a standardised connection with a hole (DIN EN ISO 5356-1:2004). The opening is sealed with a flow gate to protect against infection in everyday life, e.g. for professional meetings or shopping at the supermarket. This diverts the breathing air downwards and thus significantly reduces the risk of infection.

In the next expansion stage, a filter housing can be fitted on the opening. Arburg intends to manufacture this component in cooperation with partners very soon. The companies involved in this project are Weber (mould), Günther (hot runner technology), Kufner (filter), Herrmann Ultraschall (welding technology) and Packmat (packaging technology).

By using corresponding FFP2 or FFP3 filters, doctors and nurses, for example, can reliably protect themselves from viruses or bacteria when in direct contact with sick people.

The masks are designed for multiple use and can be easily sterilised. "It was also important for us to take advantage of the performance of plastic materials and to create a product that is suitable for long-term use. In this way, resources can be conserved," emphasizes Dr. Thomas Walther, Head of the Application Technology Department at Arburg. The temper-free LSR material of type Elastosil LR 5040 is suitable for food contact applications according to FDA CFR 21 §177.2600 and BfR XV. "Silicones", and has been tested for biocompatibility. In addition, the LSR has good sealing properties, a high tear resistance and can be easily sterilised.

At least 15,000 masks per week

"We expect to produce at least 15,000 of these masks per week in two-shift operation. If we were to work around the clock, it would even be possible to double this number," explains Manuel Frick, who as an LSR expert at Arburg designed the product. Two electric injection moulding machines are being used for this purpose. An Allrounder 570 A with a clamping force of 2,000 kN produces the LSR masks at the Arburg Training Center using a 4-cavity mould from Polar-Form, while an Allrounder 470 E Golden Electric with a clamping force of 1,000 kN and a 2-cavity mould from Foboha simultaneously produces the associated PP shields at the Customer Center. The larger injection moulding machine operates with a LSR dosing system from Elmet and a six-axis robot from Kuka, which, in a sophisticated demoulding process, removes the flexible masks from the mould and places them on a conveyor belt. In the second machine, the PP shields are handled

more easily by a linear Multilift Select robotic system. Finally, the PP shield is manually placed on the silicone mask with interlocking, this is completed with the corresponding elastic bands and packed. By using a temper-free LSR, this step can be carried out without disruptive production stops caused by the time-consuming and energy-intensive tempering of the component. The first contingents of face masks are being distributed to the company's own employees worldwide and to partners who have been significantly involved. In the next step, the district of Freudenstadt will take over the additional coordination and distribution to hospitals, care facilities and civil defence organisations.

Photos

ARBURG 173546 LSR mask people.jpg



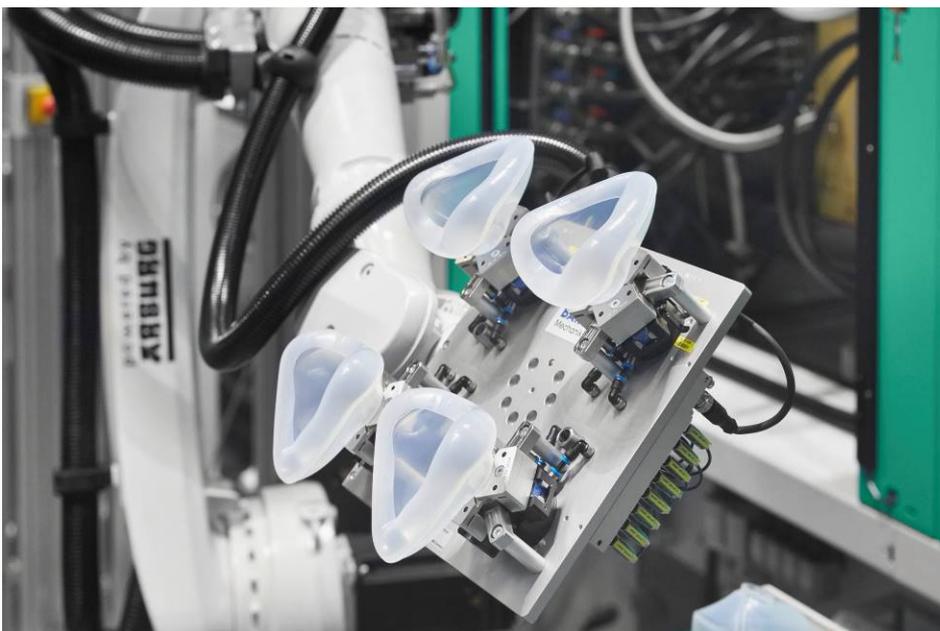
Arburg is involved in the corona crisis (from left to right): Manuel Frick, LSR Sales Manager, the Managing Directors Gerhard Böhm (Sales) and Guido Frohnhaus (Technology & Engineering) and Dr. Thomas Walther, Head of the Application Technology Department, present the first high-tech masks.

ARBURG 173489 LSR mask.jpg



The face mask consists of a soft LSR mask and a firm PP shield with eyelets for fastening the elastic straps. For everyday use, the opening can be closed by a so-called flow gate.

ARBURG 173492 LSR mask removal.jpg



Four LSR masks are produced per cycle and then removed by a six-axis robot. About 3,500 multifunctional high-tech masks can be produced per day.

Photos: ARBURG

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About Arburg

German family-owned company Arburg is one of the world's leading manufacturers of plastic processing machines. Its product portfolio encompasses Allrounder injection moulding machines with clamping forces of between 125 and 6,500 kN, the freeformer for industrial additive manufacturing and robotic systems, customer- and industry-specific turnkey solutions and further peripheral equipment.

Arburg is a pioneer in the plastics industry when it comes to production efficiency, digitalisation (Industry 4.0) and sustainability. The "arburgXworld" program covers all digital products and services, and is also the name of the customer portal. The company's strategies regarding the efficient use of resources and circular economy as well as all related aspects and activities are outlined in the "arburgGREENworld" program.

Arburg's central aim is for customers to be able to produce their plastic products, from one-off parts to large-volume batches, in optimum quality at minimum unit costs. The target groups include, for example, the automotive and packaging industries, communication and entertainment electronics, medical technology and the white goods sector.

An international sales and service network ensures first-class customer support at a local level: Arburg has its own organisations at 34 locations in 26 different countries and, together with its trading partners, is represented in more than 100 countries. Its machines are produced exclusively at the parent company in Lossburg, Germany. Of a total of roughly 3,200 employees, around 2,650 work

in Germany. About 550 further employees work in Arburg's organisations around the world. Arburg has triple certification according to ISO 9001 (quality), ISO 14001 (environment) and ISO 50001 (energy). Further information about Arburg can be found at www.arburg.com