

packaging

Ready for dynamic performance



ENGEL
be the first

Today's markets require **speed** and **efficiency**. They demand **constant quality** and **permanent availability**. A challenge we from ENGEL have met already for four generations: to provide **sophisticated solutions** for the efficient and profitable production of packaging parts. We do not only focus on **maximizing** the **performance** of our machines but also support our customers being **a reliable partner** in all their development and manufacturing processes. As a result, our customer base is constantly growing, and many international top companies have chosen to place their trust in our **experience**, our **expertise** and the **on-site assistance** we offer all over the world. A **dynamic** world, the spurs us to become even better every day.

ready for **a new challenge**



Your challenge: "How can I produce as **efficiently**, **profitably** and **cleanly as possible**, and at the same time save my available **resources** optimally?" **ENGEL packaging** focuses on giving you **maximum satisfaction**. You can therefore be sure that our machines, which are designed for **long-life cycles** and for operations in **cleanroom environment**, offer the **process stability** that you require for your **high-performance production**. Combined with **energy-saving technology** your investment pays off twice.

Maximum **profit**

With the flexible injection moulding solutions by ENGEL packaging, you will achieve extremely short cycle times and outstanding process stability. Because tailor-made solutions are our standard: ENGEL will always provide you with exactly that solution that ideally fulfils your needs regarding your manufacturing profile and optimum output levels.

Save **resources**

Going for cutting-edge ENGEL packaging solutions will help you to reduce costs long-term. Save energy by using highly efficient hardware and software. Save material by using innovative injection moulding technologies and reducing bad parts. Save on new investments thanks to flexible machine concepts, that can be adapted to new production requirements.

Clean production

Cleanliness is crucial when manufacturing packaging products. Hence, we at ENGEL are constantly developing new tools that guarantee maximum cleanliness. Depending on their design, our machines are therefore able to meet ISO 7 cleanroom standards and fulfil GMP regulations – thanks to lubricant-free tie bars or clamping systems as well as encapsulated toggle levers.



ENGEL packaging **caps and closures**



Maximum **output**: The production of **caps and closures** requires high-performance solutions, because your customers expect perfect, clean **quality that is produced efficiently** from you. The flexible, **innovative machine concepts** by **ENGEL packaging** allow you to meet these requirements, regardless of whether you are producing caps and closures for **beverages, cosmetics, food** or **cleaning agents**. No matter if you focus on **standard caps** or **sophisticated tailored solutions**: In cooperation with **top** mould makers we provide you with an integrated and customised production cell. Just as you expect from the **world's leading manufacturer** of injection moulding machines.



Maximum **output**

With all-electric, hybrid and hydraulic high-performance machines – such as the ENGEL e-cap and the ENGEL e-speed, you will achieve maximum output at extremely short cycle times. Powerful electric and hydraulic injection units, barrier screws with a high plasticising rate and the precise parallel movements of our fast and robust toggle lever clamping unit enable top performance.

Safe production

ENGEL machines offer you high process stability and exceptional safety levels. All process parameters are monitored by the ENGEL machine's control system. The intelligent mould protection software autoprotect guarantees you outstanding operational stability and availability.

Reduce **operating costs**

Increase your output and still save operating costs. With machines such as the ENGEL e-cap you can make your manufacturing processes significantly more profitable - thanks to excellent energy efficiency and very low cooling water consumption. And the long operational life span and low maintenance costs of ENGEL packaging turnkey solutions help you to control your "total cost of ownership".

Clean production

Cleanliness is important especially for the beverage and cosmetics industry. ENGEL packaging machines are optimised for clean production: like the ENGEL e-speed and the ENGEL e-cap with encapsulated toggle lever with closed loop lubrication and lubricant free tie bars. The clamping mechanism of the tie-bar-less ENGEL victory works without lubricants as well. ENGEL machines therefore meet ISO 7 cleanroom standards and fulfil GMP regulations.

