

# e-motion

ready for high performance



**ENGEL**  
be the first

**More and more, always faster, always more precise, always cleaner!**

This is what customers expect from you. The ENGEL emotion is the ideal production unit for the continuously growing demands of a dynamic market. Thanks to a flexible, all-electric, highly efficient machine concept that delivers constant and clean quality.

**Able to always deliver perfect quality:** with its sophisticated, all-electric machine concept, the ENGEL e-motion meets the highest requirements. All of the main movements are servoelectric, so parallel movements are possible during operation – resulting in extremely high dynamism. The

established ENGEL machine control provides for fast, interference-free regulation of the process while maintenance-free AC servomotors with integrated displacement measuring system supplement a design based around longevity.

## ENGEL e-motion **clamping unit**

### **powerful, clean, stable, robust**

- encapsulated toggle lever
- closed lubrication system
- reduced friction
- excellent mould protection



## ENGEL e-motion **injection unit**

### **precise, fast, powerful, durable**

- high process stability
- short set-up times
- powerful motors
- low maintenance costs
- intelligent contact force system

# ENGEL e-motion **clamping unit**

powerful, clean, stable, robust

## encapsulated **toggle lever**

- very clean clamping unit
- minimal wear of mechanical components

## durable **linear guidance**

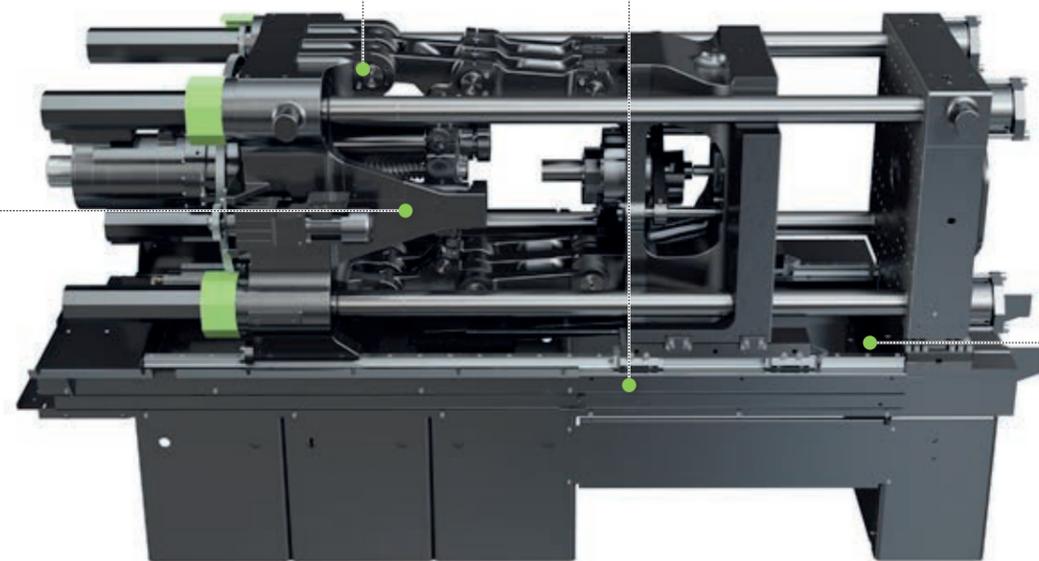
- precise platen guidance
- reduced friction
- energy-efficient mould movement

