

A Machine Strategy with Extra Automation

At Goerlich, a Turnkey Plant Replaces Two Machines with a Vertical Clamping Unit

The aim of the project was clear: a highly automated turnkey system must replace several decentralized, operator-guided machines in order to be able to mass produce enclosures for a vacuum sensor with three inserted pins in a way that is smooth, automated and therefore faster than before in large-scale production, and error-free. The plastics processor Goerlich chose the machine manufacturer Arburg as a partner in its goal of achieving greater production efficiency.

From electronic components to housings: the potential applications of plastics technology in the electrical industry cover a wide range of shapes, sizes and applications. They also include many electrical components in automotive production, which are produced by injection molding. In its involvement in the electrical industry, Goerlich Kunststofftechnik GmbH, Wilsdruff, Germany, relies on its precision, experience with different materials and state-of-the-art technologies.

Many Subprocesses Implemented in a Confined Space

The housing for a vacuum sensor consists of a polybutylene terephthalate (PBT-GF30) reinforced with 30% glass fibers and integrating three metal pins. The fully automated plant, which the injection-molding machine manufacturer Arburg has conceived together with Goerlich, and in which the housings are produced, will in the future be able to manufacture three versions by exchanging the corresponding mold inserts. The plant replaces two decentralized operator-controlled machines with a vertical clamping unit (type: All-rounder 320 C), including testing technology, which were previously necessary for series production.

Andreas Armbruster from Arburg's Turnkey Project Planning team ex- »



All upstream process steps are integrated in a very small space: after the pins have been punched out (right), a Scara robot places them in the correct position on a loading plate (left) so that the Multilift V robotic system can pick up 24 pins and insert them into the mold © Arburg

The Author

Susanne Palm works in corporate communications at Arburg GmbH + Co KG, Lossburg, Germany.

Company Profile

Goerlich Kunststofftechnik GmbH, Wilsdruff, Germany, manufactures switches, plug connectors and technical components for the automotive, telecommunications and electrical industries by injection molding. The company was founded in 1978 by Rudolf Görlich in Leingarten near Heilbronn, Germany, and today has its sole headquarters near Dresden, Germany. In 2019, before the beginning of the Corona crisis, Goerlich achieved sales of EUR 10.3 million with about 100 employees.

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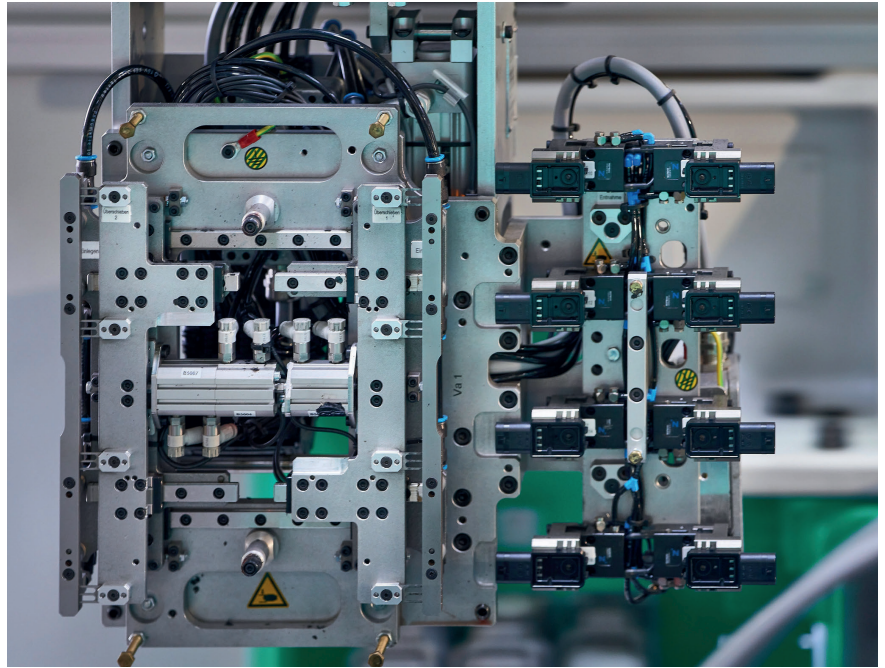


Fig. 1. The tasks of the gripper at the Multilift V are extremely varied and demanding in this application © Arburg

plains the extensive specifications that the system had to meet: "The biggest challenge was implementing the various production steps within the required short cycle time. Above all, the feeding of the 24 very delicate pins from the punching strip to their insertion into the 8-cavity mold is correspondingly demanding." According to Armbruster, what is special about the system is that the many sub-processes can be implemented in a very confined space with straightforward technology (**Title figure**). Without this automation solution, the annual production volume

would only be achievable by deploying considerably more staff.

Automated Parts Testing in Multiple Steps

The injection mold was developed and constructed in Goerlich's mold shop. Besides a hot runner with cold sub-distributor, it is also equipped with hydraulically operated slides for precise receiving of the pins. The gold-plated plug contacts are fed on the conveyor from upstream and separated out. A Scara robot places these on a loading plate



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Fig. 2. Goerlich manufactures enclosures for vacuum sensors efficiently and flexibly with its compact turnkey system © Arburg



with rotary drive in the correct position for pickup by a Multi-lift V robotic system (Fig. 1). The pins are inserted into the mold slides without force, as is the removal of the eight finished parts on the ejector side of the mold.

After the contacts have been overmolded, the four sprue sub-distributors are first demolded and ejected into the machine stand. The robotic system places the eight connectors on a testing device with slide and NC axis for exact positioning. By moving the slide to different positions, a continuity and high-voltage test with 1000V and a light test are carried out in succession, followed by the marking of the OK parts. Finally, a turntable distribution system that rotates back and forth through 180° ensures that parts are ejected into PE bags using separated cavities.

A hybrid Allrounder 470 H with a clamping force of 1000 kN and size 290 injection unit is used in the turnkey system (Fig. 2), which is equipped with several core pullers and special signals. The combination of an electric toggle-type clamping unit and a dynamic injection unit enables simultaneous movements. This results in time advantages in series production. The Selogica control system is highly valued because it supports communication between the various plant control systems, thereby ensuring fully coordinated production processes.

Smooth Project Flow

Thomas Ehrlich (Fig. 3), operations manager at Goerlich, is very satisfied with Arburg as a system supplier: "With this turnkey system in particular, Arburg's project management team ensured that there was thorough and rapid communication and coordination between the suppliers, and hence a solution-oriented approach to the project." Goerlich relies exclusively on Arburg for its injection molding production. The 34 Allrounders, including two-component and vertical machines, process special plastics such as PEEK, PSU, PEI, and LCP.

When asked why the company was pursuing this one-machine strategy, operations manager Thomas Ehrlich answered: "The Allrounders are reliable machines with which we can pro-



Fig. 3. Thomas Ehrlich, operations manager at Goerlich, is delighted with the increase in efficiency that the turnkey system brings to his injection molding production © Arburg

duce our portfolio for our customers in excellent, high-quality continuous operation. There is no reason for us to change or add anything, quite simply because we have been very satisfied with Arburg, its range of machines, and its service since the beginning of our working relationship in the 1980s. The smooth implementation of the turnkey system has once again confirmed our strategy." ■



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