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Liquid Coating Painting Center for More Quality, Efficiency and Flexibility **Powder Coating** New Powder Coating System Doubles Production Capacity **Blasting** Homogeneous Surface Roughness Around the Clock

Cleaning Process Not All Vapor Degreasing Is the Same

Tailor-Made High-Purity System in Special Dimensions

The requirements in the high-purity area of industrial parts cleaning are becoming increasingly complex – and so are the demands on the system manufacturers. A specialist for technical cleanliness in the process chain is a sought-after partner in this sector and has now already implemented the second large-scale cleaning system for the company Trumpf.

In 2018, LPW Reinigungssysteme GmbH already supplied a customized high-purity cleaning system to Trumpf Laser- und Systemtechnik in Ditzingen (Germany), for use in EUV (extreme ultraviolet radiation) manufacturing. This involves



Heavy equipment for a large high-purity system: A total of over 33 t of plant components were brought into the first and second basement levels of the new Trumpf building in Ditzingen in 16 transport units. equipment for EUV lithography, which opens up new possibilities in microchip manufacturing. Since then, the high-purity system has reliably fulfilled its highpurity tasks. When a multi-bath ultrasonic system elsewhere at Trumpf reached its limits due to its size and increased purity requirements, a sister system was built based on its model.

The new system was to take over the tasks of the existing multi-bath ultrasonic system and bring the work to a higher level, both quantitatively and qualitatively. The department in which the cleaning system is used is, among other things, the internal supplier for various components for optics assembly (mirrors, mechanical components, structural components and more) in the subsequent clean room. The procurement was based on the good experience with the previously supplied system.

Chamber concept makes process control more flexible

The chamber concept of the Power Jet modular series had won out over the open multi-bath ultrasonic system concept for several reasons. The hermetically sealed treatment chambers allow significantly more degrees of freedom in process control, including reduced media and contamination carryover, optimized and improved drying systems and a large number of freely selectable variables for component-specific program selection.

Four different cleaning methods

The new system was also designed as a Power Jet model. This is equipped with three treatment chambers and six flood tanks, whose cleaning and rinsing processes are based not only on the classic methods (spray cleaning, pressure flooding processes, multi-frequency ultrasound) but also on the vacuum pulse process of cyclic nucleation (CNp), which has been patented since this year.

Further developments and adjustments

In terms of process technology, the first system served as a template. Together with the Trumpf specialists, the experience gained from the first system was adopted and the further developments of the LPW high-purity systems were also integrated into the new system. This was primarily the newly developed ultraworking chamber for high-clean processes. Drying is ensured by a combined vacuum-infrared technology with minimal re/cross contamination load.

In addition, changes were necessary because the working chambers had to be adapted due to the larger batch. Adaptations to the infrastructure conditions were also necessary. For example, the automation system with the associated cleanroom airlock was completely revised. The plant system is now directly connected to the cleanroom at Trumpf



After insertion and placement, several hundred meters of connecting pipelines were laid between the working chamber module and the supply and treatment systems located approximately 50 m away. via fully automated feed automation with adapted laminar flow units via LPW cleanroom airlocks. The return line for the empty goods carriers is included in the overall automation. Especially the basket/pallet return from the clean room had to be adapted to the structural conditions.

Special challenges

The purely technical requirements corresponded to those that LPW has been fulfilling for years in a wide variety of high-purity industries. "In this plant in particular, in addition to the experience of the direct predecessor plant, a lot of experience from the Grade 1 systems in the ASML environment as well as the experience from applications in the semiconductor sector (Silicon Valley) flowed into it," reports Managing Director Gerhard Koblenzer.

The cleaning specialist's application engineering team was particularly called upon for this project with regard to energy efficiency optimization and also in terms of infrastructural integration and installation. This is because the Power Jet system is located on two different floors in the Trumpf building and therefore had to be separated accordingly. "Accompanying the integration into the infrastructure – qualitatively and organizationally – and also the energy efficiency optimization, among other things with the networking of the on-site infrastructure really challenged our specialists. But we achieved very good results," concludes Gerhard Koblenzer. //

Contact

LPW Reinigungssysteme GmbH Riederich (Germany) info@lpw-cleaning.de www.lpw-cleaning.de

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