Work **flexibly**

Thanks to the tie-bar-less machine concept of the ENGEL victory, you can use large, bulky moulds on a machine of a relatively small size. Consequently, the footprint of the ENGEL victory will be smaller than that of a machine with tie bars. Another benefit of the tie-bar-less technology is that you can use the complete platen area for your mould. Consequently you will save investment cost.





ENGEL **e-cap**

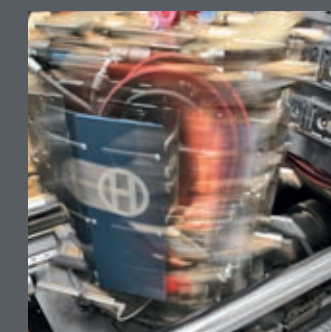
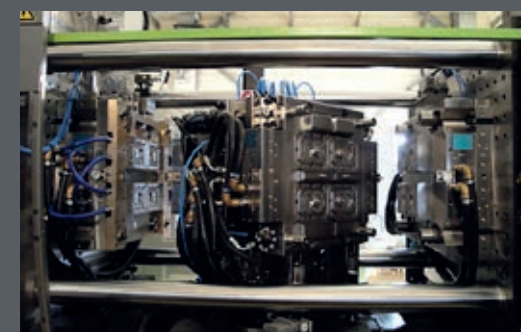
- specially designed for cap production
- all-electric machine concept with excellent performance data
- significantly lower energy consumption than similar machines with hydraulic injection units
- extremely clean production thanks to an encapsulated toggle lever

ENGEL **victory** und ENGEL **e-victory**

- perfect for closure production
- simple and very fast mould changing thanks to tie-bar-less technology
- optimal utilisation of the platen dimensions
- constant part quality thanks to the patented ENGEL force divider
- particularly energy-efficient thanks to the ENGEL ecodrive

ENGEL **e-speed**

- machine concept designed to produce constantly at high performance levels
- high injection speeds thanks to hydraulic inline injection unit
- outstanding energy-efficiency thanks to linear guidance of the moving platen
- all-electric clamping unit for excellent performance levels
- innovative energy concept to prevent electric current peaks



ENGEL **cube technology**

The innovative production system for complex multicoloured and multi-component caps. With the all-electric ENGEL cube technology both components are produced in one step including labelling – ready to be filled.

ENGEL packaging **thin wall containers**



Using less material means realising more profit. This formula seems simple – but its solution is highly complex. **ENGEL packaging** will transform your **thin wall containers** into a product produced at low-cost that meets **high-tech requirements**. With our **high-performance machines** you can produce containers with **extremely thin walls at constant process stability** – in quantities and at speeds that will **maximise your competitiveness**. If necessary, we will develop optimal solution together with you and **leading mould makers**. These solutions are **highly efficient** and do not just save material through **innovative technology**, but also help to **reduce your energy costs**.

Save **material**

ENGEL machines are able to efficiently produce parts with minimum wall thickness. The ENGEL e-speed and the ENGEL e-motion are two examples of such machines and both offer outstanding injection speeds.

Increase **productivity**

The high-performance machines by ENGEL packaging offer maximum output through operating at extremely short cycle times. Two examples are the all-electric ENGEL e-motion and the hybrid machine ENGEL e-speed. Both machine types feature exceptionally short dry cycle times thanks to the possibility of parallel movements and an optionally increased drive power.

