

Wittmann innovations

Volume 18 - 1/2024





The cover photo shows a non-return valve (consisting of stop ring, check ring, and screw tip) and three plasticizing screws.

WITTMANN innovations (Volume 18 - 1/2024)

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Editorial

Dear Reader,

At the end of every year in Austria there is an election for the word and non-word of the year. Words that have struck the country's residents positively or negatively during the year can be sent to a jury. One candidate for the bad word of the year 2023 was surprisingly "open to technology".

To understand: The word "technology-open" is currently used in German-speaking countries primarily in connection with the climate-neutral car of the future. This happens whenever the battery technology specified by politicians is questioned and the development of other, also climate-neutral drive types is discussed. Green politics has taken technical decision-making away from car manufacturers. Critical questioning or



rebellion against the decision in favor of battery technology is not desired. There can be no talk of "technology openness".

Fortunately, we at WITTMANN are not in such a predicament as the European automobile manufacturers.

Being open to technology and not setting any limits to free thinking is not tolerated by us, but is expressly desired. Because that is what you, our customers, benefit from the most.

We recently demonstrated our openness to technology at the Fakuma in Friedrichshafen last October 2023.

With nine new products, this year's innovation offensive achieved a new trade fair record in our company's history. And not just quantitatively. All new developments contribute equally to the current

trend topics of energy efficiency, circular economy, digitalization and sustainability. You can continue to rely on the WITTMANN Group's high level of innovation in the future. Because investments in technologies that save energy and raw materials pay off even in challenging times. Now is definitely the right time to optimize production processes.

The 2023 financial year was characterized by a cooling global economy. We expect activity to pick up in many regions in the new year, although not immediately in the first quarter. In any case, we enter 2024 with optimism.

At this point I would like to thank all of our employees for their outstanding performance. We thank you, our customers and business partners, for your trust and loyalty. Despite all adversities, we can look back on a successful year 2023.

Very cordially yours,
Michael Wittmann

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Energy consumption cut by 30% with the EcoPower Xpress

A new packaging concept in thin-wall technology has brought about the energy revolution in injection molding for Heinrich Axmann GmbH & Co. KG in Cologne, Germany. For this project, the company invested for the first time in an all-electric machine. Compared to hybrid machine models, the cut in energy consumption is more than 30%. The injection molding partner WITTMANN delivered the EcoPower Xpress as a fully integrated, all-inclusive solution equipped with a Sonic high-speed robot.

Susanne Zinckgraf



The newly developed packaging makes it very easy to present ready-to-eat meals on a plate in an appetizing way.

Almost everyone has experienced this: when opening the package, the ready-made meal looks delicious. The meat and side dishes are attractively arranged. But now comes the tricky part: transferring the food onto a plate. Many consumers use a spoon, others even turn the bowl upside down to get the contents out, which definitely spoils their looks and thus all too often the appetite as well.

Heiner Axmann, CEO of Heinrich Axmann GmbH & Co. KG, has come up with a brilliant idea to solve this dilemma. He developed a plastic bowl which can be opened with the help of a tear-open mechanism along the bottom of the package. The edge of the package then folds back upwards, the meal slides out smoothly onto the plate and looks just as appetizing as it did when freshly prepared and filled into the packaging bowl. "Our customer had institutions such as hospitals, retirement homes or child day care centers in view, which operate without kitchens of their own", Heiner Axmann reports during our visit to the corporate headquarters in the southern Cologne suburb of Rodenkirchen. "Everyone should be able to enjoy their meals. What is more, the new concept offers highest possible standards of hygiene. The nurse dishing out the meals never comes into contact with the food herself."

Creative from experience

Established in 1932 and family-owned ever since, Heinrich Axmann specializes in developing and manufacturing packaging solutions made of plastic. Bowls and small pots for both liquid and solid food items, such as gourmet salads or coffee creamers, constitute a major part of its production volume.

Again and again, new creative solutions emerge from its extensive wealth of experience. So, the impulse for developing the new ready-to-eat food bowl goes back to the lid for a delicatessen package already designed in 1979. The original drawing board design is still kept in a cabinet at Heiner Axmann's office today.

With this latest new development, the company has landed a real coup. "Our customer is still at the start-up stage, but already has the prospect of a major order from the USA. The first bowls in the new packaging design will be used at a New York hospital." In this case, the customer is a major catering company, for which a large quantity of bowls has already been produced to FDA standard in Cologne.

Delivery of the mold for series production is on the way. The injection molding cell for this purpose is already there. Especially for this new product, Heiner Axmann

has invested in an EcoPower Xpress 300 all-electric injection molding machine with 300 tons clamping force and a Sonic high-speed robot. The injection molding partner WITTMANN has supplied the production cell as a fully integrated, complete solution.

