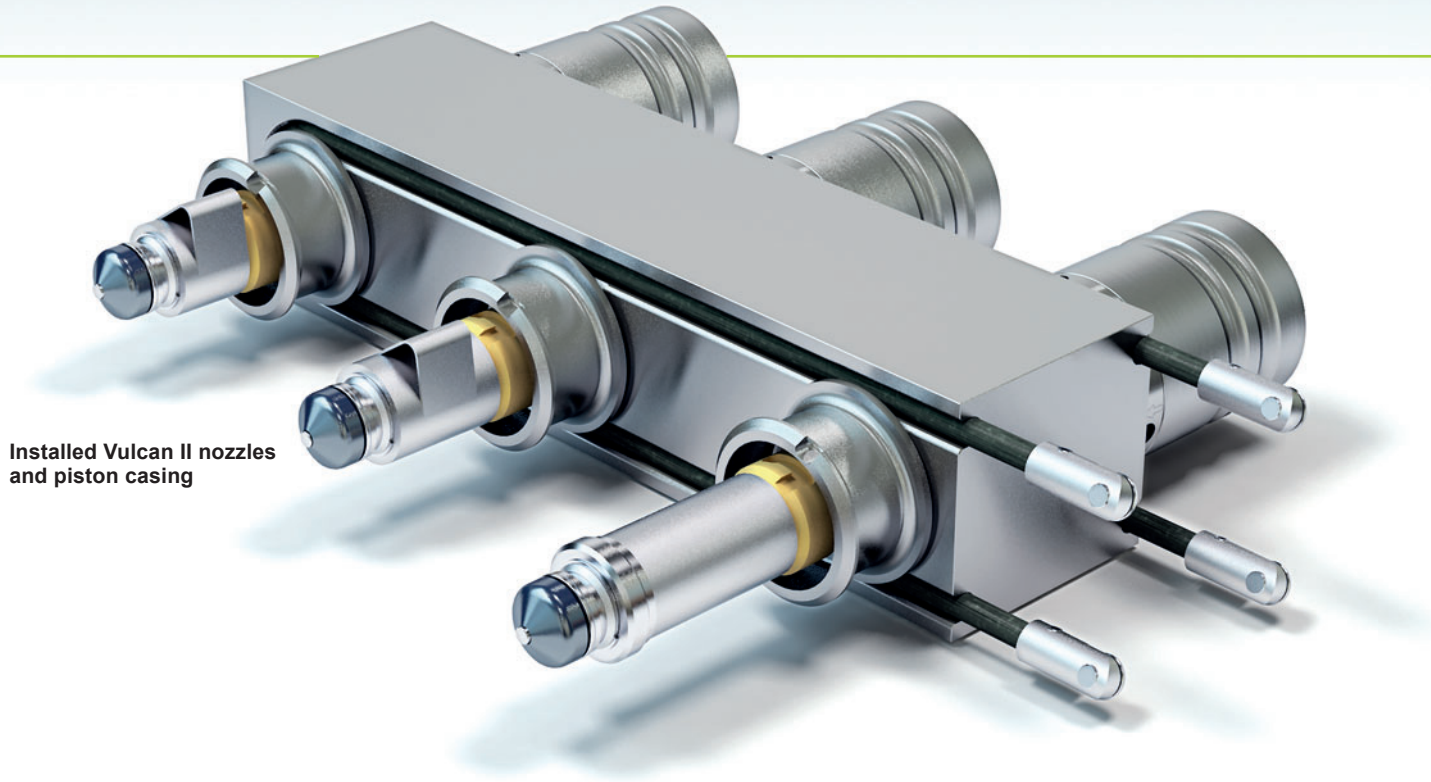

Installed Vulcan II nozzles and piston casing

MHT Vulcan II - faster and more efficient

Hotrunner components

High material throughput, even filling, quick cooling. When it comes to high-performance tools with up to 192 cavities, as they are used for PET preforms, the hotrunner has its work cut out for it. It decides performance. The tool manufacturing MHT Mold & Hotrunner Technology AG (MHT) has updated its hotrunner components and offers now three advantages with its new Vulcan II series: longer operating times and quicker maintenance combined with lower energy consumption. To achieve this, the development team completely redesigned the piston package.

Overall, the piston package of the Vulcan II is somewhat thinner, longer and based on a totally different setup, consequently increasing durability and ease of maintenance. Here, the pistons and piston housing have exchanged the number of their parts: the piston itself is now made from two components (previously one) and the piston housing is now made from one piece (previously two), which results in stability advantages. The central goal of the redesigning process was the tightness of the system. While so far a metallic sealing between the valve bushing and the backing plate was only created by the contact pressure when the processing temperature was reached, this task is now carried out by an elastic O-ring. The latter already closes the valve bushing in cold conditions and prevents the escape of compressed air. Further wear and tear-optimised piston seals can be replaced without any stretching and thus without any material damage, thanks to the two-part construction of the piston. One simply opens the piston casing, removes the upper part of the piston, inserts a new seal and closes the entire system again.

A special focus of the Vulcan II is the resistance against PET dust. For this purpose, the valve stem guidance of the reversing device was lengthened considerably. This prevents PET dust from getting into the piston housing, where it would have an abrasive effect and limit the precise function of the piston. Just in case, the piston package still has an emergency reservoir, where the PET dust is able to be collected temporarily. All measures combined result in the maintenance interval increasing to up to six million cycles, and when maintenance is needed, it is completed quickly because all piston packages are very easily accessible. Also removing the valve stem is no longer required with the Vulcan II.

Changes as extensive as those now implemented for the sub-assembly piston housing had already been made to the nozzle tip of the Vulcan I – and these were optimised even further. Now, the nozzle tip is screwed into the base of the nozzle with an internal screw thread, resulting in the heating band being in direct contact with the nozzle. Formerly, the tip had had an exterior screw thread, so that the metal layer of the nozzle base was located between it and the heating band. As a result, the heat transfer is now considerably better and more efficient. In plastic injection moulding, the transition from the nozzle to the cavity is the meeting place of hot and cold.

While the material in the hotrunner has to be gently and evenly kept at processing temperature, the material in the cavity is supposed to cool down very quickly. On the one hand to keep cycle times as low as possible and to allow for a high throughput, but on the

other hand also to prevent the PET from crystallising.

This would otherwise cause the preform – and therefore later the bottle – to not being completely transparent at this point. To better split the two temperature areas of nozzle and cavity, the insulation performance was enhanced by a titanium ring. The result was a reduced energy requirement thanks to the more efficient separation between the hot and cold areas.

When comparing the – apart from the hotrunner – identical tools, power consumption of the Vulcan model was higher by a double-digit percentage. Further power savings can be achieved by using a HP gate insert, which directs the cooling to the mould contour and prevents unnecessary dissipation of heat from the hotrunner nozzle. This allows for double savings: less heating required at the nozzle tip and lower cooling performance of the cooling water system.

Also the owners of an existing MHT tool can benefit from this savings potential, simply by replacing the existing nozzles with the Vulcan variety. With the change, they simultaneously gain an increased amount of flexibility. The two-part nozzle with tip inlay makes the exchange particularly easy – be it in case of wear and tear or if a new diameter, a new design or different materials are required. Pre-alignment of the valve stem is possible as well.

To summarise, the Vulcan hotrunner components of MHT combine tightness with easy maintenance and energy efficiency.

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Nozzle cases of different lengths with heating and thermal sensor