

Maximum Cleanliness for Highest Laser Precision

Efficient Component Cleaning at TRUMPF with Eco-lander's partner MAFAC



In the cleanroom production areas of TRUMPF Laser SE in Schramberg, strict cleanliness requirements apply. The MAFAC PALMA ensures the necessary particle and film cleanliness of laser components to maintain their full functionality. Particularly, laser-guiding components must be entirely residue-free to guarantee precise performance.

Challenges:

- Cleaning a wide variety of components (ranging from 1 mm to 500 x 300 x 250 mm) made of materials such as aluminum, stainless steel, copper, and plastics.
- Removing contaminants from deep, hard-to-reach holes and complex geometries.
- Preventing particle transfer and recontamination in sensitive assembly areas.
- Ensuring contamination-free transfer into the cleanroom.

Solution: The MAFAC PALMA employs a multi-stage cleaning process that combines spray flooding, ultrasonic cleaning, vacuum technology, and kinematic cleaning. Multiple rinsing stages with specially treated water prevent recontamination. The final drying process involves pulsed high-purity compressed air, hot air, and vacuum drying. A closed transfer system ensures that components reach the cleanroom without any risk of recontamination.

Additionally, the cleaning media and water quality play a crucial role. Three of the system's four media tanks are equipped with full-flow and bypass filtration systems, extending the service life of the carefully adjusted cleaning baths. A coalescing oil separator removes contaminants, while the rinsing water is purified through reverse osmosis, ensuring complete demineralization.

Advantages:

- High cleaning quality due to precisely tailored processes.
- Flexible program management for various materials and coatings.
- Reduced maintenance effort thanks to identical machine designs and standardized spare parts.
- Efficient process integration through short distances and fast service availability.
- Reliable removal of microscopic contaminants, improving product longevity and functionality.
- Optimized automation with semi-automatic loading and fully automated cleanroom transfer.

Conclusion: The MAFAC PALMA ensures consistently high component cleanliness and is an integral part of TRUMPF's manufacturing process. The combination of state-of-the-art cleaning technology and optimized handling significantly contributes to product quality and customer satisfaction.