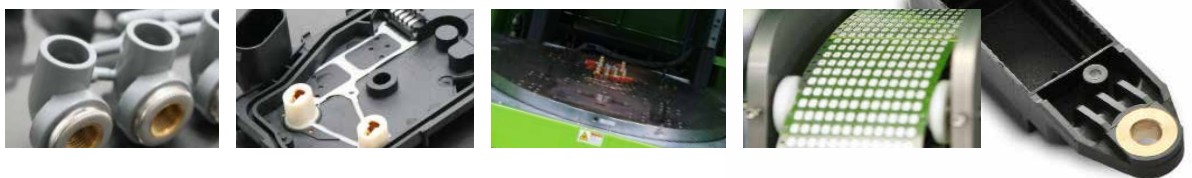


insert your ideas.

# ENGEL insert PRO





## In command of insert parts. ENGEL insert

Overmoulding of metal, glass or other materials to produce plugs, switches, sensors, LEDs or numerous other composite parts is the domain of the ENGEL insert machines.



Thanks to the vertical design of the clamping unit, insert parts can be quickly and precisely positioned in the lower half of the mould.

Insert-placing and part take-off, often time-consuming processes, occurs parallel to the injection process when a rotary or sliding table is used. This means higher productivity and at the same time greater process stability.



# Different models for all requirements

Common advantages of the key points in typical ENGEL-quality

- High injection performance and excellent process stability
- Excellent injection process control
- Ergonomically optimised mould mounting height
- Small footprint
- ENGEL CC<sup>200</sup> control unit with intuitive touchscreen user interface
- Comprehensive range of options including customised solutions

- Single station execution
- Wide platens with T-slots
- Safety gates for safeguarding the mould area
- Safety tunnel and strip feed interface
- Energy-efficient drive technology ENGEL ecodrive
- High-speed injection at max. 600 mm/s



ENGEL insert single LED		80			200			330			500		
		18	22	25	25	30	35	30	35	40	35	40	45
ENGEL insert V 40 single LED	400 kN												
ENGEL insert V 60 single LED	600 kN												
ENGEL insert V 80 single LED	800 kN												
ENGEL insert V 100 single LED	1000 kN												

- Rotary table execution
- Light curtain for safeguarding the mould area
- Smart pump hydraulics  
alternatively: energy-efficient drive technology ENGEL ecodrive
- 2-station rotary table, diameter 1200 mm  
alternatively: 3-station rotary table



ENGEL insert rotary PRO		80			200			330			500		
		18	22	25	25	30	35	30	35	40	35	40	45
ENGEL insert V 40 rotary PRO	400 kN												
ENGEL insert V 60 rotary PRO	600 kN												
ENGEL insert V 80 rotary PRO	800 kN												
ENGEL insert V 100 rotary PRO	1000 kN												

- Single station execution
- Light curtain for safeguarding the mould area
- Smart pump hydraulics  
alternatively: energy-efficient drive technology ENGEL ecodrive



ENGEL insert single PRO		80			200			330			500		
		18	22	25	25	30	35	30	35	40	35	40	45
ENGEL insert V 40 single PRO	400 kN												
ENGEL insert V 60 single PRO	600 kN												
ENGEL insert V 80 single PRO	800 kN												
ENGEL insert V 100 single PRO	1000 kN												

- Sliding table execution
- Light curtain for safeguarding the mould area
- Smart pump hydraulics  
alternatively: energy-efficient drive technology ENGEL ecodrive
- On both sides demoulding station with separate ejectors



ENGEL insert shuttle PRO		80			200			330			500		
		18	22	25	25	30	35	30	35	40	35	40	45
ENGEL insert V 40 shuttle PRO	400 kN												
ENGEL insert V 60 shuttle PRO	600 kN												
ENGEL insert V 80 shuttle PRO	800 kN												
ENGEL insert V 100 shuttle PRO	1000 kN												



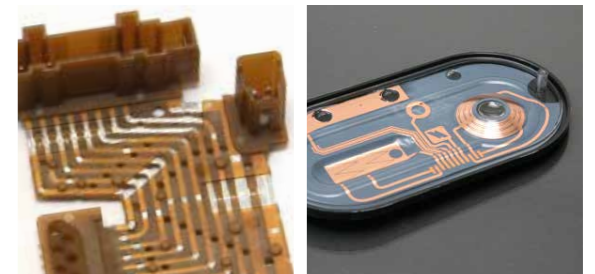
## 60 years of experience with vertical machines – deployed worldwide



At the end of the day, our many years of experience in cooperation with moulders are the foundation on which the highly-developed vertical machines of the ENGEL insert series are built.

Our reference list sounds like a “Who is Who” of the industry. The ENGEL insert is used everywhere, no matter whether for technical moulding, medical technology, automotive, electrical or electronic components.

