Large Waste Reduction Thanks to Direct Gating

Needle Valve Technology Saves Energy and Improves Efficiency

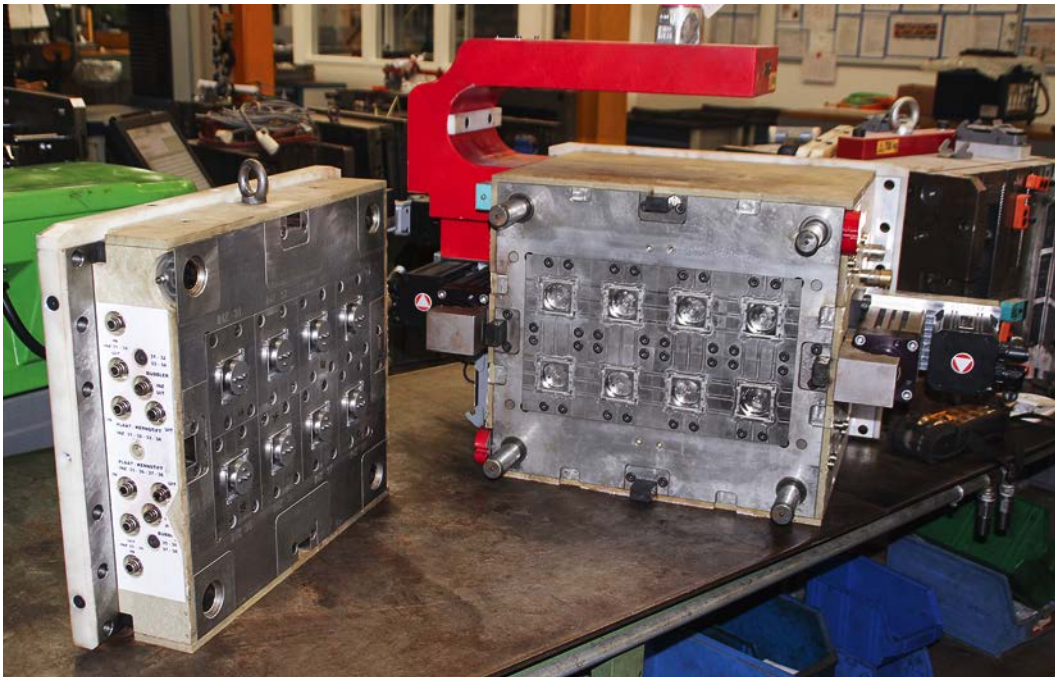
A practical example from switch and plug outlet production shows the benefits that can be gained by using a hot runner system with needle-valve technology. In this case, the partner of the Belgian manufacturer Niko was Günther Heisskanaltechnik.

The family-run company Niko concentrates on the development and manufacture of switches, plug outlets, detectors, access control systems and home automation technology, with production sites in Sint-Niklaas in Belgium and Sonderborg in Denmark. As part of the optimization of its production processes, the Belgian market leader planned to make the production of a combination plug outlet more efficient. Not least, the injection molder was also concerned with reducing waste and energy consumption in production. Furthermore, Niko wanted to avoid the possibility of sprue residues getting between the mold plates in the parting line, and thereby damaging the mold.

Modification to Full Hot Runner Helps to Save Energy

With the changeover of the molds from a 4-cavity semi hot runner to an 8-cavity full hot runner, and the use of a system with needle valve nozzle, Günther Heisskanaltechnik GmbH provided the appropriate solution. The needle guide made of powder-metallurgical steel and the optimized needle valve permit very low-wear operation. During the closing movement, the valve is first guided via a cone as far as the cylindrical precentering, where it is precisely inserted into the cylindrical gate point. The valve guide is mounted floating in the material tube. Both the valve drive and the ejector package are operated by electrical servo motors, which contributes to the desired energy saving.

With the changeover to the full hot runner and variotherm temperature control, articles with no visible weld seams and very good surface quality can be produced. The amount of maintenance work required in production has reduced significantly. The possibilities for implementation in the new molds were simulated and tested under the supervision of mold designer Franky De Pauw. »



From the tunnel gate to hot runner direct gating: Through the reduction of the sprue waste and energy consumption, manufacturing costs for plug outlets can be clearly reduced (© Günther Heisskanaltechnik)

Producing plug outlet covers means large quantities of articles
(© Günther Heisskanaltechnik)

The production of the plug outlet covers is converted to an 8-cavity injection mold with electrically operated hot runner valve system
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The article is then directly gated with a gate point diameter of 2.5 mm. The shot weight is 11.11 g per needle valve, the total weight of the plug outlet cover is thus 88.88 g. The specialists at the Günther pilot plant had previously ensured that the thermoplastic blend of polycarbonate and acrylonitrile styrene acrylate (PC+ASA) can be processed in such a way that the gate point and surface quality meet all the specifications.

Thanks to the direct gating, Niko now saves about 2 t of waste per year and it is no longer necessary to grind 10 t of sprues. The contamination due to sprue residues within and around the machine is thus now a thing of the past, and the mold chamber can be cleaned at significantly longer intervals.

Faster Production and Color Change

Another advantage of direct gating is the reduction of the cycle time by 6 s. Because of the higher productivity, machine capacity is freed up to manufacture other products. In addition, the times for the color exchange – with three different colors in one mold – is reduced from the previous 60 to 20 min. "It paid off for us to invest in the new hot runner system," explains Marc Weyn, Senior Project Engineer at Niko. "The overall result convinced us. We were able to reduce the amount of waste as well as the energy input. Together with the reduction of the number of machine hours due to the shorter cycle time, these measures allowed us to save about EUR 10,000 per year." ■

Hans van Dinteren from the Technisch Buro Bäcker, consultant to Günther Heisskanaltechnik, in conversation with Marc Weyn, Senior Project Engineer at Niko (© Günther Heisskanaltechnik)

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Company Profile

Niko NV, headquartered in Sint-Niklaas, Belgium, is, by its own information, a market leader in Belgium in the manufacture of switches, plug outlets, detectors, access controls and home automation technology. The family-run company markets over 5000 products and solutions via subsidiaries in Belgium, France and the Netherlands, Slovakia, Sweden and Switzerland. With a worldwide sales network, Niko also supplies its products on the international market.

- www.niko.be

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