Reduce **operating costs**

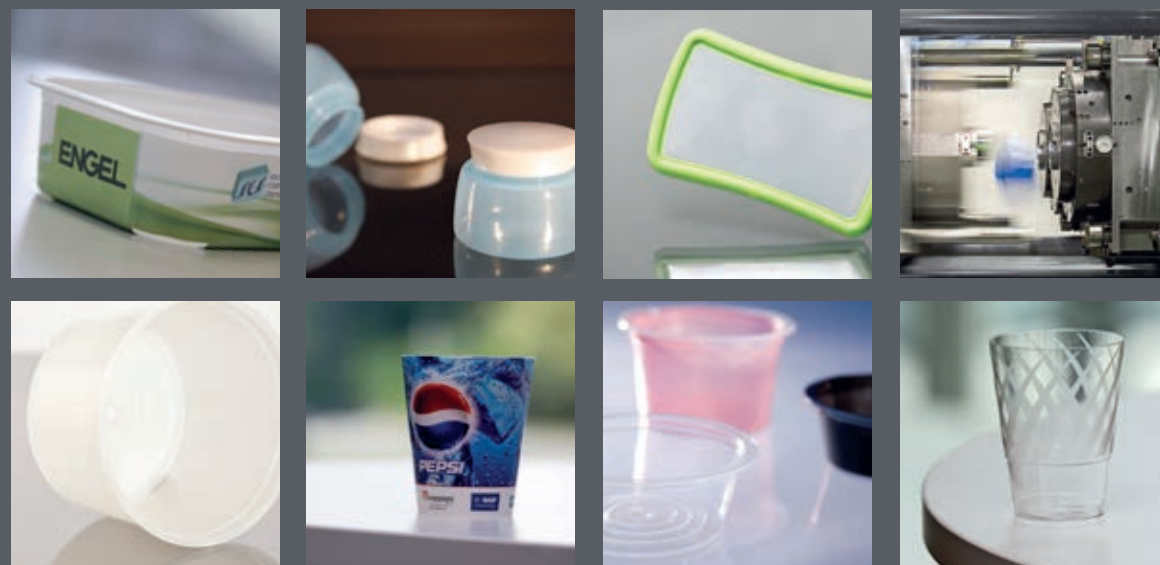
Regardless of which turnkey solution you go for, all different types of ENGEL machines reach excellent energy efficiency levels. Furthermore, the cooling water consumption is very low. You can expect long service-lives at low maintenance costs.