Highest injection performance for strongly varying wall thicknesses

With this package for instant food, Axmann also opens up a new chapter in injection molding technology. The EcoPower Xpress is the first all-electric injection molding machine in its machine pool.

"For a long time, it has not been possible to manufacture thin-walled packaging articles by high-speed injection molding on an all-electric injection molding machine", Heiner Axmann explains. "The EcoPower Xpress, however, is fully up to the challenge." The demands on the injection performance are particularly stringent.

For tearing open the package, the bowl comes with two flaps on one of its long sides – two, because the designers thought of left-handers as well when developing the part. Starting from these flaps, two fine, extremely thin-walled lines, about 5 millimeters apart, run along the bottom of the package. Predetermined breaking points form a kind of tear strip.



The control system integration of both the injection molding machine and the robot facilitates operation of the production cell.



The Sonic high-speed robot has been specially developed for high-speed applications in the packaging industry.

The wall thickness at these breaking points is no more than 0.05 millimeters. This is only a tenth of the wall thickness at the bottom and at the edge. Nevertheless, the bowl, consisting of a PP copolymer, must remain stable and airtight while being filled with hot food. 120°C is the required tolerance. Injection takes place centrally at the bottom of the package. "Our greatest challenge is that during injection the melt needs to pass twice through these extremely thin areas in order to fill the cavity completely to the very edges", Andreas Brüggemann, the company's Production Manager, explains. "For this purpose, we need a particularly high injection speed with extremely short filling times."

"The EcoPower Xpress is predestined for this type of application", says Andreas Hollweg, Sales Manager for WITTMANN

injection molding technology in Germany. "The injection units of this machine series are laid out for the highly dynamic injection speeds required in this case." A further advantage with a very positive effect especially in the production of food packaging is the encapsulated toggle lever provided as standard, which ensures an extremely clean production process.

Good parts around the clock

Currently, the new high-speed production cell is fully utilized with a mold for producing crystal clear bowls. With their facet design, these plastic bowls are indistinguishable from glass bowls at first sight. They can be found on the refrigerated shelves of supermarkets filled with barbecue salads of the Merl brand. Heinrich Axmann has been producing these packages for many

years for FMR Frische Manufaktur Rheinland GmbH & Co. KG. "These salad bowls make very similar demands on thin-wall injection molding to those of the newly developed ready-to-eat food bowls", Brüggemann points out to us. "On this product we are testing how far we can go with the new EcoPower Xpress."

The crystal clear bowls also come with only 0.5 mm wall thickness and a sophisticated design. They are produced in a two-cavity mold with 5.7 seconds cycle time. The filling time for the total shot weight of 44 grams is less than 0.1 second.

At the time of our visit to Rodenkirchen, the fourth week of continuous operation has just begun. "The machine runs around the clock with maximum performance and consistently high parts quality", Brüggemann reports. "Ultimately, the machine's repro- >>

ducibility is the decisive argument in favor of its use for injection molding food packaging products."

Reliable robot movements

The target set for the new tear-open bowls is a cycle time below 5 seconds. The total shot weight will be 70 grams, and here, too, the maximum filling time is expected to be 0.1 second. The main factors determining the cycle time are cooling time and parts removal. This is why the EcoPower Xpress has been equipped with the Sonic robot. WITTMANN presented this high-speed robot model specially developed for high-speed applications in the packaging industry for the first time at the K 2019. "Its strength is its great reliability in extremely fast movements", Jörg Schröer, Regional Sales Manager of WITTMANN, explains. "This is precisely what shortens the removal time."

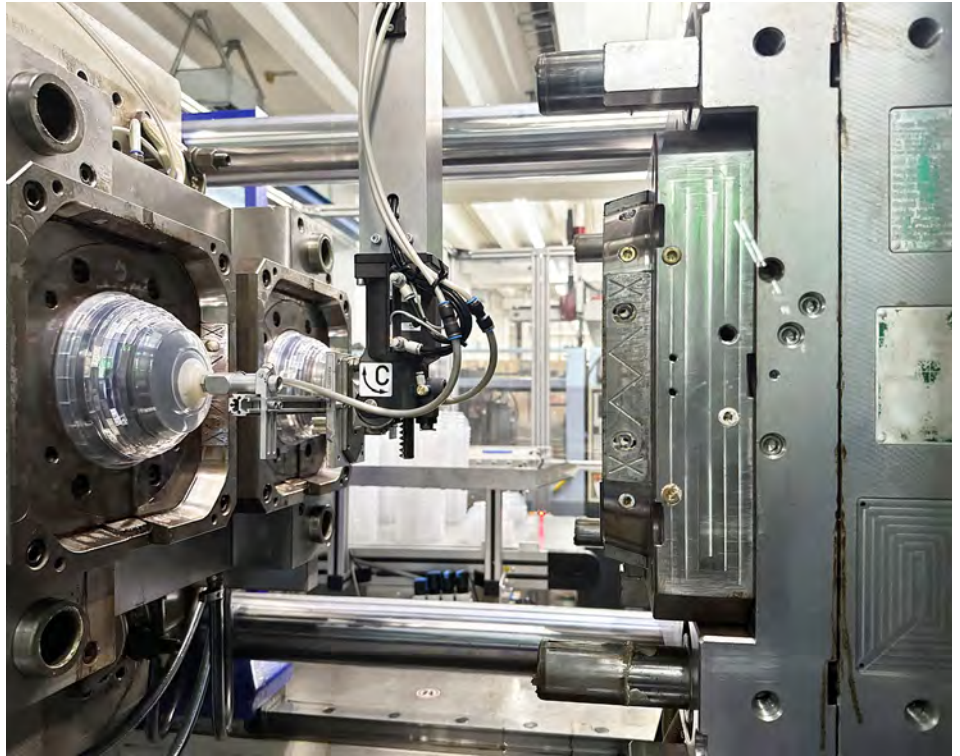
WITTMANN robots have enjoyed the highest level of trust at Axmann for decades. The company's machinery includes more than 30 injection molding machines of different brands. All of these are equipped with linear robots from WITTMANN.

