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PRESS RELEASE

WITTMANN BATTENFELD at the K 2022

Micro loudspeaker made of thermoplastic and silicone

Silicone processing is one of WITTMANN BATTENFELD's core competencies. Among the company's exhibits to be presented to visitors of the K fair at its booth No. C06 in hall 15 is a microscale LSR application.

It is the production of a micro membrane for a high-quality mini loudspeaker made of thermoplastic and liquid silicone, manufactured on a MicroPower 15/10H/10H Combimould using a single-cavity mold supplied by Starlim Spritzguss GmbH, Austria. The MicroPower used for this application is equipped with a 2-step screw-and-plunger thermoplastic aggregate and a 2-step screw-and-plunger LSR aggregate.

The loudspeaker membrane made of PA6 and a self-adhesive LSR material is produced inside a single-cavity mold from Starlim by way of a 2C injection molding process. The special challenge in this type of micro application is process-safe handling of the extremely small shot volumes.

Especially in prototyping and/or testing of pilot molds for micro parts, the use of large standard machines often requires large quantities of material to be processed, in order to generate a sufficient throughput rate inside the injection unit. As a consequence, micro parts in particular are subject to considerable process fluctuations, thus causing high reject rates. Another problem is the excessive energy input into the system, which is required to produce the finished parts in spite of their relatively small injection volume. The large volume of material needed also requires the construction of a sufficiently large mold, with an excessive amount of sprue in relation to the size of the part itself. This causes heavy costs, since expensive cavities must be produced in relatively large numbers, too, and the mold consumes an excessive amount of energy during the heating phase as well as in operation.

Another noteworthy aspect is the delivery time. Since the manufacturing time required for micro molds often depends on the shape of the part to be produced, a reduced number of cavities will definitely shorten the lead time accordingly. This aspect, too, should not be overlooked in our fast-moving industry, as it can be decisive in winning or losing the contract for any given project.

Normally, the main cost driver in micro molds is their small part geometry, which often takes up most of the manufacturing time in mold making. Quite frequently, this requires special processes which, due to the high standard of precision, cause longer processing times. It often happens that minute adjustments of only a few μm take several hours. Of equal importance in the manufacturing process are the downstream measurements of the molded part, which may also last several hours.

All of this means that the reduction of size to a single-cavity mold really makes sense and can save a lot of time and costs during the pilot phase.

A further important contribution towards an efficient overall process is made by the “LSR18mc-Kartusche” LSR metering pump designed for small metering volumes, supplied by EMT Dosiertechnik, Germany. It is a 1-liter cartridge system laid out for extremely small metering volumes. This newly developed, semi-transparent cartridge solution enables early detection of possible air pockets and offers the added advantage of further optimized sturdiness in the overall structure. The even emptying flow of the cartridges ensures highest precision and consistent high quality. The short mixing section enables fast cleaning as well as efficient, resource-saving use of the entire system. The application on display is intended to demonstrate that the right machine together with the matching mold technology make it possible to achieve a perfectly controllable process, even with extremely small shot volumes, in order to minimize the production costs within a short time for prototype parts and initial sampling as well.