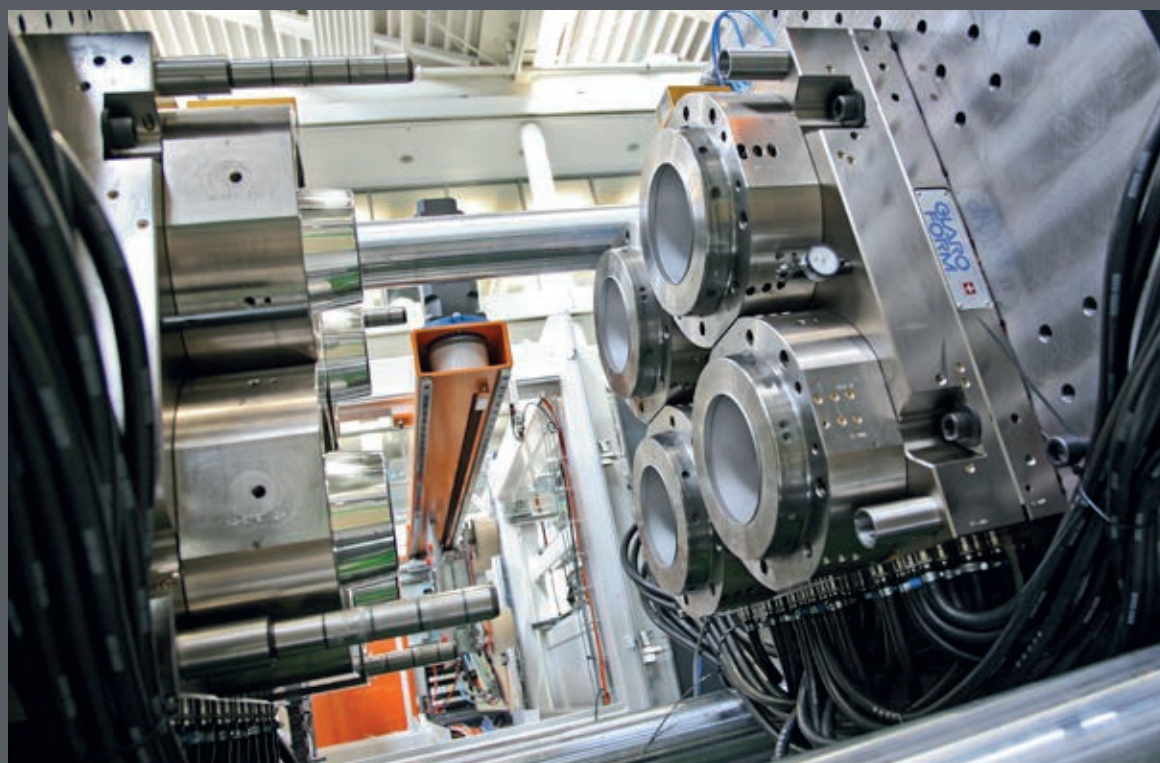
Supply **cleanliness**

Anyone aiming to get ahead of their rivals in the food industry needs to be able to manufacture in clean conditions. To ENGEL packaging, this means machines that can meet ISO 7 clean room standards and fulfil GMP regulations. Thanks to lubricant-free tie bars, the ENGEL duo, the ENGEL e-speed and the ENGEL e-motion are able to do both of these. The ENGEL e-speed and the ENGEL e-motion also have encapsulated toggle lever joints with oil return, which provides optimised oil lubrication, less friction and lubricant consumption, and a considerably longer service life.

Safe production

You can manufacture at high speeds and still protect your machine and your mould. Our intelligent control feature Active-Speed-Setup helps you to optimise your machine movements quickly and easily without sacrificing smooth motions of the platens and injection unit. The extremely low reject rate is an extra bonus.





ENGEL **e-speed**

- high injection speeds due to hydraulic inline injection unit
- maximum energy efficiency thanks to an innovative kinetic energy recovery system
- all-electric clamping unit with a large opening stroke for IML applications
- machine concept designed to operate constantly at high performance levels

ENGEL **e-motion**

- all-electric high-performance injection moulding machine
- proven and long-life machine concept
- exceptional servo-electric injection speeds
- very clean clamping unit thanks to an encapsulated toggle lever and the closed lubrication system for the ball screw spindles
- extremely low maintenance costs



ENGEL **IQ weight control**

Produce moulded parts of consistent quality: ENGEL's patented software IQ weight control will ensure that your filling quantity remains the same even when the ambient conditions are changing. Shot for shot. The bonus:

- significantly improved weight repeatability
- reduced rejects and therefore higher productivity



ENGEL packaging **pails, buckets and round containers**



Mass production requires constant **quality** standards, no matter for what kind of pail or bucket. **ENGEL packaging** knows that nowadays quantity is not enough – to be **competitive** in the field of round containers, it is necessary to supply products that are both light and very robust. And you are faced with new **challenges** every day. ENGEL will work with you and **leading mould makers** to develop **highly efficient machine and production concepts** enabling you to meet this challenge and succeed.

Maximise **output**

Thanks to extremely short cycle times you will achieve maximum output with the high-performance machines ENGEL e-motion and ENGEL e-speed when producing small pails and buckets. In addition, the high injection speeds support you in reducing your costs and the amount of material you use by enabling thinner wall thicknesses.

Clean production

The production of small buckets for the food industry requires cleanroom capability. As all ENGEL machine types feature platens that are not tie bar guided no lubricant will leak into the mould area. Besides that, the all-electric ENGEL e-motion operates without hydraulic oil and has encapsulated toggle levers with a closed loop lubrication system to ensure clean production.

Flexible possibilities

Anyone who produces large buckets needs maximum flexibility. Best for such applications are the ENGEL duo and ENGEL e-duo series. All the machines in the range have a small footprint. Their long opening stroke enables easy demoulding. Additionally, when using IML, the labels can be inserted simultaneously enabling a significant reduction in cycle time.