With the new complete production cell for making the thin-walled bowls, the company has purchased for the first time a fully integrated solution from a single source. "For us, this had the great benefit of getting the entire equipment delivered in full compliance with the CE standard", Heiner Axmann reports. "This has saved us a lot of time and money." A further advantage is the easier operation of the production cell, where the machine and the robot can be operated jointly from the central monitor of the machine's control system.

DC technology in view

"Thin, thinner, thinnest", is Andreas Brüggemann's answer to the question about current manufacturing trends. The requirements for thin-walled products are becoming more and more stringent, in particular for reasons of material efficiency.

The sustainability targets were also the factor that tipped the balance in favor of acquiring an injection molding machine with an all-electric drive. "Energy efficiency is now the most important criterion whenever we invest in new machines and technologies", says Heiner Axmann. "Especially for machines making packaging products, for which we require extremely fast movements and high injection speeds, energy efficiency is a decisive factor in reaching the required lowest possible costs per unit. The modern machines display the consumption figures,



The high level of stability shortens the parts removal time even with extremely fast robot movements.



Jointly exploiting efficiency potentials: Andreas Brüggemann (Production Manager at Heinrich Axmann), Jörg Schröer (Regional Sales Manager at WITTMANN), Heiner Axmann (CEO of Heinrich Axmann) and Andreas Hollweg (Sales Manager Injection Molding Technology of WITTMANN in Germany) on the production floor in Cologne. (from the left)

so that we can easily compare them. Compared to a hybrid machine, the EcoPower Xpress consumes over 30 percent less electricity when used with the same mold."

As a member of BVFE, the German Federal Association for the Promotion of Energy Efficiency, it is a matter of honor for Heiner Axmann to work meticulously on keeping energy consumption as low as possible in all corporate departments. Many actions to that effect have already been taken. "Over the last few years, we have reduced our total energy consumption by 1.5 million kWh", says Axmann. Most recently, the company's photovoltaic system to generate its own electricity has been extended. Axmann is

already discussing with WITTMANN how the DC technology with a battery storage system presented at the Fakuma 2023 could be used at their own company.

"WITTMANN is a family-owned company, like us, and that makes the difference", says Heiner Axmann. "We very much like working with family-owned companies, since they take a different approach. They are more dedicated in counseling as well as in service. They seek genuine partnerships rather than mere profit maximization. They want us to be satisfied customers."

Susanne Zinckgraf is Head of Strategic Marketing of the WITTMANN Group.

SARTECH's recycling solutions

The Slovak injection molder SARTECH uses screenless granulators from WITTMANN to produce high-quality regrind. The regrind obtained in this way is primarily sold to a recycling company and is also reused by the company in the context of inline recycling.

Juraj Majerský – Denis Metral

Located in Stará Turá, SARTECH SLOVAKIA, s.r.o. is the Slovak branch of the French SARTECH Group, and as such part of the Ardivest SA holding with main shareholder Yves Carcenac.

SARTECH SLOVAKIA was established in 2004. Christophe Ite-Prat has been the Plant Manager of the Stará Turá location since 2008 and had held various positions prior as an injection molding specialist – Aries, RC Jura, Bacou-Daloz, Mecaplast, and Faiveley Plasturgie.

The company produces technical parts for the automotive industry. The applications include overmolding of inserted parts on vertical machines and two-component injection molding. The Stará Turá location currently operates ten injection molding machines with clamping forces of 100 to 300 tons. Over 20 employees work here.

For Christophe Ite-Prat, the manageable size of the company is a distinct advantage since this factor contributes to higher quality standards – as does the high motivation of the technical staff in production.

