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All-electric, highly precise and tie-bar-less

## ENGEL e-motion 30 TL extends smaller end of range

In time for K 2013, Engel has expanded its range of all-electric e-motion injection moulding machines to include a tie-bar-less 30-ton version. The new Engel e-motion 30 TL combines maximum precision and energy efficiency with low machine weight and a compact design, thereby setting a new global standard in the manufacture of precision optical parts and electronic components.



This company has been constructing tie-bar-less, all-electric injection moulding machines for the small clamping force field for more than 12 years. The machine concept has now taken a major step forward with the expansion of the series. The experience of selling more than 60,000 tie-bar-less machines in the Engel victory and e-victory series and the findings of extensive analyses have led to optimisation of the mechanical properties of the machine components along with a reduction in the weight of the new machine.

The most striking innovation is that the Engel e-motion 30 TL has a new kind of 'intelligent' frame concept in place of the double machine frame. This guarantees very high platen parallelism together with an even distribution of clamping force across the entire mould fixing platen. The sealed three-point toggle lever with maintenance-free crank mechanism works

with a servomotor to facilitate very short dry cycles of well under one second.

The servoelectric ejector and mould height adjustment are integrated into the moving mould fixing platen. As with all Engel e-motion machines, the main movements are servoelectric; this makes it possible to synchronise parallel movements.

As far as injection is concerned, the ENGEL e-motion 30 TL is equipped with the established in-line injection unit 50, which now delivers an injection speed of 800mm/s. Three barrel diameters are available as standard: D15, D18 and D20.

### For optical lenses and electronic components

With a length of just three metres, the new all-electric tie-bar-less machine offers a highly compact

## 2 / ENGEL e-motion 30 TL extends smaller end of range

design that saves valuable floor space in the production hall. Moreover, thanks to tie-bar-less technology, it is possible in many applications to use a smaller machine than mould size would normally dictate. With no tie-bars in the way, mould fixing platens can be used to the hilt. Tie-bar-less technology also makes mould changes easier and speeds up automation as direct parts handling is possible

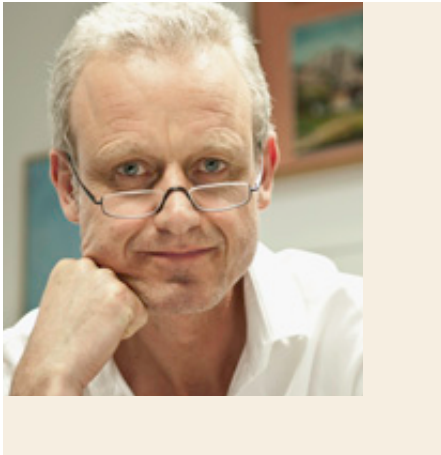
from the side.

Promising high precision, efficiency and flexibility, the Engel e-motion 30 TL is ideal for manufacturing high quality optical components and electronic parts such as connectors for mobile devices. At the same time, the high performance level of the new tie-bar-less machine offers advantages to producers of other components requiring a

low clamping force.

At the K trade fair, which takes place in Düsseldorf from 16th to 23rd October 2013, the company will produce 60-pin board-to-board connectors using an Engel e-motion 30 TL for the first time from its stand in hall 15. This is an application that demands particular precision: the distance between the pins is just 0,5mm.

ENGEL AUSTRIA GmbH A 4311 Schwertberg



Dear readers, dear subscribers,

This is the first cleanroom online newsletter.

From now on every month you will receive the German and English newsletter.

