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Press Release

Bacteria: access denied.

Tiny DC motor systems for use in the human body have to be built in a clean environment, free of microbiological contamination. Welcome to the GMP cleanroom of maxon, where discipline and gelatin meet.

Amongst the hustle and bustle of the busy manufacturing facility at the DC motor specialist's headquarters in picturesque Sachseln, Switzerland lies a world very different from the rest of the areas of the maxon Group. Recently opened, is a production area for DC motors to be used in medical applications. The particle concentration in the air is low and constantly monitored. This clean environment is usually perfectly adequate because DC motors for insulin pumps, medical dosing units, etc. do not have to be completely free of germs and bacteria.

However, applications in the field of high-tech medicine are another story altogether, especially when it comes to implantable drive systems. For these applications, assembly is being moved to the new GMP area (Good Manufacturing Practice). In this cleanroom class, not only the particle concentration, but also the microbiological contamination of surfaces and the air is measured and examined for traces of spores, bacteria, or fungi. This clinical environment places high demands on the ventilation technology, the instruments, and especially the people that spend time inside it.

People who work in this environment always have to observe the same strict processes and rules. The two production staff members, Albane Lloqanaj and Ruth Da Silva, put on special pants and tops that arrived vacuum-packed from a cleanroom laundry. These uniforms are made from high-tech materials and are anti-bacterial. The two staff members then put on special hygiene masks, hair nets, gloves, labcoats and antistatic shoes.

Additionally, they have to follow a six-step hygienic hand disinfection procedure and disinfect their hands for at least 30 seconds using skin-friendly disinfectant. Subsequently, the gloves are disinfected with pure alcohol that evaporates without leaving any residue. This ensures that neither particles nor germs can stick to the gloves. All these process steps occur in a defined order. Additionally, care has to be taken that no contaminated air enters the GMP room from the outside. To this end, three zones that are separated by automated airlocks have to be crossed. It is only possible to open one door at a time, because the further you go in, the higher the air pressure in the respective room becomes.

Inside the cleanroom itself, the staff have to be highly disciplined. For example, they are not allowed to touch their faces. And if they do, it must always be consciously, so that they can immediately disinfect their gloves again. "I like this kind of work very much, because it's challenging, varied and responsible. No mistakes are allowed when our drives are being used for implantable systems", says production staff member Albane Lloqanaj. This also requires an open approach to errors. Team leader Stefan Kathriner: "It's important that we immediately alert each other if something looks strange or we suspect an error. Criticism is never personal, always objective."

The effort involved in operating such a GMP environment is immense, which is why only a few special customer orders for implantable systems are processed there. In the past few years, the cleanroom specialists at maxon have learned a lot from these projects. Stefan Kathriner says, “We have comprehensive know-how and hope that we will be able to handle more customer orders of this kind in future.”

To ensure that the amount of germs or bacteria on the work surfaces or in the air does not exceed a certain threshold, maxon regularly conducts tests with a nutrient-rich gelatin. These so-called agar plates are pressed onto surfaces or left open around the room. The gelatin serves as breeding ground for micro organisms. After 72 hours in the incubator, it is possible to see with the naked eye whether there is contamination and how high it is.

For further information contact maxon Group Australia Tel. +61 2 9457 7477.

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The press release is available on the internet at: www.maxongroup.net.au



Gelatin is used to conduct tests for germs or bacteria on the work surfaces or in the air don't exceed a certain threshold. © maxon/Philipp Schmidl



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The Swiss specialist for quality drives

maxon is a developer and manufacturer of brushed and brushless DC motors, as well as gearheads, encoders, controllers, and entire mechatronic systems. maxon drives are used wherever the requirements are particularly high: in NASA's Mars rovers, in surgical power tools, in humanoid robots and in precision industrial applications, for example. To maintain its leadership in this demanding market, the company invests a considerable share of its annual revenue in research and development. Worldwide, maxon has more than 3000 employees at nine production sites and is represented by sales companies in more than 30 countries.