

Press release

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## Automated contamination control is more reliable – and it can breathe

Susanne Brendle  
Tel. +49 69 75 75-6457  
Susanne.Brendle@messefrankfurt.com  
www.messefrankfurt.com  
www.cleanzone.messefrankfurt.com

**It appears to be a new law of nature: anything that can be digitalised, will be. Including in cleanroom production facilities. On 19 and 20 November 2019 in Frankfurt am Main, the Cleanzone trade fair will demonstrate how this can be put into practice in individual companies.**

Digital technologies offer tremendous potential for increasing production efficiency and quality. Whereas initial efforts focused on data collection, people are now taking the next step: enabling communication. This quickly leads to automation, the deployment of robots and self-optimising systems. Whereas contamination control has already been automated to a great degree in the semiconductor industry, with many of the processes being encapsulated (taking place in mini-environments), the trend is now moving on to other industries – including the automotive, pharmaceutical and biotech sectors.

According to Egon Buchta from Ingenieurbüro & Reinraumservice Egon Buchta GmbH in Wannweil: “The more demanding the requirements for a cleanroom are, the greater the advantages offered by automation and the use of robots. That is because people are the primary source of micro-organisms and particulate contamination, and therefore pose the greatest risk of disruptions and downtimes.” It goes without saying that automation also helps combat the sector’s lack of specialists and skilled personnel.

That is why robots are already active in cleanrooms. These are not humanoid versions with a head, arms and legs, but rather a wide range of single- and multi-armed grippers and autonomously mobile disinfection units, such as the UVD Robot that was presented at Cleanzone 2018 by LabTec Labortechnik. Following manual cleaning by human staff, these robots carry out a final cleaning in which concentrated UVC light is shone on ‘infection hotspots’ in pharmaceutical production facilities, laboratories and hospital rooms. These disinfection robots can be started with an app, after which they independently travel to their place of deployment. Once the robot has completed its task, it reports that “bacteria has been eliminated at the hotspot”, creates a log and leaves the room.

Messe Frankfurt Exhibition GmbH  
Ludwig-Erhard-Anlage 1  
60327 Frankfurt am Main  
Germany



Messe Frankfurt/Sandra Gätke

### **Automation and robotisation require dialogue**

In fields that are subject to strict regulations, automation and robotisation pose particular challenges for production. These are but a few of the problems that might occur: A family-run firm in the pharmaceutical industry is looking to bring its overseas production back to Europe. Quality and cost factors make it advisable to switch to large-scale automation as part of this transfer, as that is the only way that the return home is financially viable. For one complex mixing process, there are a number of cleanroom-compatible automatic mixers that could be used, but these would be unable to withstand the centrifugal forces created by the existing process. Alternatively, there are robot systems that are sufficiently robust mechanically, yet these are not suitable for use in cleanrooms. What is to be done?

Another example: As part of the quality control process in a pharmaceutical production facility, ten employees are taking samples from the ongoing process manually. The goal is to automate this step, and initial tests using a pilot system in the laboratory delivered promising results. But this is where questions arise: What can be done to disinfect the robots' mechanical systems? How should the chemical waste be dealt with?

In each of these examples, one thing is necessary: The operator, and if necessary their suppliers as well, have to sit down with cleanroom experts specialising in microbiology for the pharmaceutical industry and work together on developing practical solutions. The result might, for example, involve taking robots with suitable mechanical capabilities and rendering them cleanroom-compatible through the addition of coverings and encapsulations. Or, a cleanroom-compatible robot could be upgraded mechanically so that it is able to perform the desired tasks. An additional robot may be required for waste disposal.

### **Cleanrooms that breathe**

Josef Ortner, Ortner Reinraumtechnik GmbH, Villach, is certain: "Automated systems are more reliable than people. They drive innovation. Over the past few weeks, I have witnessed the launch of an interesting project in the pharmaceuticals industry with the motto

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‘Automation in the pharmaceuticals industry, including upstream and downstream steps such as filling and mixing’. A great deal has happened in this area over the past few years.”

In the interplay between digital technology and automated controls, the use of access control data for fine-tuning air exchange volumes can open up additional opportunities, because if an intelligent system knows how many employees are in the cleanroom, it can ensure that the air-exchange volumes are higher for twenty people than they are for four. The cleanroom can breathe.

Limitless opportunities? – To achieve even greater fine-tuning, experts expect measurement technology to reach a whole new level. While many things have been optimised over the past fifteen years, it will not really be possible for a cleanroom or even an entire factory to ‘breathe freely’ until today’s point-measurement procedures according to ISO 14644 have been replaced by the screening of larger areas or even three-dimensional spaces. The data obtained in this way can then be compiled in a central monitoring station and evaluated digitally. In effect, this creates a dynamic contamination map for the entire cleanroom, whereby the changes in contamination over time can be used as additional information for fine-tuning the air-exchange volumes. This impacts both micro-organisms and particulate contamination.

### **Pumps for soap and disinfectant dispensers produced in a clean environment**

Even supposedly ‘simple’ components must be carefully controlled for particulate and biological contamination. A good example is offered by the pumps for soap and disinfectant dispensers. These are produced in an ISO class 7 cleanroom using a plastic injection moulding process in which employees’ role is limited to supplying their robot ‘colleagues’ with individual parts. That is because picking various parts from different containers and passing these on in the proper quantities continues to be quite challenging for robots.

Even so, Markus Thamm, cleanroom.de GmbH, Heidelberg, believes that: “This process will also be automated over the long term. As soon as the quantities being dealt with increase, it is worthwhile to develop a product-specific automation solution.” There is no better place to begin a dialogue about the opportunities presented by digital technologies, automation and robotisation than at a specialised trade fair – such as Cleanzone on 19 and 20 November 2019 in Frankfurt am Main.

Before Cleanzone opens its doors in Frankfurt in November, the second Cleanzone Middle East will be taking place in Abu Dhabi on 18 and 19 September. This conference and exhibition is focused on the Middle East, parts of Asia and Africa, bringing together the manufacturers of cleanroom technology and equipment with user industries.

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