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## Cleanroom for medical devices: Powerhouse in a compact space

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Swiss plastics processor Flex Precision Plastics Solutions manufactures highly complex medical products in cleanrooms with an above-average degree of automation. When the company needed new cleanroom space that also met the new process requirements, Flex turned to IE Plast: an existing assembly cleanroom was to be largely dismantled and converted into a new ISO 7 clean room for injection molding.

The existing conditions and the high degree of automation meant that the plant layout had to be tailored to the local conditions. A classic arrangement of the injection molding systems would have meant a significant increase in space requirements and consequently necessitated a new building. Consolidation, on the other hand, required that all media be routed precisely to the respective required location in the room via the ceiling plenum, where space was very limited.

IE Plast designed the ceiling plenum holistically and with great attention to detail. This made it possible to route the necessary building services for rooms and systems, media connections, and raw material transport to their respective destinations.

### PLANNING AND CONSTRUCTION PERIOD

› 10 months

### CONSTRUCTION SCOPE

- › Floor area: 1.850 m<sup>2</sup>
- › Cleanroom area: 800 m<sup>2</sup>
- › Storey height: 4 m

### INVESTMENT TOTAL

› CHF 3 million

### IE SERVICES

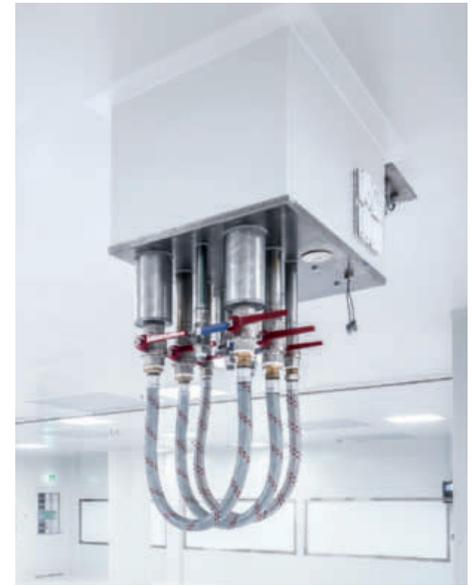
- › General planning and execution
- › Operations and cleanroom planning
- › Qualification



Removable lock for plant installation



Sophisticated cooling concept for the supply of plants and building services



Media column as interface to the system for refrigeration, compressed air, exhaust air, system signals, etc. Equipped with reserve positions for future expansions.

Despite the given plant height and storey ceiling, a ceiling plenum was realized, which is just accessible for maintenance work and inspections. The lack of room height required a special solution: Heavy injection molding tools (>5 t) were brought in from the side using a special vehicle.

### **Powerhouse – creating sustainable benefits**

Energy efficiency is a high priority for Flex. However, given the high installation density in the new cleanroom, a great deal of energy must be made available. A selective approach would have been insufficient in this context. In order to develop a precisely tailored solution, IE Plast measured the energy and cooling consumption in the total inventory over a period of time and converted it to future production volumes and plant concepts. The high energy consumption brings with it a considerable amount of process-related room waste heat. This heat emission is captured in a scalable cooling and recirculation system and as much of it as possible is emitted to the outside air via an energy-optimized freecooling-system. By extracting the process-related vapors and exhaust air at the point of origin, IE Plast was able to minimize the cooling demand and the amount of fresh air required.

### **„Time to Market“: perfectly orchestrated for project connection**

The project was subject to very high time pressure from the start, as the “time to market” principle is of central importance for Flex. In order to meet this requirement, the immediately adjacent raw material conveyor and the cleanroom above it can be switched over to the emergency unit in a targeted manner. This ensures that they are available at all times. The extensive construction and building services work was subject to tight deadlines. The high level of dependency of the individual trades on the local conditions meant that a high level of coordination was required. Nevertheless, the project went according to plan: in just four months, the construction work was successfully completed thanks to the experience of the entire planning team and the close cooperation with the client and the authorities.

### **Qualification – planned steps for quality assurance**

A rapid planning and implementation process carries the risk that details will be overlooked and that the qualification process will remain incomplete. The added value is achieved by aligning the qualification steps with the classic construction processes. In a well-coordinated team, it is possible to react quickly and in a risk-based manner to upcoming changes – in the sense of qualification as a decisive cornerstone of quality assurance.

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## **Contacts**

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