ENGEL at Koplas 2017

inject 4.0 for the optimisation of quality and efficiency potentials

Schwertberg/Austria – February 2017

„Experience the smart factory“ – this is the theme of the Koplas 2017, which will take place from March 7 through March 11 in Goyang, South Korea. At the ENGEL AUSTRIA exhibition booth, visitors of the plastics trade fair can experience this theme in real time. The injection moulding machine builder and system expert, headquartered in Austria, will provide demonstrative examples of the opportunities created by digitalisation and networking, and how inject 4.0 can help to take advantage of these in a simple fashion.

inject 4.0 – this is ENGEL’s answer to the challenges of the fourth industrial revolution. The goal is a smart factory in which production processes continuously self-optimise through the networking of production systems, the systematic use of machine, process and production data, and the deployment of decentralised, intelligent assistance systems. Producers can thus increase the productivity and quality of their production and respond flexibly to ever faster changing requirements.

In all three areas of the smart factory – smart machine, smart service and smart production – ENGEL today already offers mature products and solutions that provide an immense benefit individually as well as in the context of an overall digital strategy.

Compensate for process fluctuations before they result in defects

In the factory of the future, the human/machine interface plays an even bigger part than today. With processes becoming more and more complex due to increasing integration and automation, steering and controlling them must become that much more simple and intuitive. Self-adapting, decentralised assistance systems increase process capacity and quality, without requiring the machine operator to acquire special expertise. During the five days of the
exhibition, in order to clearly demonstrate the functionality of these smart-machine solutions, at its booth ENGEL will be producing inject 4.0 logos on an all-electric, tie-bar-less ENGEL emotion 80 TL injection moulding machine. The CC300 control is capable of simulating process fluctuations; the automatic readjustments by the intelligent assistance systems can then be tracked on the display of the machine. While iQ weight control maintains consistent injected melt volume throughout the entire injection moulding process, iQ clamp control monitors the mould breathing and continuously readjusts the clamping force. This way, fluctuations in the environmental conditions and in the raw material are automatically detected and compensated for within the same shot, before resulting in rejects.

iQ flow control, the third assistance system that is being presented at the Koplas, is based on e-flomo, the temperature control water manifold by ENGEL that monitors and documents all cooling and temperature control cycles of injection machines and independently regulates either the flow volume or the temperature difference. iQ flow control now connects e-flomo with the temperature control unit, thus the pump speed automatically adjusts to the actual need. This results in higher energy efficiency. ENGEL developed the integrated temperature control unit in cooperation with the Swiss temperature control unit manufacturer HB-Therm, and continues to strengthen its systems competency with the new e-temp line of temperature control units.

With its ENGEL e-motion 80 TL injection moulding machine and the integrated ENGEL e-pic robot, the production cell being presented at the Koplas also achieves high standards of efficiency and precision in terms of design. The e-motion TL series combines the benefits of ENGEL’s tie-bar-less technology, such as quick setup processes, efficient automation solutions and compact production cells, with all-electric drive technology. Thanks to these characteristics, the e-motion 80 TL is being preferentially deployed in the production of precision components and high-quality optical components in the electronics industry.

The innovative kinematics of the e-pic pick-and-place robot combines linear movements with a swivel arm, thus requiring very little space. The swivel arm is made of a thermoplastic composite material tailored to the specific requirements of lightweight construction, which additionally increases the energy efficiency and dynamics.
Machine and robot with a uniform control logic

ENGEL’s second machine exhibit also emphasises the efficiency potential of tie-bar-less technology. On an ENGEL e-victory injection moulding machine, gear components made of TPE will be produced live at the exhibition. These sophisticated products require a high degree of precision, which the tie-bar-less hybrid machine ensures with its electric injection unit and outstanding platen parallelism. During the Koplas, the e-victory will also be working with integrated parts handling. An ENGEL viper linear robot will extract finished parts from the mould and place them on the conveyor belt. Since the RC300 robot control is designed as a subsystem of the CC300 control, the robot and the machine can be programmed and controlled through a uniform control logic. Furthermore, both systems access a common database, which reduces cycle time in many applications since the robot and the machine can precisely coordinate their motion sequences.

Keeping an eye on production

Besides the machine exhibits, visitors can dive even deeper into the subjects of automation and inject 4.0 at several Expert Corners in the ENGEL exhibition booth area. The areas of smart production and smart service have their own dedicated Expert Corners.

The smart production Expert Corner is focused on e-factory, ENGEL’s MES (Manufacturing Execution System). Tailored to the specific requirements of the injection moulding industry, it achieves an especially great depth of vertical data integration, down to the level of individual cavities. e-factory creates transparency, for example to optimise the utilisation of a machine pool’s total capacity, or to correlate key productivity indicators with economic objectives. It becomes especially interesting when e-factory not only connects the production cells of a single site, but creates an entire worldwide production network. This allows company headquarters to also optimise processes at other sites, and to provide support even to far-away colleagues. The MES has a modular design. The solution can thus be adapted precisely to the individual requirements of the producer, and can be flexibly expanded as needed.

Avoid unplanned system downtime

In order to increase the availability of machines and production cells, smart service relies on short paths, remote maintenance, and a view towards the future. The new ENGEL solution e-connect.monitor thus makes it possible to analyse the condition of process critical machine
components during operation, and to generate a reliable failure prognosis. This condition-based, predictive maintenance allows for the maximum use of critical machine components while still avoiding unplanned system downtime.

**ENGEL at Koplas 2017: hall 5, booth P640**

Inject 4.0 – ENGEL’s answer to the challenges of the fourth industrial revolution. During the Koplas, the logos that will clarify the interaction between the areas of smart machine, smart service and smart production, will be produced at the ENGEL exhibition booth.

The ENGEL e-motion TL series combines the benefits of ENGEL’s tie-bar-less technology with all-electric drive technology. This ensures a very high degree of efficiency, for example in the production of high-precision as well as optical components for the electronics industry.
Thanks to its lightweight construction swivel arm, the e-pic pick-and-place robot achieves high dynamics and requires very little space.

For the production of gear components at its exhibition booth, ENGEL is using a tie-bar-less e-victory machine with an integrated viper linear robot.

The intelligent assistance systems of the iQ product family, for example iQ weight control, compensate for process fluctuations before rejects are created.
With the ENGEL MES e-factory, the producer can monitor the entire production from a single computer.

Pictures: ENGEL

ENGEL AUSTRIA GmbH

ENGEL is one of the leading corporations in plastics machine manufacturing. Today, the ENGEL group of companies offers all technological modules for plastics processing from a single source: Injection moulding machines for thermoplastics and elastomers, as well as automation. Also, individual components are in and of themselves 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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