Inline recycling – pros and cons

SARTECH produces technical parts made of PA and PP with a glass fiber content of up to 50 percent. Due to the special quality that the parts must have, the injection molding process usually does not involve the use of regrind, which could negatively affect the crucial properties of the finished parts. The central WITTMANN Junior Double 6 screenless granulator, equipped with two rotors, is used to reduce the volume of waste – from sprues and scrap parts.

The production of the resulting regrind is strictly monitored in order to achieve the best quality for every color and every type of material. The ground material is finally filled into big bags and sold to a recycling company.



Central screenless granulator Junior Double 6 (top) and beside-the-press screenless granulator S-Max 2 in the SARTECH injection molding production area.

However, some parts allow the use of regrind. In these cases, S-Max 2 screenless granulators from WITTMANN are used for inline recycling.

The regrind is mixed with the virgin material according to a defined system in order to prevent parts that consist of different types of material layers. Such parts, which would have changed technical properties,

could be created without conscious mixing due to the different densities of virgin material and regrind.

A fundamental problem lies in the use of granulated material consisting of grains of different sizes. During plastification or the phase of screw rotation, inhomogeneously dimensioned granules would not be melted evenly, which would in turn change the properties of a part made from it –, and even the entire manufacturing process would lose stability.

SARTECH defines its method of regrind utilization in line with customers' recommendations to maintain a high quality of parts. In addition, the WITTMANN screenless granulators, which are used to grind material filled with glass fiber, play a crucial role here:

- WITTMANN granulators produce homogeneous, clean regrind without longs.
- Thanks to their high torque, screenless granulators are ideal for brittle materials and thick-walled parts.
- The low speed of rotation of 27 rpm @ 50 Hz reduces wear in the cutting chamber significantly and ensures low noise development.

Not least, Christophe Ite-Prat highly appreciates WITTMANN because of the local service in Slovakia and the good understanding with the WITTMANN teams.

Juraj Majerský is Managing Director of WITTMANN BATTENFELD SK spol. s r.o. in Trenčín, Slovakia.

Denis Metral is International Sales Manager for granulators at WITTMANN BATTENFELD France in La Buisse.

The Tempro basic success story

WITTMANN water flow regulators in the injection molding sector have long been the global industry standard. In terms of temperature controllers, the Tempro basic series laid the foundations for success over 40 years ago.

Gerald Schodl

The company that Dr. Werner Wittmann founded in 1976 began producing temperature controllers shortly afterwards. This move would subsequently revolutionize injection molding production around the world.

The first Tempro basic temperature control devices had upper temperature limits of 90°C and 140°C: the Tempro basic 90 and the Tempro basic 140.

The success of this first series of devices became an example for all temperature controllers subsequently developed and built at WITTMANN. Today, WITTMANN Technology's diverse portfolio of temperature controllers masters all conceivable applications in injection molding production – and not only there.

Successful standard solutions

The development work on the Tempro basic temperature controllers was started with the aim of bringing devices with complete standard equipment onto the market – in terms of pump and heating capacity – with which as many users as possible could be reached – worldwide. This strategy was reflected in the sales figures right from the start and immediately proved to be highly successful. The large number of devices available to injection molders helped to establish WITTMANN as one of the leading brands for temperature controllers. "Do you also have a WITTMANN in your injection molding shop?" became a common saying, referring to the likely presence of a WITTMANN temperature controller in an injection molding production facility. After the company had already achieved a high level of recognition for its water flow regulators, WITTMANN had now also become a well-known name in the field of temperature control technology.

Over the years, the demand for this basic series of temperature control devices has not diminished: The WITTMANN Tempro basic still impresses with its quality and reliability – regardless of the version in which it is used, although it is not simply for the

mass injection molding of simple parts. On the contrary, it is also used for a wide variety of more complex applications in the automotive and electronics industries. And time and again, Tempro basic devices have acted as a door opener for the high-end temperature controllers of the Tempro plus D series as well as other peripherals and automation solutions from WITTMANN.

To date, no fewer than 70,000 devices of the two device types Tempro basic 90 and Tempro basic 140 have been sold. An impressive success story.

From basic to basic C

The increasingly demanding requirements in the injection molding sector have led to numerous interesting options for Tempro basic temperature controllers today. In order to express this fact in the naming, the Tempro basic 90 became the Tempro basic C90, and the Tempro basic 140 became the Tempro basic C140. Users continued to react positively because, despite the various possible equipment variants, the Tempro basic remained a classic Tempro basic – with all its advantages: quality, functionality, reliability, user-friendliness and longevity, all with minimal maintenance effort. But the user can also transform the device into a solution tailored to a specific application by selecting the appropriate options.

