

ENGEL at the NPE2018 with reinforced industry expertise

Intelligent system solutions for comprehensive process overview, safety and efficiency

Schwertberg, Austria – January 2017

Highest quality and highest efficiency – at NPE2018 from May 7 to 11 in Orlando, Florida, with multiple, exciting injection molding applications ENGEL will prove that this does not have to be a contradiction in terms. In order to secure a decisive advantage for its customers in the automotive, teletronics, technical molding, packaging and medical industries, the injection molding machine manufacturer and systems solution provider relies on innovative technologies, tailor-made production concepts, and intelligent controls.

ENGEL at the NPE2018: West Hall, Booth W3303

From individual injection molding machines to highly integrated production cells, ENGEL delivers tailor-made solutions to the injection molding industry. Developing customer-specific solutions requires more than technological know-how. It relies on understanding and efficiently implementing the customers' individual requirements. To achieve this, ENGEL aligns its industry expertise in five business units, and this not only at its headquarters in Austria. Three years ago, ENGEL Machinery Inc., based in York, Pennsylvania, appointed dedicated business unit managers for North America, and has since then continuously reinforced its local industry know-how as well as application technical capacities. "The feedback of our customers is excellent. The most recent successes confirm that we are on exactly the right track", reports Mark Sankovitch, President of ENGEL Machinery Inc., ahead of the NPE2018. "We can respond to the requirements and requests of our customers in the various industries even faster, and provide them with more targeted support in solving their very individual challenges. As a systems provider, we are increasingly accompanying our customers throughout the entire life cycle of the machines and systems – this is the trend that we are addressing with the new structure."

ENGEL
be the first

ENGEL AUSTRIA GmbH | A-4311 Schwertberg | tel: +43 (0)50 620 0 | fax: +43 (0)50 620 3009
sales@engel.at | www.engelglobal.com

From automotive to technical molding, to teletronics and on to medical and packaging: Each industry presents its specific challenges, even though the principal trends may be the same. Process integration and automation are continuing to gain importance in North America. At the same time, the producers have increased their focus on the topics of digitalization and networking. What these trends have in common is that they result in more quality, efficiency and cost-effectiveness, but also in a higher complexity of production processes." As a systems solutions provider, we ensure that even complex processes can be easily and securely controlled", states Sankovitch. "This will be clearly represented by the exhibits at our trade show booth."

Automotive: Premium interior components at low cost per unit

For the first time in North America, ENGEL will present a fully automated, integrated production cell for the DecoJect process. This technology combines injection molding and IMG (in-mold graining), opening new possibilities for the production of premium interior automotive components. As opposed to conventional in-mold decorating processes, DecoJect does not simply transfer the paint from the foil to the component, but rather the foil is punched out and remains on the component. This way, in addition to color and pattern, surface structure and haptics are also addressed. At the same time, it significantly increases the scratch-resistance of the surfaces. "Even for smaller production runs, DecoJect provides us with an extremely cost-effective possibility of optically upgrading injection molded components and coordinating surfaces in the vehicle interior", emphasizes Larry Alvey, Manager of ENGEL's Automotive Business Unit in North America.

During the NPE, ENGEL will produce interior upper door trim with various surface structures on a duo 5160/1000: From a refined leather grain, including the seam, to a modern carbon look. The DecoJect thin foils were developed by Benecke Kaliko, a member of the Continental Group based in Hannover, Germany.

To start the process, the foil is drawn from the roll into the open mold, heated by an IR-radiator mounted to the robot grip, and preformed directly in the injection mold with the help of vacuum. Immediately afterwards, the foil is back-injected with polypropylene and punched out before the robot removes the component and transfers it to the integrated laser station for precision cutting. One ready to install part leaves the production cell every 60 seconds. Since a design change requires only a few minutes for the exchange of the foil rolls, the lot

size no longer affects the cost per unit. To save additional raw material, the MuCell foam injection molding by Trexel (Wilmington, USA) is used. Other partner companies involved in the project are Georg Kaufmann Formenbau (Switzerland), Galvanoform Gesellschaft für Galvanoplastik (Germany), HRSflow (Italy), ICO SYSTEM international coating (Germany) and Borealis (Austria).

With its advanced expertise in automation, ENGEL provides an essential contribution to the efficiency and flexibility of the process. Heating the foil and removing the component from the mold is handled by an ENGEL viper linear robot. In addition, in an easiCell placed directly next to the clamping unit of the injection molding machine, an ENGEL easix articulated robot is integrated with the laser station for the precision cutting of the foils. Thanks to its standardized and modular construction, the automation cell developed by ENGEL allows for the extremely space-saving integration of robots, as well as process units located up- and downstream of the injection molding. It also significantly reduces the complexity of the application. The entire process can be operated using the CC300 control unit of the injection molding machine. The uniform control logic throughout all components of the production cell makes it especially easy for the machine operator to confidently handle the integrated process without any special training.