## closed **cooling and lubrication systems**

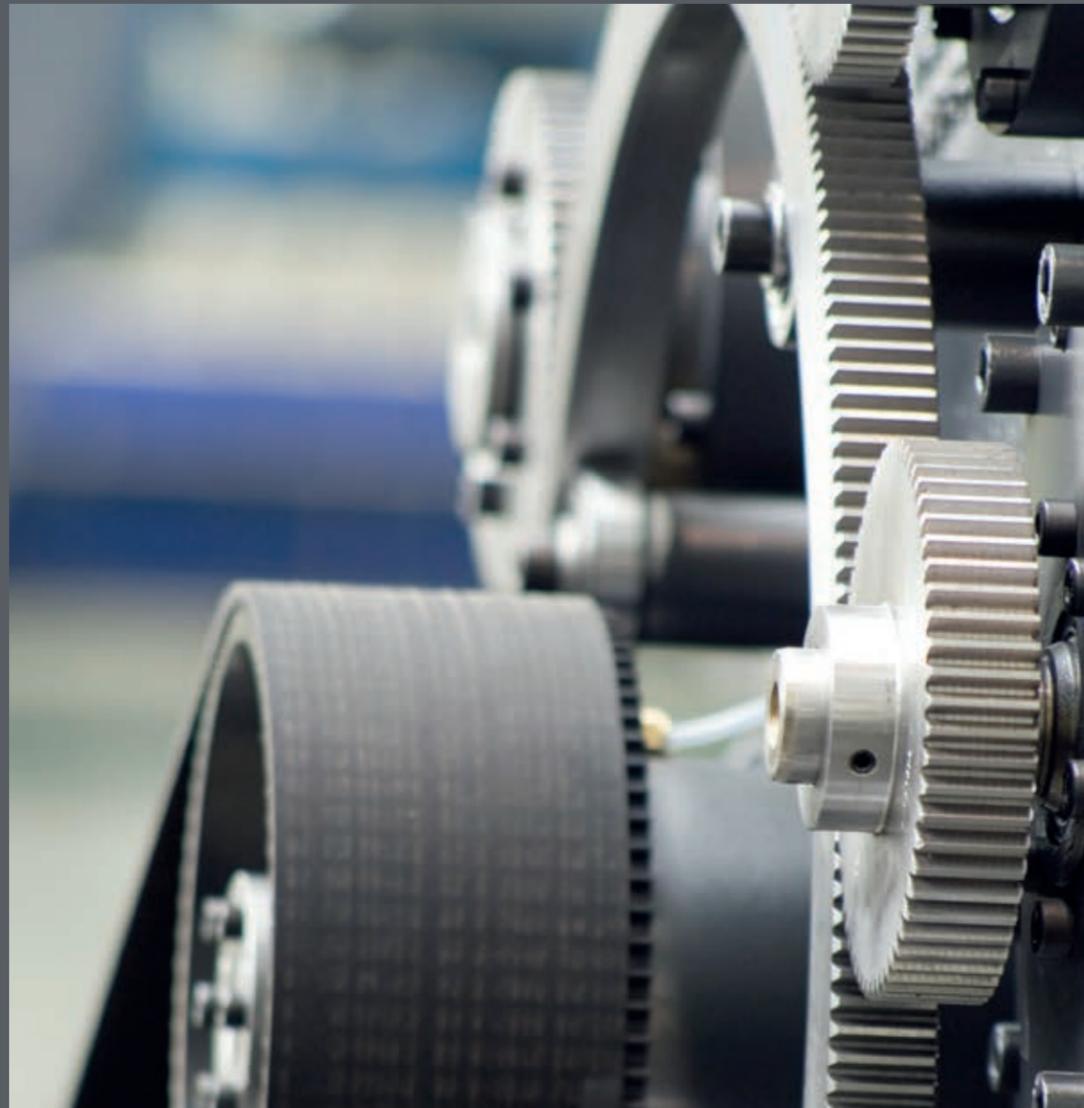
- consistent lubrication
- lubricant consumption reduced by approx. 90%
- fast dry cycle time

## ENGEL **autoprotect**

- excellent mould protection
- high availability
- minimal mould wear



**Absolute cleanliness in your production facility is essential – or at least desirable.** The new sealed toggle lever on the ENGEL e-motion not only ensures a working environment suitable to clean room standards. Due to the closed clamping unit system, you can also be sure of highly cost-effective and energy-efficient production.



## **encapsulated** toggle lever

No waste here! Gaskets patented by ENGEL ensure that no oil whatsoever can escape from the high quality bushings. All lubrication points are supplied simultaneously via metering elements, while the oil pressure is continuously monitored.

## **closed** systems

Cleanliness is of the utmost importance. Due to the closed system for toggle lever and spindle, optimum and clean lubrication for all elements is provided at all times. Moreover, sensors determine required the cooling water amount for the spindles, which results in reduced cooling water consumption.

## **minimal** wear

The enclosed system ensures that the bolts are permanently covered in a film of oil. This reduces friction on the bearings, thus minimising wear. The result is a much longer service life for all relevant parts.

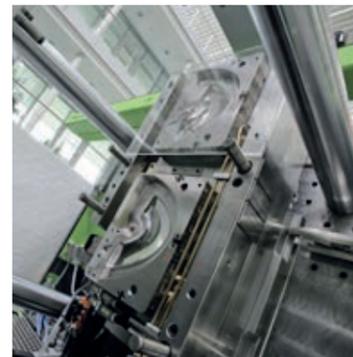
## **lower** maintenance costs

Investing in a closed lubrication system can significantly cut maintenance costs: compared to conventional systems, consumption of lubrication alone is reduced by as much as 90%.

