



ENGEL at Fakuma 2009

Driving you eco – Focus on energy efficiency

Schwertberg/Austria – October 2009. This year's FAKUMA trade fair, from 13 to 17 October in Friedrichshafen, once again proved that energy efficiency is a buzz topic more than ever before. In keeping with the theme of "Driving you eco", ENGEL exhibited its latest state-of-art energy-saving and performance concepts. And was highly successful in doing so. The highlights included the presentation of the new ENGEL viper robot series, the new ENGEL victory 160 series with ecodrive and the "small" ENGEL duo pico large-scale machine series – also featuring ecodrive.

380 square metres of floor space under the auspices of sustainable, energy-saving injection moulding concepts - this was FAKUMA 2009 for ENGEL. In line with our mission of "driving you eco", the focus was on energy-optimised, powerful systems. The centre of attraction was the new speed-controlled ecodrive drive system, which was demonstrated on the new ENGEL victory 160 and the ENGEL duo 500 pico. And the presentation of the new, state-of-art viper robot series once again underlined ENGEL's system integration competency. ENGEL rounded off its trade fair appearance with a fully-electric ENGEL e-motion T medical and an example from Engel's fast-running speed series. ENGEL was also the only company to provide demonstrably comparable energy characteristics - measured in line with the Euromap 60 guidelines - for its machines.

ENGEL ecodrive – Innovation in energy efficiency

Demonstrated for the first time on a hybrid ENGEL e-victory at FAKUMA 2008, the new ecodrive drive system is now also available for the fully hydraulic ENGEL



victory series and the ENGEL duo pico dual platen machine. ecodrive is an innovative drive system based on servomotors that control the drive speed independently of the speed required for the machine. In other words, the drive is only active during machine movements, with energy consumption dropping to virtually zero when the machine is idle.

ecodrive's benefits are particularly great when it comes to the tie-bar-less ENGEL victory and e-victory machines. In contrast to standard hydraulics with asynchronous drives, ecodrive does not consume flushing or idle energy when the machine is not in motion. Legacy hydraulic drives continuously pump the hydraulic oil through the system. Besides the increased energy consumption due to constant motor/pump activity, the cooling water requirements of standard systems are also higher because the hydraulic oil is heated by the constant movement. Heating of hydraulic oil in particular is a key indicator of energy efficiency. With ecodrive, some ENGEL victory machines will no longer need oil cooling. All told, the machine heats up less with ecodrive. And this in turn offers benefits for deployment in cleanrooms.

Deploying electrical injection units along with servohydraulics has an additional positive effect on the energy household, as no energy is consumed while the hydraulics are idle, thus leading to vastly improved energy utilisation. In addition to this, clamping pressure lock-in, a standard feature, improves ecodrive's efficiency. This means that the clamping pressure is locked into the sealed hydraulic clamping system by means of a non-return valve. This removes the need to consume energy to maintain clamping pressure.

All told, the use of ecodrive with **ENGEL victory machines** can save **up to 70 percent** of energy consumption compared with standard hydraulics.



Additional benefits arise in the following areas:

- Minimised noise
- No performance hits
- Lower power rating for the same actual output
- Energy consumption is just as low as with electrical machines, especially if the mould design requires hydraulics.

ENGEL ecodrive is also available for ENGEL duo machines. Due to the different process conditions for large-scale machines, variable capacity pumps are deployed here. They offer more stable pressure control, especially for extended holding pressure times. On top of this, duo machines with ecodrive are supplied with special operating point optimisation software. This means that there is an optimum rpm figure for any speed at a given pressure, and an optimum pump swivel angle at which the best overall efficiency is achieved. For duo machines **energy savings can be up to 55 percent**.

veni. vidi. viper – The new, powerful robot generation

Besides ecodrive, ENGEL presented another highlight at FAKUMA: the new viper robot generation. Maximum stability, excellent dynamics, compact footprint and optimum operator convenience are the features that characterise the viper. Clever software additionally ensures faster cycle times, improved productivity and a longer working life:

- A **mass identification software** detects the manipulated mass “online”, adapts the dynamic values to match, and thus ensures optimised acceleration.
- **"vibration control"** reduces structure-borne vibration, even for longer axis dimensions.
- **"efficiency control"** optimises robot movements for maximum productivity while consuming very little energy.

