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Wake Up, It’s -Time!
WITTMANN innovations (3/2007)
Quarterly magazine of WITTMANN Kunststoffgeräte GmbH. Appears to meet the informational demands of staff and customers. Editorial office, contact:
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Dear Reader,

The largest industrial fair in the plastics processing industry – the K show – is held every three years and is taking place this year October 23rd-30th, in Düsseldorf, Germany. At the exhibition centre close, anything and everything related to the plastics processing industry will be shown. And, you can be sure to see countless innovations presented there.

Thus, every three years we have to meet the challenge to present visitors from all over the world, the latest WITTMANN developments. It is not only a challenge but also a pleasure to have the opportunity to do so every three years. Themed “Innovative Technologies for Highest Productivity”, WITTMANN will present more than 80 unique pieces of equipment from over 460 m² of exhibition space.

The variety of products will include numerous innovations, shown for the very first time. The R8 generation of robot control, which is optimized for control of the axes leading to the shortest removal times, will set new standards. Furthermore, we are presenting the first series of temperature control units within the plastics industry with a color LCD display. Visually impressive but primarily to show graphically recognizable parameters. WITTMANN is also introducing the world’s first wheel dryer with a renewable desiccant as well as a new generation of granulators. As you can imagine, our research and development departments have been active since the last show with a lot of drive to support our spirit of innovation. Once again we will maintain our reputation as the most innovative manufacturer in the industry. This is a permanent challenge of which we are convinced we will fulfill our obligation once again.

In this issue of “innovations”, we are glad to present to you some of our latest developments in detail. Besides the above mentioned products this also includes the topic of clean-room suitability. An entirely operational clean-room cell equipped with a particle indicator, a W7x5 series SCARA robot and a FEEDMAX material loader, will provide spectacular proof of the suitability.

In addition to the many products highlighted this issue of “innovations” features insight into our branches and teams in Brazil and Spain.

We hope to see you at K 2007 and welcome you to our booth A04 in Hall 10. We wish you a great reading experience with this issue of “innovations”.

With best regards,

Michael Wittmann
With the introduction of the new MAS Series granulators, WITTMANN offers highly effective conventional screened granulators for in-line recycling. The new concept ensures even more compactness and adaptability to all applications – because of the various models available.

Michael Petzmann

The MAS Series (MAS1 to MAS4) has been developed specifically for the recycling of soft to medium hard plastics. The very compact design allows MAS granulators to be used directly beside the injection molding machine. The opening of the hopper is ideally suited to allow automated loading and can be easily adjusted to suit the individual application.

The hoppers are manufactured with a special sandwich design to provide optimal sound insulation for low-noise operation. The hopper and regrind evacuation bin, which are in contact with the regrind materials, are made from high-grade steel.

The modular design allows the hopper to be quickly adjusted to fit any application in just a few seconds without the use of tools. The special design and additional fly back curtains ensure that parts, sprues or materials are not thrown out of the hopper.

The grinding of parts

The reduced number of rotor revolutions and the optimally designed cutting geometry produce a high quality regrind with very little dust. The design of the feed hopper and cutting chamber make it possible for the rotor to easily "grab" the parts. All MAS models are driven directly via a gear motor and equipped with double bearing rotors. The substantial double bearing ensures the granulator is shockproof for increased durability. The bearings are protected by seals and a rotor shaft that have been specially designed for this purpose.

Thus, it is not possible for small plastic particles to contaminate the bearings. A window located beside the rotor bearing and an arrow allow the operator to check the direction of rotation.

Two kinds of rotors

The MAS series is equipped with two different types of rotors: the MAS1 and MAS3 are equipped with staggered rotors and the MAS2 and MAS4 with open rotors. The staggered rotor is suitable for small to large sprues, small to medium size injection molded parts and blow molding scrap. The staggered rotor knives offer the optimal solution to "pull" parts into the cutting chamber. The cutting force is distributed across several rotor knives which provide a simple scissor cut for added energy savings, along with low-noise operation and high cutting performance. The high-alloyed, hardened rotating knives can be sharpened several times depending on the amount of wear. The cutting geometry of the knives allows them to be changed without any additional adjustment. The two fixed knives can be turned four times before they have to be replaced.

The open rotor is recommended for soft materials used in injection molding. Optimal circulation of air within the cutting chamber prevents thermal degradation of the molecular structure or melting of the material. The slanted open rotor moving knives combined with two inclined fixed knives provides a double scissor cut that once again improves the quality of the regrind and minimizes dust. The rotating and fixed knives can be sharpened several times depending on the amount of wear.