This makes it possible to equip the basic device with exactly the right heating, cooling and pump performance. In addition, if necessary, the user can choose between analog and digital interfaces for data transmission. Thanks to WITTMANN's innovative strength and technical expertise, special requests can also be implemented accordingly.

Vortex flow measurement

High professional expertise leads to new solutions: A new type of flow measurement is now available for the Tempro basic C90 and C140 temperature controllers. This is the so-called vortex flow measurement which is

based on the principle of the Kármán vortex street and is used to determine the volume flow rates of liquids.

Tempro basic temperature controllers have a measuring range between 2 and 40 l/min. The measurement of the flow rate has an accuracy of ± 0.6 l.

The particular advantage of this type of flow measurement is that there is no maintenance required.

WITTMANN has once again taken a further step in the development of its high-quality solutions in the field of temperature control technology.

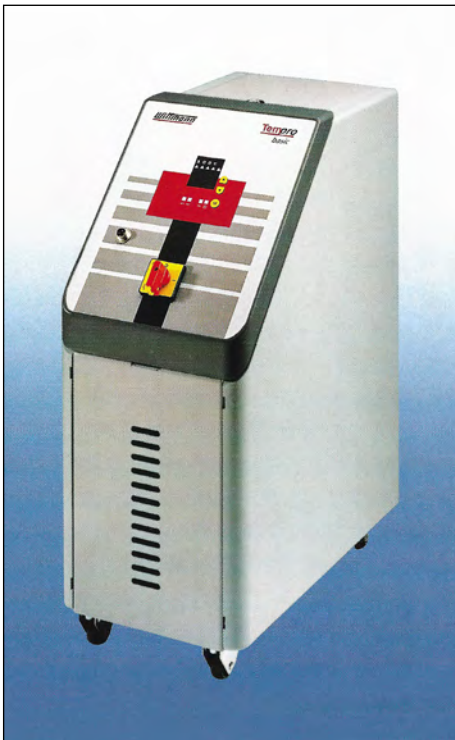
Gerald Schodl is Sales Manager for Temperature Control Technology at WITTMANN Technology GmbH in Vienna, Austria.



Tempro basic 90, 1995.



The vortex flow measurement is based on the principle of the Kármán vortex street, in which opposing vortices form behind a body surrounded by a flow. Vortex flow measurement takes advantage of this fact. A disruptive body is placed in a pipeline through which the vortex street is formed. The special structure of the vortex street creates pressure differences that are recorded by a sensor. This sensor determines the pressure pulses over a certain period of time, from which the volume flow can be derived.



Tempro basic 140, 1999



Tempro basic 140, 2005.



Tempro basic C90, current version.

WITTMANN Group automation helps odelo in Bulgaria bring the light

Stanislav Dundekov

The odelo Group develops and produces innovative lighting systems with sophisticated designs and is one of the leading suppliers to the premium automotive industry: BMW, Daimler, Audi, VW, Renault, Fiat and Ford. odelo Bulgaria EOOD, part of the globally active group of companies, opened its 23,000 m² Bulgarian production plant in Kuklen near Plovdiv at the end of 2019.

Parts that are used for top-of-the-range Mercedes-Benz lighting are made here. WITTMANN robots have also been used here since odelo Bulgaria production began.

The odelo Bulgaria management is exceptionally pleased with the quality and performance of the WITTMANN robots – which are also used at other odelo Group locations, such as in Slovenia and Türkiye.

The devices met all expectations, with particular emphasis on ease of use and maintenance.

First example: W843 pro robots

In 2021, two W843 pro robots were installed at odelo, and were equipped with special gripper solutions. The execution of the test runs and the training were carried out by WITTMANN BATTENFELD Bulgaria EOOD, the Bulgarian subsidiary of the WITTMANN Group. During each removal process, the two W843 pro robots remove time-delayed two 2-component parts from two injection molding machines positioned next to each other. The robots then placed the parts on the same conveyor belt in a sequential order.

