

August 2010, Kottlingbrunn/Austria

PRESS RELEASE

WITTMANN BATTENFELD at K 2010

The many innovative “firsts” from WITTMANN BATTENFELD at the K 2010

INNOVATION is the keynote of the WITTMANN group. Under the motto “A box full of innovations”, the WITTMANN group is presenting a large number of innovative novelties at this year’s K show. The many “firsts” from WITTMANN BATTENFELD are being presented to the public at the K 2010 in hall 16, booth D22.

Innovations are not an end in themselves, but are intended to provide additional user benefits through new possibilities. The novelties presented by WITTMANN BATTENFELD at the K 2010 meet this requirement in every respect. The outstanding novelties are highlighted in this article.

The main theme of the highlights presented by WITTMANN BATTENFELD at this year’s “K” is the *PowerSeries*, a completely new product portfolio, with *EcoPower* standing for all-electric machines, *MicroPower* for micro injection molding and *MacroPower* for large machines. These machines not only distinguish themselves by their successful combination of functionality with state-of-the-art design, but also offer a number of innovations that provide WITTMANN BATTENFELD customers with additional benefits.

The innovative “firsts” in the *EcoPower*

KERS – utilizing energy without a complex recovery system

Cost-efficient production with low energy consumption is one of the most important competitive factors for the future. WITTMANN BATTENFELD has responded to this trend at an early stage and now offers an extensive range of options to save energy in plastics processing.

The all-electric machine series from the *PowerSeries* range, *EcoPower*, offers a particularly high standard of excellence in this sector. *EcoPower* machines, specially

highlighted at the K by being present with 5 exhibits, offer the “KERS system”, which has become known by its use in F1 racing cars, as an additional energy-saving feature. KERS stands for **K**inetic **E**nergy **R**ecovery **S**ystem and designates all system components which utilize the braking energy in the injection molding machine. This energy can be gained from the deceleration of the clamping unit and the screw during the injection process. In the course of deceleration, the electric motors function as generators. The electricity thus generated is stored in capacitors or passed on to appliances in the injection molding machine via an intermediate DC circuit, instead of being fed back into the power network at a loss, as is common practice, or even being used to fuel braking resistance. The machine’s control system and the control systems of the motors are continuously supplied with control voltage from the energy buffer, and the residual energy is used to heat up the first heater band. The entire braking energy is thus converted into useful energy, with the additional benefit of the machine being “immunized” against brief power fluctuations (up to about 100 ms) and temporary power failures, thus improving its availability rate. The heater band supplied with power in this way is a standard-type heater band.

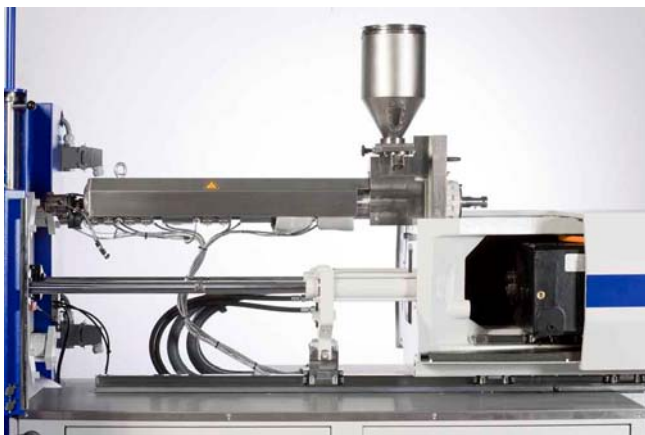


Fig. 1: Heating of heater band through KERS system, and quick barrel changing unit

User-friendliness through integrated servo-hydraulics

Another innovative feature of the *EcoPower* is the inclusion of servo-hydraulic drives for the ejector and for nozzle contact pressure generation as standard. The hydraulic block is completely integrated in the machine frame and driven by a servo motor. This modern drive concept offers a number of advantages. Firstly, it is of particular benefit to customers operating molds with hydraulic core pulls, since the machine’s hydraulic aggregate can also be used to move these. Secondly, this concept also features a low noise level, a high standard of precision and a further reduction in energy consumption for the *EcoPower*, as this aggregate can be completely switched off following nozzle pressure build-up and the movements of the ejector and core-pulling devices. 80 % of all customer applications require hydraulic core pulling

devices, therefore the *EcoPower* offers a genuine additional benefit for such applications.



