ENGEL at Elmia Polymer in Jönköping

A self-optimising production process

Schwertberg, Austria – April 2018

ENGEL is set to welcome visitors to the smart factory at Elmia Polymer 2018, Scandinavia’s biggest trade fair for plastics and rubber processing, which takes place from May 15th to 18th in Jönköping, Sweden. The injection moulding machine manufacturer and system solutions provider will present both new and firmly established products from its inject 4.0 range. Innovative process technologies for greater efficiency and quality and the new hydraulic injection units that ENGEL will be bringing to a Scandinavian trade show for the first time will also be featured over the four days of the event.

The ENGEL stand will revolve around the self-optimising injection moulding machine. The production of inject 4.0 logos will clearly demonstrate how the potential for efficiency and quality that Industry 4.0 offers can be maximised with minimal effort. For this purpose, the e-motion 80 TL machine is equipped and networked with intelligent assistance systems. The networking of production systems, the systematic use of machine, process and production data and the deployment of intelligent assistance systems is enhancing the productivity, efficiency, and quality of production operations. At the same time, processors can respond to requirements – which are changing ever more quickly – with maximum flexibility.

At the trade fair, the injection moulding machine’s CC300 control unit will simulate fluctuations in the raw material and ambient conditions. Visitors to the event will be able to watch live as the machine identifies deviations and automatically readjusts the parameters before even a single reject moulding is produced.

Compensating for fluctuations before rejects are produced

Three assistance systems from ENGEL’s iQ product range will be on show at the trade event. iQ weight control analyses the pressure profile during the injection process and com-
pares measured values by means of a reference cycle. The injection profile, switchover point and the holding pressure profile are adjusted to the current conditions for every shot, which keeps the injected volume constant during the entire production run. At the same time, iQ clamp control calculates mould breathing in order to determine the ideal clamping force and adapt it automatically.

iQ flow control is the latest iQ assistance system that ENGEL will be unveiling to a Scandinavian audience at Elmia Polymer. By connecting the temperature control units to the injection moulding machine, the software can regulate the rotational speed of the pumps in the temperature control units on demand. The result is much lower energy consumption and the stability of the temperature control process is also enhanced. e-flomo is capable of actively controlling the temperature difference in all individual circuits and automatically setting the required flow rate for each temperature control circuit.

Together with its partner HB-Therm (St. Gallen, Switzerland), ENGEL has developed a series of particularly compact temperature control units for the new integrated temperature control solution. By linking the e-temp control units to the injection moulding machine via OPC UA, the development partners have established a milestone along the road to the smart factory. The OPC UA protocol facilitates powerful, platform-independent and above all secure communication, both at shop floor level and with superordinate control systems. For this reason, it is increasingly becoming the standard for the plastics industry.

**Scandinavian launch for new e-connect customer portal**

The modularity of the inject 4.0 concept makes it easy for plastics processing firms to harness the opportunities presented by Industry 4.0. Even individual stand-alone solutions such as iQ assistance systems offer considerable benefits. In Jönköping, ENGEL will also present easy-to-implement solutions for networking machine parks and entire production sites as well as online support, remote maintenance and predictive maintenance products.

There will be a Scandinavian launch for ENGEL’s e-connect customer platform at Elmia Polymer. Now comprehensively revised, the portal is ideally equipped to handle all current and future requirements of the smart factory. At any time and anywhere, it provides an overview of the machine status, the processing status of service and support orders and the prices.
and availability of spare parts. In this way, the portal simplifies and accelerates communications between processors and ENGEL as the supplier.

All service products in the inject 4.0 range have been integrated with e-connect, including the new e-connect.monitor for predictive maintenance. For the first time, e-connect.monitor makes it possible to monitor the condition of critical components in injection moulding machines during current operations, and calculate their residual life. The aim is to prevent unplanned system shutdowns and minimise downtimes in the case of planned work such as the installation of spare parts. Two modules of this solution have already been introduced to the market: one for plasticising screws and the other for spindles in electrical high-performance applications.