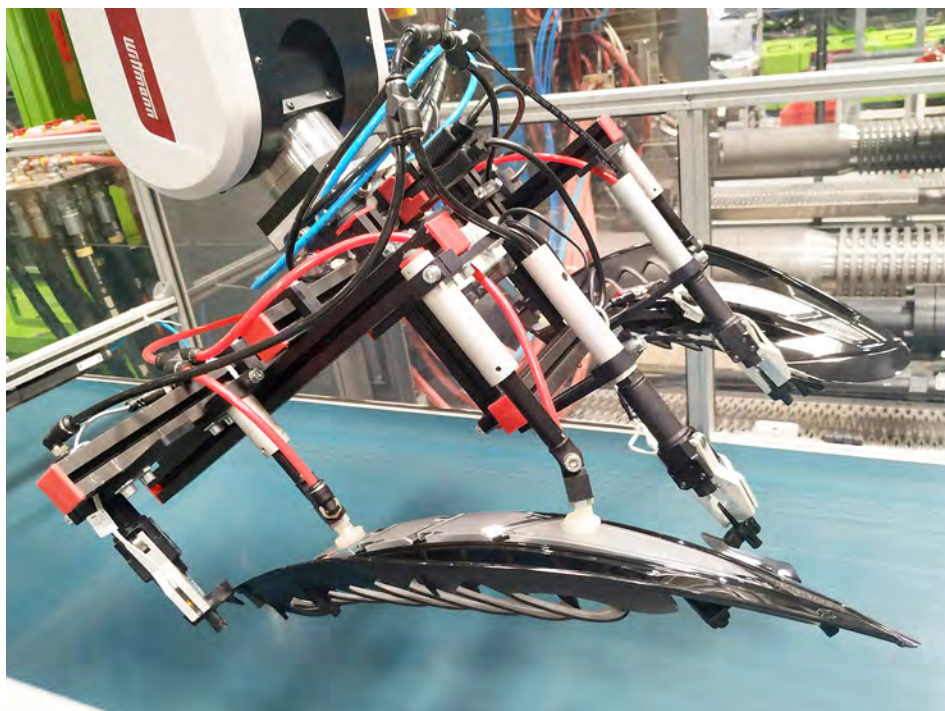
Second example: W863 pro robot

A W863 pro robot removes two plastic parts from an injection molding machine at the same time, transports them to a temporary storage place where they are fitted into a fixture. Here the parts are subjected to a thorough inspection. After completing the quality inspection, the robot removes the two parts from the fixture and places them together on a conveyor belt.

W843 pro: Application with two robots



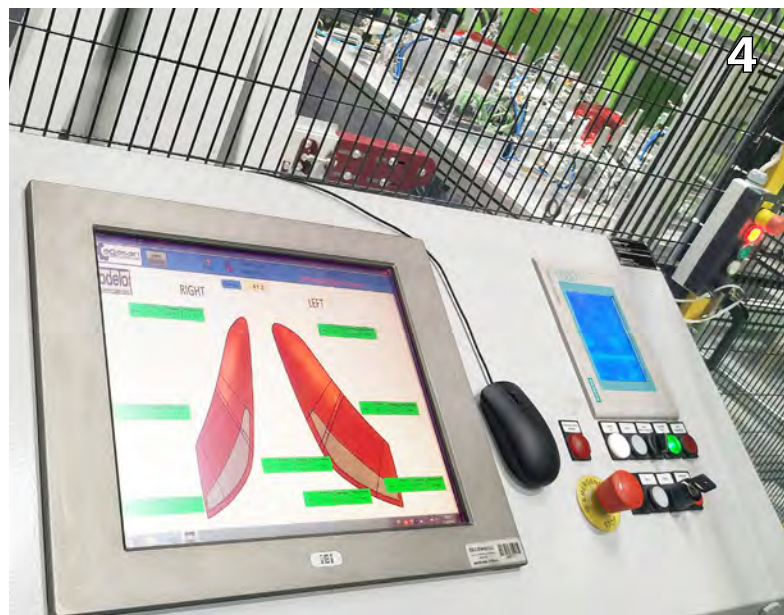
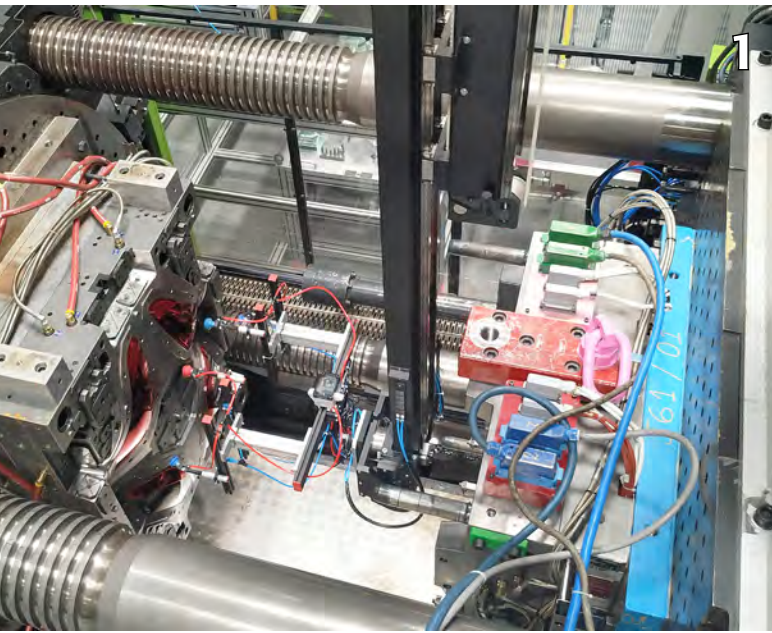
Two W843 pro robots remove two parts from two neighboring machines at different times.