## **ultimate** performance

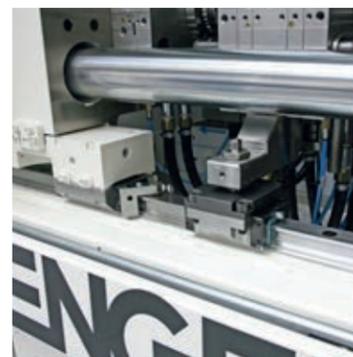
Faster mould movement means shorter dry cycles – a distinct advantage for the closed lubrication and cooling system of the spindles. Other advantages are the longer service life and continuous oil temperature monitoring.

**Sometimes you have to break with tradition to be more successful.** ENGEL has taken precisely that step with the development of the linear platen guidance system – and thousands of satisfied customers have proved us right. Stable linear guidance of the moving mould mounting platen can prevent friction and thus contamination of the mould area. The tie-bars merely serve as tie rods for the clamping force.



### **clean, low-friction** platen guidance

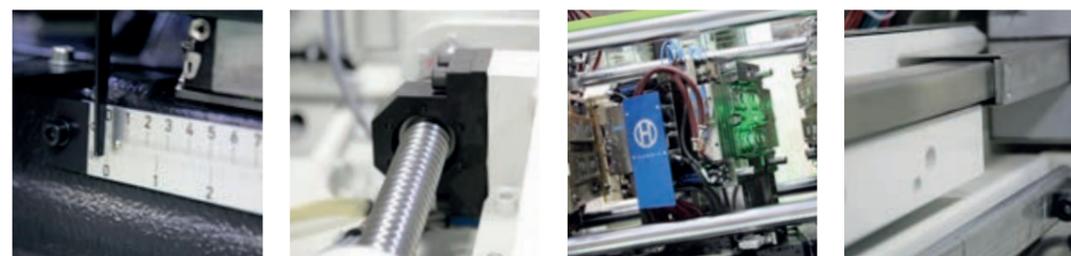
- stable, linear guidance of movable mould mounting platens
- zero friction on tie-bars
- no lubricant in the mould area
- additional platen support for stack moulds



### **perfect** platen parallelism

- adjustable platen parallelism
- durable and precise platen guidance
- minimal lubricant consumption for linear guides

**Greater security, enhanced cleanliness, less noise and lower costs:** with its innovative clamping unit, the ENGEL e-motion meets the demands of modern production with state of the art manufacturing. This impressive machine concept is also supported by other sophisticated tools.



### **excellent** mould protection

**Highly sensitive, self-learning and precisely adjustable:** with the ENGEL e-motion, your valuable moulds are protected by ENGEL autoprotect. That means extremely low tolerances of 0.1 kN or more can be set, which are perfectly monitored by the self-learning, precision mould protection software.

### **more space** between tie-bars

The optional wide platen design with enlarged tie-bar spacing offers greater flexibility, which in turn helps you cut costs in turn.

### **flexible** ejector drives

Whether you require higher ejector forces or increased ejector speeds in your production facility, the ENGEL e-motion has the ideal ejector drive for every need. All of these systems can be equipped with a direct drive, which allows an exceptionally low-noise and clean production.

# ENGEL e-motion **injection unit**

precise, fast, powerful, durable

## high process stability

- The screw position is measured by the encoder of the servomotors
- Injection, holding and back pressure measurements are made through a pressure sensor directly connected to the screw
- precise results through measurement outside the nozzle area