A pre-adjustment gauge is included with each granulator to allow easy, quick adjustment of the knives for optimal cutting clearance. The patented tensing clamps of the rotor knives ensure – without elaborate cleaning of the clamping surface – that the cutting clearance is correctly set. Replaceable inserts on the side walls of the cutting chamber prevent wear of the walls that could arise from rotating parts and sprues.
For applications using fiberglass reinforced plastics, the cutting chamber and the screen can be treated with a special surface treatment to reduce wear. The thermal output that is created when using high-temperature plastics is regulated by using water-cooled cutting chambers to prevent melting the plastic material in the chamber.

The granulators already offer low noise levels but can be equipped with an optional sound insulating cabinet. Other options include different types of bins for manual and automatic evacuation.

As well, various screens are available, especially for preventing parts that are too long (i.e. when processing sprues) from passing through. For emptying the evacuation bin, a conveying unit from WITTMANN could of course be used. WITTMANN offers the optimum solution for every application including conveying units based on the Venturi principle for small quantities to larger units with blower systems and filters for higher quantities.

Handling and security
All four models are equipped with manually operated clamping systems to allow for quick access to the cutting chamber and screen without requiring any additional tools, thus reducing downtime to a minimum. The easy handling of the units and the straightforward cleaning process simplifies operation (i.e. when changing material or color often). The ability to use both sides of using the screen results in an even longer lifetime. All that is needed are a few turns of the hand to change the position of the screen 180° to the other side. All MAS Series granulators meet the safety specifications of the EN12012 standard.

Different configurations
WITTMANN offers many options for the MAS models. Level indicators can be placed directly in the cutting chamber to provide a visual/audible alarm when the evacuation bin is full and simplify removal for emptying or cleaning.

For applications with thick walled plastic parts it is possible to install flywheels to further increase the motor capacity.

As well, various screens are available, especially for preventing parts that are too long (i.e. when processing sprues) from passing through. For emptying the evacuation bin, a conveying unit from WITTMANN could of course be used. WITTMANN offers the optimum solution for every application including conveying units based on the Venturi principle for small quantities to larger units with blower systems and filters for higher quantities.

The MAS series of granulators: MAS1 to MAS4 (from left to right).

The new WITTMANN Headquarter in Mexico

WITTMANN has opened a new 8,000 sq. ft. facility located in Querétaro, one of Mexico’s boom areas. Located 10 minutes away from their previous offices and only 15 minutes from international airport, the facility is ideally situated for the plastics industry and will allow for further expansion and continued growth in Mexico, Central America and the Andean region.

WITTMANN has been active in Mexico since 1998 and was one of the first auxiliary equipment companies there. It has since experienced continued sales growth.

The new facility includes design, engineering and technical support for complete systems integration along with spare parts, equipment inventory and comprehensive training courses. In addition, the new facility has a fully equipped demonstration and training room for local customer support.

The WITTMANN branch in Mexico has some other locations in Mexico City, Monterrey, Reynosa, Chihuahua and Guadalajara in order to provide extensive coverage to this very important market.

Carlos Chavez, the President, commented “Over the past three years we have experienced double-digit growth in this market. We attribute this growth to existing customers and continued migration of international companies to Mexico along with our ability to provide complete systems integration and local support for the entire product offering. WITTMANN Mexico has 30 employees and the new offices will allow us to add another 15. We have just completed an agreement with Equiplast as our new representative in Columbia. Furthermore we are expanding our operations in Guatemala to provide support to the Central America market.

As part of our expansion we have named Miguel Tamayo as the Sales Manager for Mexico. Miguel has been working with us since 2003. He is looking forward to serving his growing list of local customers.”

Located in Querétaro, Mexico, WITTMANN’s new 8,000 sq. ft. facility offers a complete range of services including a fully equipped demonstration and training room for customers.

Michael Petzmann is Export Sales Manager of the Recycling and Granulators Department at WITTMANN Kunststoffgeräte GmbH in Vienna.

The WITTMANN innovations – 3/2007
The New TEMPRO plus C Series

The new TEMPRO plus C series of temperature controllers from WITTMANN are available in a 90°C (195°F) open system version, as well as a pressurized version for temperatures up to 140°C (285°F) and 160°C (320°F) with a newly developed design without a reservoir for the heat exchanger.