We have made some modifications online at [www.reinraum.de](http://www.reinraum.de) / [www.cleanroom-online.com](http://www.cleanroom-online.com)

In the navigation we have split the „News“ section into „News (de)“ and „News (en)“



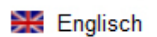
If an article is also available in German, you will see the flag:



### Molding Technology

® significantly reduces molders in the

Injection molding is always molding, from Sigmasoft®, and time-effective alternative to



### Virtual Molding

soft® reduziert öffnet dem Spritzgießverarbeiter

Bauteilen im Spritzgießprozess ist en und Änderungsschleifen idert dies nachhaltig, indem es eine

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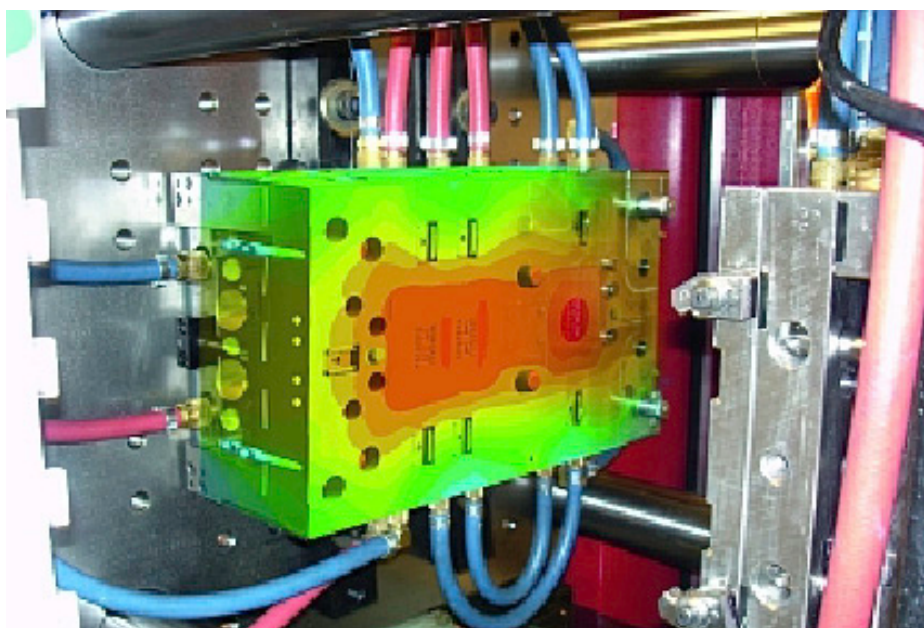
Best regards

Yours Reinhold Schuster

**A newly developed functionality in Sigmasoft® significantly reduces production costs and strengthens injection molders in the development chain**

# Sigma Engineering presents Virtual Molding Technology at K 2013

The start-up production of new parts in injection molding is always linked to extensive mold trials and iteration. Virtual Molding, from Sigmasoft®, changes this fundamentally as it offers an economic and time-effective alternative to conduct virtual injection molding trials and part try-outs totally independent from machine occupation and personnel availability.



Sigma Engineering GmbH, Aachen, Germany, presents at the K 2013, hall 13, booths A01 and A08, a new technology which significantly reduces the production costs in injection molding and offers injection molders the possibility to effectively bring their know-how early into the development process. Under the name Virtual Molding a new method has been developed, which reproduces virtually the complete injection molding process up to the very detail with the software Sigmasoft® and therefore reduces substantially the processing efforts at the machine and the linked material, personal, processing and energy costs.

“Virtual Molding is not only a completely new technology”, explains Dr. Marco Thornagel, Executive Director at Sigma: “Above all, it is a whole new method. The injection molder gets from us a tool to communicate his know-how through the complete development process in a comprehensive way. He gains certainty in his planning, improves his confidence to engage on deadlines and the quality towards his customers, and

strengthens therefore his position as a value-added partner”.

When a new plastic part is developed, each station in the development chain takes responsibility for its own field. The designer takes care of the article geometry and the mechanical part properties, often involving the use of injection molding simulation. The mold designer takes care of the mold mechanics, steel selection, centering, etc., and the injection molder has at the end the responsibility to produce plastic parts with the mold already developed, up to the required quality standards and even generating a profit. Oft enough the mistakes of the complete development process appear only at the injection molding stage, where the time and cost pressure is imminent and the position of the converter towards his customers gets compromised. For the injection molder it is therefore absolutely necessary to bring his know-how early enough into the development process. Precisely these are cases where Virtual Molding adds value.