Our machines have not just clearly demonstrated their value in large-scale facilities operated by global players, but also with small to mid-sized enterprises – wherever injection moulding assembly occurs, and wherever bulky insert parts or cables, hoses, profiles or metal strips are over-moulded with plastics.



## Hydraulic ENGEL injection unit

High injection performance and excellent process stability

### Excellent injection process control

The hydraulic ENGEL injection unit impresses with excellent closed loop control of the injection process. Compared to conventional injection controllers, the "clamped system" of injection plungers included in the standard version with the highly sensitive electronic controllers reacts extremely quickly to disturbing influences and any process-related changes. This guarantees excellent injection moulded parts and a high degree of reproduction accuracy. Control accuracy is even further improved by the electro-hydraulic variable capacity pumps included in the standard version.

A servo-valve is available as an option (standard feature of the ENGEL ecodrive) for further optimisation of extremely low injection speeds.



### Accumulator for high injection performance

Extremely high injection speeds of up to 1000 mm/s are necessary to achieve the required quality of moulded parts with extremely thin walls. The required injection performance is provided by optional hydraulic accumulators. The injection process is controlled by a servo-valve.

### Efficient plasticizing drive

The plasticizing drive is powered by a hydraulic motor. These hydraulic motors are available in three sizes for each injection unit. Besides the standard motor, a motor for higher speeds or higher torques is available as an option in each case. This enables the drive unit to be tuned with the respective plasticising unit and moulding material to be processed, guaranteeing a high level of energy efficiency.

### Plasticising unit

A range of barrel and screw configurations is available for optimum tuning of plasticising to match the application. The barrel is mounted on the injection unit by means of a quick coupling. The plasticising unit is pressed torque-free against the mould; the required force can be set on the machine control unit.

# Drive technology. Milestone. ENGEL.

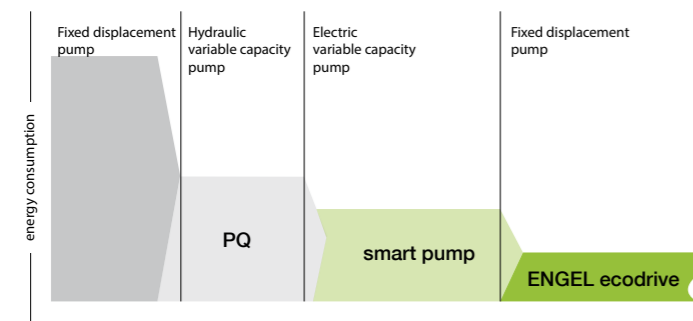
## Energy efficiency thanks to ENGEL ecodrive

Efficient ENGEL hydraulics. Control of all machine movements:  
**fast, reproducible and energy-efficient.**

ENGEL is a pioneer in energy-efficient hydraulic concepts. The basic hydraulic design of an injection moulding machine is even more important than efficiency of the hydraulic drive components. For many years ENGEL has had a concept that in itself guarantees very low energy requirements for the central hydraulic system of the respective machine.

Besides the particularly energy-efficient machine design, ENGEL has also been committed to highly efficient hydraulic drive units for many years. ENGEL set the standard in energy efficiency and control quality over 15 years ago with the replacement of PQ hydraulics by EHV hydraulics.

And thanks to the new optional ecodrive servohydraulics, ENGEL now combines the advantages of hydraulics with those of servodrives. ENGEL ecodrive offers additional improvements in precision control and thus represents a milestone in energy efficiency.



Evolution of hydraulic drive technology

**ecodrive inside**



# Oil temperature Indicator for energy efficiency of hydraulic machines

## ENGEL ecodrive –

a revolutionary hydraulic concept with decisive advantages:

- Excellent energy efficiency
- Substantially lower cooling water requirements
- Extremely low noise level
- Optimum for clean room applications
- Includes „on-board“ hydraulics for operating core pulls

Hydraulic closed-loop controlled	single LED	single PRO	rotary PRO	shuttle PRO
smart pumps				
ecodrive				
ecodrive with accu up to 600 mm/s				
ecodrive with accu up to 1000 mm/s				

All subject to change!

■ Standard    □ Option

Up to **100%** cooling water savings for the oil cooler

Up to **70%** energy savings compared to conventional hydraulic machines

### The system

ENGEL ecodrive in the ENGEL insert consists of a servomotor with fixed displacement pump (instead of a permanently running asynchronous motor with variable capacity pump).

### The energy efficiency

ENGEL ecodrive boosts energy efficiency by radical reduction of the energy dissipation common to conventional hydraulic machines. The portion of supplied energy that is not applied as movement energy for individual machine movements is transformed into heat. The majority of this heat is transferred to the hydraulic oil and via the oil cooler with additional losses to the external cooling water supply system.

ENGEL ecodrive reduces energy losses to such a high extent that only minimal heating of the hydraulic oil occurs. Cooling water consumption at the oil cooler is reduced to a minimum, in many cases to zero.



ENGEL **insert**

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be the first.