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Cleanroom production: profile system simplifies construction of workbenches

Bacteria do not stand a chance

Dental implants only heal successfully if they are completely free of bacteria. For this reason, all work involving their manufacture must take place from the outset under cleanroom conditions. Altatec has implemented a system of workplaces using a modular building kit system which allows it to meet the strictest hygiene requirements.

The loss of a tooth will always leave behind a painful gap. However, with today's technology, implants in the jaw can take over the task normally filled by a natural root and provide a firm foundation for false teeth. The preferred material for implants is titanium because this metal is known to integrate well in the surrounding tissue. A further key point is that the implants must be completely free of germs – only if they are, will they become safely embedded in the bone. The demands made by manufacturers such as Altatec GmbH Wimsheim, South Germany, on their production environments reflect this need.



The chip-removing production processes, which involve machining titanium rods on special-purpose lathes and the subsequent cleaning, testing and packaging stages, take place according to clearly defined logical processes under hygienic cleanroom conditions. When designing its production environment, Altatec had to provide ergonomic and functional workplaces for its employees which, on the one hand, provide a sufficiently aesthetically pleasing environment and, on the other hand, meet the strict need for cleanliness and cleanability for cleanroom applications.



Market research and quotations from full-service suppliers offering various "off-the-shelf" workplace systems were, however, not up to the required standards explains Jean-Marie Wyss, Managing Director of the company. Many of the operations were specific to that single, personalised, product as the implant passes through production and into the packaging stages, he explains. So it was a logical step for the company to consider building their own workplaces. "To do so, we needed a flexible, modular solution", he continues. It was also crucial to find a system that had a low abrasion coefficient and was resistant to chemicals. "The material has to withstand thorough cleaning for many years without allowing particles to rub off", adds Gerhard

Scheytt, responsible for final processing at Altatec. "As a general rule, the components used in a cleanroom have to be easily accessible so that no joints, gaps or other hollow spaces remain which cannot be properly cleaned and which could then become a source of infection."

The company finally decided on a system, the MB Building Kit System made by Item Industrietechnik GmbH, based in Solingen, Germany, which enables the special-purpose benches to be constructed in a way which is both versatile and congruous. Thanks to its use of aluminium profiles, which offer a choice of multifunctional grooves or completely sealed sides, the matching fastening technology and numerous flexible functional elements, this system provides a solid base for industrial installations of all kinds. Using this modular building kit system, workplaces for a wide range of production environments can be constructed, and individually tailored guards and enclosures and production aids built.

In terms of the potential sources of infection, the multifunctional grooves may be counterproductive, continues Production Manager Gerhard Scheytt, in particular if they cannot be completely sealed off.

"However, the MB Building Kit System enables us to realise seemingly contradictory requirements in terms of structures and accessories within a single system." Other systems required a series of compromises. "In addition, item also offers a profile with closed grooves and the corresponding special-purpose screw connectors and radial seals." Despite this, the versatility of the system is not compromised, which is why this profile type was now being used to a considerable extent for new projects. "The cable and compressed air ducting inside the profiles is also a great help in terms of cleaning the surfaces."



In this way, Altatec was able to implement not only the workbenches and production equipment for the chip-removal operations in the production process but also the assembly and testing bays in the

470 m² hygiene and cleanroom environment. During the planning and implementation phases and the construction of the first benches, an engineer from item supported the company. The Building Kit contains a number of components specially for use in cleanrooms, from fastening elements for profile constructions to special-purpose components for fixing cables, pipes and hoses. The modular concept was the ideal solution. "In comparison with custom-made products, we have been able to make considerable savings and we also had no problem validating the rooms, either", underlined Jean-Marie Wyss, Managing Director of Altatec.

A layman may not, at first, see why the work has to be conducted under cleanroom conditions if the implants have to be sterilised afterwards anyway. Gerhard Scheytt explains the necessity in the context of the overall process:

"Cleanliness in terms of particles and germs during these final stages before packaging is absolutely critical because we have to make sure that the implants are not rejected by the wearer due to foreign substances." During the qualification phase of the Building Kit System and the subsequent regular audits, the number of particles and the infection rates in the air are monitored as a matter of routine and the work surfaces checked for cleanliness by swabbing. In this way, the company is able to ensure that the patients will have the greatest possible peace of mind as regards their implants for several decades.

