Press release
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Sumitomo (SHI) Demag at K 2013: Increased competence in packaging injection moulding

Systec SP broadens the machine basis for packaging injection moulding – activeColourChange accelerates colour change

Efficient and economic solutions for packaging injection moulding are one of the key applications that will be presented by Sumitomo (SHI) Demag Plastics Machinery at this year's K trade fair in Düsseldorf. The new Systec SP will be shown to the expert audience for the first time. Thus the Japanese-German manufacturer of injection moulding machines extends its successful El-Exis SP high-speed series by a second machine platform for packaging injection moulding and for high-speed technical parts, which also uses a hybrid drive and is equipped with a comprehensive standard equipment package. The Systec SP 280, presented at the trade fair, is also equipped with the new technology module activeColourChange. This flexible pigment dosing system allows extremely short colour change times to be performed.

The new Systec SP relies on the El-Exis SP platform. The abbreviation "SP" which is used in the name stands for "Speed Performance" and shows that this machine model meets the increased performance and speed requirements in packaging injection moulding. The two machine models, Systec SP and the high-speed El-Exis SP, will be presented in production environments at the K trade fair.

Systec SP for packaging injection moulding – precise, quick and very economical

Clear proof of the productivity of the new packaging machine from Sumitomo (SHI) Demag is evidenced with the manufacture of IML decorated PP buckets (1 l content) on a Systec SP 280 (clamp force 2,800 kN). The cycle time for the two-cavity mould and a shot weight of 78 g is only 5.3 s. The simultaneous demoulding of decorated buckets and insertion of IML labels into the mould for the next cycle is completed by a high-speed linear robot. Partners in this project are the French companies Sepro Robotique, La Roche-sur-Yon, as

well as Machines Pagès, Foncine-le-Haut, for the robot and IML technology, and Collomb Mecanique, Oyonnax, for the mould.

The Systec SP, like the El-Exis SP, which has a proven record, has an optimally fine-tuned drive system in terms of speed, acceleration, precision and energy efficiency. The hybrid drive of the machine includes a strong electrical drive for dosing operation as well as hydraulic drives for mould movements and injection process. Equipped with the innovative standard drive system activeDrive, combining a frequency-regulated high-performance engine with a hydraulic pump, the Systec SP is very fast and energy efficient; all cycle-relevant axles can move simultaneously. A hydraulic accumulator and a quick position-regulated hydraulic valve ensure highly dynamic injection: the Systec SP ensures an injection speed (screw feed) of 500 mm/s which makes it perfectly suited for the application. A standard machine with a hydraulic accumulator can only achieve 300 mm/s which is not sufficient for the mentioned applications. The dry cycle times of the Systec SP are further reduced compared to a hydraulic injection moulding machine of the same size. In addition, the activeDrive drive system allows high energy savings compared to the conventional hydraulic drives.

Additional technology modules integrated into the standard Systec SP range from the activeQ mould protection system through the activeAdjust function. The highly sensitive activeQ/activeQ+ mould protection detects every malfunction during the entire opening and closing stroke of the injection unit. During disturbances the response times are reduced to a minimum by active slow down operation. The operator can use activeAdjust to optimise the injection cycle by individually controlling the adjustment for the ejector, closing movement and injection process thus increasing the productivity of the Systec SP. At the same time this technology module provides quiet and smooth machine operation in every operating condition. The improved NC5 plus control system with its intuitive process-oriented user interface provides an easy-to-use control platform for adjustment, monitoring and documentation of all relevant process parameters.

The application focus of the new Systec SP from Sumitomo (SHI) Demag is the serial production of products with a flow path to wall thickness ratio of up to 350:1. This is often required for buckets, stacking boxes, snap locks, caps, etc. with cycle times between 4 s and 12 s. In this packaging segment the high productivity of the EL-Exis SP, which has established itself in high-end packaging injection moulding, is not always required. For this

reason, Sumitomo (SHI) Demag now offers the new Systec SP used in connection with the Systec platform as a very efficient machine base, combining high productivity and high quality of injection-moulded packaging. The new Systec SP series will cover the clamp force range of 1,600 to 4,200 kN.

El-Exis SP – high-speed machine for maximum performance in demanding applications

With El-Exis SP Sumitomo (SHI) Demag has set a benchmark in terms of dynamics, speed and durability of packaging injection moulding. 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 1,500 to 7,500 kN. An example of the high machine dynamics: In the demonstration with 2,500 kN clamp force, the El-Exis SP accelerates in approx. 25 ms to a screw feed speed of 800 mm/s.

The El-Exis SP 420-2500 (clamp force 4,200 kN), producing PE-HD screw caps, will be presented at K 2013 to demonstrate its capabilities. The hot runner mould is producing with 96 cavities for 28 mm caps weighing only 1.2 g and with tamper-evident protection for mineral water. A barrier screw with an L/D ratio of 25:1 ensures the required dosing capacity with sufficient reserves; a special non-return valve provides process safety and high reproducibility. The hybrid drive technology, the movement of all axles optimised by activeAdjust and the improved NC5 plus machine control allow a cycle time of 2.3 s during the cap production. As a result, more than 150,000 caps can be produced with the 96-cavity mould per hour.

To prove the reproducible high process stability and to ensure 100 percent control of all screw caps, the production cell has been equipped with an optical injection system IMDvista from the Swiss company IMD Ltd., Brügg. All peripheral components are integrated into the NC5 plus machine control and permit central operation. Due to the highest dynamics, short cycle times and the resulting strong ejection, the high-speed El-Exis SP allows the lowest unit costs and high efficiency.

