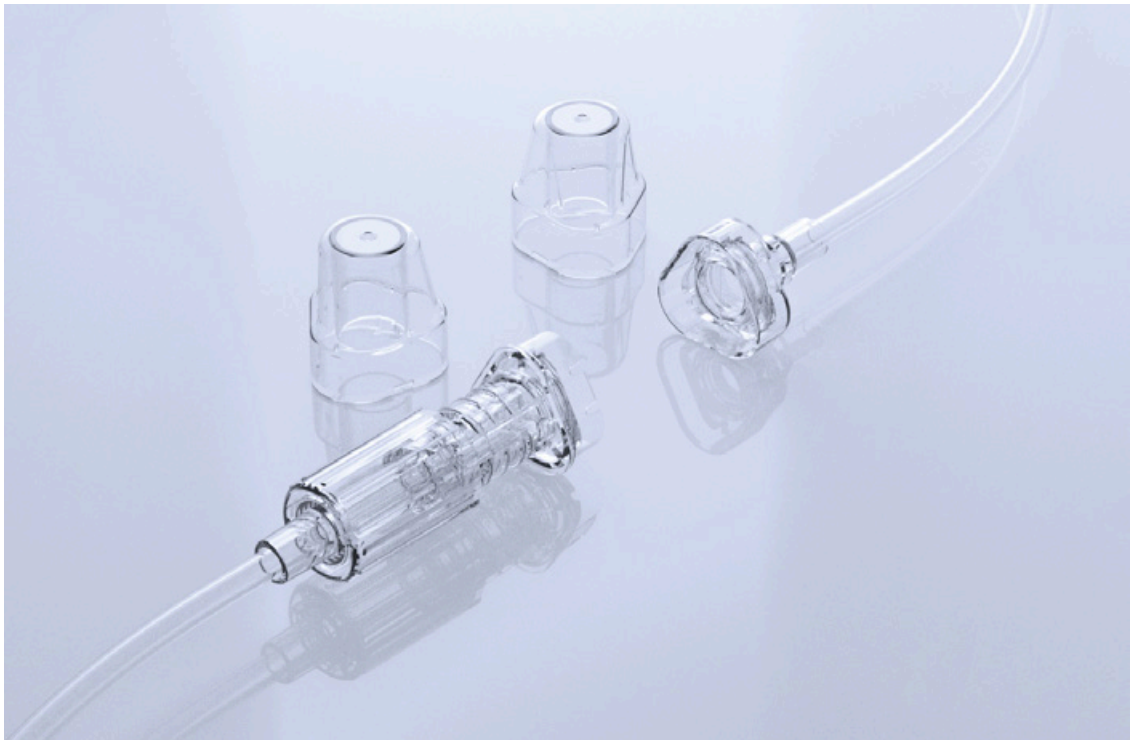
From idea to product

Innovative plastic primary packaging for pharmaceuticals

At PHARMAPACK in Paris, Spang & Brands is going to spotlight two innovative pharmaceutical devices: A single-use nasal dosing device and a sterile connector. With the special single-use dosing device, Spang & Brands is setting a new standard in medication of nasal mucosa.



The sterile connector is especially designed to transport liquids such as infusion solutions, medications or stored blood regardless of the degree of sterility of the environment.

Besides those two highlights, the company will exhibit two-part sealing systems made of TPE and various caps for pharmaceutical primary packaging such as glass bottles and bottle packs as well as mixing and dosing systems.

The first highlighted product is the single-use nasal dosing device, enabling highly precise application of the drug to the nasal mucosa. In general, there is a growing trend to administer medications via mucosa because it enables direct application of minimal doses and many patients are afraid of needles. The dosing device is designed to be patient friendly and ensures precise agitating of the medication and obtains the expected fast, and strong effect. The patented dosing system has a simple structure consisting of four plastic parts and can be used as platform for custom developments.

