Sumitomo (SHI) Demag breaks through the magic 2 second barrier with the El-Exis SP 450

Record-breaking results with screw caps
Or: A machine of superlatives

Sumitomo (SHI) Demag Plastics Machinery GmbH, based at Schwaig near Nuremberg, has already proven several times since its market launch at the K 2010 that the El-Exis SP (Speed Performance) high-performance series is driving back the boundaries in the manufacture of packaging materials. The German-Japanese injection moulding machine manufacturer is now introducing a newly developed machine size with its El-Exis SP 450-3000 model, which is again achieving record results in the high-speed production of thin-walled screw-caps.

As Marketing Director Bernd Tröger explains, "The 4,500 kN version with a light capping range of 920 mm fills the gap which has existed until now between the 4,200 and 5,800 kN clamping force sizes. We have matched the new frame size precisely to the high-performance caps and IML moulds. Taken in combination with the activeAdjust function, this means we are now achieving sensational cycle times." Whereas market-standard values for screw cap production with 96 cavity moulds have until now been on the scale of approx. 2.5 seconds, Sumitomo (SHI)
Demag's new system now even breaks the magic 2 second barrier and produces 96 screw caps in a work cycle of 1.92 seconds. This gain in cycle time means there is a significant increase in productivity for the packaging industry: 180,000 bottle tops are created per hour. The exceptional result was achieved by the El-Exis SP 450-3000 during the in-house trade fair using a 96-cavity high-performance injection mould from parts manufacturer Schöttli AG, based in Diessenhofen in Switzerland. The perfectly synchronised production unit manufactured what are called X-light screw caps from a PE-HD, the parts weight of which is just 1 g.

activeAdjust perfects production performance

The market demands ever lighter and thinner-walled bottle caps, the mass production of which poses the highest demands for production performance while adhering to the narrowest tolerances. "With our Speed Performance model, we have already made ourselves indispensable in this market. Highly dynamic and yet also precise mould movements as well as further increases in performance on the injection side allow these challenging tasks to be undertaken", emphasises Bernd Tröger.

In addition, the activeAdjust function now supplied in the new NC5 plus control version with its individual setting options for every machine movement provide yet further potential opportunities for optimisation. As well as the option of accelerating or decelerating movements by using sliders, the steepness of speed ramps can also be individually regulated as well through activeAdjust. "Finely tuned to match application and mould, we have now efficiently synchronised the complete process with its movements for injecting, switching to hold pressure, ejecting and the clamping
unit in this way and achieved a new best performance", adds the Director of Marketing.

At the same time, the active mould protection design guarantees a high degree of safety and availability. The extended activeQ+ mould protection means that the valuable means of production is checked, moved and supervised not just when being closed but also opened.

**El-Exis SP 200 with IML operating innovation**

Quick, precise, reliable - these are properties which recommend the high-performance El-Exis SP series for other applications in the packaging industry as well, such as in-mould labelling (IML). Together with its partner company of Marbach moulds & automation GmbH, based in Bad Urach, Sumitomo (SHI) Demag demonstrated the manufacture of thin-walled bowls with full-cover labelling at the customer open day. In this new IML development, which was first presented in the autumn of 2011, the banner label and the base label are inserted overlapping around a radius, thereby providing complete coverage of the plastic surface with the label up to a high level on the sealing edge. Previous IML solutions required a partition on the container base, meaning all-over coverage with the label in the injection mould was not possible.

During the in-house trade fair, the full cover labelling ran on a high-speed El-Exis SP 200 machine (2,000 kN) equipped with a two-cavity IML hot channel mould from Marbach. The compact production cell manufactured the bowls from PP in a cycle time of approx. 2.8 seconds. In this process, the Full Cover Label Placer from Marbach ensured the highly efficient insertion of the banners and base labels in one stroke. The high precision mould stop position of the El-Exis
SP ensured the exact positioning of the labels despite the high production speed.

**El-Exis SP now in ten clamping force sizes from 1,500 up to 7,500 kN**

Since it was first launched at the K 2010, Sumitomo (SHI) Demag has successively developed its El-Exis SP series and now offers the high-speed series in ten frame sizes ranging from 1,500 to 7,500 kN. Compared with the earlier El-Exis series, increases in performance on the injection side have been achieved with the new Speed Performance model, together with an optimisation of the mould movement. The hybrid high-performance machine has an electric drive for the dosing movement, an electro-hydraulic drive for opening the mould as well as storage hydraulics for the injection movement and for the ejector. All ancillary movements of the El-Exis SP are controlled hydraulically through servo valve technology. Predestined for manufacturing thin-walled packaging, the El-Exis SP machine sets the standard in terms of high performance with low energy consumption. The hybrid drive design with energy recirculation during parallel operation means the El-Exis SP requires up to 40% less energy than comparable high speed machines.

**Sumitomo (SHI) Demag Plastics Machinery GmbH: company profile**

Sumitomo (SHI) Demag has helped shape the development of the plastics industry in a sustainable manner since it began. As a specialist in injection moulding machines for plastics processing, Sumitomo (SHI) Demag is counted, together with its Japanese parent company, among the leading companies in the industry world-wide. 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 driven injection moulding machines with clamping forces ranging between 180 and 20,000 kN. With over 100,000 machines installed, Sumitomo (SHI) Demag has a presence in all important markets throughout the world.

With more than 5,000 machines being sold each year, Sumitomo Heavy Industries, with its Plastics Machines Division, is ranked as one of the largest manufacturers of injection moulding machines in the world.

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

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. Due to the production capacities created, Wiehe today supplies the international market with its IntElect series of electric
injection moulding machines with up to 4,500 kN of clamping force as well as hydraulic machines in the Systec series with up to 1,200 kN of clamping force.

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, has now moved to a larger factory site with a production area of 11,000 m². The injection moulding machine programme consists of the Systec C series with clamping forces of between 500 and 10,000 kN 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 operating and 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 represented in all major industrial markets.

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The new clamping force size of 4,500 kN is precisely synchronised with high-performance moulds with 96 cavities for manufacturing screw caps and achieves an exceptionally short cycle time of 1.92 seconds with the use of activeAdjust.

Photo: Sumitomo (SHI) Demag
96-cavity high-performance injection mould from Schöttli for X-light screw caps

Photo: Sumitomo (SHI) Demag

The mass production of ever lighter bottle tops poses high demands for production performance and production quality; in the photo, the X-light bottle tops made from a PE-HD weighing only 1 g.

Photo: Sumitomo (SHI) Demag
As the core of this compact production cell, the El-Exis SP 200 high-speed machine produced full surface decorated thin-walled bowls with the IML full cover labelling innovation at the customer open day in a cycle time of approx. 2.8 seconds.

Photo: Sumitomo (SHI) Demag