Even large interior components can be cost-effectively manufactured using DecoJect. The desired surface characteristics such as color, structure, robustness and feel are provided through the foil. (Image: ENGEL)



A duo 5160/1000 injection molding machine is being used for the production of ready to install door panels. (Image: ENGEL)



Developed by ENGEL, the automation cell easiCell keeps the entire system compact. For the Deco-Ject process, the easiCell integrates an easix robot and a laser station. (Image: ENGEL)



The easix articulated robot follows the component contour along the laser and finally places the ready to install door panel on the conveyor belt. (Image: ENGEL)

Medical: Interdental brushes in a one-shot process

The healthcare application presented in Orlando also impresses with an extremely high degree of integration. Interdental brushes known as "scrub!" and developed by Pheneo (Germany) will be produced on a clean-room version of the all-electric e-motion 170/110 T injection molding machine. Together with the grip surface and core, up to 500 bristles can be formed in a single-component injection mold. Extremely delicate in the bristle area, the high-performance precision 8-cavity mold comes from Hack Formenbau (Germany), with Hekuma (Germany) providing the automation. A highly integrated, automated production cell will be presented, built in the modularized HEKUflex design by Hekuma. Immediately after injection molding, the parts will be inspected by a vision system and packed in retail bags, 16 parts to each. A bag leaves the production cell every four seconds.

"With our highly-integrated manufacturing process and the single-component construction we exponentially surpass the efficiency of established products and processes in the market", states Jon Kelm, Manager of Medical and Packaging Business Units for ENGEL North America. "As a rule, interdental brushes consist of three components – the grip surface, a wire mesh, and the filaments – which are usually produced in independent processes. By contrast, our solution does away with entire work steps, and reduces the logistical effort.

With a total shot weight of only 1.93 grams, completely filling eight cavities with filigree structures places very high demands on the mold as well as on the precision and consistency of the injection molding machine. ENGEL has two answers for this: First, the all-electric, high-performance e-motion injection molding machine, and secondly, inject 4.0. Under the inject 4.0 umbrella, ENGEL is bundling software products for the digitalization and networking of production processes, for example the intelligent assistance systems of the iQ product family, which detect fluctuation in the environmental conditions and raw material, and automatically compensates for these before rejects occur. In the CC300 control of the e-motion, visitors can observe how iQ weight control analyzes the pressure curve over the screw position during injection and adapts the switchover-point as well as the injection speed profile and the holding pressure to the current conditions. Simultaneously, iQ clamp control determines and automatically sets the optimum clamping force for the process taking into account the level of mold breathing. As the third system on the team, iQ flow control regulates the temperature differences in the mold's individual circuits and the performance of the pumps in the temperature control devices, ensuring constant temperature conditions while reducing power consumption. "With the intelligent assistance systems, the injection molding machine is continu-

ously self-optimizing", explains Kelm. "This allows all levels of machine operators to achieve optimal results."



In booth W3303, ENGEL will produce single-component interdental brushes, fully automated on an all-electric e-motion 170/110 T injection molding machine. (Image: ENGEL)



The production technology developed by ENGEL in cooperation with Hack Formenbau and Hekuma makes it possible to fully form up to 500 bristles using a single-component process. (Image: ENGEL)



Integrated into the CC300 control of the e-motion injection molding machine, the iQ assistance systems compensate for process fluctuations in real time. (Image: ENGEL)

ENGEL
be the first

ENGEL AUSTRIA GmbH | A-4311 Schwertberg | tel: +43 (0)50 620 0 | fax: +43 (0)50 620 3009
sales@engel.at | www.engelglobal.com

Teletronics: Consistent process integration boosts competitive ability

In the teletronics industry, the subject of process integration often revolves around plastic/metal hybrid composite components. With the production of thermal switch housings at the NPE, ENGEL proves that it can also forge tailored solutions for this challenge. From the punching of the contacts to the inspection and labeling of ready-to-use electronic components, all work steps are fully automatic. The raw material for the brass carrier plates is fed directly from a reel and prepunched including a thread. The thread is servo-electrically tapped before the carrier plates – still on the line – are overmolded with glass-filled nylon on an ENGEL insert 60V/35 vertical injection molding machine. Quality control happens within the production process. In addition to the camera inspection, high-voltage testing is integrated into the tool, thus already guaranteeing a one hundred percent short-circuit inspection during production. In order to ensure seamless traceability, the good quality parts are labeled by laser before the sprue and carrier tabs are removed and the components are separated from the belt. Eight ready to install parts leave the production cell every 20 seconds.

