ENGEL medical at K 2022

Maximum output on the smallest footprint

Schwertberg, Austria – June 2022

The plant footprint and energy consumption are increasingly important key efficiency indicators. ENGEL is establishing new records in both disciplines at K 2022. On a minimal footprint, an all-electric high-performance machine is producing sample vessels for medical diagnostics in two-component injection moulding under cleanroom conditions.

At the heart of the production cell, is an all-electric ENGEL e-motion 160 combi M injection moulding machine, and again this is a first. Where ENGEL previously exclusively offered the combi M design with larger injection moulding machines, ENGEL is presenting an injection moulding machine with just 160 tonnes of clamping force and a horizontal indexing table in Düsseldorf for the first time this October. In the combi M design, the indexing table divides the injection moulding machine's mould closing area in the centre to operate two moulds in parallel. This makes combi M technology useful both for integrating two-component injection moulding and for efficiently doubling the output, if two identical moulds are mounted. The combi M machines are equipped with two injection units as a standard feature. One injection unit is fitted on the stationary platen, the second on the moving platen.

Machine footprint reduced by more than 20 percent

The diagnostics components that ENGEL is producing at its stand on the eight days of the show, are two-component parts. In a first injection moulding step, the primary parts with cylindrical cavities are injected using a polycarbonate material dyed in black. Then the indexing table rotates through 180 degrees in order to seal the cylinders with transparent polycarbonate on one side with lenticular covers in a second injection moulding step. While this is going on, the next set of primary parts is being produced on the other side. The two moulds, with 32 cavities each, come from Hack Formenbau in Kirchheim unter Teck, Germany.

combi M horizontal indexing table technology by ENGEL saves valuable floor space, especially where multiple-cavity moulds are used. A comparable 32-cavity mould with a vertical rotary table would have needed a larger e-motion injection moulding machine with at least 280 tonnes clamp force. In this application, the horizontal indexing table technology reduces the injection moulding machine's footprint by more than 20 percent. Especially in the cleanroom, this significantly improves cost efficiency. On top of this, the smaller machine consumes less energy. The all-electric injection moulding machines from the ENGEL e-motion series are already some of the most energy-efficient machines on the market in this class.

Additionally, automation makes a massive contribution towards the production cell's exterior dimensions, which are very compact all told. This is attributable to the compact cell. Thanks to its standardised design, the automation cell, developed by ENGEL, makes it particularly easy to integrate various automation components and other process units while being far narrower than standard safety guarding at the same time. Inside the compact cell at the K show, two robots are working as a pair to manufacture diagnostics products. An ENGEL viper 20 linear robot is removing the two-component parts and depositing them in trays. Finally, an ENGEL e-pic pick-and-place robot is covering the fully populated trays with an intermediate layer to be able to stack them in boxes and then discharge them via a tray server, which is also integrated.

Smart assistance for validated processes

Digitalisation has reached the cleanroom – this, too, is something that the exhibit at the ENGEL stand makes clear. The e-motion combi M injection moulding machine is equipped with a whole series of smart assistance systems from the ENGEL inject 4.0 program for manufacturing two-component parts. Among other features, this includes iQ weight control, which detects fluctuations in the injection volume and material viscosity and automatically compensates for them within validated limits in the same cycle, and iQ flow control, which ensures constant temperature control ratios by controlling temperature differences in the individual cooling circuits based on a set value. On top of this, visitors to the show can experience the iQ process observer live. The special thing about this smart assistance system is that it does not just optimise individual steps in the injection moulding process, but keeps track of the entire process at any given time. Several hundred parameters are analysed at

the same time, and quality-relevant deviations from the reference are transparently displayed. In many cases, the software directly delivers an optimisation proposal. iQ process observer is one of the first artificial intelligence applications in injection moulding.

Smart assistance systems make the production process more stable and safer, which explains why the focus is increasingly shifting to them in medical technologies and pharmaceuticals. After all, even validated processes can be dynamically controlled. The key to doing this is the definition of process windows instead of concrete setting values for the parameters to be retroactively adjusted.

ENGEL developed the new Parameter Limits feature in order to keep all preset values constant with a defined process window. With the help of the new software, a process window can be defined for up to 150 individually selectable process parameters using the CC300 control panel on ENGEL injection moulding machines. This means that the tolerance limits are directly available on the injection moulding machine at the start of production, and that they are reliably complied with in the on-going process. In turn, this eliminates the risk of input errors. It is this safety on top that makes Parameter Limits so interesting for applications in medical technologies. At the K show, ENGEL is demonstrating the use of Parameter Limits live.

Injection moulding technology from a single source

As a system solution provider, ENGEL ensures in the scope of process digitalisation that the control units of external systems, such as the mould or peripheral units, can be integrated with the central CC300 control panel on the injection moulding machine. For example, the HACK moldlife sense software is integrated with the CC300 machine control unit with the help of Webviewer technology. HACK moldlife sense detects errors and irregularities in the mould and automatically notifies the machine operator before rejects and high costs occur.

ENGEL stands for injection moulding technology from a single source. From the injection moulding machine through automation to the integration of external systems.

ENGEL at K 2022: hall 15, stand C58

Extremely compact: combi M technology on the one hand, and the compact cell on the other, substantially reduce the space required for the production cell.

Under cleanroom conditions, ENGEL is producing sample vessels for medical diagnostics in two-component injection moulding at its stand at K 2022.

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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