innovations

Special Issue Medical Applications
Dear Reader,

The development of the medical field has already emerged as one of the major trends of the twenty-first century. This is likely to only continue as the number of people with access to healthcare is increasing, and their average age is steadily getting older. These developments will lead to higher demand for newer and better medical products.

While the pressure to save cost and innovate is far less considerable in the medical field than in the automotive world, medical engineering challenges the suppliers of production equipment in its own way. There has to be an incredibly high level of technical competence, as well as unique solutions to cope with problems such as dust particles in the ambient air and the physical involvement of the worst culprits of infection – humans themselves. The requirements of medical production facilities have evolved, and today the two most frequently used catch phrases are “clean room capability” of the equipment and “lights out” production. For decades now, we have successfully faced these unique challenges.

In fact, some of our products are constructed specifically for use in clean room applications. One example is our fully electric EcoPower injection molding machine, which is driven through direct drives and sliding guides only. All of our robot models are minimizing the need for human interaction, which can add impurities to highly sensible production processes. Our FEEDMAX B central conveyors are the only material loaders on the market that are built completely hermetically as a standard.

In this context, one of our injection molding machines deserves to be specially emphasized because it already features its own integrated clean room: the WITTMANN BATTENFELD MicroPower, which, in itself, is a complete closed system for the production of small and complex special parts.

With this special issue of our innovations magazine we are presenting several typical clean room applications running in practice. Apart from the fact that clean room capability is a pre-condition for equipment used in medical production, we believe the units should feature highly modular construction and should be useable in the most flexible ways, just like equipment used for conventional applications. These are the requirements that we meet at the WITTMANN Group.

The innovations team wishes you an inspiring reading experience.

Sincerely, Michael Wittmann
MicroPower – ideal for the molding of medical small and micro parts

WITTMANN BATTENFELD has responded to the increasing importance of micro parts in medical technology with MicroPower, an injection molding machine model specially developed for high-precision production of extremely small parts. The all-electric MicroPower – available with clamping forces of 5 and 15 t – is attracting attention from the medical industry due to its speed, its extraordinary cost-efficiency and absolute process reliability.

Gabriele Hopf

With this new generation of injection molding machines, the innovative two-step injection unit, consisting of a screw and a plunger with a shot volume ranging from 0.05 to 4 cm³, is of special interest. The melt that is injected through this injection aggregate is uniform in regard to its temperature, resulting in the highest quality parts with stable production processes and short cycle times. Because of the short cycle times and the machine’s low levels of material and energy consumption, the MicroPower is extremely cost-efficient. Adding further to the MicroPower’s cost-effectiveness is that the entire range of peripheral equipment is specifically geared to the production of micro parts.

This includes small-volume and low-throughput material dryers, material feeders, tempering equipment with matching performance specifications, and the W8VS2 robot, a special robot designed for handling small parts. Through the use of MicroPower, overall cost can be reduced by 30% to 50% compared to standard machines.

Flexible and cost-efficient

The modular machine system consists of a basic platform that can be extended according to customers’ needs. The platform can be retrofitted with a rotary disk, parts removal handling, integrated quality monitoring via image processing and a clean room module. The machine is extendable up to a complete production cell.

The clean room-compatible design and the clean room module, which allows for Class 6 clean room environment according to ISO 14644-1, are optimally suited for medical applications. In such applications, parts are injected, tested and deposited in the clean room.

The benefits of the new WITTMANN BATTENFELD MicroPower molding machine become obvious when for example processing extremely expensive high-end biodegradable plastic materials that are used frequently in contemporary medical technology for clips, bone screws, and bone plates, etc. These materials cost 2,000–5,000 €/kg (1,200–3,000 $/lb), so even a tenth of a gram in material saved through a reduction in the amount of sprue underscores the equipment’s great cost-efficiency. The material is also processed extremely gently to prevent unnecessary shearing.
The market for medical products is constantly growing, and it demands more and more elaborate applications. With its medical division, WEIDMANN is meeting these demands, leading in the production of customized instruments and products that are used in laboratories and for in vitro diagnostics. Production is concentrated at the Swiss Bad Ragaz facility, with about 100 workers. After tripling the clean room area in 2009, it now takes up 2,500 m² of the production floor.