This production solution, developed by ENGEL in cooperation with its partner MMS Modular Molding Systems (Austria), guarantees the lowest possible cost per unit while also achieving a high degree of flexibility. Thanks to the modular design of the MMS systems, additional processing units can be integrated, for example, for resistance testing or laser welding, riveting, assembly or cleaning of the parts. "Regardless of the number of modules, the entire process can be monitored and regulated via the CC300 control of the insert machine", says Stefan Aberl, director automation at ENGEL North America. "This substantially reduces complexity and significantly simplifies the operation of the entire process."

Thermal switches, such as those used for monitoring electric motors in automobiles or in the domestic appliance industry, are traditionally produced in a complex, multi-stage process. As a rule, the metal components are even punched and overmolded at different locations. This not only requires considerable logistics overhead, but also ties up a large amount of material, since two independent processes need to be started up. This is a considerable cost factor, especially when non-ferrous metals are used.



The production of thermal switch housings includes multiple work steps, which ENGEL integrates into a clearly structured overall process. (Image: MMS)



The highly-integrated process makes the production of thermal switch housings economically viable. Upstream of the injection process there are a strip uncoiler, a press module and a processing module for tapping a thread; downstream there are quality controls, laser marking and another press module. (Image: ENGEL)

Packaging: Production efficiency at its peak

Highest degree of efficiency with the best quality and shortest cycle times. This is the daily challenge that the manufacturers of beverage caps face. For the production of 26 mm caps with tamper-proof bands made from HDPE, ENGEL is presenting a state-of-the-art solution at the NPE. During the five days of the show, the production cell will run at a cycle time of two seconds, and also achieving outstanding energy efficiency and the highest degree of process consistency.

At the core of the highly-integrated solution is an all-electric e-cap 2440/420 US injection molding machine, equipped with a 96-cavity mold by Z-Moulds (Austria). On the periphery, ENGEL integrates a dry-air system by Eisbär Trockentechnik (Austria), and an optical inspection system by Intravis (Germany) into the overall concept.

To combine minimal energy consumption with outstanding process consistency and precision in the production of beverage caps, ENGEL relies on the all-electric high-performance machines of the e-cap series, which, with clamping forces of 120 to 460 US tons, were developed specifically for this market segment. With their high-performance servo-drives, the e-cap machines ensure the required plasticizing capacity and maximizes part production quality even when using the new high-strength HDPE materials with an MFI significantly lower than 2 or even 1 g/10 min. "Geometrically, beverage caps have reached their lightweighting minimum", clarifies packaging expert Jon Kelm, "while simultaneously placing higher demands on precision and repeatability." In spite of its impressive performance, the e-cap uses very little power and cooling water, even at high speed. The increased ejection and clamping forces help to achieve very short cycle times.

Highest performance for thin-walled containers

At the NPE2018, ENGEL packaging is represented with a total of two integrated production cells. At its exhibition booth (South Hall, Booth S27009), Campetella Robotic Center from Italy is producing airline cups in thin-wall technology on an all-electric ENGEL e-motion 740/240 T US injection molding machine using a mold produced by Fostag (Switzerland). The cups are removed from the mold with the help of high-speed automation, and packed immediately after injection molding.

With cycle times significantly below 3 seconds and injection speeds of more than 500 mm per second, the all-electric machines of the e-motion series are being increasingly used for the production of thin-walled containers. The closed system for toggle levers and spindles guarantees optimal, clean lubrication of all moving machine components at all times, thus complying with the strict hygiene requirements of the food industry.



Maximum output with minimal energy consumption: During the NPE, an all-electric e-cap injection machine equipped with a 96-cavity mold will be producing 26-mm caps with tamper-proof bands in a cycle time of under 2 seconds. (Image: ENGEL)



Geometrically, beverage caps have reached their lightweighting minimum, while higher demands on precision and repeatability are being placed on the injection molding machine. (Image: ENGEL)



At NPE2018, Campetella Robotic Center from Italy is producing airline cups in thin-wall technology on an all-electric ENGEL e-motion 740/240 T US injection molding machine. (Image: ENGEL)

Technical Molding: Sophisticated LED lenses of liquid silicone

In the technical molding exhibition area of ENGEL at the NPE2018, the focus is on the advanced processing of liquid silicone (LSR). Lenses for LED headlights will be produced on an e-victory 310/120 US injection molding machine equipped with a two-cavity mold by ACH solution (Austria). These technical parts represent a wide range of applications. From automotive to construction to street lighting, LSR is rapidly gaining in importance. This is due to its special characteristics. Highly transparent LSR has a lower yellowing index than standard lens materials, is UV-resistant, and stable across a very broad temperature range of -20 to +150 °C. In addition, even complex lens geometries can be efficiently and consistently produced with injection molding.