Peter Weber

The colored LCD display is new on all models of the TEMPRO plus C line. It enables very easy operation of the temperature controller and provides the user with ample information. There is visual representation to indicate when the temperature is within the allowed range, i.e. a green mold on the screen. If the temperature is too hot, this mold turns red, if it is too cold or, if the unit is heating up to set point and therefore out of tolerance range, it turns blue. In both cases, a yellow warning triangle reminds the user that the temperature is out of the set range.

This TEMPRO plus C can display up to three values simultaneously. Besides the actual temperature the user can choose two other values such as set point, flow rate, pressure – either to or from the mold, or the operating hours that the controller has been in use.

Pressure measuring

Pressure gauges in the process line to the mold and gauges, measuring the system pressure electronically, are a standard features for all TEMPRO plus C units. From the difference between these two pressures, the controller calculates the pump pressure which can also be displayed. A flow measurement is available as an option and works as follows: Two ultrasonic transmitters are located in a brass pipe a defined distance from each other. They are sending and receiving one signal in the direction of the flow and one in the opposite direction – against the flow. Using the time difference between these two signals we can calculate the speed and because the diameter of the piping remains always same, we can also calculate the flow rate of the medium that flows through (in respect of the sound curve that varies according to temperature changes 0–160°C). The flow meter has an accuracy of 5% of the volume measured.

Reducing the medium volume

In the TEMPRO plus C units with a pressurized system the cooling medium volume has been reduced by more than 50% and thus, may shorten the preheating time as well as the cool down period. Since there is no float that controls the level of cooling media in the system, the pressure gauges must guarantee that there is always sufficient water in the pipes, mold lines and heat exchanger. The controller opens and closes the fill valve (together with a booster pump) as well as the ventilation valve, in order to maintain a system pressure of 1 bar over the steam pressure curve. This prevents the pump from being destroyed by cavitation.
Important new features

The reduction of the medium inside the TEMPRO plus C units results in a faster reaction of the controller and the PID control. For example, in a volume of 3 litres the temperature changes quicker than in a volume of 6.5 litres. With the newly developed control card and software we can achieve an accuracy of ± 0.2°C (0.4°F). The reaction time of the controller was reduced and, via solid state relays, we can switch the heating on/off more frequently, also the cooling periods have been reduced. In addition, the solid state relays have a much longer operating life than contactors.

A very important improvement was made to the mold purge function: the new TEMPRO plus C 140 and 160 units can evacuate molds of any size without overfilling the tank inside the system because the incoming water is released by a solenoid valve into the cooling system of the factory. No limit in purge volume anymore.

An additional pump can also be installed on the TEMPRO plus 90 unit to pump out the tank water first before it starts evacuating the mold and thus, could further increase the purge volume.

The “Mold Evacuation” mode can be selected from the Fn menu and can also be assigned to one of the F1 to F4 buttons, allowing it to be selected with a single button. This is suitable in cases where the customer needs to access this feature (function) more often. Other modes that can be selected by the F1 to F4 buttons are the Cool Down function or control to a second set point.

External sensors

In the same way as with previous WITTMANN models of temperature controllers, external sensors can be connected to the new TEMPRO plus C (PT 100 socket is standard, FeCo is optional) and serial interfaces are also available.

Language and time set can be configured in a special menu.

The ability is given to switch on the TEMPRO plus C unit with a timer and the counter of operating hours can give information as to how many hours and at what temperatures the unit was operating.
Good Performance With Comfort – The New R8 Robot Control

At this year's K show WITTMANN is presenting R8, the latest generation of robot control. This unit offers highly improved performance as well as numerous additional operating functions. And it is offering easy accessibility, of course.

**Michael Wittmann**

The most evident element of the new control is the ergonomically designed TeachBox, equipped with an edge guard like previous models, to assure reliability even under rough conditions. The mechanics for the connection of the R8 TeachBox and detachable emergency stop block have changed along with the locking device. A spring on the underside of the TeachBox secures the connection with the emergency stop block and can now be disconnected with a single hand movement. Long guiding ridges on both devices ensure guaranteed docking of the connectors between the emergency stop block and the TeachBox. The two deadman switches (with three positions each) on the inside of the two TeachBox holders allow both right and left handed people alike a comfortable operation in the working area of the robot.

**Programming and software**

For different programming demands and different operator's knowledge the WITTMANN R8 Control is offering three operator modes of programming that basically reflect the level of the operator's familiarity with the control and are adjustable for optimum performance based on the complexity of the application. The three modes are 1) Text Editor for the creation of arbitrary removal or operational sequences, 2) Graphic Editor for the simplest creation of standardized sequences, and 3) Tool Change Mode for the adaptation of only a few selected commands. These modes are the same as the successful R7.2 control.