**Lancet devices for diabetics**

An especially successful product from WEIDMANN's medical division is the so-called MULTICLIX device. The device is a gentle lancet, specifically for diabetics, which helps the user to ascertain their proper dose of insulin. The
lancet’s dimensions approximate those of a ballpoint pen, and it features a drum that is equipped with six hygienic and safely kept lancets made of special chromium steel (length 16 mm, diameter 0.3 mm). These lancets can puncture the patient’s finger nearly painlessly.

The needle point is covered by a soft elastomer protection cap, thus shielding the needle point from contamination and damage. This TPE capping is pierced by the needle once the lancet’s mechanism is activated, and after the needle has been used by the patient, the lancet automatically retracts into the protection cap. For easy handling, the piston of the lancet is coated with a hard ABS thermoplastic. Both components – TPE capping and the ABS coating – are molded simultaneously around the lancet on a WITTMANN BATTENFELD 2-cavity vertical machine with two injection units. In the Bad Ragaz plant, over 500 million MULTICLIX devices can be produced per year.

**WEIDMANN’s lancet production**

The entire lancet production process happens under the conditions of a Class 8 clean room environment: the feeding of the needles, their insertion into the cavity, the subsequent injection molding process and the removal of the parts, including the fully automatic assembly of the lancets into the drums. The needles are separated and inserted into the mold via a gripper system, where four moving cameras monitor the insertion process. This creates difficult challenges for the system, because a metal tool must be detected in front of a metal background.

The vertical machines that are executing the injection molding process are a 3-station design, made up of the insert station, the injection station, and the parts-removal station. The stations are arranged in a circular pattern with each other, at a respective distance of 120 degrees apart each. The upper half of the mold executes the vertical clos-
ing and opening movements. A gripper then removes the finished lancets, and every single lancet is then automatically checked by the camera system. Afterwards, the lancets are placed in magazines and passed on to special containers.

**A customized solution**

For the production of the lancets at Bad Ragaz, WEIDMANN uses four vertical round table machines with clamping forces of 75 tons – all of which are produced by WITTMANN BATTENFELD. The first one of these machines was installed in 2003.

The injection molding machines are specifically tailored to meet the high requirements of the medical community regarding accuracy and speed. Fritz Stein, WEIDMANN Division Manager of Medical Engineering comments that, when manufacturing this type of product, it is crucial to produce a huge amount of parts and every single piece has to be of the highest quality. Over the years, WEIDMANN has reached a level of excellence in the very competitive and challenging field of medical parts.

“The vertical machines from WITTMANN BATTENFELD are meeting all our demands: highest precision, repeatability, and shortest cycle times”, says Fritz Stein. All the machines that were designed for WEIDMANN are 3-station machines with two vertical injection units. Because of the small needle diameters, much attention is drawn to the absolute accuracy of the round table drilling template.

The machines are equipped with a mold mounting aid on the nozzle plate that simplifies the changing of the upper part, and, due to the specific characteristics of TPE, there is a dosing aid for optimizing the dosing process.

The servo-electric machines that have been delivered most recently are even faster and more exact than their predecessors. Again, these are vertical round table machines with a clamping force of 75 tons, and they are equipped with servo drives for the screw and the round table.

A servo driven dosing process allows for synchronicity with the other movements, while a servo driven round table moves more smoothly and guarantees greater speed and accuracy. Using the machines for such special applications also necessitates carefully harmonizing the perceptions of all parties involved. Markus Reichlin, Plant Manager in Bad Ragaz, appreciates the competence and the experience of WITTMANN BATTENFELD, and above all the excellent teamwork during the development phase.

