



Parts Cleaning. Systems and Solutions.



The MAFAC PALMA is an indispensable part of the automation process at ALPLA in Hard

ALPLA

User report

ALPLA Werke Alwin Lehner GmbH & Co KG

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The production line for machining individual and series components for the manufacture of injection moulds for plastic moulded parts (such as closures of all kinds) is like a room inside a room. It fills more than half of the production area in the Mould Shop IM (AMS-IM) department of ALPLA. Five machines for different industrial processing methods and a cleaning machine from MAFAC are installed behind glass walls. A linear unit that is reminiscent of a bridge is located in the middle of the cell. An ERS linear robot moves across this linear unit. The entire production line is operated fully automatically, controlled by a control system that is located outside the cell. This means that the robot picks up the unmachined parts from a magazine and brings them to the respective machining system, where they are milled or die-sunk. It then transports the workpieces to the parts washer. After cleaning, the parts are transported to the measuring machine. This concludes the fully automatic process.

It is a complex production process in which the MAFAC PALMA cleaning machine is integrated. The Mould Shop IM (AMS-IM) department manufactures tools and components for the production of injection moulds for over 150 ALPLA plants. For the past five years, the automation of tool manufacture at ALPLA's headquarters in Hard has been successfully advanced. The MAFAC cleaning system has an important function in the fully automatic manufacturing process. It

guarantees that the workpieces are clean, dry, temperature-controlled to 21 degrees and thus optimally prepared for measurement. Only in this way can the production line be operated completely autonomously.

ALPLA – Specialist for plastic packaging

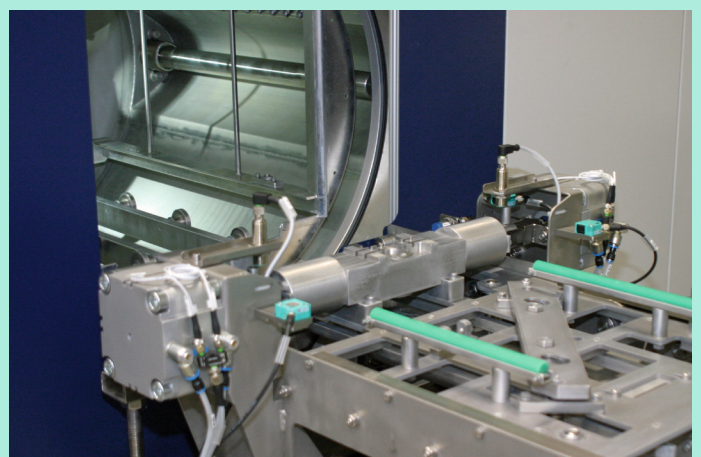
ALPLA is a globally active company for packaging systems, bottles, closures and injection moulded plastic parts. These are developed and produced for different industries. In the field of plastic packaging, the company with its in-house research department is regarded as an international leader in technology. One of ALPLA's core competences is the system delivery for plastic bottles with closure. ALPLA implements everything from bottle design and production to fully automatic packaging machines. The customer receives complete solutions from a single source that are tailored to his individual requirements. The headquarters of the company is located in Hard (Vorarlberg, Austria). "Alpenplastik Lehner Alwin OHG", the cornerstone of the company, was also founded there in 1955 by Alwin and Helmuth Lehner. Today, ALPLA employs around 19,300 people in 176 branches worldwide. 1,000 employees work in Vorarlberg alone. ALPLA is hardly visible to the public. The only thing that indicates the origin of the bottles and lids is a rectangular "a" on the closure or on the bottom.

High cleaning requirements

"We clean electrodes, tools and components - in short, everything that passes through the production line," says Sascha Hermann from



The production line at ALPLA, including the cleaning process, is fully automated. The parts washer MAFAC PALMA is loaded by a jointed-arm robot.



The receptacle system of the MAFAC PALMA cleaning machine demonstrates the complexity of the fully automatic process.

the AMS-IM team. It is a wide range of parts that is manufactured in the fully automatic process. The requirements for cleaning are correspondingly extensive. The cleaning process must be adapted to the different materials of the workpieces - aluminium, steel and non-ferrous metal - and the different types of contamination. Depending on the machining process, there are residues of milling chips, oils or erosion sludge on the parts. These can occur both in particulate and in film form.

Nine cleaning programs are stored

In view of such an extensive cleaning requirement, it is not surprising that nine different programs are stored in the MAFAC PALMA. They are activated fully automatically. The running time of the cleaning programs is between 10 and 25 minutes. The workpieces are cleaned on identical fixtures that are first of all used for the preceding machining process. This eliminates the need for reclamping for cleaning. A cleaning process patented by MAFAC is applied to its full extent: During the cleaning process, a spray frame equipped with a special nozzle arrangement rotates around the basket receptacle system. The rotation of the basket receptacle system is independent and rotates in the opposite direction to the spray system.

Cleaning - Rinsing - Temporary corrosion protection

The three holding tanks of the MAFAC PALMA are used in the sequence cleaning, rinsing, temporary corrosion protection. The fluid temperature in tank one and tank two is 30 degrees. A cleaning agent in a three-percent concentration is added to holding tank one. Medium tank two is used as an intermediate rinsing tank in which the softened water contains no additives whatsoever. Medium tank three is provided with a corrosion protection in 0.2 percent dosage and is constantly temperature-controlled to 21 degrees.

