HEMO
THE CLEANING SYSTEM

Advanced Parts Cleaning with Fully Automated Handling

High automation, process reliability, outstanding cleaning results, excellent efficiency, and — most importantly — reduced personnel manpower: these were the requirements that Röhm set for a new cleaning system for mechanically processed production parts. Parts cleaning specialist HEMO was able to implement these goals perfectly in practice using its SOL-VACS technology combined with a well-designed loading system.

In the world of precision machining, the name Röhm stands for accuracy, quality, and reliability. Headquartered in Sontheim an der Brenz, Germany, the company has for decades been recognized as a specialist in the development, design, and manufacturing of high-precision, robust, and long-lasting clamping and gripping tools. The standard product portfolio includes around 7,000 components, and since each clamping or gripping element consists of multiple mechanically processed steel parts, a large variety of parts must be cleaned after machining. Many of these parts are subject to strict residual contamination limits, which can only be achieved with advanced parts cleaning systems.

For more than thirty years, an aqueous multi-bath system handled the cleaning at Röhm. With the new parts cleaning system, everything was meant to change. Alexander Götz, Project Manager at HEMO, states:
„When Röhm's production experts planned a replacement, it wasn't just about having the latest technology — it was also about significantly reducing the manpower. Previously, two staff members were permanently assigned to loading and unloading the old system; moving forward, this process was to be fully automated."

The entire parts cleaning system fits within the existing footprint of the previous system.

Top-Class Fully Automated Loading

For HEMO's technicians, fully automated loading is generally nothing unusual. However, in this case, standard solutions were not feasible, as the system had to work within an existing space and handle two completely different types of carriers: perforated metal boxes for bulk parts and stackable pallets for individually fixed components. The dimensions of the two carrier types differ, and — what posed a particular challenge — the tolerances for automated handling are also very different: up to 20 millimeters for the perforated boxes and only a few tenths of a millimeter for the pallets.

> „Nevertheless, we succeeded in designing the entire loading system so that we can handle the different dimensions and large tolerance variations without any manual adjustments. In addition, we were able to meet all other requirements of our customer Röhm, especially regarding the limited space available," explains Alexander Götz.

Depending on the carrier type, a single cleaning batch can consist of ten perforated boxes or twelve stackable pallets. Operators benefit from the innovative loading system because they only need to push the cart with parts into the loading station and use a handheld scanner send the batch data, which automatically selects the corresponding carrier. Misoperation is further prevented by sensor-based monitoring of the loading station. The specifically designed gripper of the fully automated handling system is designed to handle both fundamentally different carrier types. Perforated boxes are loaded in stacks of five, and pallets in stacks of six onto the roller conveyor.

SOLVACS: Cleaning and Drying Under Vacuum

The cleaning batch is transported via the driven conveyor to the feeding position in front of the system's cleaning chamber. Here, the batch is lifted and placed into the basket holder. Once the door closes and locks, the automatic cleaning process begins. This process follows the well-known SOLVACS method (SOLvent VACuum System), in which all cleaning steps are carried out under vacuum or at a reduced pressure below 100 mbar.

The special feature of this process is its flexibility: it allows the optional use of chlorinated hydrocarbons, hydrocarbons, and modified alcohols in the same system. Even aqueous cleaning stages can be integrated. This means that in one system, parts can be degreased with solvent, cleaned with water, then dried spot-free with solvent, and — if required — preserved with a solvent-oil mixture.

The BEYOND system impresses with advanced technology and fully automated loading.

At Röhm, the company currently relies on the classic solvent cleaning process, consisting of pre-spraying, two-stage immersion cleaning, vapor degreasing, preservation, and vacuum drying. „We clean the parts using non-halogenated hydrocarbons, supporting the process with ultrasound as well as rotational and tilting movements. The cleaning quality is as convincing as the throughput of around one ton per hour," explains Alexander Götz.

After cleaning is complete, the working chamber door opens, and the batch is removed via the handling system and placed onto the two-track roller conveyor. In parallel, parts on the loading track return via a discharge track to the removal station, where the gripper loads an empty cart in several steps. The operator then receives the cart and transports it for further processing.

On the right side of the image is the loading station, and to the left of it is the parts removal area. Carts are used at both stations.

System Technology Meets Expectations

The new system fully meets Röhm's high expectations. It cleans and preserves up to 40 perforated metal boxes or 48 stackable pallets per hour. The excellent cleaning results are achieved through finely tuned cleaning programs and high solvent quality maintained via continuous distillation. Equally important, intensive vacuum drying ensures that any remaining solvent is completely removed from the parts.

The true beneficiaries of this advanced system technology are also Röhm's employees. The automatic loading relieves them from physically demanding tasks and provides a clean working environment, while also offering more engaging responsibilities, such as operating the system via handheld scanner and monitoring a high-resolution Siemens PLC control panel.

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