



GLOBAL SPEED AND PRECISION

As a specialist for injection moulding machines for plastics processing, Sumitomo (SHI) Demag is one of the leading companies in the industry. Elisabeth Skoda visited the company's headquarters in Schwaig near Nürnberg to look at its production facilities and get a comprehensive overview of its portfolio, speaking to packaging key account manager Arnaud Nomblot and head of marketing Bernd Tröger.

The Japanese-German company was created in the spring of 2008 through a merger of the injection moulding activities of Japan-based Sumitomo Heavy Industries (SHI) with Germany-based Demag Plastics Group.

Sumitomo (SHI) Demag runs a comprehensive development and production network, with four production sites in Germany, Japan and China with a total of 3000 employees, offering a product portfolio of all electric, hydraulic and hybrid powered injection moulding machines with clamping forces ranging from 180 to 20,000 kN. Across the entire group, a turnover of USD 6.24 million was achieved last year.

The main Demag facility in Schwaig/Germany focuses on the hydraulic Systec, the hybrid Systec SP and the hybrid high performance, high-speed El-Exis SP machines.

In order to cater for the increasing importance of electric drive technology for injection moulding machines, Sumitomo (SHI) Demag has expanded the factory in Wiehe/Germany into an international centre of competence for electric machines. At the main Sumitomo site in Chiba in Japan, the focus lies on machines with small and medium clamping forces, with around 95 per cent of machines provided being electric. In Ningbo, in China, Demag Plastics Machinery (Ningbo) Co., Ltd has been producing high-performance injection moulding machines for the Chinese and other Asian markets since 1998. The Chinese daughter company of the German-Japanese manufacturer Sumitomo (SHI) Demag has its own factory with a production area covering 11,000 m². The injection moulding machine program is comprised of the hydraulic construction series Systec C,

with a clamping force of 500 to 10,000 kN, for the Asian markets. Demag Plastics Machinery (Ningbo) Co., Ltd plans to expand the production capacity in Chinese Ningbo (Province Zhejiang). It is envisaged that the current annual production of around 650 will expand to 1,000 by the year 2015.

Packaging expertise

For packaging applications, Sumitomo (SHI) Demag's Systec SP and especially the El-Exis SP machinery ranges take centre stage. The name gives away one of the key strengths – SP stands for 'Speed Performance'.

Celebrating its 15th anniversary this year, El-Exis SP is on the market in its third generation and is constantly being developed further to suit all requirements of the packaging market.

"The packaging industry has its own customers with specific requirements, often focusing on mass products. El-Exis SP is a high speed machine ideal for products requiring high speed and high volume, such as bottle closures or cups for medication, and is also ideally suited to thin wall injection moulding with IML (in mould labelling)," Mr Tröger explains.

This machine completes the fastest movements and injection strokes with the highest precision and safety in the production of standard caps, as well as thin-walled and packaging parts with minimum tolerances and also in precision applications with high injection pressures and a clamp force range of 1500 to 7500 kN.

As El-Exis SP is powered by a combination of hydraulics and electrics, it combines the advantages of both systems, such as the precise positioning of the clamping unit over the entire cycle. This allows for machine productivity of over 98 per cent. El-Exis SP achieves extremely fast, smooth and continuous injection cycles through separate control circuits for clamping unit, injection unit and additional movements.

"Our current machinery range is fit for the future. We already have applications that are able to run a 96 cavities cup application on a 420 t machine in a production cycle of

2.3 seconds – not just for trade fair demonstrations, but in daily operation. The performance of the El-Exis SP for the next generation of mould technology will be in the region between 1.8 and 1.9 seconds. Machines have to be able to cope with these short cycle times without down times," Mr Tröger adds.

Thanks to its hybrid drive, El-Exis SP can offer extremely fast and dynamic injection and ejection. Mr Nomblot explains the process and the reasoning behind choosing a hybrid system: "As an example, filling times for yoghurt cups are calculated at between 100 and 200 ms. With such a short time frame, acceleration is of key importance. El-Exis SP is able to accelerate to its maximum speed within 23 ms. This acceleration can currently not be achieved with purely electrical machines in the clamping force range of 150 to 750 tons, and that is why we opt for hybrid machines for certain applications despite our expertise in the area of electrical machines".

"The hybrid clamp with a decentralised servo motor with a constant pump is a patented system by Sumitomo (SHI) Demag. Depending on whether the servo motor turns right or left, the clamp is turned forward or backwards by a hydromechanical gear box. This functions with hardly any losses and thus achieves high performance and high speed. All axes can be moved independently from one another, which is of key importance in the area of high speed machines – injection can take place while there is movement of clamp. Despite the high speed, control and precision is guaranteed. Different axes are defined around 90 per cent in advance; what remains is individual optimisation."

Sumitomo (SHI) Demag's machines have to be able to deal with a range of different applications. In the area of closures, strong, fast ejectors are needed; for thin wall technology, a precise positioning of the clamp is necessary. In order to cater for this, Sumitomo (SHI) Demag has developed the 'activeAdjust' concept, creating operating convenience that is one of the machine's unique selling points, as Mr Nomblot explains.

