New moulding benchmarks

The demands placed on injection moulding companies are steadily increasing. The key concepts in this context include higher quality standards, more complex moulded parts and lower energy consumption. In order to produce cost-efficiently, manufacturers are increasingly turning their attention to automation solutions and energy efficiency. ***APN*** reports

The Allrounder A machines, all the main drive axes are powered servo-electrically and operate precisely, independently, and rapidly in an extremely energy-efficient manner, while also reducing emissions

Arburg (www.arburg.com) has long been aware of these developments and has been implementing customised turnkey projects for over ten years. As a main contractor, Arburg offers its customers individual solutions that are designed and implemented for specific customers and industries in which all components are perfectly coordinated.

"The subject of energy efficiency is nothing new for Arburg; it has in fact been anchored in the corporate philosophy for decades. In this regard, we take a holistic approach to the efficient use of energy. The goal is not simply to use as little energy as possible during the manufacture of products. Arburg also seeks to use its products and expertise to help minimise energy consumption among its customers," explains Michael Hehl, spokesperson for the Arburg management team and responsible for plant development. "On one hand, this involves identifying all the energy-efficient Allrounder injection moulding machines with the Arburg "e²" Energy Efficiency label. On the other hand, the modular machine range not only allows the Allrounders to be equipped to optimum effect for specific applications, but also with regard to energy efficiency."

When it comes to production cells, Arburg's modular range of machine and robotic systems means that the customer always gets the most cost-efficient automation solution. Thanks to the unique Selogica control system, even highly complex systems can be reliably programmed and operated with ease. "The integration of robotic systems and peripherals makes Selogica an intelligent central regulation and control system for the entire injection moulding process. The unique graphic sequence programming via icons with immediate plausibility check makes the system easy, convenient and reliable to operate. In addition, the teach-in function enables interactive and intuitive programming of the Multilift robotic system," adds Hehl.

In order to enable the programming of six-axis robotic systems, which can perform even highly complex handling tasks, the Selogica user interface has been integrated in the robotic control system. This means that machine operators who are familiar with the Arburg control system can program even the complex movements of a six-axis robotic system using the usual sequence editor and, more importantly, without external help.

Improving energy competence

In the field of energy-efficient machines, the Arburg product range features two complete Allrounder machine series, the electric Alldrive (A) and the hybrid Hidrive (H), which fully meet the highest standards. In the case of the Allrounder A machines, all the main drive axes are powered servo-electrically and operate precisely, independently, and rapidly in an extremely energy-efficient manner, while also reducing emissions. The six machine sizes cover a clamping force range between 350 and 3,200 kN.

The concept of the hybrid Allrounder H

machines takes the best from the Arburg modular component system to create a high-performance machine. The servo-electric clamping unit of the Allrounder A and the tried-and-tested hydraulic injection unit are combined with hydraulic accumulator technology and servo-electric dosage. This results in machines that provide the highest production performance as well as short cycle times and reduced energy consumption. The five machine sizes cover a clamping force range between 600 and 3,200 kN.

The Allrounder A and H machines excel not only due to their energy-efficient operation and excellent production performance, but also thanks to their application versatility in terms of sector-specific solutions, flexibility with regard to automation and potential for achieving cycle time reductions. High output and availability, as well as energy-optimised operation guarantee high cost-efficiency.

The advantages of the electric Allrounder A machines are very impressive owing to their outstanding combination of speed, precision and energy efficiency, with minimised emissions and noise levels. Whilst the focus of the Hidrive machine series is on aspects such as high production performance, reduced cycle times, energy optimisation and high value. Complex production tasks can thus be implemented at competitive unit costs.

In the case of the Allrounder A and H machines, the high efficiency of the toggle-type clamping unit ensures energy-efficient operation. In addition, the energy recovery of the servo motors on both machines during braking also has a beneficial effect on the machines' energy consumption. Besides, Allrounder H machines also use performance-adapted hydraulic accumulator technology with the minimum amount of installed pump capacity and motors of efficiency class EFF1. As a result, the energy-saving potential of the Alldrive machines can be up to 50% lower than that of a comparable hydraulic machine, depending on the application. With the Hidrive machines, energy optimisation of up to 40% can be achieved.