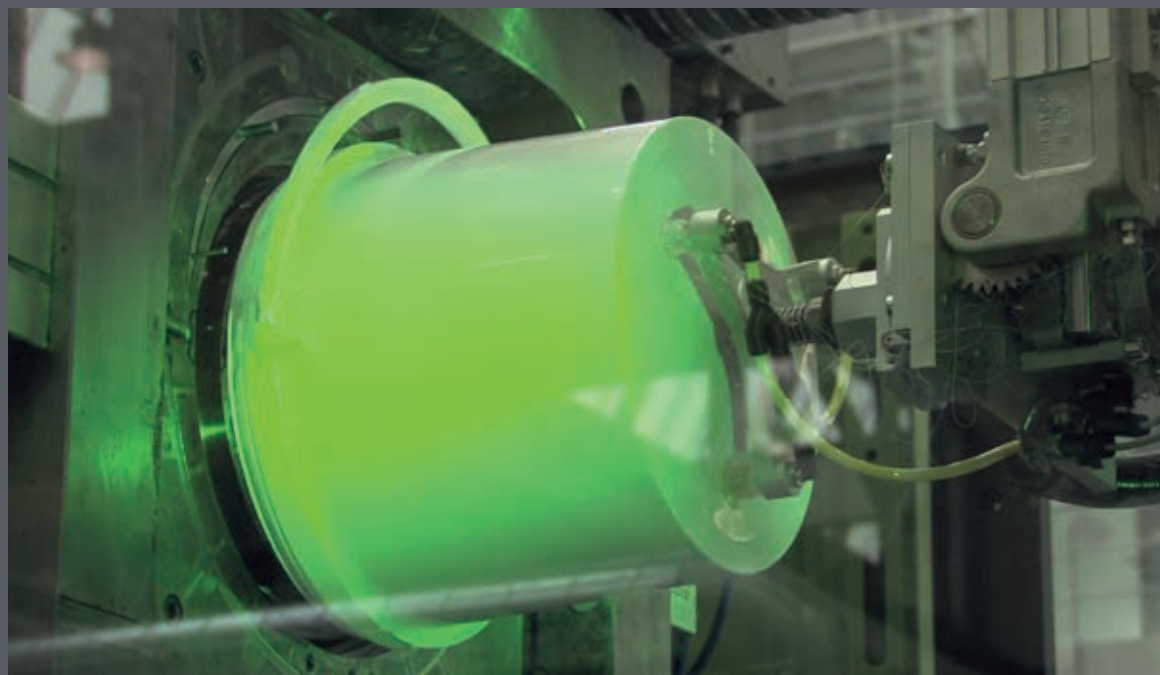
Preservation of **resources**

ENGEL is committed to environmental protection and sustainability. This is why the ENGEL e-speed, the ENGEL e-motion, the ENGEL duo and the ENGEL e-duo all meet the requirements for modern and highly efficient production regarding energy and material consumption. The ENGEL e-speed 650, for example, uses a kinetic energy recovery system which stores the energy gained in the slowing-down process for reusing it during acceleration enabling a significant reduction of power peaks.

Deliver **quality**

ENGEL packaging machines produce small or large buckets at constantly high quality standards. The outstanding machine availability furthermore secures your timely delivery.





ENGEL **e-speed**

- machine concept designed to produce constantly at high performance levels
- high injection speeds due to hydraulic inline injection unit
- maximum energy efficiency thanks to an innovative kinetic energy recovery system
- all-electric clamping unit with a large opening stroke for IML applications

ENGEL **e-motion**

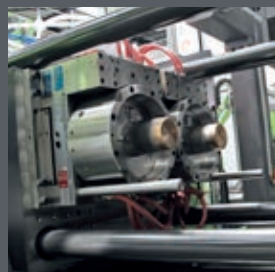
- all-electric high-performance injection moulding machine
- energy-efficient and durable thanks to linear guidance of the moving platen
- exceptional servo-electric injection speeds
- optional wide-platen design for more tie-bar distance

ENGEL **duo**

- very small footprint
- extremely fast two-platen injection moulding machine
- Large opening stroke for IML applications
- outstanding energy efficiency
- high operational safety levels

ENGEL **e-mac**

- small footprint thanks to the compact design of the machine
- adequate performance levels
- all-electric means energy-efficient
- attractive price/performance ratio



ENGEL packaging **large containers and pallets**



When producing **large-volume parts** creativity is required. The challenges with regard to the production of **boxes, pallets**, as well as **large and industrial containers** are various: for example handling the product during the manufacturing process or reducing the weight. **ENGEL packaging** thinks on a larger scale when **customising sophisticated solutions**, that offer **flexibility** as well as **cost and energy efficient production**.