Completely new is the internal program for calculating the individual paths of the single numeric axes and determining the time optimized moves between the various points in space. Additionally, special optimization has been achieved for perpendicular moves for instance, like in each sequence of part removal when the vertical axis is descending and the demolding axis is moving into the mold area.

Also, changes by the operator to the speed of the axes during the automatic mode are instantly included into the calculation. For the operator this results in shorter moves leading to a time savings of up to 25% depending on the utilization of the axes and the path the robot takes.

In terms of reducing downtime of the injection molding machine, the R8 control introduces a new removal command called SmartRemoval that allows maximum speed when moving in and out of the molding area. As every mechanical system is influenced by the mass of inertia which is most noticeable at the initial stage of movement, the Smart Removal function uses the time the mold needs in order to open to accelerate the vertical robot axis to the optimal velocity and then into the open mold area at the highest possible initial speed. This means that the most inefficient part of the movement profile for an axis, namely the initial acceleration with the least distance per time unit, now occurs simultaneously with the mold opening. The adaptive algorithm that is executed in the background is constantly analyzing the chronological behavior of the mold opening and generating the optimal velocity profile for precise just-in-time movement into the mold for part removal.

**Numerous profitable functions**

The command is executed in such a way that in case of emergency an immediate stop of the robot is possible before reaching the mold. SmartRemoval is best suited for short removal cycles and permits time savings of up to 300 ms, depending on the particular circumstances and the mold opening moves. As many applications do not require the full cycle time to complete the remaining robot sequence once outside the molding area, the R8 control provides the operator with the EcoMode function. In EcoMode, the robot control calculates the total time outside the molding area and automatically establishes the minimum velocity for all moves in order to reach the mold just before it opens and to be ready to remove the next part. The EcoMode results in the most gentle operating conditions for the robot mechanics.

Furthermore, the R8 control allows the operator to set up user-defined safety sections with the TeachBox. Any critical regions can be protected from faulty operation, for example the area covered by the injection molding machine and its safety guarding. The robot simply is not allowed to move into these areas. Up to twelve areas can be defined.
and displayed on the R8 control screen from different angles. They can also be called up as arbitrarily zoomed and are very easy to edit. The positions of all six numeric axes of the robot are considered when checking the safety sections. This allows complete control of the moves and does not at all depend on the actual active operational mode of the robot.

By default, the R8 control offers control of the analog vacuum data of up to four circuits. As an option, it is possible to extend the control to include the vacuum data for 16 circuits total.

The respective data of the analog vacuum control for each circuit is transferred separately to the sequence program with the desired tolerances and is automatically considered when needed. This also improves the security of the process because it makes it possible to prevent closing of the mold on parts that have not been removed and improves the operator’s comfort because it is not necessary for the operator to intervene after having changed the mold.

**Highest flexibility and user-friendliness**

Unlimited program sequences can be saved on the memory stick provided via the USB port or via the internal compact flash card.

The R8 control provides numerous improvements that further simplify the robot operation.

According to the known principle of the previous generations, the new WITT-MANN R8 robot control allows as well the creation of an almost unlimited number of program sequences and of program sub-sequences that are very simple to understand and also very easily accessible by means of the most intuitive user interface. Thus, all suitable applications for the appropriate user can be covered.

From the well-known and typical pick & place working process to the most complex peripheral devices with a lot of additional numeric and pneumatic equipment – the R8 generation is meeting any expectations.

Michael Wittmann is General Manager of WITT-MANN Kunststoffgeräte GmbH in Vienna.

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**Fit for the Clean Room: FEEDMAX Loaders**

**Plastic parts have become more complex, the cycle times have become shorter, the requirements regarding cleanliness have increased.**

The plastics production process has become much more demanding over the years in many ways. The parts have become more complex, the cycle times shorter and the requirements regarding cleanliness have increased. Except for the classic applications of clean rooms, such as the medical and pharmaceutical industries, more and more technical products are now being subject to rigorous production conditions requiring controlled clean room environments. Not in every case is it possible to use laminar flow boxes directly over the molding area and often, the entire processing machine is then situated in a clean room. Therefore, conveying of resin to these machines takes on special requirements.

At the K show WITT-MANN will show an operational clean room cell featuring a FEEDMAX A series central loader and a W7x5H side entry robot with SCARA kinematics.