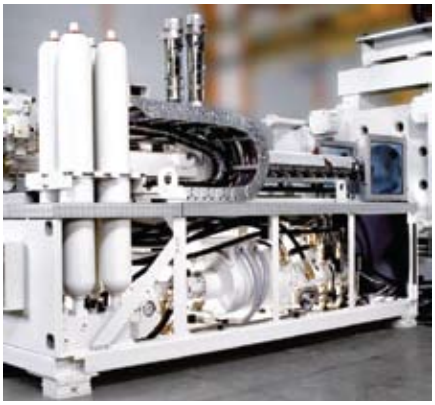
Furthermore, the independent movement axes ensure the greatest reduction in cycle time. The high-precision, cost-efficient toggle-type clamping unit can also be used to tap potential for significantly reduced cycle times on the clamping side thanks to extremely short dry cycle times, high acceleration and final speeds and simultaneous movements of the closing unit and ejector.

On the injection unit side, for example, dosing across cycles, or injecting during mould closing can significantly reduce cycle times. In the case of Allrounder A machines, this is achieved by independent servo motors for the main mould axes. In the Allrounder H, on the other hand, this is achieved by combining the position-regulated screw option, hydraulic accumulator technology and servo-electric drives for the mould and for dosage.

The main requirements for high-quality part production in injection moulding are homogeneous material preparation and precise injection. The position-regulated screw and servo-electric dosage guarantee process stability for both series across the entire injection moulding operation. The resulting high quality and reproducibility of the moulded parts thus leads to less scrap and permits material optimisation. On the clamping side, a planetary roller screw drive is used on both machine series to ensure exceptionally precise positioning of the mould.

Compact, fast, low-maintenance

With its new MX series machines, KraussMaffei (www.kraussmaffei.com) can now deliver sustained performance under demanding conditions. KraussMaffei's MX series is a range



Easy and maintenance-friendly access to all hydraulic valves in the injection unit and clamp

CoverForm competence centre opens for hands-on innovation

In cooperation with machine builders KraussMaffei, Evonik Industries has achieved a milestone in plastics processing the CoverForm system solution that enables the manufacture of injection-moulded plastic components with a functional surface in just one step. The CoverForm Competence Centre was opened in Darmstadt last year, and offers a hands-on experience of this highly innovative process. "With CoverForm we are introducing a future technology together with KraussMaffei that is the result of a successful development cooperation arrangement," said Gregor Hetzke, president of the Performance Polymers Business Unit of Evonik Industries at the inauguration of the CoverForm Competence Centre.

KraussMaffei developed the machine technology for the process, based on the company's extensive expertise in injection-moulding and reaction technology. Evonik developed the required product combination of a specialty Plexiglas moulding compound (Plexiglas cf moulding compound) and a precisely adjusted multicomponent solvent-free reactive system on an acrylate base for the functional coating.

Dr Karlheinz Bourdon managing director of KraussMaffei (left) and Gregor Hetzke, president of the Performance Polymers Business Unit of Evonik Industries at the inauguration of the CoverForm Competence Centre in Darmstadt, Germany

Dr Karlheinz Bourdon, managing director of KraussMaffei, emphasised at the opening ceremony: "Together, we two partners have developed an entirely new, integrated process named CoverForm, which enables us to offer a very convincing solution to our customers that significantly reduces the production costs of transparent components with a scratch resistant coating." The new CoverForm system solution substantially cuts the fabrication costs for scratch resistant and chemical-resistant plastic components since they require no subsequent time-consuming and costly coating. CoverForm produces plastics parts that are ready for installation when they leave the injection machine.

of big injection moulding machines between 800 and 4,000 tonnes. Capable of delivering very high shot weights, MX machines are the answer for many specialised applications, including sampling for new large moulds. The new MX machines combine high throughput with a very high yield of good parts. Rejects, waste and downstream costs are drastically reduced. "Fast responses and machine movements, an error proof, easy-to-use control system and fast cycling – it all adds up to a higher yield of zero-defect parts. MX machines are the fastest on the market in their class. Moreover, they are as modular as they come. This means big benefits for our customers, for example, machine components can be swapped or upgraded quickly and easily," explains Dr Karlheinz Bourdon, member of the Board of Management of KraussMaffei.

