

ENGEL e-speed meets stringent thin-wall demands for Greiner Packaging

Aiming for climate neutrality

Greiner Packaging, based in Kremsmünster in Austria, has been producing plastic packaging for over 60 years – with a passion for its field and a drive for continuous improvement. One key motivator for the company is sustainability. As packaging becomes lighter all the time and fewer raw materials are required, production processes are having to meet fresh challenges. Thanks to e-speed injection moulding machines from ENGEL, Greiner Packaging is reducing the wall thickness of its food containers while enhancing efficiency.

“Our customer’s specification was to reduce weight as well as carbon emissions while maintaining container stability and improving recyclability,” says Andreas Ecker, Application Engineer at Greiner Packaging, looking back on the recently concluded project. The client – Austrian dairy Ennstal Milch – already applies high standards of sustainability in its thin-wall monomaterial cups for Greek yoghurt produced from polypropylene using the IML process. Striving for still greater things, however, the manufacturer of dairy products turned to Greiner in Kremsmünster. Now the yoghurt cups are produced here using 20 percent less material than previously.

“We managed to reduce the container thickness by 0.1 millimetres to 0.3 millimetres on the sides and 0.35 millimetres on the base. In-mould labelling, or IML, supports the lightweight trend,” says Ecker. Despite being just under 50 micrometres itself, the label provides extra stability. Thorough product testing revealed no drawbacks in filling or logistics; nor were consumers disadvantaged. Even when filled, the new-design yoghurt cups can be safely stacked; when consuming with a spoon, they sit in the hand with no discernible difference. The cups are suitable for hot filling up to 85 degrees Celsius as well as cold filling. This is important for Greiner as Ennstal Milch and Greek yoghurt are not the only beneficiaries of the new thin-wall range; the new lightweight IML cups are produced in different forms for many other products.

“Injection moulding technology enables considerable variance of shape, with very low production tolerances,” says Engelbert Pranzl, Plant Manager in Kremsmünster. Sealing edge or base, round or square – every food producer has its own specific packaging design, and Greiner needs to adapt flexibly. The packaging specialist serves global markets from its base in Kremsmünster. The focus is on Europe, with other production sites serving local consumers in the USA and Asia.

Hydraulic benefits maximised

Adjustments to the production process have made it possible to reduce wall thicknesses in food containers. With this in mind, Greiner invested in a new e-speed 380 injection moulding machine from its long-standing engineering partner ENGEL. “We turn the hydraulic power of the hybrid machine to our advantage,” says Andreas Ecker. “We need extremely high dynamics in the injection stage, which pushed our electric injection units to the limit. For the yoghurt cups, we have a wall thickness/flow path ratio of 1 to 240, and we inject at 1,700 bar.”

With the high mechanical stresses in mind, ENGEL designed its e-speed injection moulding machines – which combine an electric clamping unit with a hybrid injection unit – specifically for high-speed thin-wall applications. To ensure the cleanliness demanded by the food industry, the toggle lever is encapsulated.

Expansion of the series over the past year has further enhanced the performance of all clamping force ranges. The hydraulic inline injection unit with electric plasticising drive now delivers even greater injection performance. It is designed for injection speeds of up to 1,200 mm per second. The machine base and mould mounting platens have also been tailored more closely to the requirements of thin-wall packaging and the use of multi-cavity moulds – both with and without IML. The main aim is to ensure precision of machine movements while achieving durability. In the case of in-mould labelling in particular, repeatability is critical.

Energy efficiency also maximised

The yoghurt cups for Ennstal Milch are produced fully automatically in a six-cavity mould. For this purpose, the 3,800-kilonewton machine is equipped with high-speed automation courte-

sy of Dutch IML specialist Brink. The robot takes the IML wrap arounds from the magazine and places them in the mould. After injection moulding, it removes the decorated and ready-to-use cups, directs them to quality control and stacks them on a discharge belt. The stacked cups are then packed into boxes in another automated process. The quality check is visual and performed with a camera; among other things, the correct position of the label is checked to ensure the contents are properly protected and will not subsequently spill out. Greiner's clients insist on zero errors.

The injection moulding machine, automation and quality control are designed for flexibility, so as to ensure the shape of the container and the form of the label can be changed in a short conversion time. Another consistent priority across the spectrum of products and moulds was maximum energy efficiency.

