

Chinaplas 2021: ENGEL at Industry 4.0 – Factory of the Future

Leverage the full potential of your injection moulding machine

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How can consistently high product quality be maintained in the face of fluctuations in raw material? How can high machine availability and productivity be ensured even in the face of travel restrictions? – ENGEL will be providing answers to these burning questions during Chinaplas 2021 from 13 to 16 April in Shenzhen, China. The injection moulding machine manufacturer and system solution provider, headquartered in Austria, will once again be participating with its own exhibit at Event Industry 4.0 – Factory of the Future in Hall 11.

"Covid-19 has accelerated digitalisation in the plastics industry," says Gero Willmeroth, President East Asia and Oceania at ENGEL. "Our customers are increasingly investing in digital solutions. smart service and intelligent assistance have become even more prominent in the last twelve months." These trends are reflected in the ENGEL exhibit. The all-electric and tie-bar-less ENGEL e-motion 80 TL injection moulding machine is equipped with many digital products from ENGEL's inject 4.0 program.

While smart assistance systems from ENGEL's iQ series help plastics processors to leverage the full potential of the injection moulding machine, even if qualified personnel are not present at all times, digital service products are all about ensuring high productivity in order to remain able to deliver even in the event of a crisis.

Self-optimising injection moulding machine

The human-machine interface plays an important role in the factory of the future. As production processes become increasingly complex due to process integration and automation, management and control of them must become all the more simple and intuitive. This is

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where smart assistance systems boost process capability and quality without requiring operators to acquire additional special skills.

During the four days of the show, fluctuating process conditions can be simulated on the CC300 control unit of the e-motion 80 TL machine in order to track automatic readjustment by the smart assistance systems on the machine display. For example, iQ weight control keeps the injected melt volume consistent throughout the entire injection moulding process, while iQ clamp control determines the optimum clamping force based on mould breathing.

Keeping track of several hundred process parameters

ENGEL is continually developing its smart assistance system portfolio. The latest products to be presented in Shenzhen include iQ process observer and iQ melt control.

Where smart assistance systems have so far been able to optimise individual steps in the injection moulding process, the new iQ process observer continually analyses several hundred process parameters across all four phases of the injection moulding process – plasticising, injection, cooling and part removal – in order to automatically detect drifts. In the form of plain text messages, the system points out unfavourable process settings and conditions as well as the possible causes of them. "This helps the user to optimise stability over the entire process and to correct errors quickly," says Willmeroth.

The goal of iQ melt control is to conserve both the material to be processed and the mechanical components of the plasticising unit. In practice, plasticising often occurs faster than the cycle requires, which can have an impact on product quality, but also on the service life of the screw. iQ melt control therefore determines the optimum plasticising time. Instead of plasticising at the maximum possible speed, the system makes full use of the part's in-mould cooling time for plasticising, ensuring very good melt homogeneity.

Unifying simulation and the real world

Another new feature is sim link, a joint development by ENGEL and Autodesk, the provider of the Moldflow simulation software. "To date, many findings from the simulation of injection moulding processes on the machine remain unused, and this is precisely what is now changing," says Willmeroth, explaining the motivation. With the support of the software, both the

parameters optimised by Moldflow can now be converted into a process settings data set and used directly on the injection moulding machine, and conversely, process parameters and measurement results from the injection moulding machine can also be imported into Autodesk's simulation program. "We are opening the door to a new approach to optimising ongoing production processes," says Willmeroth. "Simulation speeds up the task of creating process settings, mould setup processes and process optimisation, in turn significantly boosting productivity. This is increasingly making simulation an affordable competitive edge even for smaller injection moulding operations."

Ensuring productivity, also in times of crisis

To boost the availability of injection moulding machines and manufacturing cells, smart service relies on online support, and condition-based, preventive maintenance. Covid-19 has shifted e-connect.24 in particular even further into the focus of plastics processors. The online support and remote maintenance tool, empowers ENGEL service staff to connect to the injection moulding machine from a remote location so that they can respond without delay in all support cases. The screen pages of the machine control unit are transmitted via a secure internet connection. Since the data are accessed in real time, the current state of the machine is displayed. As a result, the machine operators on the ground and external support staff can see the same production data, and they can offer advice and guidance to one another. The manufacturing cell can be controlled remotely, if necessary. Another benefit is that the user is notified by e-mail in the event of a malfunction. Thanks to this range of options, e-connect.24 ensures very high levels of machine availability, even if travel is not possible or production is temporarily unmanned.

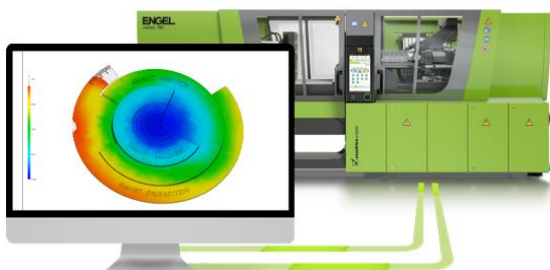
ENGEL does not use external manpower in service, but relies exclusively on its own highly qualified service technicians. "We have extensive resources here in China and support our customers in the local language," Willmeroth emphasises.



ENGEL is demonstrating at Chinaplas how digitalisation potential can be optimally leveraged with the manufacture of inject 4.0 logos on an e-motion 80 TL injection moulding machine.



The new iQ process observer analyses several hundred process parameters across all phases of the injection moulding process and points out counterproductive process settings and conditions.



Thanks to sim link, simulation data can be transferred directly to the injection moulding machine and, conversely, measurement data records can be imported from the machine control unit into the simulation program.



Digital service products boost the availability of machines and production units, ensuring high productivity and continuous delivery capability even in the event of crises.

Pictures: ENGEL

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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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