## powerful motors

- high injection speeds
- outstanding acceleration

## long service life

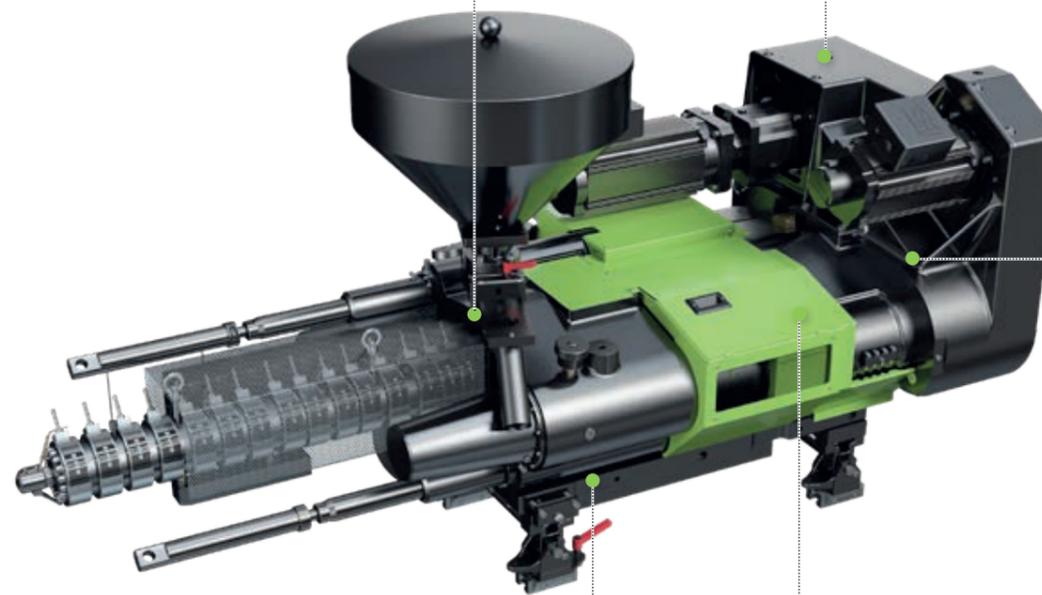
- enclosed spindle with permanent oil-bath lubrication
- no separate oil cooling necessary
- high efficiency
- low maintenance costs

## short set-up times

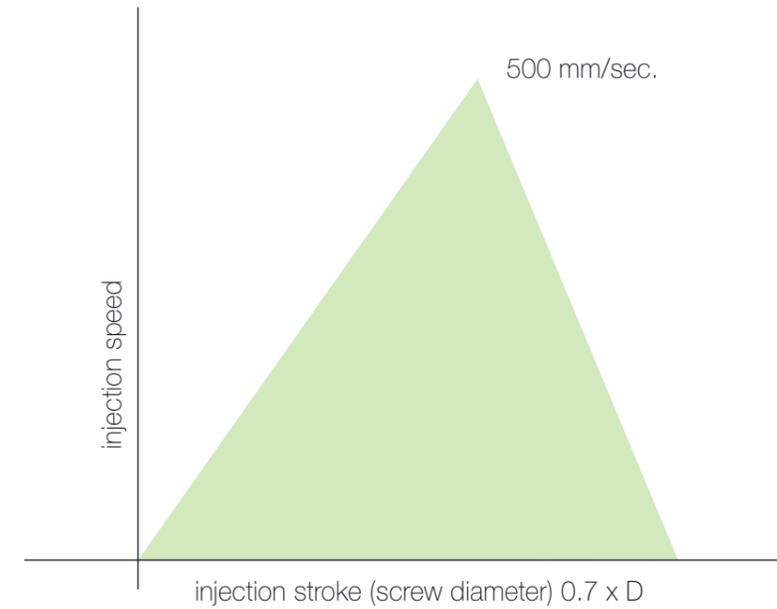
- injection unit can be swivelled
- ideal accessibility to screw tip
- easy-to-clean screw
- fast barrel changes
- intelligent quick mounting system

## intelligent contact force system

- force distributed through two symmetrically aligned spindles
- precisely adjustable contact force and nozzle movement
- parallel movements help to reduce cycle times



**Sophisticated components are required to assure that a flexible machine design functions properly.** The clean, efficiently functioning clamping mechanism of the ENGEL e-motion is backed up by Europe's fastest all-electric injection unit. Most impressively of all, the unit offers optimised performance for every application.