“You can imagine Virtual Molding as a

virtual injection molding machine”, explains Dr. Thornagel. “It clearly demonstrates the effects of the injection molding process related to article and mold quality. Up to now, the only way to get good parts was to stay in front of the machine and to vary parameters with the mold already built until the parts fulfilled the quality requirements. With virtual Molding this optimization will take place long before the steel is cut. How much real iteration can you afford nowadays? The planning and optimization of the injection molding process in parallel to the geometry design and the mold development makes troubleshooting at the end superfluous. Processing problems can be identified and resolved, before they even appear. Herewith we offer a new possibility to reduce development time and to minimize risks. For our customers this is an appealing offer, particularly considering global competition.”

A further important advantage: with the demonstration of all process parameters and its consequences in the injection molding process on the screen, at any time and any location from mold and part, the process turns far clearer. Many effects which in the practice do not find any explanation, will find their real causes based on the physical information about the flowing and cooling effects of the plastic material. “After our first installations in the industry we have realized that the communication within a company now flows in a different way: the processing engineer can show the mold maker where the exact cause for a tempering problem originates and which solving approaches are realistic from the production point of view. Or the designer can understand early why a part concept is not viable due to production reasons”, claims Dr. Thornagel. “It is not an overstatement to say that Virtual Molding can change the way a company does business”.

SIGMA Engineering GmbH  
D 52072 Aachen

# Arburg Hungary: June event „Produktion efficiency live“

- **Juniális: Focus on cost-effective moulded part production**
- **Around 80 guests gained detailed information on automation and energy requirement**
- **Enhanced efficiency: Perfectly combining the Allrounder injection moulding machine and Multilift robotic system**

On 27 and 28 June, the Arburg team presented innovative injection moulding solutions at the subsidiary in Budapest, Hungary, on the occasion of Juniális 2013. This event is a permanent fixture in the Hungarian plastics industry calendar and this year was dedicated to the overarching topic of production efficiency. The event met with an extremely positive response from around 80 guests from 40 companies.

“At Juniális, we demonstrated that we are not only a manufacturer of innovative injection moulding technology, but also possess expertise throughout the entire value-added chain of the injection moulding process. This means that we can provide all-round support to our customers who wish to enhance their production efficiency,” said Gabriella Hollik, Managing Director of Arburg Hungary. “First and foremost, at this event we presented our expertise in automation and focused in detail on the topic of energy efficiency.” Gabriella Hollik and her team were especially pleased that the event was attended not just by longstanding customers, but also by many prospective clients who are considering purchasing an Allrounder injection moulding machine for the first time. In a successful blend of theory and practice, the guests gained an overview of different approaches to increase production efficiency in a specialist presentation and through practical examples, and were able to take some valuable ideas and inspiration away with them for their own production facilities.

## Production efficiency live

Using two exhibits, each of which combined an Allrounder injection moulding machine with a vertical Multilift robotic system, the company illustrated how unit costs can be efficiently reduced, for example through the use of automation and energy-saving machines.

An Allrounder 470 E from the electric entry-level Edrive series produced small parts boxes. Part removal and set-down was performed by a Multilift Select, which was fully integrated in the Selogica control system. In addition, the machine was equipped with the Selogica “Set-up Assistant” module. This human-machine interface assists the installation technician at every step through guided menus, and simplifies the set-up process - from mould changes and automatic parameter calculation, through to teaching



the finished production sequence.

A Multilift Select also ensured high-precision parts handling in the production of a stacking box on an Allrounder 470 C from the hydraulic Golden Edition series.

In addition, the hydraulic machine was equipped with the Arburg productivity package, which reduces the energy requirement by up to 20%. This package includes the Arburg AES energy-saving system with variable-speed pump drive and water-cooled motor. This makes the two-circuit pump technology for simultaneous movements even more cost effective. Furthermore, dry running times can be shortened, the cooling requirement optimised and noise levels reduced.

## Comparative energy consumption measurement

The company offers a whole range of technical equipment for permanently reducing the energy requirement of injection moulding machines and therefore also unit costs. The measured values of different Allrounder series and equipment options were compared in an energy consumption measurement, using the same process data and material throughput. The result clearly demonstrated opportunities for potential savings. For example, use of the productivity package reduced the energy requirement by 20%. In a presentation, the results were compared and analysed in a practical context.

