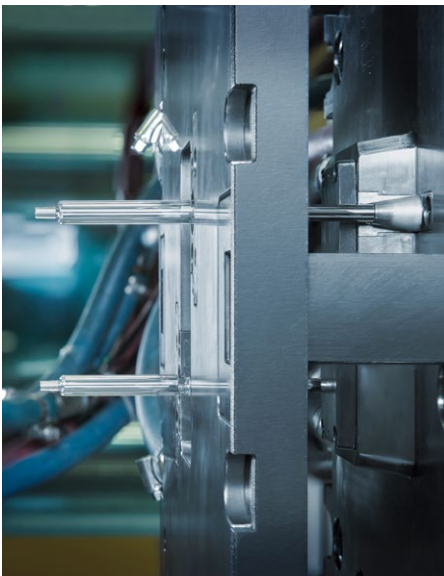


MEDICAL SYSTEMS

Primary drug containers for needle-free injection

Gerresheimer and Portal Instruments develop an innovative primary packaging



Injection molding of cartridge body

Together with Portal Instruments (Boston, USA), Gerresheimer Medical Systems has developed an innovative primary drug container for use in needle-free automatic injection system. The cartridge-like container, made of the high-performance polymer COP (Cyclo Olefin Polymer), serves as the primary packaging for the sensitive active agent and is equipped with a nozzle, with which the hair-thin jet of medication is generated for the injection.

Automatic injection systems play an increasingly important role in the treatment of chronic illnesses. Patients can administer medication themselves at home with these devices and thus save the frequent trip to the doctor's office. When the injection then also takes place directly through the skin without a needle, many people find it much easier to follow the prescribed treatment. Portal Instruments has developed a needle-free automatic injection system, the injection jet of which is considerably thinner than that of the usual canulas, and which can inject even viscous medications through the skin in less than a

second. The device is also networked through the Internet, so that the correct treatment can be monitored by the patient, and possibly also by the physician.

Gerresheimer, together with Portal Instruments, has now developed a drug container that fulfils the high demands of the medication and the injection procedure. Portal Instruments decided in favor of Gerresheimer as a development partner because the company possesses know-how in the development and production of syringes of COP. "For this project, we were able to access our experience from our own product, the polymer syringe Gx RTF® ClearJect®, and develop a customized solution on this basis," Manfred Baumann (Global Executive Vice President Sales & Marketing, Administration & TCC, Management Board, Gerresheimer Regensburg GmbH) explains.

Most modern, highly effective medications are today manufactured with biotechnological methods. These sometimes very expensive medications make especially high demands of their primary packaging. COP is often used as a material for pre-fillable syringes and cartridges. The unbreakable, clear-as-glass material hardly interacts with the highly sensitive active agents and is therefore well-suited for the storage and administering of the medication.

Especially challenging in the project was the development of the nozzle and its fastening in the cartridge. The nozzle is a micro-injection molding part with an inner diameter smaller than 200 µm. The connection with the cartridge body is generated via laser welding as it is an adhesive-free solution that eliminates the possibility of chemical contamination of the medication solution. However, the laser welding of two transparent components (Clear to Clear) is especially challenging and care needs to be taken not to deform the precise nozzle by the heat generated from the laser. Mold making, production of the syringe body, and of clinical samples took place at the Gerresheimer location in Wackersdorf.



Left: Injection molding of cartridge body

Right: Clear-to-clear laser welding of the two transparent components cartridge body and nozzle

Above: Packaging in Tyvek-sealed 160-unit standard nests/tubs

About Portal Instruments

Portal Instruments develops administering systems for the creation of a commercial, networked platform for the needle-free administering of medication for the treatment of chronic illnesses. With an innovative, needle-free injector with connectivity, analysis, and digital accompaniment, Portal wants to improve patient experiences and results. The company has entered into a pioneering partnership with the Japanese pharmaceuticals company group Takeda in order to bring this vision onto the market with a combination of medication and administering systems in the segment of inflammatory intestinal disorders.