Increase **productivity**

Your aim is to achieve maximum output at the shortest cycle time possible – even when injecting high shot weight parts. The ENGEL duo is the intelligent solution for this challenge. The flexible machine concept offers space to install more than one injection unit. So without significantly enlarging the compact footprint, excellent injection performance can be achieved by injection with a small distance between the nozzles. The bonus: Thanks to extremely powerful injection units, the ENGEL duo helps to increase your productivity.

Flexible combinations

Your needs are unique. And we are committed to fulfil these but using or flexible and intelligent modular machine system. The ENGEL duo machine series offers you countless options. And you can adapt your ENGEL duo to changing demands in future.

Reduce **clamping force**

You use large moulds, need excellent performance and maximum output – but the clamping force required is low. Electronic clamping force optimisation made by ENGEL and the options wide platen or wide platen extended as well as more distance between the tie bars help you to produce large parts extremely efficiently. Besides that, this additional space simplifies automation concepts for easy and fast take-out of the molded parts.

Optimise **automation**

There is only one control for both the machine and the robot. Following this principle, ENGEL has optimized the communication and coordination of both the machine and the robot. Your benefits are shortest take-out times and therefore increased productivity.

Guarantee **quality**

To ensure that your parts meet the highest requirements, the ENGEL duo machine works with a clever optional coining system: Four different pressure pads can be activated individually and depending on the stroke. This enables fast-response parallelism control, as well as injection and negative compression moulding technologies. Thanks to ultrasonic measurement, the exact position of the platen or tie bar is constantly monitored. Precise setting guarantees excellent platen parallelism and reduced mould wear and tear.





ENGEL **duo**

- very small footprint
- extremely fast dual-platen injection moulding machine
- high flexibility for various applications
- extremely low noise emission thanks to patented ENGEL sound insulation
- outstanding energy efficiency
- optimal accessibility
- high operational safety

ENGEL **e-duo**

- compact design with reduced footprint
- all movements servo-electrically driven
- reduced energy consumption due to high injection power without hydraulic accumulators
- high precision thanks to electric drive technology - maximum repeatability included



ENGEL **coinjection**

- cost reduction by using regrain in the core
- large variety of injection units for flexible use - in combination or on their own
- create unique marbling design effects on the surface
- decades of experience

ENGEL **coining**

- reduction of the required clamping force
- highly precise parts
- reduction of internal stress of the parts
- modular concept to meet individual requirements



ready for **ultimate support**



ENGEL services

Always there where you need us



560 of the best equipped service technicians

55 support hotline technicians

9 production plants

29 sales subsidiaries

60 representatives

Your concern is **our challenge**

It is important to always keep your injection moulding equipment in top shape and constantly available. The wide range of services offered by ENGEL ensures that you can produce competitively at any time. It doesn't matter whether your production cell is a single machine or a complex integrated system solution. ENGEL makes it possible for you to utilise all options for optimisation at any time, and therefore consistently get the most out of your machine over the long term. In addition, we offer professional training for machine operators as well as the fastest delivery worldwide, and experienced installation of spare parts. Diverse maintenance contracts also guarantee top-level machine availability. Because our goal is the best possible performance of your ENGEL machinery.

Support – we assist you on-site

- save costs incurred by downtime
- immediate support around the clock, worldwide
- knowledgeable help from the ENGEL service team
- for ENGEL injection moulding machines of any generation
- for all ENGEL technologies and any control unit version

Upgrade – install reliable added value

- for all ENGEL injection moulding machines
- professional upgrade solutions
- to supplement and optimise
- equip machines for use with completely new applications
- utilise machines with greater cost-effectiveness

Know-How – increase your competence

- thorough training with a comprehensive transfer of know-how
- make optimal use of machine potential
- individual seminars and training programs for you and your staff
- informative events on industry-specific topics
- take advantage of efficient, targeted and practical information, instruction and training
- either at your own facility or at one of the worldwide ENGEL training centres