Sterile connectors will be highlighted, too. Solutions (liquid medications, pharmaceuticals or stored blood) can be transported safely through the sterile connector from bags, bottles or ampoules to another container and finally transfused into the patient with no risk of contamination. Jürgen Mader, Chief Technology Officer, pointed out the advantages of the new system: “Regardless of the environmental conditions, there is no risk of contamination thanks to the sterile, particle-free connection”. Mader added a few striking examples: “If need be, the connection can be set up outside the hospital, outdoors, or at the patient‘s home“. Since pathogens typical of hospitals can crop up anywhere, sterile connectors mean one less thing to worry about. The sterile connector is safe and easy to handle. Friedrich Echterdiek, Chairman of the Management Board, expressed his confidence: “This patented technology has potential for a wide variety of future applications”.

Spang & Brands will also exhibit a sterile bag-sealing system consisting of a 2-component plastic TPC

From idea to product

(temper proof cap). The company will also exhibit 2-port bottle pack caps with TPE sealing components, break-off caps made of various plastic parts and combinations of materials, and other sealing systems.

Along with its brand-name products, Spang & Brands operates as an expert supplier under contract for customer projects involving ready-to-use pharmaceutical and medical packaging.

Spang & Brands handles every step in new customer projects: from the idea to the finished product. Its in-house technology centre ensures the seamless flow of CAD tool data and very-high-precision CAM tooling for pharmaceutical technical products: "Precise to within a micron", said Alexander März, Chief Technology Officer. At PHARMAPACK, the company will exhibit a variety of pharmaceutical and medical technology systems at stand K53: injection-moulded single- and multi-component high-precision and micro products, such as connecting pieces, working parts for infusion solution bags and sealing systems, penetrable membranes, catheters, syringes, implant components for minimally invasive treatment, as well as assembled components. "We have been specializing in precision and clean-room injection moulding technology for the medical and pharmaceutical industry for over 35 years. We have both the latest equipment and a highly skilled and experienced team", explained Echterdiek. Clean rooms are used for fully automated and manual assembly and packing of the parts and assemblies – from pilot lots or just-in-time lots ranging from small series to mass production in the millions. Quality control is supported by strategically positioned test points and 3D measurement technology.

The CEO affirms that: "Pharmaceutical primary packaging is becoming increasingly demanding in terms of ease of use and optimal safety for the patient. At PHAR-MAPACK, we are going to demonstrate that we have mastered the technology necessary to that purpose: parts development, mould making, injection-moulding technology – 70 machines, mainly electrical, clean room applications, assembly and production processes for the entire value chain."

At the exposition, Mr Echterdiek, Mr Mader and März will be happy to answer any questions clients may have.

Spang & Brands GmbH
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Dear subscribers,

back from the LOUNGES that for the first time after four years in Stuttgart took place in their „birthplace" Karlsruhe, our heads are still buzzing with all the information and of course the extremely enriching conversations with you, our readers and customers. Thank you very much for all the praise we have received for our 2018 Yearbook. In addition to the trade fair report, you will also find in this newsletter everything you need to know about research, innovation, products and events. One thing is clear: the industry is growing rapidly, with new user and customer groups wanting and needing pure environments. We`re happy about it. I'm sure you are, too.

We wish you a virus-free start to the spring (which hopefully will come soon).

yours sincerely,

Reinhold Schuster

Pack medical products flexibly, efficiently and with process reliability

The trend in the medical products industry towards greater individualisation and product variety continues unabated. At this year's MedTec in Stuttgart, MULTIVAC will therefore be presenting flexible solutions for packing medical products in small to medium-sized batches. The packaging solutions to be exhibited, among them a thermoforming packaging machine, a traysealer and a chamber machine, are highly efficient and suitable for producing a wide range of pack formats.

The exhibits will include a R 081 thermoforming packaging machine a compact model for small-scale production and for those companies, which want to launch into automated packaging. The machine can be used for producing both vacuum packs and modified atmosphere packs with reduced residual oxygen content. Flexible and rigid films as well as Tyvek® and paper-based packaging materials can be run with ease. The range of pack formats can be freely configured. The drawer system en-sures that format change is fast and simple.