### high performance

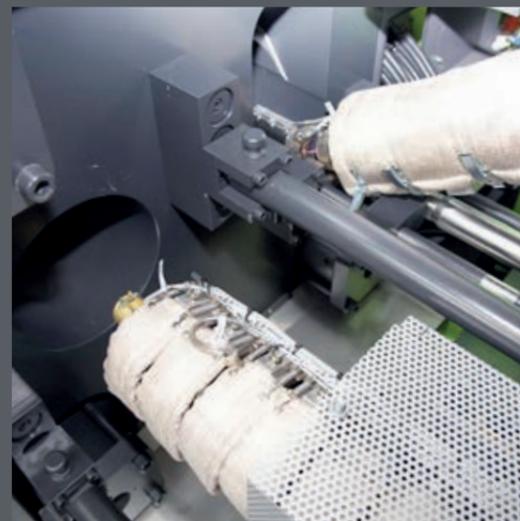
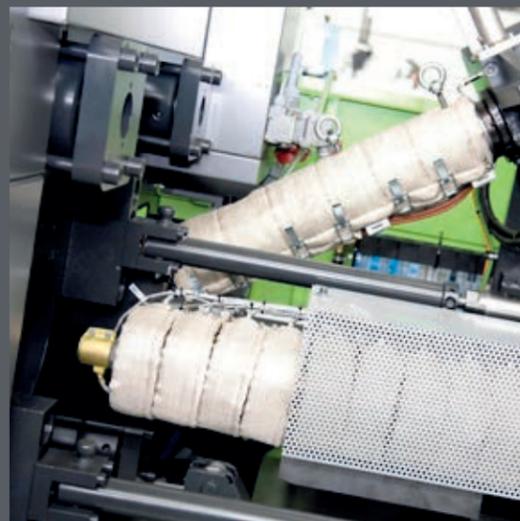
Enabling you to produce faster, ENGEL e-motion injection units offer optimum acceleration values. The set speed is thus attained considerably much quicker and the filling phase is shortened.

### constant lubrication

A long service life coinciding lower costs: the permanent oil-bath lubrication of the spindles ensures consistent lubrication in the injection unit, which negates the need for a separate oil cooling system. Since one oil change per year is sufficient, the system saves on maintenance costs.

### lower energy consumption

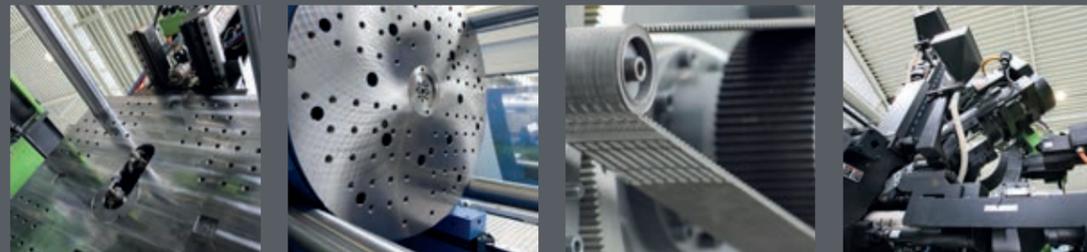
Output is increased significantly as energy costs are cut by as much as 70%: in the all-electric injection unit of the ENGEL e-motion, high efficiency components make for perfect energy balance.



ready for **productivity**



**The plastics in your world are colourful – and with ENGEL combimelt, we offer you the perfect technology for multi-colour injection moulding.** As a market leader and pioneer in this sector, it is very important to us that we utilise our experience for your maximum benefit. That's why with the ENGEL e-motion, we have delivered a perfectly coordinated machine concept to meet your specific needs.



## large mould area

Since the total projected cavity surface is generally very small, moulds for multi-colour applications require a small clamping force relative to the size of the mould. With its large mould area (especially in the wide platen version), the ENGEL e-motion offers just that bit more flexibility that you need when it comes to machine design and mould changes.

## perfectly coordinated technology

We work with you to develop precisely the machine concept that is perfect for your individual production needs. ENGEL e-motion ideally supports all multi-colour mould concepts: rotary table, index plate, slider technology, coinjection and picking and placing of parts by a robot.

## servoelectric rotary table

- precise servo drive
- automatic position optimisation (repeatability +/- 0.1 mm)  
independent of rotational speed and mould weight
- no mechanical end stops necessary
- automatic rotary time optimisation
- automatic speed optimisation
- automatic determination of acceleration and braking ramps

# ENGEL hydraulic unit

**To provide the best possible support for ancillary hydraulic movements as in the case of integrated cores and shut-off nozzles, the all-electric ENGEL e-motion comes with an in-built intelligent solution:** an innovative hydraulic unit with ENGEL ecodrive drive technology. The solution is available either in a mobile stand-alone version or as a compact, integrated solution inside the injection unit framework.