Here, one of the W843 pro robots places the parts on the shared conveyor belt.

Stanislav Dundekov is the Managing Director of WITTMANN BATTENFELD Bulgaria EOOD in Plovdiv, the Bulgarian subsidiary of the WITTMANN Group.

W863 pro: Application with quality control



- 1: The W863 pro robot has moved into the mold area to take out two parts from the machine. Then, the W863 pro moves the parts to the temporary storage place in order to insert them into the fixture.
- 2: Handling of the parts above the temporary storage or fixture respectively (bottom right corner of the picture: parts fitted into the fixture).
- 3: Part inserted into the inspection fixture.
- 4: Test station for quality control.
- 5: After the quality control, the W863 pro picks up the parts again and finally places them on a conveyor belt.

Peripheral and automation solutions for Tunisia

AB Inject SA, an aspiring Tunisian injection molder, uses automation systems and peripherals from the WITTMANN Group in its production in El Metbassta in the Kairouan governorate.

Julie Filliere

AB Inject was founded in 2020 by Brahim El May, also the company's Managing Director. In El Metbassta, a few kilometers north of Kairouan, AB Inject has a brand new production facility with state-of-the-art equipment, completed in 2022. Despite all the adversities that the COVID pandemic brought during the construction phase, production has been running at full speed since last year.

The company specializes in the injection molding and assembly of technical plastic parts, which also includes insert molding and two-component injection molding. AB Inject also supports its customers in product design and development of molds, which can also be maintained, repaired and modified here. The specialist knowledge gained over the years in various international companies and the most modern work equipment enable the development and production teams to achieve the highest quality standards.

AB Inject works for the automotive, electronics and household goods industries, among others. Depending on customer requirements, both small and large quantities are produced, with a wide variety of materials being processed. All products manufactured here are exported.

Equipment and philosophy

AB Inject currently uses a total of four injection molding machines, horizontal and vertical, with a clamping force of up to 300 t. All automation solutions and all other peripheral devices come from WITTMANN. Two Primus 16 robots and a W821 robot as well as a sprue picker remove the finished parts or sprues.

From the WITTMANN peripheral device portfolio, Drymax beside-the-press dryers, Feedmax S3 net single material loaders



A view of the WITTMANN peripherals and robots installed on and next to AB Inject's injection molding machines.

and Tempro basic C temperature controllers are used with every processing machine. At AB Inject, particular attention is paid to inline recycling, for which S-Max 2 and S-Max 3 granulators were purchased from WITTMANN: "These granulators make a decisive contribution to production that is equally economical, i.e. saves costs, and can be operated with responsibility for the environment", says Brahim El May.

This production philosophy is consistently practiced at AB Inject, as the company is currently working on equipping itself with photovoltaic modules to supply itself with electricity. This process is expected to be completed in 2025. Brahim El May: "We

live in a time when energy costs are constantly increasing, and if we want to look to the future with confidence, we need to better control our resource consumption."

Prepared for future growth

AB Inject likes to plan in advance, which is also the reason why the current production of four injection molding machines can easily be increased to ten machines in the future, as sufficient space was already provided when the factory was built. Even further growth is not unthinkable, as AB Inject's location offers the fundamental possibility of doubling the existing plant space.



Automation and peripheral equipment for one of the AB Inject injection molding machines: W821 robot, Drymax material dryer, Feedmax S3 net material loaders, Tempro basic C temperature controller, and S-Max 3 granulator.



From left to right:
 Gregory Maron,
 WITTMANN BATTENFELD
 France SAS Salesman;
 Brahim El May, Founder
 and Managing Director of
 AB Inject SA; Hédi Bouarada
 of IDS, the Tunisian agency
 of the WITTMANN Group;
 Taha Yassine Ben Azouz,
 AB Inject Technical Manager.

Partnership with WITTMANN

When Brahim El May is asked about working with WITTMANN, he emphasizes the attentiveness, professionalism and speed of reaction of the people working at WITTMANN. In particular of Hédi Bouarada from IDS (Industrial Development Services), the local agency of the WITTMANN Group in Tunisia.

Hédi Bouarada had already successfully supported Brahim El May on injection molding projects over a period of 18 years, even before AB Inject was founded. Logical consequence: Brahim El May also turned to Hédi Bouarada for the needs of his own company.

All those who worked for this project at IDS and WITTMANN thank AB Inject for the trust they have placed in them, wish AB Inject great and continued success, and hope to be able to accompany this ambitious company for many more years.

Julie Filliere is the Communications & Marketing Manager of WITTMANN BATTENFELD France SAS in La Buisse, France.