The aim of the demonstration is to show the suitability of the loader and robot for clean room applications by measuring the discharge of particles using a counter with 6 particle channels.

The clean room cell is equipped with 2 flow modules ensuring a maximum air stream volume of 1,200 m³/hr. This allows a 66-fold air change rate, corresponding to a Class 1,000 clean room according to U.S. Federal Standard 209 e, and to a Class 6 clean room according to ISO 14644-1. Previous research has shown that WITT-MANN robots – equipped with an adjustment kit – are perfectly suited for use in clean rooms up to Class 1,000 (resp. 6). The latest research has shown the suitability of WITT-MANN material loaders for clean room applications. Unlike many competitive products, the FEEDMAX A series loaders are hermetically constructed.

This is achieved using a pneumatic material discharge shut-off valve which eliminates the need for compensation vents in the loader base, irrespective of the particular pressure ratio when the loader is opened or how it is secured to the unit where the material is being received. Even the vacuum valve doesn’t need any compensation bores (that would allow for the discharge of particles) to function fully. The installation at the K show will readily show the suitability of WITT-MANN loaders to operate under Class 1,000 (resp. 6) clean room conditions. •
The New Robot Functions

Two unique functions available with the new WITTMANN R8 generation robot control will provide WITTMANN’s customers the competitive advantage. – A description of the new functions follows in detail.

Wilfried Hagn

Not only WITTMANN as a manufacturer of robots and automation solutions, but above all our customers realize they must assert themselves in everyday competition for their markets and constantly improve in all areas of production. Hence, an understandable demand of our customers is the reduction of takeout time or, a reduction of the “unproductive time” between the end of the cooling process in the mold (respectively in the IMM) and the start of the next injection cycle. The most common method of cycle time reduction in the past was to equip the takeout axes of the robots with stronger and stronger motors/drives or more massive power transmissions and base constructions, to achieve very high speed (m/s) or acceleration (m/s²) values. The reality is that these “fast robots” can never reach their (theoretical) maximum speeds because of the relatively short strokes and must begin deceleration after only a very short acceleration phase in order to reach their programmed position precisely.

To compensate for this physical fact, at least partially, the acceleration values must be set extremely high and this again requires a very massive and therefore expensive construction to remain precise and avoid vibrations. In addition, there are many more details in the production cell beside the robot speed/acceleration which have an influence on the unproductive time, for example, ejector speed, signal transfers, mold opening speed, etc.

SmartRemoval

The SmartRemoval function, which will be standard in the new upcoming R8 control, monitors all the time relevant processes in parallel no matter whether they are a result of the robot or the machine. In collaboration with the machine controller the software then optimizes the takeout path for the robot. Or, simply, just performs a “SmartRemoval”. The following highlights what the WITTMANN software engineers have realized in order to solve this problem intelligently without forgetting the simplicity in handling.

The customer only needs to program the start position above the mold as well as the takeout position for the hand off of the finished part, the rest will be automatically performed by the controller. The only important condition for this function is the right adjustment of the S5-switch (mold safety area) on the Y-arm of the robot which might also be adapted in case of a mold change (EOAT change) with a large difference in dimensions. Once the robot is started in automatic mode several internal processes optimize the takeout time while constantly supervising and adapting automatically. “Le Mans start” is a concept from the car racing sport (“24 hours of Le Mans”) and signifies a start defined by a signal, however, not from a standstill but during slow movement. Quite similar is this part of SmartRemoval. The robot monitors itself beginning with the very first cycles in automatic mode in order to calculate when the mold will open the next time, allowing the Y-axis to begin moving from the waiting position just before the mold has fully opened. When it receives the signal from the machine that the mold is fully open, the Y-axis is already in position to enter the molding area. Precious time can be saved here. But on the other hand, if the signal is not received at the calculated time the robot will stop at the last possible point above the mold to avoid any damage.

Very similar is the synchronization with the ejectors. On the basis of the preceding measurements the robot can start the ejector forward signal at a set time before reaching the takeout position, allowing the finished parts to be in the correct position without waiting for the ejectors. We are calling this process “Move In”. The “Move Out” process is based on a similar principle. The best possible time to set the “mold close” signal is automatically calculated and the signal is sent to the machine before the robot has completely left the molding area. The purpose of this was to eliminate the delay caused by the transfer of the electric signals. In summary, savings of up to 0.5 s per cycle can only be achieved with the new SmartRemoval function, corresponding to a time savings of about 10% on a total cycle time of 5 s.