To utilise energy as efficiently as possible even in high-speed operations, the e-speed 380 is fitted with an energy recovery system. This system absorbs braking energy from the moving mould mounting platen and returns the stored energy to the motor to accelerate the platen again. "For us, the energy efficiency of the machine was a key factor in our decision," emphasises Engelbert Pranzl. "Even though we are continually enhancing the performance of our production systems, we are committed to cutting energy consumption year by year." Greiner Packaging appointed a dedicated energy efficiency manager to closely monitor all energy efficiency projects on the spot, paying particular attention to production processes. Within the factory, ageing hydraulic injection moulding machines are gradually being replaced with hybrid and all-electric machines.

Driving development in partnership

ENGEL first delivered an all-electric injection moulding machine to Greiner almost 20 years ago. Since then, Greiner has been closely involved with ENGEL's development of electric drive technology, the two companies acting as development partners on numerous projects. "From our viewpoint as a user, we have a wealth of knowledge and experience to contribute," says Pranzl. "Another thing we appreciate about ENGEL is the fact that as a user, we are listened to – our suggestions really are taken into consideration as the machines develop. For example, our ideas were applied to the support for mould mounting platens on the e-speed machine."

Another example would be the Speed version of the ENGEL viper linear robots – originally conceived as a special development for Greiner Packaging. In many applications without in-mould labelling, viper robots remove products from the injection mould for Greiner. “Thanks to the Speed version, the viper robots keep these interventions as short as possible. This means we can cut overall cycle times yet further,” says Pranzl.

“Our partnership is one of mutual respect, even if it is highly demanding,” stresses Klaus Mittmannsgruber, Regional Sales Manager (Central Austria) at ENGEL. Both partners regard their proximity as an advantage: Kremsmünster is a mere 45-minute drive from ENGEL headquarters in Schwertberg. Both look forward to the resumption of face-to-face meetings in the wake of the pandemic, even if ENGEL’s virtual trade fair and symposium were warmly received by the Greiner team. “Innovations were presented in an efficient way, plus we were able to ask certain questions and discuss specific requirements in smaller groups,” reveals Pranzl. “If we should be unable to meet in person for any reason, the virtual format devised by ENGEL makes a very good alternative.”

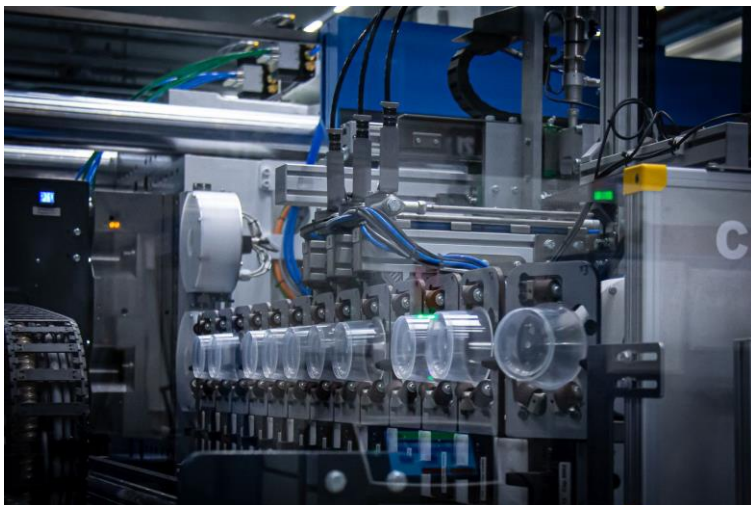
Open to new materials

When it comes to enhancing sustainability and establishing a circular economy, the packaging manufacturers, mechanical engineering firms and the food industry are on the same page. Greiner Packaging and ENGEL are both founder members of ‘Packaging with a Future’, an initiative that harnesses the expertise, experience and commitment of companies across the packaging value chain with the aim of facilitating the resource-efficient utilisation of packaging.

One high priority for Greiner Packaging will be to conserve even more material in future while cutting carbon emissions further; all packaging will be 100% reusable, recyclable or compostable, with greater use made of recycled material. rPET was the first recycling material to be positively rated by the European Food Safety Authority and approved for the manufacture of food packaging. Engelbert Pranzl has no doubt that rPP will follow suit. Work continues on the temperature resistance of PET with a view to making rPET an option for the packaging of dairy products in the near future. Greiner Packaging is already processing bioplastics, the proportion of which is also set to rise. “Our goal is to be a climate-neutral company by 2030,” reveals Pranzl – and engineering partner ENGEL is well placed to help Greiner achieve that target.



Greiner Packaging has developed a PP yoghurt cup at a material saving of 20 percent.



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Engelbert Pranzl (left) and Andreas Ecker (right) from Greiner Packaging are using ENGEL e-speed injection moulding machines to reduce the wall thickness of food containers and raise efficiency at the same time.



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Pictures: Greiner Packaging