“The WITTMANN BATTENFELD machines are fitting optimally in our concept”, says Reichlin. He emphasized the ingenuity of the three tie-bars, one of them being placed in the middle of the round table, and the two others behind it. This makes it possible to insert and to remove the parts unhindered from all sides of the machine.

Furthermore, some special controls and special functions were integrated into the machine’s control unit. The WITTMANN BATTENFELD UNILOG B6 machine control uses Windows XP™ as its operating system, which offers enormous flexibility for the realization of any demand.

WITTMANN BATTENFELD is becoming a leader in the development of round table machines. Many years ago, the company introduced the machine to the market and it has continuously advanced the technology. WITTMANN BATTENFELD was the first manufacturer of injection molding machines to mass-produce vertical round table machines.

Some more “firsts” of WITTMANN BATTENFELD include the lowering of the round table to a convenient working height, and the development of the servo-electric round table drive.

Today, the company offers a quasi-all-electric machine where only the build-up of the clamping force is done hydraulically, which allows the machine to maintain its low round table height.

WITTMANN BATTENFELD round table machines are available with clamping forces of 40 to 270 tons and with round table diameters of 752 to 1,755 mm. The safeguarding of the insertion area and the part-removal area is achieved using light curtains, which ensures optimal access both when removing parts and when realizing continual auto-motion concepts.

The machine’s flexible drive concept is based on either two electric variable capacity pumps or on the use of servo-electric drives for all axes. This not only enables parallel motions that lead to short cycle times, but also high precision.

The special servo-electric round table drive in particular realizes the fastest possible rotary motions at perfectly aligned acceleration that holds the insert in a safe position. •
EcoPower – the perfect solution for medical technology applications

The WITTMANN BATTENFELD EcoPower is an all-electric injection molding machine with clamping forces ranging from 55 to 300 t. It stands out not only for its energy-efficiency and compact design, but also for its process reliability and cleanliness. This makes it an ideal choice for clean room applications in the medical industry.

Gabriele Hopf

The first machine of the EcoPower series, EcoPower 110, was on display at Fakuma 2009. Since then, the series has been extended by adding both smaller and larger models, and it is now available with clamping forces ranging from 55 to 300 t.

The standard version of the machine can be specially equipped for a variety of applications, such as high-speed applications or high-precision injection molding under clean room conditions. WITTMANN BATTENFELD’s customers appreciate the EcoPower above all for its cleanliness, energy-efficiency and compact design.

EcoPower – predestined for medical technology

Apart from its energy-efficiency, high speed and compact design, the main factors attracting special attention from the medical industry are the EcoPower’s process reliability and clean room compatibility.

The EcoPower’s process reliability and high speed are mainly a result of the direct drive of the injection unit via a circulating ball spindle, which minimizes transmission loss and enables exact control and repeatability of the metering and injection processes. The precise, efficient toggle drive of the clamping unit features high dynamism, positioning accuracy and energy-efficiency as well. The EcoPower’s special suitability for clean room applications is based on a number of features. First, all-electric machines such as the new EcoPower emit considerably less radiation heat than hydraulic machines.

This not only reduces energy consumption, but also significantly increases the suitability of this equipment for precisely tempered and air-conditioned clean room environments when compared to their hydraulic counterparts.

Second, the EcoPower contains only direct drives, no belt drives, and all the guide systems installed are roller guides instead of conventional sliding guides. This prevents the inevitable particle emissions that occur with belt drives and sliding guides.

The remote function of the UNILOG B6 control system from WITTMANN BATTENFELD also allows for the user to move the operation of the machine to a position outside the clean room area if so desired.

Finally, an extremely high standard of cleanliness in the EcoPower is achieved by its smooth surfaces, which, together with stainless steel covers and nickel-plated clamping plates, are easy to clean. The EcoPower is also available with a closed-loop water cooling system as an option, to prevent air turbulence.