**Very deep vertical data integration**

At the Expert Corner for smart production on the ENGEL stand, the focus will be on the authentig MES from the ENGEL subsidiary T.I.G. Tailored to the specific requirements of the injection moulding industry, the manufacturing execution system offers particularly deep vertical data integration to the level of individual cavities. The software ensures transparency in order to, for example, utilise the total available capacity of a machine park or correlate productivity indicators and economic objectives. Thanks to its modular structure, authentig can be adapted to the precise individual needs of processors; as it is not dependent on a specific interface, injection moulding machines of different brands can be incorporated.

**New injection units for even greater efficiency, precision and performance**

The new injection units will enable the ENGEL victory and ENGEL duo injection moulding machines to achieve even more impressive performance, precision and efficiency. At Elmia Polymer, ENGEL will be presenting its new generation of hydraulic injection units at a Scandinavian trade fair for the first time.

Based on its many years of experience in the different fields of use of its injection moulding machines, ENGEL has restructured the sizes of the units and optimised their performance data, such as injection pressure, injection speed and plasticising capacity, for current and future requirements. This makes it possible to address the specific needs of users even more exactly in the machine design. All in all, the new units enable more precise injection and
higher process stability. Control of temperature and pressure in the barrel contribute to this in equal measure. Temperature control of the feed throat was one focus of development work. The temperature control range was enlarged to safely rule out clumping in the feed zone and absorption of moisture across a wider range of materials. The new concept minimises energy losses both during heating and cooling of the feed through. The main contributor to better controllability of the pressures is the revised piston design.

Furthermore, the long established ENGEL ecodrive servohydraulic has now become a standard feature of the victory and duo machines.

**Producing high-quality surfaces with efficiency**

Visitors will also be attracted to the stand by a large video wall on which ENGEL will present new developments in the area of process technologies. One focus will be on technologies capable of producing high-quality surfaces with great efficiency. The clearmelt process, for example, uses in-mould coating to produce ready-to-install trim components with very high-quality yet robust surfaces in a single work step. Polyurethane is used for surface finishing since it allows for fast changes between different colours.

The integrated and fully automated DecoJect process, which combines in-mould graining and injection moulding, also cuts down on work steps. Since colour, structure and haptics are achieved through the foil, DecoJect represents an extremely cost effective way to visually enhance injection moulded parts and harmonise surfaces in vehicle interiors – even in the case of small batch sizes.

The application examples on show will clearly demonstrate how innovative process technologies and integrated system solutions can meet even the most stringent quality demands while keeping unit costs competitive.

**ENGEL at Elmia Polymer 2018: Hall C, stand 4:20**
The injection moulding process that optimises itself: ENGEL will produce inject 4.0 logos to illustrate the strong potential of digitalisation and networking to raise efficiency and quality.

iQ weight control compensates for process fluctuations before rejects are produced. The intelligent assistance system is available for electric and hydraulic injection moulding machines.

With iQ flow control, ENGEL has established a milestone on the road to secure data exchange in the smart factory in partnership with HB-Therm. The recently developed e-temp temperature control units will be integrated into the CC300 control unit of the injection moulding machine via OPC UA.
The fastest link to the world of ENGEL: ENGEL’s e-connect customer portal is ideally equipped to meet the new demands of Industry 4.0.

Performance, precision, efficiency, modularity and ergonomics: with the development of new hydraulic injection units for the victory and duo series, ENGEL has reconciled attributes that often appear contradictory.

Pictures: ENGEL

ENGEL AUSTRIA GmbH

ENGEL is one of the global leaders in the manufacture of plastics processing machines. Today, the ENGEL Group offers a full range of technology modules for plastics processing as a single source supplier: injection moulding machines for thermoplastics and elastomers together with automation, with individual components also being competitive and successful in the market. With nine production plants in Europe, North America and Asia (China and Korea), and subsidiaries and representatives in more than 85 countries, ENGEL offers its customers the excellent global support they need to compete and succeed with new technologies and leading-edge production systems.
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