

**NEWS RELEASE**

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**Process reliability and energy efficiency  
with SpeedDrive**

At the Fakuma 2017, the WITTMANN **TEMPRO plus D** temperature controller with **SpeedDrive** option was presented to the public for the first time, and very successfully. The first orders for this model with a speed-controlled pump were already received before the end of the fair.



**TEMPRO plus D160 temperature controller,  
now new with SpeedDrive**

The energy input must be analyzed at every conceivable point in order to achieve an optimized economic performance in terms of power consumption. Basically, mold tempering in injection molding machines plays a vital part in this context. This ultimately led to the development of temperature controllers, which are now able to utilize the waste heat of a cogeneration unit for mold heating, and which can reduce the power consumption to the minimum required for the process by using a pump with variable rotational speed.

The utilization of waste heat became possible through the **ECO-Heating** option brought to market in 2014, with which the **TEMPRO plus D90** temperature controller from WITTMANN was equipped. With this option, the built-in electric heating element is activated only when the waste heat of the cogeneration unit is not sufficient to maintain the process. The latest **SpeedDrive** option has now made it possible to set

one of four process parameters (rotational speed, pump pressure, differential temperature or flow) as an additional control variable to achieve energy-optimized operation without jeopardizing the process.

### **Ways to save energy**

An inspection of the entire temperature control circuit has revealed several different areas where energy can be saved. Better insulation of the molds and tubes already reduces the power consumption to some extent. This effect is more pronounced with higher processing temperatures (> 100 °C) than with lower temperatures. As for the pump, energy savings can be realized by using more efficient motors. In 2016, for instance, the efficiency class IE2 motors then used by all manufacturers were still the state of the art. The degree of efficiency of such a 1.1 kW motor was between 79 and 79.6%. In response to new environmental regulations, the motor manufacturers changed from IE2 to the efficiency rating of IE3 at the beginning of 2017. 1.1-kW motors of this type reach a degree of efficiency ranging from 82 to 82.7%. This development was followed by the pump manufacturers, which now also use class IE3 motors.

### **TEMPRO temperature controller with *SpeedDrive* option**

The ***SpeedDrive*** option consists of a pump equipped with a permanent-magnet synchronous motor. In combination with a matching frequency converter, this configuration reaches an efficiency rating of more than 86%, which corresponds to efficiency class IE4. In this way, the power consumption of the motor can be reduced by up to 30% when other operational parameters of the pump (working pressure and flow) remain unchanged, which leads to significant energy savings and ultimately to a reduction in costs. Additional savings can be achieved by lowering the working pressure of the pump through reducing the motor speed, which cuts the pump's power input and consequently the power consumption even further. Here it should be noted, however, that this action also reduces the flow quantity and consequently increases the differential temperature between the mold inlet and outlet.

### **Differential temperature as a process parameter**

The differential temperature is already influenced by the mold design (number, diameter, length and geometry of the tempering channels) and the type of connection to the mold (diameter and length of the tubes between the temperature controller and the mold, as well as serial or parallel flow through the tempering channels). The differential temperature is a very important indicator concerning the thermal balance of a mold and the homogeneity of temperature distribution inside the cavities, and it should be pre-defined for every mold, depending on the product to be manufactured. Once the differential temperature has been calculated for a given application, it can be set as a fixed parameter for the **TEMPRO** with ***SpeedDrive*** and monitored by defining tolerance margins. In the event of any change in the injection molding machine's process parameters which have an effect on the cycle time, the temperature controller responds to such a change by increasing or reducing the motor speed of the pump to maintain the set differential temperature.

## Perfect tempering solution

Regardless of which parameters have been set: a **TEMPRO plus D** equipped with **SpeedDrive** gives processors a decisive head start in terms of process accuracy over appliances with conventional pumps, since the variable speed makes it possible to adjust the operating point of the pump to the process.

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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.

### Contact:

WITTMANN Robot Systeme GmbH  
Am Tower 2  
90475 Nuremberg  
GERMANY  
Tel.: +49 9128 7099-0  
[info.de@wittmann-group.com](mailto:info.de@wittmann-group.com)  
[www.wittmann-group.com](http://www.wittmann-group.com)