

Press Release

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Micro parts made from Technical Ceramics for the medical technology industry

Sembach manufactures very small components using the micro-injection moulding process

The ceramics specialist Sembach Technical Ceramics has recently started using the micro-injection moulding process. This process is not yet very widespread in the ceramics industry since manufacturers of medical technology devices and components still often lack the knowledge about materials from the field of Technical Ceramics. Technical Ceramics, however, have a number of positive properties that are particularly suitable for miniatures, particularly in the medical technology sector.

Micro-injection moulding is used to describe the production of components whose weight is approximately between 0.01 and 0.5 grams. Some parts are so small that they can only be seen with a magnifying glass. Micro-injection moulding differs from classic injection moulding in that it has a very small injection unit that is integrated in the injection moulding machine instead of the normal size unit. This injection unit is based on a different technology. A piston press is used instead of the usual worm shaft. This piston is so small that it can transport very small amounts of material. It is important to monitor the process, which would not be possible with micro-injection moulding on a normal injection moulding machine. The resolution is too coarse to measure injection pressures, injection volumes, etc. However, monitored processes are the be-all and end-all in many industries and a key requirement for suppliers. With the small injection unit, it is possible to resize the minimal piston movements and thus measure and monitor these small quantities. This is how Sembach ensures process reliability for the micro parts.

Technical Ceramics predestined for medical device technology

Parts that are manufactured using the micro-injection moulding process are in demand, for example in medical device technology. The manufacture of medical components, in particular, is subject to sensitive requirements, especially when it comes to components on medical devices that are in direct contact with body tissue. Here, the special suitability of ceramic material (usually oxide and non-oxide ceramic), which is particularly biocompatible, corrosion-resistant and wear-resistant comes into its own. Some typical micro parts made using micro-injection moulding are miniature bushings for pacemakers, tips for endoscopes for minimally invasive procedures (see illustration) or tools for miniature components.

High quality standards

With the strict certification according to IATF 16949, which Sembach has, the company is also ideally positioned for medical devices and tools. Sembach, for example, has manufactured the miniature bushings for pacemakers mentioned above. The volume of this part is 13.9 mm³ and the weight 0.055 g. The quality control following the manufacturing process of the micro parts can be carried out automatically at Sembach, depending on the quantity, using a visual microscope inspection or, for high volumes, as an optical 100% inspection using camera systems.

2,753 characters / 3,143 keystrokes

Pictures:



Image: Micro-injection moulded part made of Technical Ceramics: an endoscope tip for minimally invasive procedures. ©Sembach Technical Ceramics

About Sembach GmbH & Co. KG:

Sembach Technical Ceramics manufactures high-quality components made of Technical Ceramics for the automotive industry, mechanical and plant engineering, medical device technology, energy technology, the household appliance industry as well as the subject area of measurement, control and regulation. With the stability of a fifth-generation family-run company, Sembach is one of the internationally established suppliers of Technical Ceramics. Depending on the design requirements, Sembach can use manufacturing processes such as dry pressing, ceramic injection moulding (CIM) and extrusion. The company, based in Lauf an der Pegnitz near Nuremberg, offers the greatest possible flexibility in terms of design, while at the same time being economical. It currently employs around 240 people, about a fifth of whom are skilled workers from in-house training.

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