Gabriele Hopf

EcoPower with laminar flow box from Petek Reinraumtechnik, Germany.
In April 2010, the first machine of the EcoPower series was installed at STELLA KUNSTSTOFFTECHNIK GMBH – one of the most important partners for the production of liquid pharmaceuticals. The long-standing WITTMANN BATTENFELD customer based in Eltville, Germany, specializes in products for packaging, dosing and administration of drugs in liquid form. The company has relied on cooperation with WITTMANN BATTENFELD for many years.

Gabriele Hopf

STELLA, a family-owned company in the second generation, developed from a glass foundry in Thuringia, which used to produce the bottles known as “Stern” (= star) dripper bottles that gave today’s STELLA KUNSTSTOFFTECHNIK GMBH its name. Since its foundation in 1949, it has been engaged in developing, manufacturing and distributing packaging products made of glass and plastics.

Its product portfolio includes injection-molded plastic parts in the form of dripper inserts, spouts, syringe adapters, dosing pipette adapters, screw caps, screw caps with originality ring, pipettes and pipette caps, pistons, sealing elements and cylinders of dosing pipettes, dosing cups, components of childproof closures and tube bodies.

STELLA now counts pharmaceutical companies of all sizes in more than 70 countries among its customers, which invariably place the most stringent demands on parts quality. Only such materials and colorants as have been approved for direct contact with pharmaceuticals and food are processed. Today, STELLA employs 85 people at two facilities in Germany, in Eltville (since 1965) and Kastellaun (since 1978). With some 650 million parts manufactured annually – the equivalent of about 900 million to 1 billion individual value-adding processes – STELLA undertakes mass production of parts with a typical part weight of around two grams. Heino Deussen, owner-manager of STELLA, and Georg Fischer, plant manager in Kastellaun, point to the high significance of technical precision and the virtual absence of germs in the production of their parts.

“Our customers’ fault tolerance is minimal. The slightest deficiencies or contamination of products would have serious consequences, including return shipments of entire production lots and claims for damages.”

Thanks to the use of latest technology, STELLA meets these demands in every respect. The finished parts are “collected” from the processing machines and transferred to quality inspection by a driverless box transport system, without coming into contact with humans. STELLA has its own mold design and mold-making facilities with appropriate clean room technology and uses tools for industrial image processing as well as modern labeling and assembly processes.

STELLA and WITTMANN BATTENFELD

STELLA and WITTMANN BATTENFELD can look back on many years of partnership. The first BATTENFELD injection molding machine was installed at STELLA in 1986. Today, 40 injection molding machines are operating at the
Kastellaun plant, and two more in Eltville, all of which have been supplied by WITTMANN BATTENFELD. The two machines delivered most recently already came equipped with integrated WITTMANN robots with a UHS (Ultra High Speed) system, which is an additional benefit.

After all, the company has been cooperating successfully with WITTMANN Robot Systeme GmbH for many years as well. Most of its machines are hydraulic machines from the CDC and HM series.

In April 2010, the first all-electric machine was installed, a WITTMANN BATTENFELD EcoPower 110, also with an integrated WITTMANN robot. The EcoPower, with its outstanding clean room compatibility, high precision and process reliability, meets the high quality standards in medical technology production in every respect.

With the new, all-electric EcoPower, STELLA now has an injection molding machine that offers the ultimate in efficiency, precision and cleanliness. It features a compact injection unit and a clean clamping unit with a highly efficient direct drive.

The waste heat, which is normally not utilized, and the braking energy of the drives, usually reclaimed by an elaborate system, are fully utilized within the machine in the EcoPower series, to supply the control system with the necessary voltage and for barrel heating. This makes the machine series extremely energy-efficient.

The injection unit of the EcoPower machine is laid out for high injection speeds of up to 400 mm/sec. The direct drive via a circulating ball spindle minimizes transmission loss and favors precise regulation and repeatability of metering and injection processes.