New technology activeColourChange – automatic, extremely fast colour change

For efficient utilisation of resources Sumitomo (SHI) Demag provides injection moulders with a versatile kit including customised technology modules. Its purpose is to implement the aspects of durability, energy efficiency, availability and productivity with the highest production efficiency. ActiveColourChange provides a new, liquid colour metering system designed for the particular utilisation in injection moulding processes. The colour is fed directly from a closed system into the metering zone of the injection unit filled with melt. In contrast to colouring with master batch, the upstream zones (feed zone and compression zone) are free of colour. Thus the screw length that needs to be cleaned during the colour change is significantly shorter. As a result, compared to master batch, activeColourChange extremely reduces the colour change times.

Sumitomo (SHI) Demag will demonstrate activeColourChange on the new Systec SP 280 (production of 1 l buckets) with three different 1% colours at the K trade fair. Project partners for this exhibit are ViscoTec Pumpen- und Dosiertechnik GmbH, Töging a. Inn, for paint pumps and dosing, and Rowasol GmbH, Pinneberg as the supplier of liquid colorants and ViscoTainers. The new colour dosing and change system can use up to five colours. The colour dosing system is integrated into the NC5 plus machine control and is activated and deactivated automatically. After a few cycles with activated colour feed, the components are evenly coloured and can be removed.

During the colour change process the current liquid colorant (colour No. 1) is automatically deactivated once the selected product volume is reached. When changing the colour (No. 2) several options can be used. The screw channel and the front of the screw can be cleaned before the activation of colour No. 2. As an option, the operator can enter the time during which the system will be cleaned with the new colorant. This cleaning of channels in the colour module above the colour 1 metering zone allows further reduction in colour change time. All production quantities, colour change processes (with or without cleaning or complete decolouring) and colouring sequence are defined by the operator as part of a program run before production start. After that activeColourChange operates fully automatically; the colour change does not require operator assistance.

The colour is fed using ViscoTainers. ViscoTainer includes a plastic container with integrated dosing/preparation function, as well as a control and drive unit. Thus, contact with liquid colorants can almost be excluded during operation – the production remains clean. All parts of ViscoTainer that come into contact with the liquid are isolated from the required peripheral

components. activeColourChange uses precise feed pumps which allow reproducible metering of the smallest colour doses even under the high melt counter-pressure. To ensure very high homogenization, the metering zone of the screw is equipped with a special mixing section. It ensures high coverage even with low colour ratios which, if nothing else, positively affects the cost factor. In addition, waste is reduced due to the clearly shorter colour change times with activeColourChange. This increases machine availability for part production which generates additional value and is, last but not least, a significant criterion for packaging injection moulding.

Sumitomo (SHI) Demag Plastics Machinery GmbH
Sumitomo (SHI) Demag has consistently shaped the plastics industry from its inception. As a specialist for injection moulding machines for polymer processing, Sumitomo (SHI) Demag and its Japanese parent company are among the leading companies in this sector globally. The Japanese-German company was formed in the spring of 2008 by merging the injection moulding activities of Sumitomo Heavy Industries (SHI) and those of Demag Plastics Group.

The global development and production network of Sumitomo Heavy Industries and Sumitomo (SHI) Demag consists of four plants in Japan, Germany and China with more than 3,000 employees. The product portfolio encompasses all-electric, hydraulic and hybrid injection moulding machines with clamping forces of between 180 and 20,000 kN. With over 100,000 machines installed, Sumitomo (SHI) Demag is present in all important markets throughout the world.

With more than 5,000 machines sold each year, the Plastics Machinery Business of Sumitomo Heavy Industries counts as one of the largest Global manufacturer of injection moulding machines.

The main Sumitomo plant in Chiba produces machines with low and medium clamping forces. Around 95 % of all machines supplied by Japan have an all-electric drive.

The main Demag facility in Schwaig/Germany focuses on the hydraulic Systec and the hybrid high performance, high-speed El-Exis SP machines. Recognising 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. Thanks to the new production capacities, Wiehe now supplies all electric injection moulding machines worldwide with its IntElect series with clamping forces up to 4,500 kN and also the hydraulic Systec series with clamping forces of up to 1,200 kN.

Sumitomo (SHI) Demag continues to operate the former Demag plant in Ningbo/China which has been active since 1998. Since 2007 the subsidiary located there, Demag Plastics Machinery (Ningbo) Co., Ltd, had its own, newly built plant and after reaching full capacity, moved to a larger factory with a production area of 11,000 sqm. Injection moulding machines from the Systec C product line with clamping forces of between 500 and 10,000 kN are produced here for Asian markets.

In addition to injection moulding machines, Sumitomo (SHI) Demag offers customised and standardised systems for the automated handling of moulded parts, technical solutions for special applications in process engineering, tailor-made service concepts and various forms of financing for investments in injection moulding machines.

With its seamless sales and service network of subsidiaries and representations, Sumitomo (SHI) Demag is present in all major industrial markets.

www.sumitomo-shi-demag.eu

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<Systec_SP_IML_bucket>

An IML decorated 1 l bucket, produced in a very efficient way using the new Systec SP 280 packaging machine with a cycle time of 5.3 s and a two-cavity mould.

<El-Exis_SP_caps>

PE-HD screw caps for mineral water bottles produced in a stable process with a 96-cavity mould and a high-speed El-Exis SP 420 with a cycle time of 2.3 s.

<activeColourChange>

activeColourChange (for three colours) allows direct feed of liquid colorants into the metering zone of the plasticizing system; this new concept leads to a significant reduction in colour change times.

Pictures: Sumitomo (SHI) Demag