"With 'activeAdjust', customers can control the machine functions via a slider and can adapt them to individual needs, achieving a productivity increase of up to 7-8 per cent. ▶





Despite all the technology and dynamics within the machine, it remains easy to operate. New customers generally are able to control it after just one day.”

“In contrast, the Systec SP range was developed for applications which need less production volume, but higher flexibility. It is used in a cycle range of around five to six seconds, and apart from offering increased flexibility, it also constitutes a smaller initial investment,” Mr Tröger adds.

Market demands

“One of the key market demands has been shown as a reduction of cycle times: production has to become faster and faster, and we see increasing demand for applications with cycle times of under three, or even under two seconds,” says Mr Nomblot.

“Another important factor is energy efficiency. Thanks to its unique hybrid power concept, El-Exis SP offers the best compromise between production speed, machine life span and energy efficiency. At K 2013, we demonstrated the manufacture of HDPE drinks closures weighing 1.3 grams with a cycle time of 1.9 seconds, in order to demonstrate what impressive results the cooperation between tools and application can yield.”

Another important topic for Sumitomo (SHI) Demag’s end customers is the CO2 footprint, and companies are prepared to invest more and more money in this area.

“Often, information regarding the CO2 footprint is printed on the packaging nowadays, and of course behind this packaging stands the entire process chain. Our El-Exis SP range is an important building block for the manufacture of products with less CO2 impact,” Mr Tröger explains. “Plastics moulders have to find a compromise between production speed, rentability, availability and energy efficiency that is future-proof: out of these components, El-Exis SP was developed.”

Close cooperation

Sumitomo (SHI) Demag is proud of its excellent expert customer care. The company is active particularly in Europe, North and South America as well as the Middle East, and comprehensive services are key for future success.

“In the packaging industry, we often see big international groups, and our aim is to look after them all over the world. Our packaging expert team is led by Mr Nomblot and works hard to put customer care and consulting centre stage. We offer our customers a complete partnership with turnkey solutions and manufacturing cells. Our agents share our global vision. For example, our team in China can profit from the experience of our team in Brazil. Our ‘super experts’ help our customers in the areas of optimisation and process care, and support them when starting up a machine. As soon as the machine is set up, we offer worldwide service on site,” Mr Tröger says.

“Just as important as the cooperation with the customer is our network with tool manufacturers, downstream equipment manufacturers and IML robot manufacturers, in order to obtain the ideal calibration to achieve optimal functionality,” Mr Nomblot adds.

Sumitomo (SHI) Demag is always working on expanding its capacities, optimising production and vertical integration. One important building block to the company’s success is the in-house manufacture of components.

“We are able to manufacture core components especially for packaging, so we do not have to rely on buying components from external manufacturers. Strong links between development and production are the key to success, and this cooperation allows us to create the perfect product. Our know-how is in the detail, and this is a big competitive advantage,” Mr Tröger explains.

“Our central location within Germany is ideal for us. Thanks to good transport connections, our partners in the areas of tools and IML devices are no further than four hours away from us.”

Mr Nomblot compares high performance in the packaging industry with competitive sports: “The last 10 per cent of performance is most difficult to reach, and the way to get there is with excellent internal know-how.”

Fit for the future

Demands on machines in the packaging industry continue to increase. Mr Nomblot mentions closures as an example: “Over the years, cycle times have got shorter, performance has increased, and higher cavity numbers are demanded. There also is a higher demand for machines with higher clamping force. Sumitomo (SHI) Demag therefore targets the development of machines with clamping forces of 580 t up to 750 t. IML, which requires high precision in production, is growing in significance in the North American market, which traditionally was a stronghold of cans and cardboard boxes, and pack sizes are increasing.”

“Our customers increasingly ask for complete packages in order to be able to set up production easily without necessarily having in-depth injection moulding knowledge,” Mr Tröger adds.

Sumitomo (SHI) Demag plans to further expand its expertise in the field of packaging in the future. “It is our aim to be considered an expert on every continent, and we are well on the way to achieving that with our team of packaging experts. Growth and process optimisation are important on all continents. We also want to improve our energy efficiency and reduce the CO2 footprint of our products further. Sumitomo (SHI) Demag has the target to continuously reduce consumption of the machines and technologies used during production by 30 per cent compared to today’s standard. With ‘Blue Technolution’, Sumitomo (SHI) Demag is labelling its own system solutions, which are capable of achieving these ambitious targets. Consequently, efficient, highly dynamic and precise electric and hybrid injection moulding machines will be of key importance,” says Mr Nomblot.

“As a multi-company group it is important to keep increasing cooperation with our proprietor in Japan and expand synergies even further. Our technolution, our global footprint and our expertise are the three pillars on which we will further build our success,” Mr Tröger concludes. □

Visit: www.sumitomo-shi-demag.eu