Cleaning with Modified Alcohol

Meeting the Highest Standards of Cleanliness

In order to comply with predefined cleanliness requirements, the French supplier Fondex is using cleaning machines that operate with modified alcohol. After the cleaning process, the parts are checked in a clean room and packaged automatically.

For parts suppliers, high levels of production quality are no longer enough to ensure that they remain competitive. Their parts also have to meet specific cleanliness standards. Over the course of its 50-year history, the family business Fondex has always been in a position to continue developing in its role as a parts supplier. Around half of its turnover (12.5 million euros) comes from supplying stamped and formed parts to the automotive industry. More than one third of its production goes to customers outside Europe. "As a supplier of increasingly complex parts and assemblies, we must constantly ensure that we stand out among our competitors," explains David Schuler, managing director of Fondex, which is based in Cluses and has 65 employees. One distinguishing feature of the company is the cleanliness of its parts. When it needed to invest in a new cleaning system, Fondex chose the cleaning machine manufacturer Karl Roll and its French sales partner Ecobome Industrie.

Higher quality parts and improved working conditions

The main factors behind the decision to invest in two RCTS 067 hydrocarbon cleaning systems were an order from a car manufacturer for parts with specified residual contamination levels and the company's plan to begin supplying parts for medical devices. The process of achieving ISO 14001 environmental certification also played a role. "The specifications for the electronic housing which we are manufacturing for the automotive industry included very high standards of cleanliness. We wanted a high-performance solution which would also put us in a strong position to fulfil future orders," said David Schuler. The requirements for the new system included an increase in productivity in the cleaning and packaging areas, improvements in the working conditions for staff, regular checks of cleanliness levels in accordance with the ISO standard and compliance with statutory regulations.

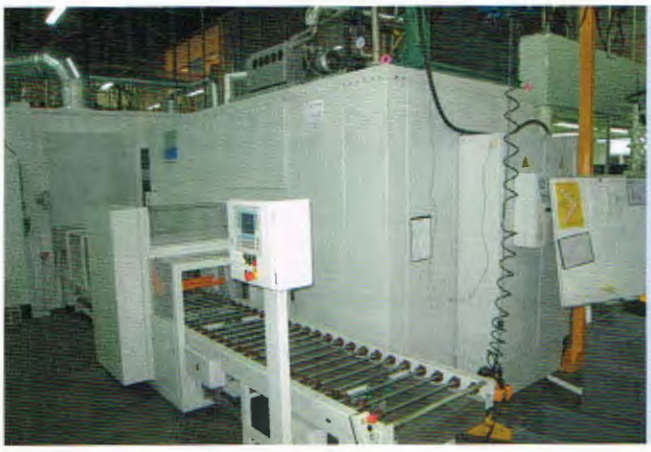
In addition to supplying the cleaning systems, Ecobome Industries was also contracted to plan the project and supervise the construction of the loading system and the conveyor leading to and from the cleaning machine, of the clean room for packaging the parts which includes a test unit for monitoring the levels of particles and of the clean area for the ordinary parts. "We have run this project jointly and we relied on the experience of Ecobome and Roll," emphasises David Schuler. The project also included cleaning tests and residual contamination analyses in the machine manufacturer's technical centre. The tests confirmed that the system could reliably produce the necessary results, which included particles smaller in size than 150 µm and surface tension greater than 42 mN/m for specific parts.

Perfectly coordinated processes

In order to meet these high quality standards, the two identical RCTS 067 single-chamber immersion sys-

The cleaning baskets are transported through the machines and on to the subsequent areas on the first-in-first-out principle.

The new cleaning system makes it possible to comply with very high standards for the removal of particulate matter and films.



In order to prevent the parts being recontaminated with environmental dirt after cleaning, the unloading area is enclosed in a tunnel. Excess pressure from the clean room helps to ensure that the clean parts do not become dirty again.

tems, which can be used with all common non-halogenated hydrocarbons and modified alcohols, are equipped with two solvent tanks for preliminary and precision cleaning. An ultrasound system with a maximum output of 16 watts per litre of bath fluid which can be adjusted to suit specific parts also contributes to the rapid and efficient cleaning process. Roll uses individual transducers that are aimed directly at the parts in the chamber. This ensures that the ultrasound is fully effective and that if one transducer fails only a fraction of the ultrasound output will be lost, so that in most cases the system can continue operating without problems. The system also includes a high-pressure agitation function with a maximum output of 10 bar. The pressure can be adjusted using a frequency converter in the case of more delicate parts.

The process of recycling the cleaning agents is also designed to comply with the cleanliness requirements. The solvent from the two tanks passes through a full-flow filtration system and a bypass filter and is completely recirculated twice an hour. The gooseneck design of the filters guarantees the ideal flow of liquid through filter bag and the reliable removal of dirt. The oil in the solvent is continuously extracted in a bypass distillation unit.

As the machines operate in a full vacuum, no explosion-proofing is needed. An automatic leak test is carried out on the cleaning chamber door before each cycle. Redundant checks of all the safety-related temperatures and pressures are also completed.

Delivered automatically to the cleanliness monitoring or packaging departments

The cleaning chamber in each machine is designed to accommodate cleaning baskets 670 × 480 × 300 (L×W×H) mm in size and has a throughput of between six and ten batches per hour. The batches are transported to the conveyor via a handling system with a bridge and lifting device. The operator then chooses the programme designed for the parts in question in the machine's control system.

After the cleaning process, the baskets return to the conveyor system and, depending on the type of parts and the required level of cleanliness, are transported to the ISO 8 clean room for cleanliness checks or to the clean area for packaging. The clean room has a device for removing the parts and monitoring them with an electron microscope. If problems occur, the cleaning process is modified immediately.

The new system has been in operation since March 2011. The cleaning machines and the connection to the clean room have enabled Fondex to comply with ISO 16323 and to achieve ISO 14001 certification. "Ecobome and Karl Roll have made it possible for us to meet tomorrow's requirements and we are very pleased about that," explains David Schuler. ▮

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