This ensures a high degree of process reliability. The efficient, precise drive of the toggle on the clamping unit features high dynamics, positioning accuracy and, once again, energy-efficiency. The exclusive use of direct drives dispenses with the particle emissions that are inevitable with belt drives and sliding guides. Since the toggle bolts are encapsulated, no oil contamination can occur on the clamping unit either.

Thanks to its modular concept, the standard version of the EcoPower injection molding machine can be configured for a great variety of applications with short delivery times, for example for high-speed applications or – the number one priority for STELLA – for high-precision injection molding under clean room conditions.

BATTENFELD offers in order to ensure highest precision, repeatability and clean room compatibility. Here, the EcoPower meets our demands in a special way.’’ Georg Fischer regards above all the absence of hydraulics and lube oil as a great advantage.

The high energy-efficiency of the EcoPower is seen as a feature which will become more and more significant. Rising energy costs, Deussen says, are a given, and highly automated production like that of STELLA requires a large amount of energy. Passing on rising energy costs to customers is regarded as an unrealistic approach. For these reasons, the development of the WITTMANN BATTENFELD EcoPower seems to point in the right direction. Apart from the excellent cost/benefit ratio of the machines, STELLA specially appreciates the quality of the partnership. Heino Deussen: “The cooperation based on mutual trust and WITTMANN BATTENFELD’s readiness to cater to its customers’ wishes, particularly in terms of configuration options and special equipment, is extremely valuable to us.”

Georg Fischer appreciates the uncomplicated processing of transactions in the business relations with WITTMANN BATTENFELD. From STELLA’s point of view, the homogeneous machinery on its production floor has proved its worth in every respect over the decades.

EcoPower – precise, clean and energy-efficient

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Swiss precision in the clean room

For the manufacturing of indicator wheels, housing parts and exiguous cog wheels FORTEQ HEALTHCARE in Nidau/Switzerland is using WITTMANN linear servo robots in the clean room. The target is: shortest cycle times at highest availability.

Werner Bürli – Walter Klaus

The production of an inhalator for the controlled dosing of pharmaceuticals treating respiratory diseases is a very typical example from the product portfolio of the FORTEQ HEALTHCARE Company. This product’s single components are manufactured highly automated in the clean room. Afterwards the parts are completed to ready-for-sale units on fully automated assembly lines. The systems are producing precision parts, amongst other things cog wheels of 0.02 grams that are used in the inhalator’s counting mechanism. This mechanism allows for overseeing the fill level of the inhalator. The counting mechanism being absolutely correct at indicating the fill-level is of prime importance, when the patient’s health is depending on the exactly regulated and continuous inhalation of the active ingredient.

The inhalator is made of ten parts, of which nine are molded by using hot runner systems. Five of these are produced in six production cells. The automation machinery is coming from WITTMANN Kunststofftechnik in Kaltbrunn/Switzerland. Because of the small weight of the single parts, it is not possible to switch off the non-conform cavities of the multi-cavity molds – therefore the removal of the whole shot is imperative.

The robot is processing the good/bad-signal and afterwards orderly placing the parts (16 to 32 pieces per shot, depending on the mold) for the subsequent separation or drops them into the scrap channel. When removing these highly sensitive parts, the gripper has to be positioned at the mold at a maximum tolerance of 0.2 mm by means of index pins. Only this is making sure that the sliders and ejector pins are not damaging the parts that still have a temperature of about 90°C. The rugged grippers are optimized in terms of weight to shorten the removal time as much as possible. Thus literally Swiss precision work is necessary that is done by the gripper construction department of WITTMANN Kunststofftechnik in Kaltbrunn.

Dr. Joachim Franke, FORTEQ HEALTHCARE CEO states: "The quality and performance of the WITTMANN automation is one reason for our years lasting supplier loyalty."

Reliability and low maintenance

FORTEQ is a young company with a long tradition, having emerged from the former Mikron Plastic Technology. Besides the injection molding technology, clean room production is playing a key role in the medical field. The manufacturing of the products is happening consistently in the ISO 8 class clean room.