Self-optimisation of acceleration and speed values additionally reduces the handling time, thus avoiding unnecessary stress on mechanical components and the drive train.



No matter whether integrated as a part of a line, or as an efficient stand-alone solution, the ENGEL viper impresses with a convincing price/performance ratio and will soon be available as the viper 40 model. Models 20 and 60 will become available early in 2010.

All told, this year's FAKUMA once again provided ENGEL with the perfect backdrop to demonstrate high-performance energy optimisation and improved efficiency: Four innovative machines on show and the viper presentation provided ample proof.

ENGEL e-motion 310/100 T

ENGEL once again demonstrated its system integration competency with a fully-electric ENGEL e-motion T. The exhibit demonstrated the manufacturing of PP pipette tips, which were injected in a cycle time of just 6 seconds, then inspected by cameras, and deposited on racks sorted by cavity. The injection moulding machine is part of a system comprising a 32-cavity mould by Tanner Formenbau AG from Feuerthalen/Switzerland and an automation cell by Waldorf-Technik from Egen/Germany. Equipped with barrel suction and nozzle suction, the machine guarantees a low level of heat dissipation into the cleanroom. On top of this the tie-bars are grease-free and the toggle levers covered, and thus clean. The ENGEL e-motion medical series combines maximum performance and cleanliness and is available as a complete series with up to 500 tonnes clamping force.

ENGEL speed 180/55

On an ENGEL speed the production of an airline cup was demonstrated using a 4-cavity mould by Glaroform AG from Naefeld/Switzerland. At the same time, the cups were decorated using in-mould labelling. The special thing about this is that the label was made of polystyrene just like the cup. This allows for clear, transparent areas in the label without visual impact of the cup. The challenge: more difficult handling due to the increased thickness and rigidity compared to legacy PP or PE labels. At FAKUMA, the machine was equipped with a fast handling robot by Beck Automatisierung from Oberengstringen/Switzerland.



ENGEL duo 3550/500 pico ecodrive

One of the absolute highlights at Fakuma was the new ENGEL duo pico – equipped with the energy-saving ecodrive system including speed controlled pumps and an electrical screw drive. The machine was used to demonstrate the production of a BMW motorcycle headlight housing on a mould by ZKW/ZIZALA Lichtsysteme GmbH from Wieselburg/Austria. The part is made of polypropylene with 30 percent fibreglass and was produced in a cycle time of just 47 seconds. Part removal was handled by an ENGEL ERC 33 robot. Compared with our main competitors, an ENGEL duo pico uses 25 percent less energy. And the ecodrive option means substantial energy savings on top. From an energy-technology point of view, this design is easily in the same range as a fully electric machine.

ENGEL victory 750/160 tech ecodrive

In the tie-bar-less field, ENGEL exhibited the new **ENGEL victory 160** – complete with ecodrive. The victory 160 replaces the 150 tonne size and offers more space and flexibility in this clamping force segment. Equipped with Flex-Link including an integrated force divider as a factory standard (this is a patented system for high-precision platen parallelism and minimal wear and tear on moulds), the machine has an exciting, modern design and supports FEM (Finite Element Method) optimisation. FEM-optimised parts keep the weight of the machine down despite improved mechanical characteristics. Besides greatly reduced dry cycle times, this also means considerable energy savings. On top of this, the victory 160 is the first fully-hydraulic injection moulding machine with the servohydraulic ecodrive. At FAKUMA, ENGEL demonstrated the production of a PP bearing block for sanitary applications. Using a 16-cavity mould with a drop core by Büchler Werkzeugbau AG from Flawil/Switzerland, the parts were produced in a cycle time of just 16 seconds and - after 2-phase ejection (part + sprue) - were deposited on a conveyor belt by an ENGEL ERC 23 robot.



