

ENGEL: Completing material cycles at Fakuma 2021

Thin-wall injection compression moulding for stack mould technology

Schwertberg, Austria – August 2021

ENGEL's stand at Fakuma 2021 from 12-16 October in Friedrichshafen, Germany, will put the spotlight on sustainability. The production of decorated mono-material food packaging and the processing of regrind from labelling waste is supporting circular economy by creating a process chain. At the same time, the company is celebrating the world première of the 4,200 kN version of the ENGEL e-speed injection moulding machine. The sophisticated packaging application combines extreme thin-wall injection compression moulding with stack mould technology.

Over the five days of the trade event, an e-speed 420/90 injection moulding machine with integrated in-mould labelling (IML) will be used to produce ready-to-use margarine tubs from polypropylene in a fully automated injection compression process. The containers, which have a wall thickness of 0.4 mm (including the label), will be removed from the 4+4-cavity stack mould via high-speed, side-entry automation and stacked on a discharge conveyor following camera-based quality control. Corporate partners at the trade show will be MCC Verstraete, Plasticsud, Campetella, Mevisco and Borealis.

The continuing trend for reducing wall thickness is leading to ever more extreme flow path/wall thickness ratios that are often in the range of 1:400. From a ratio of 1:300 and above, consistently high component quality in many applications can only be achieved by means of injection compression moulding. Other advantages of injection compression moulding technology include the lower clamping forces and injection pressures required in comparison with conventional compact injection moulding, plus the fact that even high-viscosity materials can be processed in a repeatable manner. Overall, this means reduced energy consumption and competitive unit costs.

Despite this, injection compression moulding tends to be seen as ruling out the use of a stack mould; this is because for many injection moulding machines, the speed of the platen movements is insufficient for a stack mould. For the ENGEL e-speed injection moulding machine – designed to handle the long-term, high-performance output required by the packaging industry – things are different. The electrically driven clamping unit and the toggle lever design facilitate very fast, short compression strokes – 4 mm in the case of the margarine tubs. The parallel movements can be controlled very exactly – the prerequisite for coordinating the compression stroke and injection profile to the necessary degree of precision.

High-performance e-speed machine available in new size

With the new e-speed size 420, which offers 4,200 kN of clamping force, ENGEL continues to diversify its product range, aiming to tailor its injection moulding machines and systems solutions even more closely to specific applications, thereby maximising overall efficiency. The ENGEL e-speed injection moulding machines with hybrid injection unit and electric clamping unit combine very short cycle times with maximum precision and very high injection speeds of up to 1,200 mm per second; they operate with extreme energy efficiency. An innovative energy recovery system absorbs braking energy from the platen movements and returns the stored energy to the motor – for example, to accelerate the mould mounting platens again.

The toggle lever is encapsulated to ensure particularly low oil consumption and maximum cleanliness. In this way, the machines of the e-speed series meet the strict requirements of the food industry as standard.

Intelligent labelling technology

The labels of MCC Verstraete, which will be used for the production of the margarine tubs at Fakuma, are interactive. These labels are based on technology by Digimarc and, much like a QR code, Digimarc codes can be scanned with any smartphone camera. The main advantage of these is that they extend invisibly over the entire label surface. The camera can scan any point. Moreover, the codes do not interfere with the packaging design.

From production through retail and recycling, the interactive labels offer added value. Consumers can discover the details of the ingredients and manufacture for both the product and the packaging while shopping. And when the packaging has reached the end of its useful life, the label provides information on the recycling process. Where the containers and labels are made of the same material, interactive IML packaging becomes fully recyclable.

From margarine tubs to tapered closures

The margarine tubs produced at the Fakuma event will be made of polypropylene, as will the labels. At the end of its service life, the monomaterial packaging can be shredded as is the case for production waste from the manufacturing process; the raw material thereby obtained is used in the processing of new products. At its stand, ENGEL will demonstrate these possibilities by processing waste label offcuts in the form of regrind. An ENGEL victory 460/80 will be used to produce Pöppelmann tapered closures from an 8-cavity mould. Like ENGEL, Germany-based Pöppelmann (at Fakuma in hall B5, stand 5107) is pioneering the establishment of a circular economy for the plastics industry. Protective elements in Pöppelmann's KAPSTO product range are used in the logistical and construction fields, among others. The plastic in these products is 100% recycled material.

Recycling, thin-wall technology, energy efficiency and transparency of information are critical to the success of any circular economy – and ENGEL's stand at the trade fair will underline this point.

ENGEL at Fakuma 2021: hall A5, stand 5204



The food containers have a wall thickness of 0.4 mm including the label. At the trade fair, an e-speed 420/90 injection moulding machine with integrated IML will be used to produce ready-to-use margarine tubs by means of a fully automated injection compression process. (Image: ENGEL)



ENGEL e-speed injection moulding machines with hybrid injection unit and electric clamping unit promise very short cycle times, maximum precision and very high injection speeds for extreme energy efficiency. At Fakuma 2021, ENGEL will be unveiling the e-speed 420 with clamping force of 4,200 kN. (Image: ENGEL)



At the ENGEL stand, Pöppelmann tapered closures will be produced from waste label offcuts. GPN 600 closures from KAPSTO's standard range provide protection in various logistical applications. (Image: Pöppelmann)

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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