Not only companies working in medical technology and diagnostics are to find amongst their customers. Predominantly technical plastics and polypropylene are processed in
systems that are reaching cycle times of 4.4 seconds without the use of a robot, and 7.9 seconds with robot part removal. To meet the highest quality standards, FORTEQ is starting a file for every new development as a part of the design and development process. They are monitoring the adherence of all regulations and standards, whereby the documentation of all modifications – that have emerged during the development phase – is assured. Then they start production following cGMP guidelines. FORTEQ is conducting ISO 9001:2000 and ISO 13485:2003 quality management systems.

This access was at the bottom of the decision to buy the actually existing production cells. To Dr. Franke and his team the reliability and low maintenance of temperature controllers, robots, and other peripheral units are of special importance. Six WITTMANN robot systems of different technical states are forming the center point of the automation. However, they are featuring one thing in equal measure: Undisturbed operation 7 days a week, 24 hours a day – only interrupted by necessary production cell and clean room maintenance.

The realized cycle times meanwhile are partly going below the eight-seconds-boundary. Here the highly dynamic so-called W-Drives, which are a WITTMANN development, are top-performing. Nevertheless the part removal can last up to two seconds, due to the most precisely executed mold docking and the mandatory monitoring whether each single part has been removed from the mold or not. Walter Reinmann, Head of the FORTEQ Component Production, explains: “When molding such small parts, the mold protection of the injection molding machine is not really reacting reliably, and damage caused by a part that has not been removed from the mold can lead to immense costs. We rather accept the removal times being some tenths of a second longer, due to the bigger mass of the solid gripper system. But the bottom line is that we are sure to save a lot of money by getting an undisturbed continuous run and products that are meeting the mandatory requirements.”

The WITTMANN R7.2 control is fit for teach-in programming. To meet special requirements, the list of commands can be completed. The display of errors or malfunctions as plain text is one of these special TeachBox functions.

All sensors or control inputs that are reading certain positions of the mechanical elements can be real-time controlled via the software, and they can activate an alarm in case one signal is missing within a defined time frame. Displaying plain text is making sure that the operator can localize the defect without any delay.

“If necessary, the displayed text can be entered by our operators themselves even in different languages. This is enormously facilitating the identification of problem areas. This as well is making a further contribution to increasing the equipment’s availability”, says Walter Reinmann. And if it is possible – at a cycle time of e.g. 6 seconds and a production period of 48 weeks a year – to increase the number of working cycles per year up to nearly five million, an optimal programming is mandatory.

Highest acceleration and speed are only applied, where they are necessary to keep the cycle as short as possible. This minimizes abrasion, thus reducing the room’s contamination. Every movement is as short as possible and as slow as maintainable. The intelligent program architecture of the software is allowing to build such a program structure by just taking a few simple steps – and hence is one more argument for the use of linear robots in the clean room.

The optimal production of parts that are extremely delicate, requires a perfect “teamwork of men and machine”. “In the long run, it is only possible to meet the high requirements of the pharmaceutical and medical industry by reverting to a highly qualified team of experienced experts and selected efficient and reliable machinery”, states FORTEQ HEALTHCARE CEO Dr. Joachim Franke in conclusion.

Intelligent control

A 32-fold vacuum gripper is removing the cog wheels weighing only 0.02 grams. The linear robot is maneuvering the vacuum gripper within an 8-seconds-cycle. Afterwards, the precision parts are assembled fully automatically.

Werner Bürli is General Manager of WITTMANN Kunststofftechnik AG in Kaltbrunn, Switzerland. Walter Klaus was (until his retirement in 2008) Technical Director of WITTMANN Robot Systeme GmbH in Schwaig, Germany.

Short cycle times: quick return on investment

The new robot types W721 CSS3 and W732 CSS3 from WITTMANN Kunststoffgeräte GmbH are 3-axes servo-robots. Compared to their direct predecessors a really significant reduction in cycle time from 12.5 seconds to only 8 seconds was achieved – maintaining absolute identical operational reliability and precision of the units. Considering 48 weeks of operation a year, the return on investment is occurring in very short time.