EcoMode

At many customers’ plants the robots are optimized by the in-house programmers for fast takeout. However, after the cycle is finished the robots have to wait for the next mold opening before beginning motion. The EcoMode function can be activated with the R8 control to minimize the robot speeds and hence, reduce wear on the mechanics. Once activated, the waiting period above the mold is calculated by the robot control and then the speed (override) outside the mold area is reduced automatically for all axes. The waiting period of the robot above the mold for the next cycle is reduced to a minimum.
The Truth About Blender Economics

**Gravimetric blending has been a big win for processors. The ability to account for every gram of additive has allowed to keep very close tabs on the use of expensive ingredients, as well as use up regrind material in a controlled manner.**

Lorne Berggren

With overall costs of plastics production rising in step with the rise in oil and gas prices, over which the processor has very little control, it is contingent on these manufacturers to watch costs where they do have some control.

This brings us back to the cost of color and other additives, which historically have been relatively expensive, and sometimes used haphazardly. It is well understood that adding too much color will not make a defective part. Indeed, in the past, many processors added excessive color or additive to avoid producing defective/off-spec parts, or scrap.

**Two ways of gravimetric blending**

Along came the gravimetric blender, and it was not long before processors were able to get a much better handle on color or additive use, by metering a budgeted percentage of each in each batch of blended material. For example: adding color at the rate of 1% of the weight of virgin material used, (or of the total batch if desired) allows the operator to keep consistent control over their production, rather than manually or volumetrically adding these expensive materials.

Most blenders on the market control the addition of each component by opening a slide gate for a certain period of time, then weighing how much material dropped. It is rare that the weight of the material dropped achieves the required percentage, so the controls of the blender, in an effort to do better next time, adjusts slightly the time of drop to compensate for the under/over weight condition of the previous drop. This would be great if the blender hoppers were filled to exactly the same level before metering started, and pellet size was absolutely consistent. However, this is never the case, and no matter how much the time is adjusted, the material “dropped” will rarely ever achieve the set weight. So, repeatedly missing the target, and adjusting the drop time, goes on, batch after batch. This method used by most blender manufacturers is known as “hunting.” The “hunter” blender manufacturers say “don’t worry, it really does not matter, because over the whole shift or time period, it all averages out”.

While there is some truth to this, it omits one very important fact. To make up for the batches that have less color than required, the blender must add more color the next time, and in keeping with the fact that too much color does not hurt the quality of the part, invariably the adjustment adds a little more than necessary. So for example, if you set the color component for 1% of virgin, the blender will, on average, add a little more than 1%, to say 1.2%. This extra color basically guarantees that the parts will all be good, and everybody should be happy. But wait. The processor has prepared his budget based on 1% color. So every time this percentage is exceeded, it costs him money. This small excess surely is not excessive, some believe, but if you look at the economics, the excess is really not small, and it does steal profit from the job.

Some blender manufacturers quietly admit that accuracy is not really important to injection molders, and close is good enough, and these blender manufacturers get away with inaccuracy by just being close. They believe that processors are tired of hearing from salesmen, and reading brochures, that all blenders are extremely accurate, so they get away with inaccuracy by just being close. The accuracy capability of the load cells that all blender manufacturers use is indeed remarkable, but it is how the controls on the blender use this capability that is in question. “Hunting” type blenders are by design, not consistent, and accuracy between batches is neither expected nor possible.

Can processors live with this little secret? Yes of course they can. The parts come out just fine, the machine operators are not criticized for producing scrap, and the processor is saving money by using a blender vs. no blender. But what if there was a blender available that did not “hunt” and weighed each component accurately in each batch? Would the processor save more money on color and additives? The answer is absolutely YES.

There are such blenders on the market that use weight, and not time, as the default. A true “weigh” blender accurately weighs each component in each batch, where previous or subsequent batches have no relationship with the current batch. Each batch and each ingredient is on its own. Continuous monitoring of the weigh scale during the dispensing of each material ensures they meet their weight set points each and every time.

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**WITTMANN innovations – 3/2007**
The New DRYMAX ED80: Always Supplying the Right Quantity of Air

The DRYMAX ED80 dryer adjusts the quantity of air to the material throughput to constantly supplying air up to 80 m³/h (50 cfm). If more process air is needed, the dryer automatically switches on a second blower.

Andreas Vierling

It is an everyday experience for operators: The material throughput of the processing machinery may vary as a result from machine downtime and different production needs. The dry air dryer then has to adjust the dry air quantity according to the particular needs and the actual material throughput. In any case the resin has to be dried efficiently and energy-saving.