Successfully navigating the crisis

Sustainable, energy-efficient, but powerful. Intelligent technological solutions from ENGEL effectively combine these requirements for modern injection moulding machine design. At this year's Fakuma in Friedrichshafen ENGEL presented the latest developments in the field of energy efficiency. On top of this, ENGEL is now helping its customers to implement planned investments, thanks to a comprehensive portfolio of financing instruments, such as leasing offers and supplier loans. And last but not least, the scrapping bonus has been extended to year's end for customers who have still not made up their minds. ENGEL's success justifies the company's policies. The first six months of 2009 also saw ENGEL's market share increase due to a clear focus on product policy as well as comprehensive and advisory services. At nearly 30 percent in Europe, 15 percent in North America, and nearly 10 percent on the relevant Asian markets. "Although the classic upswing has still not arrived after this crisis, and stabilisation will take some time - the investment climate is becoming noticeably more positive. And: people who do their homework, such as ENGEL does - this means positioning your company well, investing in development and reinforcing system integration - will survive a crisis without needing to fear for their existence. You could also say that, if you understand your customers and act accordingly, you will be able to weather a crisis", said Dr. Peter Neumann, CEO of ENGEL Holding.



Figures:



Fig. 1: Production cell with ENGEL e-motion T for manufacturing pipette tips (r.).

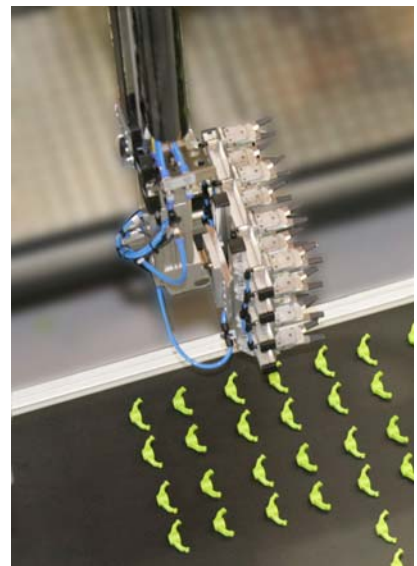


Fig. 2: ENGEL victory 160 with ecodrive for manufacturing a bearing block for sanitary applications (r.)



Fig. 3: The new high-performance ENGEL viper robot generation

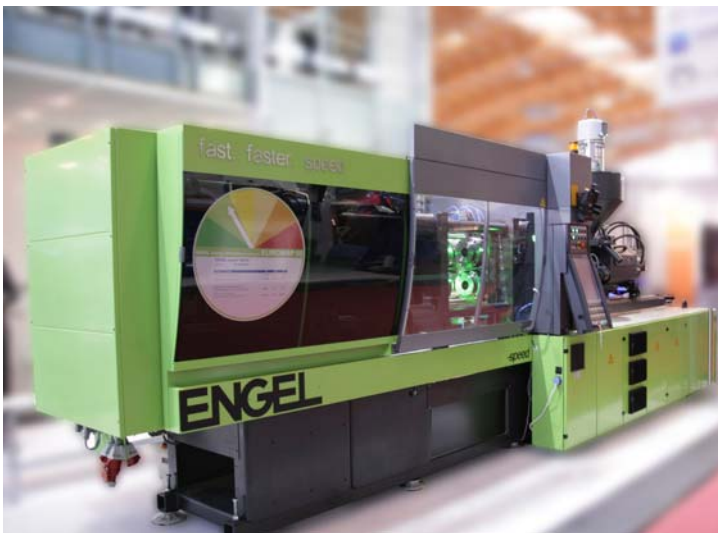


Fig. 4: ENGEL speed 180 with in-mould labelling was used to produce an airline cup made of PS



Fig. 5: BMW headlight housing – manufactured on an ENGEL duo pico ecodrive

ENGEL AUSTRIA GmbH

The ENGEL brand denotes the world's biggest manufacturer of injection moulding machines and, at the same time, one of the world's leading plastics processing machine manufacturers. Today, the ENGEL Group offer a full range of technology modules for plastics processing as a single source supplier: Injection moulding machines for thermoplastics and elastomers, as well as automation, with the assurance that individual components are also competitive and successful on the world markets. With eight production plants in Europe, North America and Asia (China, Korea), subsidiaries and representatives in over 85 countries, ENGEL offers its customers the optimal global support they need to compete and succeed with new technologies and leading-edge production systems.

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