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WITTMANN robots help save lives

**GREINER BIO ONE, located in Kremsmünster (Lower Austria), is the worldwide market leader for special medical pre-analytic systems and security solutions. This innovative specialist trusts in the robots produced by WITTMANN.**

*Martin Stammhammer*

Worldwide, thousands of employees in medical labs support doctors and scientists daily by performing detailed blood tests, producing crucial information supporting the endless fight against the most persistent human illnesses.

To reduce the ever present danger of infection of lab employees during blood transfer, and to always guarantee equal quality of tests, the majority of these labs are using the VACUETTE® system from GREINER BIO ONE.

**The VACUETTE® system**

This pre-analytic system consists of a plastic tube molded with break-proof PET, which is then assembled, together with two more plastic parts and an elastic stopper, to the VACUETTE® system. During assembly, the tube is half filled with a carrier liquid and is then closed afterwards under vacuum.

Using this system guarantees that only a certain amount of blood is transferred to the test tube, and that the transfer occurs without any contamination from the environment. GREINER BIO ONE was the first supplier worldwide to produce this progressive system using plastic, and they have gained worldwide market leadership in this field as a result of their innovation.

GREINER BIO ONE selected the thoroughly proven WITTMANN robotics systems for the automated production of their testing tubes. Günther Pakanecz, production manager at GREINER BIO ONE headquartered in Kremsmünster, Lower Austria, emphasized his appreciation for the easy programming of WITTMANN robots as well as the other technical advantages they offer, such as reliability, high speed and accuracy. Strict hygiene regulations are required at Mr. Pakanecz’s plant, thus production occurs under conditions that mirror those of a clean room.

**Pipette needles: removal and control**

A WITTMANN robot system is also used in the production of another highly successful GREINER BIO ONE product, pipette needles. A W721C robot removes the parts quickly and efficiently from a 16-cavity mold by using a specially designed and customized EOAT (end-of-arm-tooling). Then robots place the pipettes into a peripheral station for cavity separation before they are deposited in boxes.

GREINER also requested a special operation to allow easy removal of cavity-separated samples for the quality control. Günther Pakanecz is confident that GREINER BIO ONE will be able to achieve its goals for the increased production and quality assurance with the WITTMANN system.

**The GREINER Group**

The GREINER BIO ONE company is 100% owned by the GREINER Group and is active in bioscience and preanalyt- ics in 100 countries worldwide. About 1,200 employees work...
in 19 representations and 5 production locations (Austria, Germany, Hungary, USA, Brazil), with an estimated turnover of approx. 220 Mil. EUR in 2006. The entire GREINER Group with approximately 6,500 employees achieved a turnover of approximately 820 Mil. EUR in 2005.

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Martin Stammhammer is Sales Manager for Robots and Automation Systems at WITTMANN Kunststoffgeräte GmbH in Vienna, Austria.
Over the past twelve months WITTMANN BATTENFELD UK has supplied a total of four full servo 3-axis WITTMANN W721 robots into CTP’s Mitcham based molding shop, thereby helping to increase the overall production volume at the factory while also decreasing reject rates and machine stoppages.

Medical products

CTP’s diagnostic cell of nine machines is currently molding a range of disposables for the medical market: pipette tips and cuvettes for medical diagnostics. These are then exported to the tune of some 20 million units per week. And, thanks to the increased robotics and automation performance at the company, CARCLO TECHNICAL PLASTICS is steadily increasing its output.

CTP’s Molding Shop Manager Andy Fay explains that greater stability was needed for the automatic removal of pipette tip moldings from the injection cells: “The Y axis of the WITTMANN W721 linear robot was much steadier and robust than the previous model of robot. We were therefore able to rely on a much shorter dwell time in the mold and thereby increase output. The new WITTMANN robots have also given us peace of mind and removed any possibility of tool damage due to inaccurate robot positioning.”