The drying process - a tailor-made solution

The cleaning process takes between 30 and 180 seconds per holding tank. After that, two thirds of the cleaning process is completed. What follows then is the drying process. "The drying process was the biggest challenge," says Johann Pamminer of MAP Pamminer, MAFAC's distribution partner in Austria. Since the workpieces are transported to the measuring system fully automatically after cleaning, they must not only be clean but also absolutely dry. Otherwise there is a carry-over of moisture into the measuring system, which falsifies the measuring result. In addition, the workpieces must be temperature-controlled to

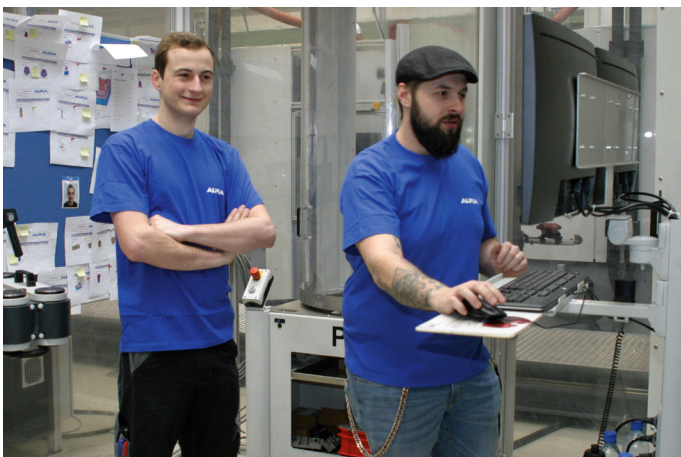
21 degrees. "We have solved this as follows: The water temperature in tank three is controlled to 21 degrees by a heat exchanger, MAFAC HEAT.X, which is an optional part of the MAFAC PALMA", so Johann Pamminer. Drying itself takes place by means of the rotating impulse blowing process, in which the water is knocked off the workpieces in an impulse-like manner with ultrapure compressed air. During this process, the blowing system rotates around the basket receptacle system, which rotates in the opposite direction. Residual drying then takes place via a vacuum drying system integrated in the MAFAC PALMA.

Useful bath life of six to eight weeks

The MAFAC PALMA installed at ALPLA is operated around the clock, seven days a week. Useful bath life is around six to eight weeks. This useful bath life was realised by competent on-site support by the experts from MAP Pamminer. The holding tanks are designed in a cascading manner. Holding tank one is equipped with a coalescence oil separation system with integrated floating suction device and a main-flow ultrafine filtration for filtering fine dirt particles. Medium tank two is also equipped with a main flow ultrafine filtration.

"The workpieces are clean, oil-free and dry"

"Since we have installed the cleaning machine from MAFAC, our workpieces are clean, oil-free and dry," says project manager Michael Schöflinger. The MAFAC PALMA has been in operation at ALPLA for a good six months. Before that, a single-tank machine from another manufacturer was in use. "But that didn't work because the parts weren't clean and dry. We had to clean and dry the parts manually. This rework took us about four hours a day," explains Sascha Hermann. This meant that the automation of the entire process could not be carried out in the planned form. That is why those responsible at ALPLA decided to make a new acquisition. In MAFAC's technical centre, test cleaning was carried out on the MAFAC PALMA using original components. They were convincing: "The cleaning result as well as the drying process are optimal. The material compatibility, speed and part temperature are best suited to our automation process," says Michael Schöflinger.



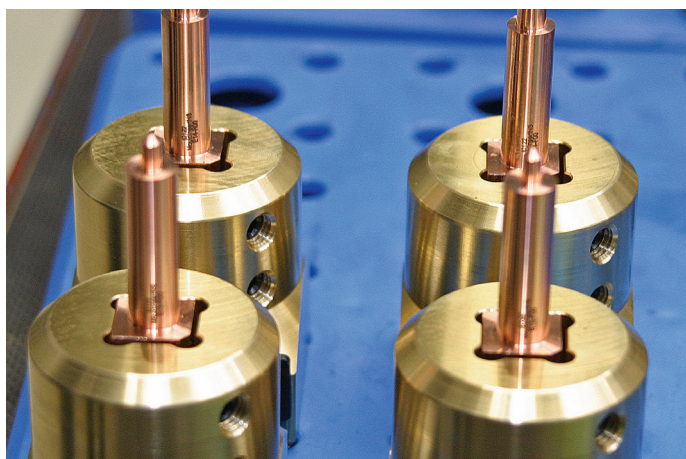
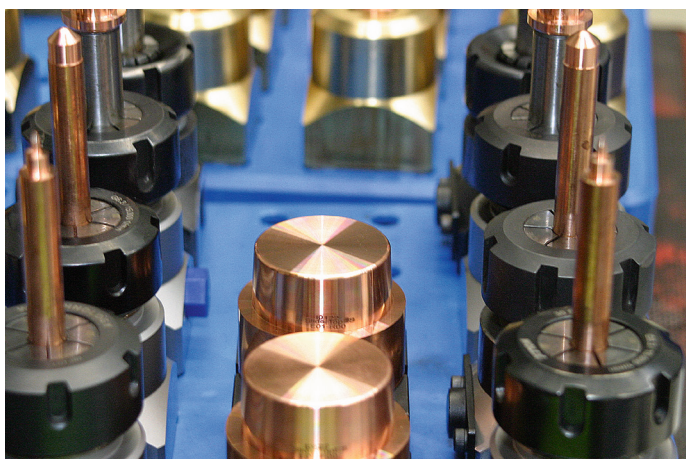
The fully automatic production line in the AMS-IM department of ALPLA is activated by a control system located outside the cell.



The young team of the AMS-IM department of ALPLA.



Peter Ruoff, Head of Marketing and Sales MAFAC, Christoph Mairhofer, Production Manager ALPLA, Michael Schöfflinger, Project Manager ALPLA, Sascha Hermann, employee AMS-IM, Johannes Hopfner, Organisational Manager AMS-IM, Johann Pamminger, MAP Pamminger.



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