Airmould internal gas pressure technology: sustainability and conservation of resources

Airmould is a process by which nitrogen is injected into a mold cavity partly or completely filled with melt to form an internal cavity structure. In this way, light-weight components can be produced within a short cycle time and simultaneously with high-quality surfaces, while saving resources as well. All components required for this process have been developed and are produced in-house by WITTMANN BATTENFELD in Germany.

Gabriele Hopf



Airmould 4.0 pressure control modules, central unit, control terminal.

With the further development of this technology – brought to market as Airmould 4.0 – a system has been created which meets the industry's demand for easy operation and compactness and offers its users a number of advantages. Airmould 4.0 is an internal gas pressure system which no longer requires a large control cabinet, thus saving customers valuable space on the production floor. The necessary pressure control modules have also been further downsized and thus become very compact. As a result, they can now be mounted and used flexibly on any injection molding machine. For easier operation, Airmould 4.0 can be fully integrated in the Unilog B8 or B8X control system of WITTMANN BATTENFELD machines. For use on machines of other brands, user-friendly operation is also ensured via the WITTMANN Group's standardized manual control terminal.

Resource-efficient

In times when CO₂ footprint and conservation of resources are buzzwords, the Airmould technology has become more and more significant for users. This process saves

resources in more than one way. Firstly, the use of this technology saves plastic material. Secondly, these material savings lead to a reduction in part weight, which is of great benefit especially for the automotive and mobility sectors by reducing, in turn, the required energy input. Since nitrogen gas is injected exclusively into the interior of the cavity in internal gas pressure injection molding, there are no limitations whatsoever to the quality of the parts' surface finish compared to compact injection molding. On the contrary: with Airmould, the gas assumes the function of the holding pressure and counteracts component shrinkage from the inside. As a result, it reduces the formation of sink marks and warpage. This aspect is of major significance primarily for thick-walled parts.

Range of use

Typical applications for Airmould technology are bar-shaped parts. These include all kinds of handles, levers, brackets and hangers for weight reduction, such as door handles for the automotive sector. Additional examples are components for white goods or home and garden tools, where material

savings have a substantial effect on costs. Some further common applications are media lines and tubes for the automotive sector and parts for the furniture industry, such as components for tables and chairs.

Apart from bar-shaped geometries, Airmould can also be used for flat parts with ribs, such as panels and covers, or beverage crates and tabletops. Here, the nitrogen is injected precisely into the rib structures, in order to prevent sink marks on the surface of the opposite side. Moreover, this process is also suitable for flat parts with local bulges. Typical examples here are car outside mirrors, housings or reusable boxes.

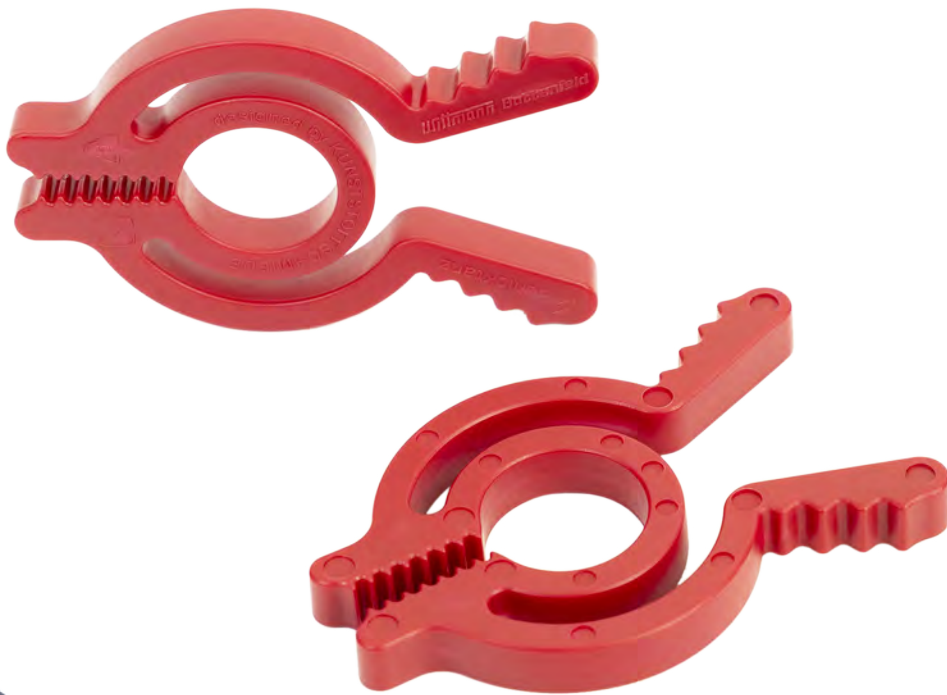
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Airmould channel
inside a door handle.



Automobile door
handle – produced
with Airmould tech-
nology for weight
reduction.



Clothes pegs –
material savings by
using Airmould.

Airmould channel
inside a gas pedal.