SmartFlow

Since 2001, the SmartFlow air distribution function has been used exclusively on the SILMAX series drying hoppers. The SmartFlow function is linked with the Material Protection function to provide energy savings and prevent resin degradation.

Now, all WITTMANN battery dryers are equipped with SmartFlow and its success has had influence on the units of other suppliers. The concept of SmartFlow is now being extended to small compact units with only one hopper. Thus, the Material Protection Function is available for these units and the smaller units are able to benefit from the advantages of varying the quantity of air.

Two independent process blowers are constantly producing process air. If there is any need for additional dried air it is then delivered at the same time. The quantity of process air is controlled by monitoring the temperature of the return air. If the return air temperature decreases because of an increase in material quantity, the need for process air also increases and the second blower is activated. Varying the air quantity can also reduce the time needed for pre-drying. If the demand for process air for example should be about 40 m³/h (25 cfm), then based on the process air peak value of 80 m³/h (50 cfm), the time needed for complete heating-up of the drying hoppers is reduced in half. Each desiccant cartridge uses its own blower for the energy saving counter flow regeneration.

This eliminates the need for valve drives and increases the operational reliability of the unit by reducing the number of components. The correct air duct – based on the direction of the blower rotation – is automatically selected by check valves.

SmartReg

The DRYMAX ED80 dryer uses SmartReg to provide the optimum solution for highly efficient drying. The SmartReg function adjusts the duration of regeneration based on the actual water absorption of the desiccant cartridge. Regeneration time is minimized and the discharge air temperature remains low. This not only saves energy but the low discharge air temperature prevents overheating of the blower during regeneration.

The DRYMAX ED80 uses only ambient air for the regeneration without increasing the humidity of the desiccant cartridge. An additional amount of water could easily lead to overcharging the dryer, especially in regions with high humidity in the air. However, the DRYMAX desiccant cartridge remains unstressed from the regeneration air portion thus, proving its stability in a humid environment.

SmartReg
WITTMANN IML Stack Mold Systems

The IML system includes a WITTMANN high-performance stack mold featuring two fully balanced mold halves with a Männer valve gated hot runner system. The first mold half produces 2 round containers measuring 95 mm x 40 mm and weighing 6 grams, while the second mold half produces 2 lids, with a 95 mm diameter and 4 grams of weight. The wall thickness is 0.5 mm for the containers and 0.55 mm for the lids. Each cavity has individual square centering for optimum accuracy and to maintain consistent wall thickness over many years of operation. The cooling manifold is designed to ensure consistent part geometry between cavities. The ejection uses a combination of a mechanical stripper ring simultaneously with a blow-off system for a fast, smooth ejection. The material used for this high-speed application is PP Copolymer MFI 100 supplied by Borealis and the labels supplied by the printer Verstraete n.v.

Removal and palletizing

A modified WITTMANN W727H side-entry robot, with the model designation W727SM, is used for the removal and palletizing of the finished parts as well as the insertion of the labels into the respective mold cavities. The W727SM robot package features two independent side-entry arms, a center arm for the hand-over of the finished parts, and two stacking arms for the placement of the molded parts on integrated conveyor belts.

The two side-entry arms are used to pick-up the labels for the lids and cups from pneumatically operated label separation units, which are located on opposite sides of the complete work cell providing a label buffer of approximately 4 hours production. The 2 sets of labels are presented in a vertical position to the respective insertion end-of-arm tooling of the two side-entry arms of the W727SM robot. During the motion into the molding area the labels are statically charged equally by the use of electrical pads integrated into the part cores of the end-of-arm tooling. After the simultaneous insertion of the labels and pick-up of the finished parts, the two side-entry arms move independently to a hand over position. At this position the simultaneous pick up of the next set of labels as well as the hand over of the finished parts to a double-sided center arm occurs. In the next step the center arm brings the molded parts to the two stacking arms, which can then palletize them according to a programmable pattern on the integrated conveyor belts.

Control of the IML system is performed by the extremely powerful R7 control system from WITTMANN, which is also used on the standard robot series to provide an easy-to-use interface and optimization of the operation. The user benefits from the ability of the R7 control to multitask not only the peripheral downstream equipment but also additional robot mechanics without additional communication interfaces. Thus, the sequence of the two side-entry arms, the center arm, the two placing arms, the label stations, miscellaneous end-of-arm tooling functions and the indexing conveyors, can all be programmed separately and run in parallel and synchronized in automatic mode. This vastly simplifies the programming of the various steps and guarantees the highest operating safety and readability.