Fig. 2: Servo-hydraulics for peripheral movements

Fully integrated peripheral equipment

The *EcoPower* offers the facility of having WITTMANN tempering devices of the TEMPRO plus C series directly integrated in the machine frame. This considerably reduces space requirements and consequently occupancy costs.

The machines are operated via the UNILOG B6 control system, which offers a uniform control and operation concept for easy handling of injection molding machines including all integrated peripheral equipment. The control system running under Windows XP® makes the integration of the machines in PDA systems and above all Internet-based service support very easy. Web service, remote service and the Battenfeld K4 production data acquisition system from Wille are also available.



Fig 3: Integration of the TEMPRO plus C tempering device in the machine frame

The innovative “firsts” of the *MacroPower*

The *MacroPower* shows real greatness by its short length and can be truly described as an outstanding example of large machine construction in terms of dimensioning. Its short length and compact footprint has been achieved by the new two-platen technology, combined with a compact injection unit and the integration of robots in the machine frame.

“Quicklock” – high speed and easy mold change through innovative locking system

Another novelty of the *MacroPower* is its “Quicklock” locking system, which favors extremely short locking times and downtimes for mold change. The short locking times combined with fast movements are the decisive factors in the *MacroPower*’s high speed. At the same time, the locking system makes it possible to keep the tie-bars extremely short and thus provide virtually tie-bar-less access to the machine for mold change.

The locking system consists of two half-shells, which are integrated in the moving platen. Locking is effected via a folding mechanism that offers the advantage of moving only one half of the half-shell, while the other half is kept in a fixed position over a pivotal point. In this way, the mass that needs to be moved is halved. This ensures faster movements with simultaneous lower energy consumption. The movement sequences are perfectly synchronized.



Fig. 4: Locking system “Quicklock”

User-friendliness through comfortable mold insertion

The machine’s user-friendly mold insertion facility is unique in the large machine sector. The locking system integrated in the moving platen permits an extremely short tie-bar system. More than 50% of the maximum mold height is left free for tie-bar-less lateral access without tie-bar pulling. In combination with an extended opening stroke of the rear safety gate as standard, this enables mold insertion from

the rear. In this way, not only is mold insertion sped up and simplified, but low ceilings in production halls no longer present any problems either. As an option, the machine is also available with a compact tie-bar pulling device integrated in the top pressure pad. This creates free space up to maximum mold height.

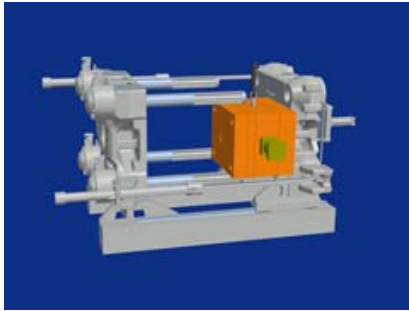


Fig. 5: Mold change through tie-bar-less lateral access

The innovative “firsts” in the *MicroPower*

Even the smallest machine of the *PowerSeries*, the *MicroPower*, can point to a special novelty: the new, two-step screw-and-plunger injection unit with a shot volume ranging from 0.05 to 3 cm³ injects thermally homogeneous melt, with the result of top-quality parts with extremely stable production and short cycle times. It enables the injection of micro and high-precision parts ranging from several grams down to micro parts weighing no more than just a few milligrams.

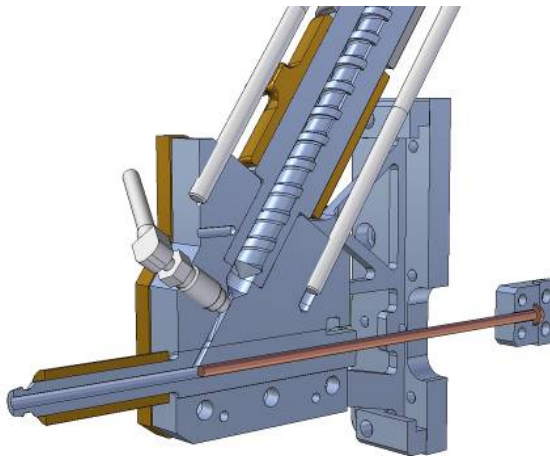


Fig. 6: The *MicroPower*'s optimized two-step injection system



Fig. 7: Injection unit of the *MicroPower*

This aggregate is able to process all materials suitable for injection according to the first-in, first-out principle with a multi-purpose screw geometry laid out for feeding all standard granulates in common use. A 14-mm screw takes care of plasticizing the plastic material without stress and with the least possible degradation. The back

