

# Hot Runner System for Medical Micro Parts

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In response to the demands for ever more compact hot runner systems for the production of plastic components used in the medical and electronics industry Heitec Hot Runner Systems introduces a new hot runner system. Until 2011 a 6.0 mm cavity spacing was considered to be the smallest possible using individually controllable hot tip nozzles. Continuous development of the Flat-Line nozzle series now allow a distance from 4.5 mm. This sets new standards for space utilization and maximum number of cavities per mold. This system is especially useful for the production of the smallest medical vial strips using PP or PMMA for analytics, or smallest TPE seals for infusion technology.

The new hot runner system now allows a closer spacing of each vial. The gating is still on each vial with a separately controllable nozzle. This can allow one to actively influence the filling behavior, if necessary. A uniform filling of the articles from the bottom of the vial up to the support strip can be achieved. The very small nozzles, and the use of good heat-insulating materials for the sealing elements result in a 45W/h energy consumption per nozzle processing PMMA. The small dimensions of the entire hot runner system also reduce the radiation of heat to the mold so that the mold cooling is much more effective. This has a positive effect on the gate vestige height of the article and the cooling time.

For the development of miniature nozzles, a test tool with a 10-drop hot runner system was built for molding of toothpicks in order to perform durability and material tests under production conditions. In producing these toothpicks made of PMMA, which are connected together in bundles of five over a thin film gate, it shows no visually detectable degradation of the plastic after a production interruption of more than 30 minutes. This illustrates the uniform temperature profile of the hot runner system.



With a gate diameter of 0.8 mm all articles filled completely right after re-starting the mold with the first shot again. There was no evidence of stringing or drool of the plastic.

Due to the small dimensions of this system it is suitable for shot weights per nozzle of 0.005 g to 1.5 g Besides appli-

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cations in analytical and medical technology it is used in standard micro injection molding applications, but also in reel-to-reel manufacturing and metal overmold applications for micro switch or IC's in the electronics industry.