

Plastics in Packaging

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IMITATION OF LIFE

How modelling tools and simulation software are being used by thermoformers to improve consistency

Italy-based Thermoplay is also regularly improving its hot runner systems, says marketing manager Maria Pomesano: "Our systems are continuously being improved to permit more cavities in the same mould area, to reduce the residence time of the molten material and to achieve a perfectly balanced system. In this scenario, the hot runner sector is developing at a very fast rate in the packaging industry and this will continue."

Meanwhile, Milacron's Mold-Masters brand has developed its Summit-Series line for medical

"The E-Multi is an affordable entry for moulders into the growing multi-colour/multi-material market. It has LSR capabilities to help transitioning from regular thermoplastic elastomer to silicone base either on single shot or dual shot over moulding applications," the product management director said.

Latest news

Elsewhere in the market, Thermoplay has recently released nozzle units that have enabled

faster cycles for its customers: "These are suitable for moulding parts where the injection speed and high pressure require high performances. The sealing area between the nozzle head and manifold has been optimised in order to compensate the injection pressure increase during fast production cycles," said Thermoplay's Pomesano.

"To get an optimal injection rate, the melt channel inside the nozzle has been increased. The thermal exchange between pin and cavity

plate has also been improved to achieve a faster cooling of the gate area and consequently a good aesthetic of the injection point. The construction guarantees a mechanical clamping even when the system is not thermally expanded."

Two companies using this technology are food packaging manufacturer Plastic Legno and consumer packaging business Simpa. Legno's application uses PS as the material, weighs 8.2g and has a cycle time of 6.5 seconds. Meanwhile, Simpa is using PP for its product with a cycle time is 7.0 seconds and a weight of 50g.

Thermoplay has also recently developed a special multi-tip nozzle for injection into restricted areas. Designed for axial injection of small parts, the particular position of the tips, which can number two or three, allows injection on the walls of the parts with a minimum distance between the points of 3.2mm. As a consequence this nozzle is said to be particularly suitable for applications where multiple injection in extremely restricted areas is required.

A sample application using this technology comes in the form of a PE perfume dispenser from West Rock Italia. The part is located inside a pump, which requires perfect concentricity on the stem of the pump body to guarantee correct operation.

"The membrane has a double function of regulating the dosing of the liquid inside the bottle as well as sealing it in. The three injection points are required to achieve optimised filling balance and uniform pressure hold during the injection cycle," said Pomesano.

Hot runners are also being used within in-mould labelling (IML) of food packaging, with US-based Mold Hotrunner Solutions providing systems in this area.

Jörg Schmidt, its director of business development, explained to *Plastics in Packaging* how thin-wall moulded containers with IML and a wall thickness of less than 0.5mm benefit from injection through the mould core.

"It allows the label to be applied to all sides of the part, including the bottom of the container. It also offers more flexibility for IML lids inside gating through the core. As well as this, it gives it a more concentric fill and improves IML automation," he said.

"Gating through the core requires extremely long and slim valve gate nozzles that allow for highly effective core cooling. New hot runner nozzles like the Rheo-Pro N10 require only a small 34mm diameter cut-out but feature a generous 10mm flow bore with a 4mm valve pin for PP applications with a melt flow index of 70.

Valve gating offers better process control and part quality compared to thermal gating," said Schmidt.

Elsewhere, Polymer Cleaning Technology (PCT), an independent provider of parts and services for brands of hot runner systems, has introduced a line of brass nozzle heaters. PCT claims that the Imperium line is available as a direct replacement for all standard OEM nozzle heaters. They can also be customised for non-standard systems and applications.

"These design features make Imperium heaters suitable for moulders involved in demanding applications where long heater life and high temperature uniformity are critical," said company president Bob Duffy.

Fellow US firm Polyshot is another with a deep involvement in the



Above left: Thermoplay has manufactured a special multi-tip nozzle for injection in restricted areas and has been designed for axial injection of small parts.

Above right: Ultra-slim valve gate nozzles have been designed by MHS for inside gating through the mould core for PP IML thin wall containers

hot runner sector. During the final quarter of 2016, the business is set to release a side gating system, which is awaiting patent approval.

"A revolutionary side gate system will excite our mould making customers in the fourth quarter of this year. It will allow easy assembly of the mould cavities with the side gate assembly. This will create an automatic, leak-free hot runner/mould cavity interface without any torquing of inserts or screws," enthused business development manager Dawn Bowerman.

She continued: "Another one of our latest technologies is the Vacuum Brazed Manifolds. It provides a very precise volume and viscosity delivery, with unrivalled accuracy. There are no 'turn plugs', steps or hold up areas. We can vacuum braze two or more plates into one piece and have accurate balance regardless of nozzle location."

Meanwhile, with interest growing in single-serve capsules in the packaging market, Plastic Technologies (PTI) has formed a partnership

with hot runner manufacturer HRSflow and mould maker ErRMO to provide a turnkey path to commercialisation for single-serve beverage and food capsules.

"PTI has been helping many brand owners develop capsules or pods that will deliver the performance parameters required by the specific product application," said Thierry Fabozzi, managing director of PTI's European business unit.

"With these single-serve containers being evaluated for everything from coffee to soup products, it is also important to be able to work with a hot runner manufacturer that has expertise in material rheology. That is why we are collaborating with HRSflow and ERMO."

Research and development

Like any market, research and development continues to play a key role in the hot runners sector. In Husky's hot runners department for example, the company maintains a dedicated R&D group with metrology and fully equipped test laboratories.

"The team of engineers in R&D include many post-graduates and a variety of expertise in areas such as material science, controls and polymer science. Having all of these resources enables Husky to investigate solutions to industry challenges from a 'first principles' perspective, breaking the problem down to the fundamental physics or chemistry to understand at a really fundamental level what's occurring."

Meanwhile Sudheer Thrissileri claims that Milacron possesses one of the largest R&D departments in the industry: "Just recently we completed two technology days in Utah and at our Milacron California HIT centre focusing on both packaging and medical."

Also across the Atlantic, Thermoplay is using R&D to test the injection systems for new polymers.

"Besides this, the other important task is to find and optimise new solutions to any new customer requirement that follow the evolving market," explained Pomesano.

With packaging types like pouches and thin-wall containers experiencing growth, and regions such as South America set to gain further momentum, opportunities will continue to arise for the manufacturers of hot runner systems and keep them on an upward curve. P

More information from:

Husky	www.husky.ca
Milacron	www.milacron.com
Mold Hotrunner Solutions	www.mhs-hotrunners.com
PCT	www.polymercleaning.com
Polyshot	www.polyshot.com
PTI	www.plastictechnologies.com
Thermoplay	www.thermoplay.it