

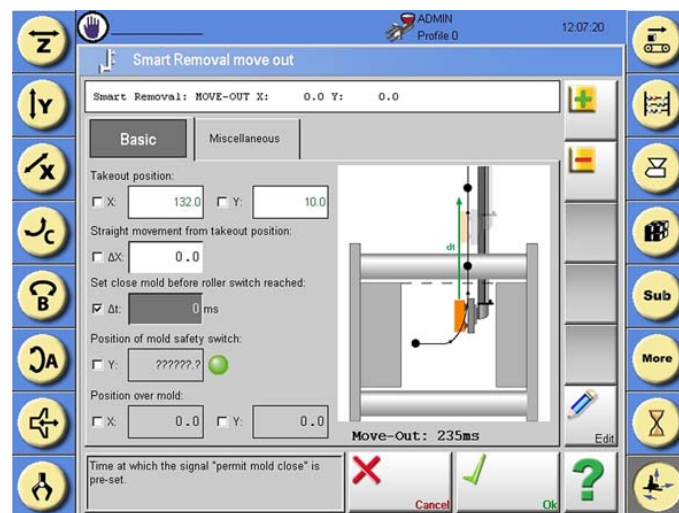
## NEWS RELEASE

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### WITTMANN robot functions for maximum efficiency

One criterion to measure the efficiency of an injection molding machine is the number of molded parts produced per time unit. Consequently, the stoppages of the processing machine must be reduced as much as possible to achieve maximum efficiency. Robots influence the efficiency by the time taken for parts removal, the mold open time. WITTMANN robots equipped with **R8** and **R9** control systems have some special functions as standard, which substantially shorten the removal time.



**Display of SmartRemoval OUT on the screen of the R8 robot control system.**



**Visualization of the corresponding removal process.**

It is clear that a robot should reduce as much as possible the time it takes to remove injection-molded parts. However, programming such time-optimized processes is not always so simple. Especially users with little or no experience can quickly reach their limits when it comes to laying down the most efficient sequence of program steps. WITTMANN is aware of this problem and offers effective tools to solve it.

The WITTMANN robot control systems **R8** and **R9** provide the command **SmartRemoval IN** as a prerequisite for every highly efficient parts removal process. This command is based on a process of machine signal analysis patented by WITTMANN. It calculates the relationship between the time taken by the injection molding machine to open the mold and the traveling and acceleration characteristics of the robot. This functions automatically in the background without operator intervention.

**SmartRemoval IN** thus offers the advantage that the robot already starts to accelerate its vertical axis before the moving mold half has reached its end position. In this way, several valuable tenths of a second can be saved, since the acceleration phase takes relatively long compared to the distance to be covered. By having the accelerated movement carried out parallel to mold opening, any negative effect resulting from the robot's inertia can be eliminated. In combination with an early command release (e.g. the release for ejector movement), total time savings of about 30% can be achieved.

To facilitate the operation of **SmartRemoval**, the command sequence is visualized to the operator by a simple chart. **SmartRemoval IN** demonstrates its strength by automatic selection of the optimal travel sequence adapted to each individual application in producing a great variety of parts.

**Mold opening synchronization** is available as standard for every WITTMANN robot which is fully integrated in the machine's control system. In the case of molded parts with deep cavities (such as waste bins or flower pots with filling volumes of more than 20 l), this function can provide a major savings potential. For here it is already possible to pull out the parts while the mold opening movement is still in progress. In this way, the connection between the gripper and the part can be established earlier. This enables savings in terms of the injection molding machine's opening stroke as well as in mold open time.

Regardless of the type of travel attributes selected, programming the demolding sequence with **SmartRemoval OUT** is always possible. **SmartRemoval OUT** functions in combination with an early "close mold" command release and is based on effective response to signals. This includes the choice of optimal timing when the signal to release the "close mold" command is given. **SmartRemoval OUT** offers the possibility to transmit this command to the injection molding machine before the mold protection sensor is reached. This eliminates delays in signal transmission. The injection molding machine starts the closing process precisely on passing the mold protection sensor. This avoids the delays which result from the traditional timing of the release only after the sensor has been passed. To counteract the risk of losing the molded part in this highly optimized demolding process, **SmartRemoval OUT** is closely linked to the **iVac** system included as standard.

**iVac** from WITTMANN offers the advantage that the molded part can already be gripped with a fraction of the necessary vacuum pressure, and thus the removal sequence can be started. In the course of the retraction movement, the vacuum pressure rises to the maximum level. Once the set reference pressure for the molded part has been reached, the signal for the release of the “close mold” command is given. This release can already take place several tenths of a second before the part leaves the mold area. In this way, signal delays at the interface between the robot and the injection molding machine are compensated, and the mold open time is minimized.

The combination of **SmartRemoval** with **iVac** optimizes the mold open time regardless of the type of robot interface (Integration, E67, E12). Compared to applications without such a functionality, the time savings potential lies at about 30%. For all WITTMANN servo robots equipped with the control system versions **R8** and **R9**, the functions described above are available as standard.

“We believe that the removal time is the most important criterion for measuring the performance of a robot system. Consequently we already created the strong duo of **SmartRemoval** and **iVac** several years ago in order to act with maximum efficiency at this point”, says Martin Stammhammer, International Sales Manager Robots and Automation Systems of the WITTMANN Group.

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The WITTMANN Group is a worldwide leader in the manufacturing of injection molding machines, robots and peripheral equipment for the plastics industry. Headquartered in Vienna/Austria, the WITTMANN Group consists of two main divisions, WITTMANN BATTENFELD and WITTMANN, which operate 8 production facilities in 5 countries, including 33 direct subsidiary offices located in all major plastics markets around the world.

WITTMANN BATTENFELD focuses on the independent market growth in the manufacturing of state-of-the-art injection molding machines and process technology, providing a modern and comprehensive range of machinery in a modular design that meets the actual and future requirements of the plastic injection molding market. WITTMANN's product range includes robots and automation systems, material handling systems, dryers, gravimetric and volumetric blenders, granulators, mold temperature controllers and chillers. With this comprehensive range of peripheral equipment, WITTMANN can provide plastics processors with solutions that cover all production requirements, ranging from autonomous work cells to integrated plant-wide systems.

The syndication of the WITTMANN Group has led to connectivity between all product lines, providing the advantage plastics processors have been looking for in terms of a seamless integration of injection molding machines, automation and auxiliary equipment – all occurring at a progressive rate.

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