## efficient hydraulics

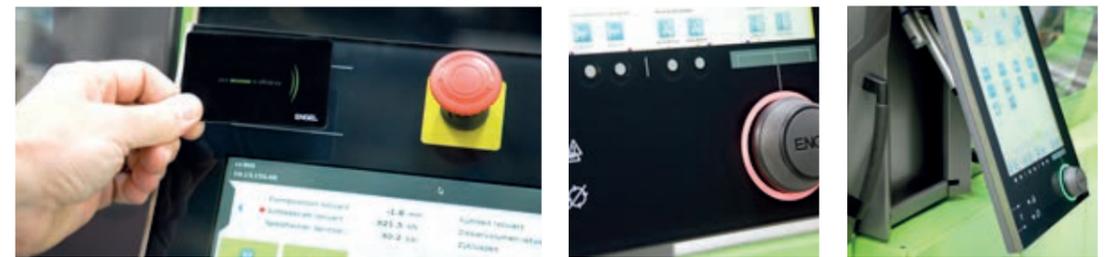
The intelligent ENGEL hydraulic unit works on the basis of one simple principle: operating only when required. In place of a conventional asynchronous motor with control pump, the revolutionary hydraulic system utilises a powerful servomotor with a gear pump. The advantage of this is that the motor only runs when oil is needed, which helps to conserve energy.



## unique pressure control

ENGEL ecodrive regulates speed and pressure very efficiently through the rotational speed of the gear pump rather than conventional control valves. The result is an optimum increase in performance with significant power and energy savings.

**Complex processes easily controlled** – with the established ENGEL machine control unit. Based on modern consumer electronics, the new user interface enables intuitive and logical inputs via touchscreen. Free programming of the cycle sequence is performed by means of simple graphic symbols and keypad pop-ups. It is also possible to configure certain keys for specific requirements in your production facility, while USB interfaces provide for a simple exchange of data with periphery equipment.



### **clear** operating logic

- no special prior knowledge needed for programming
- characteristic icons convey a clear and easily understandable language
- flexibly configurable keys

### **simple** programming

- extensive library of functions
- sequence editor for individual sequences

### **smart** dialogue

- user-friendly operation via touchscreen
- data exchange via USB interface

**Even the smallest activity must be performed properly to ensure your products leave the factory in perfect condition.** Robots and automation components from ENGEL turn the ENGEL e-motion into a reliable and highly efficient production cell, from insertion and removal, and assembly and testing, to the packaging of finished products.

## machine control = robot control

**Full integration of the two control environments:** Since both, the injection moulding machines and robots are “made by ENGEL”, communication and coordination of both production plant parts are carried out through the machine control unit. That implies for your production

- clear, standardised, logical operation of the machine and the robot
- perfect, common data management system
- significantly increased productivity provided by synchronised movement sequences
- no EUROMAP 67 interface required

## integrated automation

A complete production cell from a single source: ENGEL delivers compact, integrated robot/machine combinations that offer the advantages of minimal footprints and height. The robot moves within a slightly widened machine safety gate, directly placing parts on the conveyor belt next to the mould mounting platen in short movements.

## fast removal of sprue

Fast sprue removal is made possible through the sprue picker of the robot and the perfect individual planning of your ENGEL e-motion. Additional sprue discharge chutes are available for the rear safety gate if required.

## optimised production

Need a complete automation solution? No problem. With its ENGEL viper and ENGEL ER-USP robot series, ENGEL offers the ideal robot modules for the ENGEL e-motion. Complete automation packages are also available for simple removal tasks. Additional bonuses include operation through the machine control unit and the possibility of saving common mould data sets.

## easy-to-use robots

The new wizard for the robot – and integration in the machine control unit – make this a reality!



# all-electric, flexible machine concepts

from 300 kN to 6,500 kN

Whichever area your products are made for, the ENGEL e-motion delivers exactly the right high-performance machine concept for your precise needs.

ENGEL e-motion			50		170			310		440		740			940			1340			1640		2440			3440		
			15	18	20	22	25	30	30	35	35	40	45	50	55	50	55	60	55	60	70	60	70	60	70	80	70	80
	US tons	kN																										
ENGEL e-motion 30 TL	35	300																										
ENGEL e-motion 50 TL	55	500																										
ENGEL e-motion 80 TL	85	800																										
ENGEL e-motion 110	120	1 100																										
ENGEL e-motion 160	180	1 600																										
ENGEL e-motion 160 WP	180	1 600																										
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ENGEL e-motion 280 WP	310	2 800																										
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ENGEL e-motion 380 WP	420	3 800																										
ENGEL e-motion 500	550	5 000																										
ENGEL e-motion 650	720	6 500																										

# 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 does not 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 fast worldwide delivery of spare parts and their professional replacement. Diverse maintenance contracts also guarantee top-level machine availability. Our goal is the best possible performance of your ENGEL machinery.

### **Support – we assist you on-site**

- save costs incurred by downtime
- immediate support 24/7, 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



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