pressure for metering is controlled with ultimate precision by means of a servo motor. The exact quantity of thermally homogeneous plastic melt is fed to the injection plunger. The latter accelerates the plastic material in the aggregate to a maximum injection speed of 750 mm/s. Thanks to the smaller diameter of the plunger compared to a screw injection unit, the injection speed can be set and controlled substantially more precisely. Only when the plastic material reaches the cold cavity is the appropriate injection pressure built up immediately in the gate system. Consequently, this concept favors an extremely small melt cushion and minimal flow paths. Moreover, the formation of a cold material plug is prevented right from the start, as there is no plastic material present between the cold cavity and the injection aggregate. Thus the *MicroPower* possesses the only injection system worldwide that injects thermally homogeneous melt – which ensures uniquely high quality standards in micro parts.

This also makes it possible to reduce sprue to a twentieth compared to conventional technology and thus to achieve a drastic cut in cycle times. In practical terms, this means saving up to 90% of plastic materials, 50% of cycle times, and 60 % of the energy consumption as well, compared to standard injection molding machines.

BFMOLD™ process innovation – high-gloss surfaces without joint lines or sink marks, short cycle times

At this year's "K", WITTMANN BATTENFELD can also score with an innovative highlight in process technology. The variothermic BFMOLD™ process was developed by K.I.M.W, Lüdenscheid Plastics Institute, and the WITTMANN group subsequently acquired the exclusive, worldwide utilization and marketing rights for this process.

In BFMOLD™ technology, unlike molds with conventional tempering channels, the entire space below the cavity is used for heating and cooling. Here, the ball filling also enables a highly efficient through-flow in the tempering channel, which can at the same time be positioned extremely close to the cavity surface.

This new, variothermic process is operated in combination with tempering devices from the WITTMANN TEMPRO plus C160/2 VARIO series specially developed for this process technology. For more accurate molding of structures and prevention of sink marks and joint lines, a high temperature is generated at the cavity wall via the first circuit of the TEMPRO plus VARIO unit. For the time-optimized injection process, this keeps the cavity at a temperature above the glass transition temperature of the plastic material.

For the cooling phase, the unit switches over to the second tempering circuit, which operates at a considerably lower temperature. This enables extremely even and, above all, quick cooling of the mold area especially for flat parts. Therefore this technology is of interest not only in order to reduce cycle times, but also to prevent warpage and to reduce tension. Moreover, sink marks and joint lines can be prevented with the help of BFMOLD™ technology, above all on components with a visible surface or parts with a high-gloss surface.

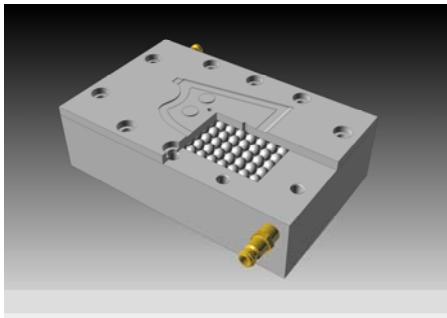


Fig. 8: Ball filling
(Photo: courtesy of K.I.M.W.)



Fig. 9: Part with high-gloss surface

WITTMANN BATTENFELD

WITTMANN BATTENFELD, based in Kottlingbrunn, Austria is a leading manufacturer of injection molding machines for the plastics industry. With 21 sales and service companies of its own and additional agencies in more than 40 countries, WITTMANN BATTENFELD provides optimal support to its customers in all matters concerning injection molding technology. Its innovative strength, highest precision and strong focus on maximum customer benefit make WITTMANN BATTENFELD a valuable partner for its customers.

WITTMANN BATTENFELD at K 2010: hall 16, booth D22

WITTMANN ROBOT SYSTEME at K 2010: hall 10, booth A04



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