For many industrial users the rack and pinion design for the “wrist” mechanism of the WITTMANN W721 robot gives it a competitive advantage. That, together with a 10 kg (22 lbs.) payload over the 6 kg (13.2 lbs.) figure normally quoted for the competitor robots means that the non-pneumatic mechanical design is winning hearts and minds of WITTMANN BATTENFELD customers.

Says Andy Fay: “Robot quality was probably the foremost factor when beginning to source with WITTMANN BATTENFELD UK. Our high cavity tooling needs fast, efficient and fault-free production on a 24/7 basis – all under clean conditions.”
Conveying

WITTMANN innovations – Special Issue Medical Applications

Conveying WITTMANN FEEDMAX B series vacuum material loaders of different sizes, with/without high quality glass sections (“Clear Tube” series). The dustproof design guarantees dust-free operation at the machine hopper.

Markus Wolfram

is Sales Manager of the Material Handling Department at WITTMANN Kunststoffgeräte GmbH in Vienna, Austria.

In response to a growing trend where more and more technical products are subject to rigorous production conditions requiring controlled clean room environments, WITTMANN has demonstrated the suitability of their FEEDMAX central loader series for such applications in an operational clean room tent.

Markus Wolfram

It is not possible in every case to use laminar flow boxes directly over the molding area, and often the entire processing machine is situated in a clean room environment. Thus, the conveying of resin to the machines takes on special requirements.

Test arrangement in the clean room

A demonstration that was initially executed at the K 2007 highlighted the suitability of the FEEDMAX loader for clean room applications by measuring the discharge of particles using a counter with 6 particle channels.

The clean room tent, equipped with 2 flow modules ensuring a maximum air stream volume of 1,200 m³/hr., allowed a 66-fold air change rate, thus corresponding to a Class 6 clean room according to ISO 14644-1. This research also proved the suitability of WITTMANN material loaders for clean room applications. Unlike many competitors’ products, the FEEDMAX A and FEEDMAX B 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, regardless 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 vents (which could result in the discharge of particles) to function fully.

This installation successfully demonstrated the suitability of WITTMANN loaders to operate under Class 1,000 and Class 6 clean room conditions.

Carclo Technical Plastics and WITTMANN

Carclo Technical Plastics manufactures a range of customized products at its Mitcham, Surrey base. These are for the medical and healthcare markets and cover conventional injection molding, insert molding,
two shot molding and assembly techniques. Carclo Technical Plastics is ISO 13485 approved to the highest standards of medical manufacture and is part of the global Carclo Technical Plastics organization with facilities across the United Kingdom, United States, Czech Republic, India and China (for more information please visit the Carclo Technical Plastics website: www.carclo-ctp.com).

Carclo Technical Plastics also uses WITTMANN’s very popular Tempro primus C kW water temperature controllers. Andy Fay comments that “The competitive price of these temperature controllers means that it is much more cost effective for us to buy in bulk and simply replace them rather than repair them as needed.”

WITTMANN’s robots received another extensive showing e.g. at the K 2010 plastics exhibition. The robots are directly aimed at the majority of companies involved in injection molding. Comparatively short production lead times ensure lower cost and a steady market supply of the WITTMANN robots.

Markus Wolfram

WITTMANN FEEDMAX vacuum loaders in the clean room

Andy Fay: “WITTMANN Battenfeld UK were so confident of the robot’s performance that they supplied the first one to us for trial painted in our factory white colors. Output was then in fact improved to the tune of around 10% over the previous robots.”

The four WITTMANN linear robots are now playing a central role in the manufacture of this product line.

Andy Fay’s reasons for working with WITTMANN Battenfeld UK include “Speed of order quotation. We particularly appreciate the quick responses always given by the company and the short delivery lead times and excellence in service, installation and back-up. Particularly when integrating the robotics into CTP’s automation further down the line.”

Barry Hill

is Director of WITTMANN BATTENFELD UK, Northants.

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