The key elements of MX machines are the 2-platen clamp, the injection unit and the hydraulic system. The 2-platen clamp system with tiebars attached through the fixed platen offers scope for wide flexibility in processing techniques. This includes, for instance, profiting from the growing trend to compression moulding techniques with back injection of decor or film inserts, or producing glazing panes or very large parts. Besides, self-lubricating guide bushes and glide profiles help to ensure reliable, low-maintenance operation for long periods. Furthermore, the MX series has the right injection unit and the optimal screw geometry for every production task. A tightly scaled choice of working capacities and screw diameters makes it possible to match injection unit performance to product requirements. "This is the only machine series on the market offering so many clamp or injection unit combinations," adds Dr Bourdon.

According to Dr Bourdon, at each processing stage, the regenerative pump drive supplies precisely the oil volume necessary to generate the required pressure. Therefore, energy consumption is reduced to a minimum. Also, the pressure- and flow-regulated pumps achieve very fast response times. The hydraulic system with its mix of constant- and variable-delivery pumps reacts to calls for rapid changes in speed as effectively as to calls for very small changes in pressure during the holding-pressure phase. In addition, hydraulic components are linked to the central machine control system via advanced bus technology. This guarantees fast and reliable data processing and immunity to interference – internal or external.

Speed to market: Thinwall packaging project achieved within a challenging time frame

Within the packaging industry, achieving speed-to-market and producing quality parts at competitive costs are important requirements for a complete system solution. When company Henke in Lohne was looking to quickly bring different new products to market they knew they needed more than just a basic machine supplier. To help them achieve this goal they turned to Husky Injection Molding Systems, a supplier they had been working with for more than two decades. Henke worked with Husky's European headquarters, located in Dudelange, Luxembourg.

Henke is a medium-sized business with about 200 employees. It focuses on thinwall packaging for general and in-mould labelling applications, as well as screw and snap caps. Henke bought their first Husky machine in the late 1980s. Today, they have more than 100 injection moulding machines; among them more than 25 are Husky Hylectric machines that produce a range of sophisticated packaging solutions.

In March 2009, Henke ordered four Husky machines to produce in-mould labelled salad bowls and matching lids. The in-mould labelling process works by applying the label during moulding. This one-step approach eliminates all post-mould labelling operations, allowing for the cost-effective manufacture of seasonal, as well as primary products. The machines included three Hylectric 300 55/50 systems to produce the bowls and

one Hylectric 400 80/65 system to produce the lids. There was just one issue – Henke needed their machines to effectively produce parts within six to eight weeks. The system supplier was up to the challenge.

Husky helped Henke to achieve this goal by completely managing the project within their extremely tight deadlines. The four systems were ordered in March 2009 and the first machine was delivered and installed in May. Following the first delivery, every four days an additional machine was picked up in Antwerp and shipped to Henke's facility where set-up, installation and integration was completed without any delays or issues. In addition to effectively facilitating the installation of these four systems, Husky helped Henke increase productivity by providing new, up-to-date nozzles specifically optimized for the needs of thinwall packaging, as well as options to improve clamp speed.

"We have enjoyed a great partnership, as well as project management, with Husky for many years. We were impressed by Husky's lead-time and trouble-free set-up pack," confirmed Ralf Schiefer, Henke's general Manager. "Technical expertise combined with practical experience lead to a promising and sustainable solution for both parties." This demonstrates the importance of establishing a strong partnership between manufacturer and supplier. By maintaining collaborative relationships, effective solutions can be facilitated quickly and productively, which in the end ultimately helps manufacturers to be more competitive by bringing their products faster into the market.