Press release
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Sumitomo (SHI) Demag at the K 2013

Systec SP and IML/IMD injection moulding – Sumitomo (SHI) Demag presents a new packaging machine and a production cell for multitouch displays

At this year's K trade fair, held in Dusseldorf on 16 - 22 October, Sumitomo (SHI) Demag Plastics Machinery will be presenting two technical innovations on Stand D22 in Hall 15. These are Systec SP, a packaging machine based on the Systec platform that has proved itself over many years, and a fully-automated IML/IMD production cell, in which for the first time, a 5" multitouch display is created by injection moulding in a single step.

High flexibility through a freely combinable range of features, available from the comprehensively equipped basic version to the complete finishing cell; these are features of the Systec machine platform that is trusted all over the world by processors from a wide range of industries. At the K in Dusseldorf, Sumitomo (SHI) Demag will now for the first time demonstrate to the international professional audience two new developments based on this platform under production conditions.

Systec SP – developed for economic packaging injection moulding

With the Systec SP 280 (clamping force 2,800 kN), Sumitomo (SHI) Demag is presenting at K a new type of machine, tailored to the packaging injection moulding. The "SP", as an abbreviation for "Speed Performance" in the machine name, documents that the demands for increased performance and speed for packaging injection moulding are covered by a hybrid drive system and specific feature modules. Combined with the robust Systec platform, this, at the same time, leads to a very good price-performance ratio. The application area for the Systec SP is the process stable, commercial mass production of packaging articles, such as latches, lids, buckets, stacking boxes, etc. An example of the performance will be demonstrated on the exhibition stand in Dusseldorf with the production of IML-decorated PP buckets (content 1.2 l). With the double mould used for this and an injected weight of 84 g,

the cycle time is only 5.3 s. Parallel removal of the decorated bucket and the insertion of the IML label into the mould for the next cycle are performed by high-speed linear handling, developed by Sepro Robotique in collaboration with Machines Pagès.

With the new packaging machine based on the Systec platform, Sumitomo (SHI) Demag offers an economic machine base for packaging injection moulding in a single application area. This is ideal for those not requiring the high-performance EL-Exis SP, previously established predominantly in the high-end sector of packaging injection moulding. The Systec SP also has a motor system that is optimally tuned with regard to speed, acceleration, precision and energy efficiency. Thus, the machine is equipped with a strong electric motor for the dosing procedure, as well as hydraulic motors for the mould and injection movements, which are supplied by a central, usage-optimised activeDrive “servo technology”. A hydraulic accumulator and a fast position-controlled hydraulic valve ensure highly dynamic injection. Further integrated technical components range from the active tool protection system activeQ, to the function activeAdjust, which offers the user the opportunity of accelerating each piece- or process-related individual machine movement, thus increasing the cycle time and with it, the productivity of the Systec SP. Naturally, all cycle-relevant axes can be moved in parallel.

Injection moulding cell for multitouch displays - IML for the function, IMD for the decoration

The manufacture of a multitouch display using a Systec 210 (clamping force 2,100 kN) documents the expertise of Sumitomo (SHI) Demag regarding complex, fully automated injection moulding cells with efficient and process-reliable mass production of innovative products. During the mass production of a 5” touch display, demonstrated for the first time on the K exhibition stand, the functional foils developed by PolyIC - PET-based coating foils with thin metallic conduction structures – are spray-coated with PMMA in the Inmold Labeling (IML) process. The narrow frame, which is also injected, is decorated at the same time using Inmold Decoration (IMD) in black piano lacquer finish. All the processes take place within the production cell in a cleanroom environment (ISO Class 7), from the insertion of the IML foil in the tool cavity, to the last of the multiple steps necessary for the post-processing, to the finishing of the display. The conductive IML foils used are optimised for injection moulding processing, and can be used for touchscreens to replace many of currently established foils, which are generally made of indium tin oxide (ITO foils). ITO alternatives are not only

technologically but also economically very interesting, because indium is a rare heavy metal that is becoming increasingly expensive with rising demand. Furthermore, the very expensive laminating process of the foil on the carrier is not required.

The central coordinating point in the injection moulding cell is a suspended industrial robot, which Sumitomo (SHI) Demag realised, together with its system partners, for the respective process stages. In each cycle, it takes one conductive Inmold label from a stack and positions it precisely onto the solid half of the single-cavity mould. At the same time, the IMD forward travelling instrument, fitted on the closing side above the moving mould half, precisely positions a carrier foil with individual images for decorative coating of the moulded part space into the cavity. After closing the mould, the display is injection moulded in PMMA using a film gate and variotherm mould temperature control; the injected weight is 25 g.

Even if the most important part of the procedure is the injection moulding process itself, the subsequent steps taking place outside the mould in a 40 s cycle period considerably contribute to the quality of the piece and the economic value. After the six axis robot has taken an injected display frame from the mould and inserted a new label, it places the piece on a workpiece carrier. From there, the piece moves to a sealed laser separation station, where a CO_2 laser with extraction system removes it cleanly and free from breakage from the film gate. Finally, the robot transfers the display to a UV-curing unit, in order to harden the covering topcoat lacquer of the decorative foil. For the last processing step, the robot transfers to the piece finally to the cleaning station, positioned below the UV station. Here, brushes ensure thorough and gentle removal of the residues of the IMD foil; loose particles are sucked from the edges without leaving a residue.

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 machines. Recognising the increasing importance of electric drive technology for injection moulding machines, Sumitomo (SHI) Demag has expanded the former Demag 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 bucket, content 1.2 l, very economically manufactured using the new Systec SP 280 packaging machine.

<Systec_210_IMD-IML>

Compact production cell with a Systec 210, that combined IML and IMD technologies. This efficiently produces a multitouch display in a single machine.

<Mould_Multitouch-Display>

The frame of the 5” display is decorated on the moving half of the mould with the IMD unit directly during injection moulding.

Photos: Sumitomo (SHI) Demag