

ENGEL at Plastpol 2023

Output meets sustainability

Schwertberg, Austria – April 2023

Green is more than a colour: At Plastpol 2023 from 23 to 26 May in Kielce, Poland, ENGEL is impressively demonstrating its expertise in resource- and energy-saving plastics processing with two challenging applications. All-electric injection moulding machines by ENGEL reduce energy consumption to a minimum and boost competitiveness in combination with smart assistance systems and process integration.

Maximum output on the smallest footprint

The development focus in the process for manufacturing sample containers for medical diagnostics under cleanroom conditions was a minimum footprint. Minimum both in terms of the CO₂ emissions and of the production cell footprint. The all-electric ENGEL e-motion 160 combi M injection moulding machine is particularly good at saving space. In the combi M design, a horizontally rotating indexing table divides the injection moulding machine's mould closing area in the centre to be able to run two moulds in parallel. One injection unit is installed on the moving platen and another on the stationary platen.

The delivery bulbs 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.

Machine footprint reduced by more than 20 percent

The e-motion machine features a whole series of smart assistance systems from the ENGEL inject 4.0 program. Among other features, this includes iQ weight control, which detects fluc-

tuations 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.

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 clean-room, this significantly improves cost efficiency. The smaller machine consumes even less energy and that despite the fact that 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.

ENGEL adding recycled material to high-end visible parts

All-electric drive technology is the mainstay of the second machine showcased by ENGEL at Plastpol 2023. TV boxes with a high-gloss finish are being produced on an e-mac 465/160 injection moulding machine. What is special about this is that the boxes are made from 100 percent rABS sourced from post-consumer waste collection. The cavity is laser engraved to create an innovative rainbow pattern on the top side of the boxes, and there are fixtures for installing fans and connectors on the side surfaces. The ultra-thin design – the wall thickness is 1.2 mm – saves material. Conventional injection moulding would require a greater wall thickness.

To achieve a closed material cycle for high-end visible components made of ABS, ENGEL is cooperating with technology expert Roctool (Le Bourget du Lac, France). The key to the premium surface quality of the recycled component is, on the one hand, mould temperature control based on induction technology. New energy-efficient, compact and air-cooled Roctool generators are used here.

On the other hand, smart assistance systems by ENGEL make a contribution to high quality in the processing of recycled materials. Since recycled materials are generally subject to greater batch fluctuations than virgin material, iQ weight control has a particularly positive impact in terms of achieving consistently high product quality in this application. At the same

time, iQ melt control improves the homogeneity of the molten plastics by automatically adjusting the plasticising time to the optimum value for the application.

The application presented at Plastpol demonstrates the huge potential for the circular economy for manufacturers of household appliances, white goods, consumer electronics and telecommunications products. The proportion of virgin material can be significantly reduced, to zero in the best case. Already today, many manufacturers are taking back end-of-life equipment for recycling and returning it to production. Thanks to this combination of Roctool induction technology and smart digital assistance systems by ENGEL, even demanding housing parts with a very thin and complex geometry can now be produced from post-consumer recycled material in a cost effective and sustainable way.

Pushing the circular economy forward together

Other system partners involved in the project's success include Moldetipo (Marinha Grande, Portugal), who built the mould, and Lavergne (Montréal, Canada), who provide the recycled material, INCOE (Rödermark, Germany) for the hot runners and Standex Engraving Mold-Tech (Treviso, Italy) for mould engraving.

Close collaboration along the value chain is essential for establishing a circular economy. This is why ENGEL is strongly committed to networking these companies on multilateral, horizontal platforms. They include the R-Cycle Initiative whose objective it is to introduce digital passports for plastics products. All information relevant to recycling is automatically recorded as early as the product manufacturing stage so that, for example, waste sorting plants can identify recyclable plastics more accurately and deliver single grade fractions for recycling. This approach puts an end to the downcycling that has been prevalent up to now by reusing the recycled plastics on a par or even with added value.

ENGEL at Plastpol 2023: hall F, stand 4



Extremely compact: combi M technology substantially reduces the production cell's footprint.



Under cleanroom conditions, ENGEL is moulding two-component delivery bulbs for medical diagnostics at its stand at Plastpol 2023.



The rABS used to produce the premium electronics boxes is sourced from post-consumer waste collection.



Featuring smart assistance software, the all-electric e-mac injection moulding machine automatically compensates for fluctuations in the raw material to ensure consistently high part quality.

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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