Economical packages

Because of the use of standard, proven components of the WITTMANN robot line, a reliable and error-free operation is guaranteed. For instance, the entire motor and servo module package is derived from the Ultra High Speed (UHS) series of WITTMANN robots. By using standardized components of the WITTMANN robot series, the complete package can be offered at an economical price.

Wilfried Hagn is Sales Manager for Robots/Automation at WITTMANN Kunststoffgeräte GmbH in Vienna, Michael Wittmann is General Manager of WITTMANN Kunststoffgeräte GmbH in Vienna.
The Brazilian market as a whole is showing great potential. Sales figures for computers and investment in new high tech facilities are increasing substantially. The plastics processing sector is developing along with a continuously increasing demand for resin and processors are facing considerable competition. Increased professionalism in the sector has also led to a better awareness of the quality of auxiliary equipment used in the production process and more modern technologies are being demanded. The combination of high-quality work and sophisticated service, all at competitive prices, is convincing more and more Brazilian processors of the advantages of WITTMANN auxiliary equipment.

WITTMANN Brazil also believes in the philosophy of offering the complete product range, from the smallest to the largest capacity requirements. Today, countless companies in Brazil are benefiting by using WITTMANN products including manufacturers of household appliances, packaging, computer hardware and especially, the automotive industry. Producing automotive components requires the highest attention to technical quality and often involves much more complex parts production. Thus, it is not surprising that approximately 60% of the robots in Brazil are used for the production of automotive components.

Efficiency

The WITTMANN team is committed to continuously showing its know-how in the Brazilian market. Their main office of 700 m², located in Campinas in the federal state of São Paulo, provides the national industry with robots, blending systems, water flow regulators, temperature controllers, dryers and granulators. The specialized development of entire systems and individual solutions is supported by their extensive service level which also provides periodic inspections and regular machine care. An in-house training center makes it possible for small groups to take courses and attend training for WITTMANN equipment. Both the technical and service teams work together to combine technical quality with excellent service from the initial discussion to the fine-tuning of the hardware, achieving the best overall results and improvements to the production process. Naturally, this includes rigorous adherence to the delivery date, service with the highest flexibility and the stocking of relevant spare parts.

Customized solutions

WITTMANN Brazil is proving itself as the ideal local partner for customized solutions because of its many years of experience. Their solutions meet the requirements of this challenging market which demands technical innovation and a very good product with moderate pricing.
Because of the strong demand for WITTMANN equipment and services, WITTMANN moved in 2002 to a new building in La Pobla de Claramunt (province of Barcelona) offering them the best location for further development. The entire line of equipment is on permanent exhibition in the technically state-of-the-art auditoriums and conference rooms. The facility also houses the department for the testing equipment and is well stocked with components and spare parts.

Today, Mr. Jordi Farres, the manager of WITTMANN Spain, is guiding a team of 22 employees and a network of 30 salesmen located at eight branches in the Spanish and Portuguese region. Each branch has technical service and storage for equipment and spare parts. This allows WITTMANN to meet the customer’s expectations across the entire region.

The development of the market

The Spanish market is showing considerable potential in the field of plastics processing although recently the migration of some large projects has impacted it. Spanish processors today are counting on much more specialized products and are eager to improve the efficiency of their processes. As a result, the demand for robots and automation solutions has grown considerably. Not only is there an increasing demand for robots but also for the entire range of auxiliary equipment because plastics processors are being challenged by much higher requirements overall. This has resulted in WITTMANN Spain increasing the capacity of their engineering department and taking on many more automation projects that require them to harmonize the production process, for example, the palletizing and final inspection and testing of finished parts in accordance with the customer’s requirements.

The objective is to achieve maximum efficiency for the production process. Because of specialization in the Spanish market for technically demanding parts of the highest quality, the WITTMANN standard design plays an important role. This includes the entire WITTMANN product line for complete solutions. Of course, employing the most recent innovations are essential to achieving these goals.

Innovations

In Spain a lot of innovation is also being placed in the development of IML solutions (In-Mold Labeling) for the packaging industry. The service includes both the design and supply of the complete mold. WITTMANN Spain offers “one stop shopping” even for IML.

With its dedicated team, WITTMANN Spain is part of one of the biggest suppliers of auxiliary equipment for processors worldwide and is well-prepared for the future. This team offers services that immediately establish unquestionable confidence of processors. •