



Parts Cleaning. Systems and Solutions.



Hohe Tanne GmbH:
Effective parts cleaning
for sensitive areas



HOHEtanne®

User report

Effective parts cleaning for sensitive areas

Well-grounded engineering expertise, a high vertical range of manufacture and optimally organised process sequences are characteristic for the high-precision production machine “Hohe Tanne” in the Thuringian Großbreitenbach. For the cleaning of fine mechanical components for sensible industrial branches, the company relies on the spray-flood cleaning machine MAFAC JAVA 100.

Beginning on the premises, it becomes clear that Hohe Tanne GmbH is no mechanical engineering company in the classical sense of its meaning. The operational building with a dimension of 3,600 square metres, which has been constructed in 2018 in respect of ecological features as a wooden construction, is located in the midst of an old spruce forest. This extraordinary façade reveals the 2016 founded high-tech factory Hohe Tanne GmbH, which incorporates a total of 17 employees, consisting of engineers, software engineers, technicians and inventors. By using environmentally friendly energy sources, hygienic equipment and systems as well as fine mechanical components and assemblies for customers of the medical engineering industry, food industry, machinery and plant engineering industry, electrical engineering industry, analytics as well as optical industry are manufactured there. “Our goal is it to produce even complex and high-quality assemblies in a cost-efficient manner with resource protection in mind. Therefore, we’ve invested in a high-quality, fully networked and automated machine park in the

sense of industry 4.0. The efficient workflow enables lean and smooth production, so that we can produce small, medium and large batch sizes economically,” explains Daniel Fuchs, Authorised Representative at Hohe Tanne.

Cleaning of precision parts on an aqueous basis

According to this economic and sustainability concept, the cleaning process of the produced components should be performed on an aqueous basis. The spray-flood cleaning machine of type MAFAC JAVA with a dual-bath system has been therefore chosen. It represents another important component of the demanding precision production and quality assurance of the company. As the components to clean are very different and have complex geometries and partially hardly reachable surfaces as well as undercuts in aluminium, steel, gunmetal or plastic, it was obvious that in addition to a spray cleaning process also a flood cleaning process would be necessary. “The procedures of spraying and flooding allow a high variety in processes so that an impact that is more extensive can be assured. Together with the counter-rotating or respectively co-rotating rotation of the receptacle and spray system, the MAFAC technology produces additional turbulences. By this way, spray shadows can be clearly reduced”, explains Sandra Steinig from the IVS Steinig GmbH in Gotha, MAFAC’s sales partner for the region of eastern Germany.



The precision manufacturer Hohe Tanne GmbH is known for the development, design and production of hygienic components and systems. The company attaches great importance to sustainable operations and production. In 2021, it received the Thuringian Energy Efficiency Award for the climate-neutral company building built in 2018 using a wooden construction.

Photo: Hohe Tanne GmbH



The MAFAC JAVA100 was designed for Hohe Tanne with a special paint finish and equipped with a transfer system for semi-automatic cleaning operation.



Precision parts with different structures are cleaned in aluminium, which have cooling lubricants, oils and chips on their surfaces.

Validated technology for high residual dirt requirements

Before the components are cleaned, they undergo a milling process. Therefore, their surfaces show residues such as cooling lubricants, emulsions, oils, chips and abrasion. In order to be easily fed in the subsequent production steps such as coating or welding and to be processed to the assembly, they have to fulfil high requirements in regard to cleanliness. "The criteria in regard to surfaces in precision production are extremely high and are in the μ -range depending on the industrial field. Since Hohe Tanne primarily serves customers from hygienically sensitive areas, we had to find a validated and economical solution for the high cleanliness requirements. At the same time, the cleaning machine had to cover a large variety of parts and be flexible enough to adapt changes in the range of tasks or requirements", Sandra Steinig continues.

The MAFAC JAVA100 was found to meet these requirements. The compactly designed machine has a special dimension in the receptacle system and, with a useful depth of one metre, offers more space for the precision parts, which are cleaned as set goods to protect the surfaces and edges. "With the additional size, we gain more flexibility in terms of parts spectrum and cleaning performance. We can handle more parts with the same throughput time or clean larger parts efficiently", says

Daniel Fuchs. Another plus of the MAFAC JAVA: If very delicate parts are to be cleaned, the movement of the receptacle system can be programmed from rotating to rocking or even standing for greater protection of the items to be cleaned.

Finally, for the benefit of an improved workflow, the MAFAC JAVA100 was equipped with a transfer system so that the cleaning process of several batches in succession can be carried out automatically: "The ergonomic equipment by means of a transfer system was an important criterion for us, as the machine is located away from production in a so-called peripheral room. This creates a high-quality environment for the cleaned parts, and at the same time we can reduce the amount of personnel required," explains Daniel Fuchs.

Variable cleaning process for a wide range of requirements

In the meantime, ten to twelve different programmes are defined. Depending on the cleanliness requirements they vary in process steps, temperature, pressure strength, phase length, basket rotation, ultrasound or different time intervals. In general, the parts are fixed as individually placed parts in three layers one above the other in the workpiece holder and go through a cleaning process with two phases in which both tanks are used in the order spraying and flooding. In

phase 1, the actual cleaning with appropriate additives, the process steps spraying, spray-flooding and spraying follow one another, whereby all dirt particles are loosened and safely removed via flooding. Phase 2 serves as a spraying process for rinsing with water and corrosion protection. This is followed by the drying phase under the influence of a pulse-blast hot-air drying process, with additional vacuum drying for parts with scooping geometries. "Since the thoroughness of cleaning and drying is the main issue with our components, we have invested a lot of time in setting up our cleaning programmes. In doing so, we have adapted the single processes very individually and optimally to the respective cleaning tasks. The drying phase is tricky, because we bring the components in three layers and partly with cover units in the basket for cleaning. However, with the right combination of temperature, time and nozzle pressure, we achieve very good cleaning results," Daniel Fuchs reports.

Cleaning machine for increasing number of parts and growing requirements

With the MAFAC JAVA100, the technical team at Hohe Tanne considers itself well equipped for current and future requirements. "We plan to clean even more parts with the MAFAC JAVA100 in the future. Very different cleanliness requirements will come into play," says Daniel Fuchs. Thanks to its validated tech-

nology, the new MAFAC JAVA100 reliably meets even the highest cleanliness requirements. In addition, the machine has a high optimisation potential, which allows it to be used flexibly and adapted as needed. It also fits in Hohe Tanne's sustainability concept: the patented process of counter-rotation or co-rotation of the basket and nozzle system ensures resource-saving parts cleaning. In addition, the waste heat from the machine is available to heat the production rooms.

Just as all resources are optimally utilised in sustainability, the experts around Daniel Fuchs also leave nothing to chance in cleaning: "Cleaning, like any other process step, must be carefully considered and planned. This also applies to the machine itself. The long-term savings effect that can be gained from precise knowledge of the process and machine is immense."



The parts are fixed as individually placed parts in a workpiece carrier.



For cleaning, the precision parts are fixed as individually placed parts in a workpiece carrier. There are very different components with sometimes very complex geometries.



After fixing the components, the workpiece carriers are automatically transferred to the cleaning machine via the transfer system.



You can choose between ten programmes in order to reach an optimum cleaning.



After cleaning, the cleaning product is removed automatically via the transfer system.



After cleaning and drying, machining residues such as oil or sanding dust are carefully removed and the surfaces are absolutely dry.

Photos: MAFAC - E. Schwarz GmbH & Co. KG



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