ARBURG GmbH + Co KG D 72290 Loßburg

**New method allows IC manufacturers to reach scaling levels at 20nm and beyond, without compromising speed and device cross-talk**

# Imec reveals method of damage free cryogenic etching of ultralow-k dielectrics

Imec today announced a cryogenic etching method that protects the surface of porous ultralow-k dielectrics against excessive plasma induced damages.

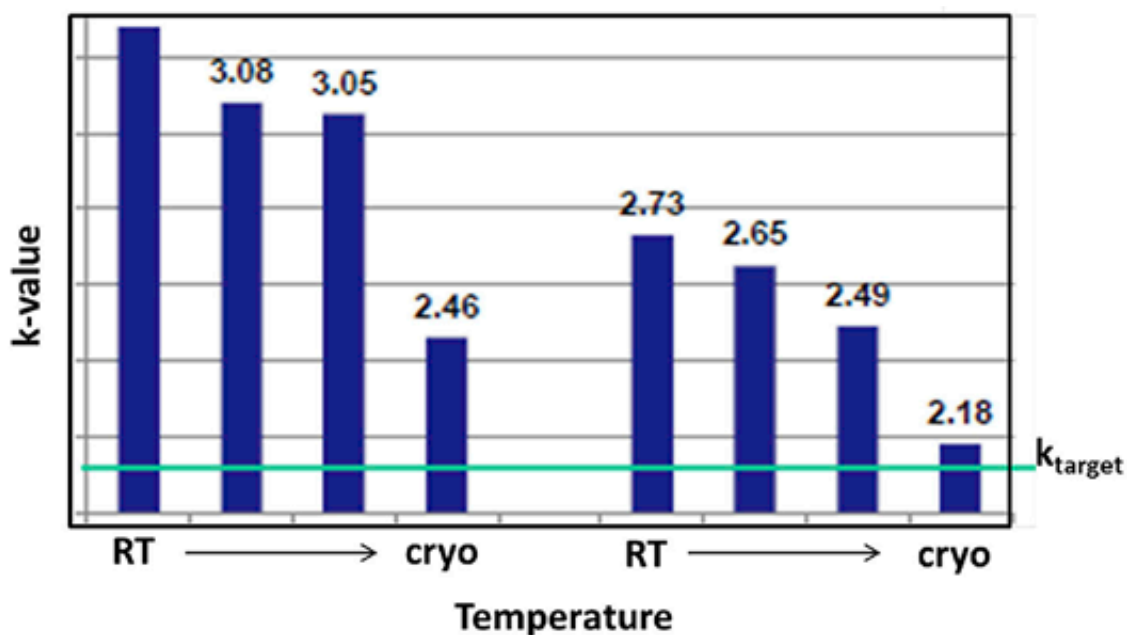
As semiconductor technology scales below the 20nm node, the capacitance increases between nearby conductive portions of high-density integrated circuits, resulting in loss of speed and cross-talk of the device. To control the increase in capacitance in deeply-scaled devices, insulating layers of porous low-k dielectrics are integrated through plasma etching. However, plasma etching exposes the dielectrics to active plasma ra-

dicals that penetrate deeply into the porous substrate, which then react and change the composition of the dielectric.

To bypass such damages, the company developed a new cryogenic etching method. By applying very low (cryogenic) temperatures during etching, a condensation of etch products in the pores of the low-k material, results in a protection of the dielectrics' surface. Imec demonstrated the method on a porous organosilicate (OSG) film. The results showed that no carbon depletion occurred when the wafer temperature remained below a certain critical level during plasma etching

“Our cryogenic etch method solves a key issue to further advancing scaling limits. It overcomes the disadvantages of current methods used to reduce plasma induced damage, such as dielectric etch at regular temperatures or low-k repair or high temperature pore stuffing, and it enables sub k=2.0 materials for integration,” stated Zsolt Tokei, program director interconnect at imec. “Our method is a true solution to further drive the development of next-generation, deeply-scaled technologies”

IMEC Belgium  
B 3001 Leuven



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