Fig. 1: MicroPower 15/10H/10H Combimould with LSR metering pump



Fig. 2: Injection units MicroPower LIM Combimould

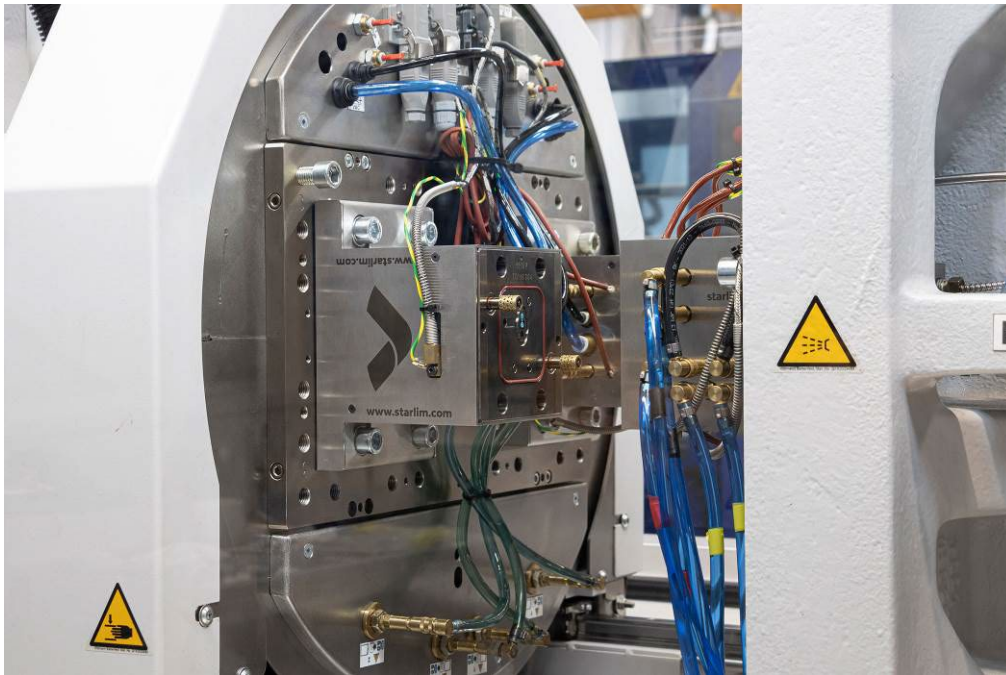


Fig. 3: Single mold from Starlim Spritzguss GmbH



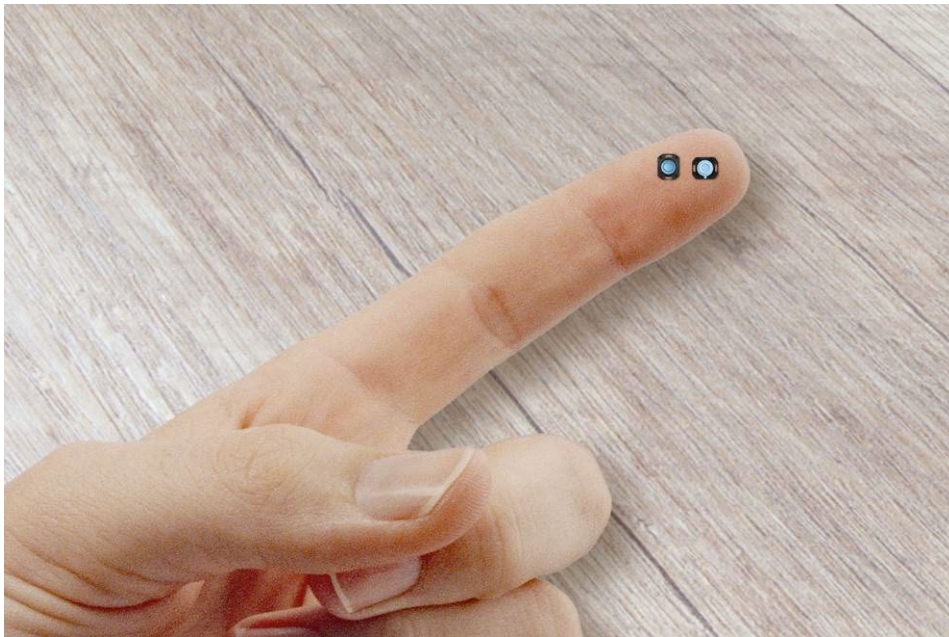


Fig 4a+b: Membrane made of thermoplastic and liquid silicone for a high-quality micro loudspeaker, manufactured on a MicroPower 15/10H/10H Combimould

The WITTMANN Group

The WITTMANN Group is a globally leading manufacturer of injection molding machines, robots and auxiliary equipment for processing a great variety of plasticizable materials – both plastic and non-plastic. The group of companies has its headquarters in Vienna, Austria and consists of two main divisions: WITTMANN BATTENFELD and WITTMANN. Following the principles of environmental protection, conservation of resources and circular economy, the WITTMANN Group engages in state-of-the-art process technology for maximum energy efficiency in injection molding, and in processing standard materials and materials with a high content of recyclates and renewable raw materials. The products of the WITTMANN Group are designed for horizontal and vertical integration into a Smart Factory and can be interlinked to form an intelligent production cell.

The companies of the group jointly operate eight production plants in five countries, and the additional sales companies at their 34 different locations are present in all major industrial markets around the world.

WITTMANN BATTENFELD pursues the continued strengthening of its market position as a manufacturer of injection molding machines and supplier of comprehensive modern machine technology in modular design. The product range of WITTMANN includes robots and automation systems, material handling systems, dryers, gravimetric and volumetric blenders, granulators, temperature controllers and chillers. The combination of the individual areas under the umbrella of the WITTMANN Group enables perfect integration – to the advantage of injection molding processors with an increasing demand for seamless interlocking of processing machines, automation and auxiliaries.

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