ENGEL has a great deal of worldwide LSR project experience in various industries, and is therefore considered a preferred partner of the lighting industry in the market introduction of the new lens material. This is the first time that ENGEL is presenting the production of LSR lenses at a trade show.

"Prerequisite for the economic production of advanced products with liquid silicone are automated processes and a high degree of precision and stability in the injection molding process", states Steve Broadbent, responsible for elastomer projects in the application technology of ENGEL in North America. "Thanks to its tie-bar-less clamping unit, the e-victory machine with its electric injection unit has shown itself to be predestined for this purpose." Free access to the mold interior simplifies setup and keeps the production cell compact. Since the mold mounting platens can be used all the way to the edge, the lens mold, which is larger in size due to the complex component structure, fits into a comparatively small 120-ton injection molding machine. In addition, the robot can access the cavity directly from the side and requires less vertical space.

The tie-bar-less injection molding machines by ENGEL impress with an outstanding parallelism of mold mounting platens. The patented force divider enables the moving mold mounting platen to follow the mold exactly while clamping force is building up and ensures that the initiated clamping force is distributed evenly across the surface. This prevents burr formation even when processing low-viscosity materials such as LSR. The components require no rework and can be used immediately after the injection molding process.

ENGEL is implementing the high-tech solution in cooperation with its partner. The mold as well as the dosage system were developed and constructed by ACH solution (Austria), and the mold is using the new electric nozzle control ServoShot.

As systems provider, when processing LSR ENGEL also integrates all components of the production cell into a common control so that the entire process, including LSR dosage and handling, can be adjusted and controlled via the CC300 operator panel of the injection molding machine.

Confidently control LSR processes with ENGEL tie-bar-less technology

The NPE2018 once again confirms the leading position of ENGEL and tie-bar-less injection molding machines in LSR processing. Altogether, four LSR applications with ENGEL injection molding machines – three of which with tie-bar-less machines – will be presented at the trade show. At Wacker Silicones (headquartered in Germany) in the South Hall, Booth S24179, coasters will be produced on a hydraulic victory 200/120 with a 4-cavity mold. An additional tie-bar-less application is being run on a victory 200/55 at the booth of the tool builder Burteck from Windsor, CT (US) in the South Hall, Booth S30045. And Shin-Etsu Silicones from Akron, Ohio, will produce eyeglass lenses on an all-electric e-mac 170/55 machine using an optical grade LSR with the mold coming from Roembke (Ossian, Indiana). The Shin-Etsu booth is in the South Hall, Booth S20125.



Thanks to its barrier-free clamping unit, the tie-bar-less e-victory injection moulding machine opens up enormous efficiency potential in liquid silicone processing. (Image: ENGEL)

ENGEL
be the first

ENGEL AUSTRIA GmbH | A-4311 Schwertberg | tel: +43 (0)50 620 0 | fax: +43 (0)50 620 3009
sales@engel.at | www.engelglobal.com



ENGEL is implementing the production cell for LED lenses in cooperation with ACH solution. For the first time in North America, ACH solution will present its new ACH MaxiMix dosage system (Image: ACH-Solution)



With their complex structure, silicone LED lenses place high demands on the precision of the injection molding process. At the NPE, ENGEL is presenting the production of lenses for the first time at a trade show. A tie-bar less e-victory injection molding machine will be used. (Image: ACH-Solution)

ENGEL AUSTRIA GmbH

ENGEL is one of the leading companies in plastics machine manufacturing. Today, the ENGEL group of companies offers all technology modules for plastics processing from a single source: injection molding machines for thermoplastics and elastomers, as well as automation, with individual components that are in themselves competitive and successful in the market. With nine production plants in Europe, North America and Asia (China and Korea), and subsidiaries and representatives for more than 85 countries, ENGEL offers its customers the excellent global support they need to compete and succeed with new technologies and leading-edge production systems.

Contact for journalists:

Martin Streicher, Vice President Global Marketing, ENGEL AUSTRIA GmbH,
Ludwig-Engel-Strasse 1, A-4311 Schwertberg/Austria,
tel.: +43 (0)50/620-3800, fax: -3009, email: martin.streicher@engel.at

Susanne Zinckgraf, Manager Public Relations, ENGEL AUSTRIA GmbH,
Ludwig-Engel-Strasse 1, A-4311 Schwertberg/Austria
PR Office: Theodor-Heuss-Str. 85, D-67435 Neustadt/Germany,
tel.: +49 (0)6327/97699-02, fax: -03, email: susanne.zinckgraf@engel.at

Contact for readers:

ENGEL AUSTRIA GmbH, Ludwig-Engel-Strasse 1, A-4311 Schwertberg/Austria,
tel.: +43 (0)50/620-0, fax: -3009, email: sales@engel.at

www.engelglobal.com