In Stuttgart the R 081 will be exhibited with the DP 230 direct web printer and the TTO 06, a network-enabled thermal transfer printer of the latest generation. The DP 230, which is fitted in the area of the sealing station, can print the packs in both the longitudinal and cross directions and is therefore suitable for machines with multi-row and multi-track dies.

As regards the traysealer sector, the T 260 will be on view, which was specially developed to meet the high demands of the medical products and pharmaceutical industries. This mobile and compact model is de-signed for running a wide spectrum of trays, and it offers companies packing small to medium-sized batches a high degree of process reliability, reproducibility and above all flexibility. The sealing die ensures that a controlled sealing pressure and precise temperature distribution are achieved. Critical parameters are monitored permanently by sensors.

MULTIVAC will also be presenting the C 300 TC chamber machine from its wide range of chamber machine products. This model enables sterile medical products to be packed securely in film pouches, and packs can be produced either as vacuum packs or with modified atmosphere and reduced residual oxygen content. A temperature-controlled and permanently heated sealing bar, which can be both validated and calibrated, ensures that this machine achieves reproducible sealing quality.

All the above mentioned machines are cleanroom-compatible and of course meet all the legal requirements as well as the GMP, GAMP5 and ISO guidelines.

MULTIVAC Sepp Haggenmüller GmbH & Co. KG
D 87787 Wolfertschwenden

Optimised energy consumption thanks to enlarged air flow and reduced current consumption

– Service life of the innovative folded IP55 filter mat up to three times longer
– 4-corner snap-fit mechanism for rapid and tool-free installation
– Easy-to-use hinged cover for quick and simple filter mat changing.

More and more active electronics, ever more compact design types, ever more wiring thanks to space-saving connection system: the space in the control cabinet has never been better utilised. But this also causes an increase in waste heat that should be dissipated. Weidmüller has now added filter fans to its range, in order to be able to offer customers the complete control cabinet infrastructure. These cool the control cabinet simply using the ambient air. On intake, it is cleaned by a filter mat, it then absorbs the heat from the components that are installed in the control cabinet, and finally it exits through an output filter. Filter fans are deployed in the case of power losses in the control cabinet of typically between several hundred watts and several kilowatts. As long as the temperature and the quality of the ambient air, and the waste heat that is to be dissipated allow, the fans are an extremely economical alternative to cooling units, both in terms of procurement and in operation. Cooling significantly extends the life expectancy of electronic components.

Weidmüller includes four different design types in its range: standard filter fans, EMC-version filter fans to meet higher demands in terms of the attenuation of electromagnetic fields, roof opening filters and Slim Line filter fans with a particularly low-profile build-in height. All versions are available with grey and black enclosures. A 4-corner snap-fit mechanism enables rapid and tool-free installation. All design types are available in different sizes and with different power levels. The smallest device has a volumetric flow of 25 m3/h, an edge length of just 109 mm and a depth of 62 mm. The most powerful device offers a volumetric flow of 925 m3/h. It has an edge length of 320 mm and a depth of 157 mm. With the design of all the filter fans, attention was paid to energy-efficiency and a long working life. If one fan should fail, it can very easily be swapped out separately. This is possible thanks to the cable gland installation and the use of a terminal block for the electrical connection.

Weidmüller builds its filter fans with low energy-consumption twinned with high air flow levels, so that they can fulfil their task accurately and economically. In addition, only high-quality filters from filter class G3 and G4 and/or with IP54 and IP55 ratings are used. Through its enlarged surface, the working life of the folded filter mat used in the IP55 version is extended by up to 300%, in comparison to traditional filter mats. The filter mats can be swapped out quickly and simply through an easy-to-use hinged cover.

A range of matched accessories complements the programme of fans. There is, for example, a selection of heating and control elements that reliably prevent the build-up of condensation in the control cabinet. The heating elements are designed for a 100V to 250V power supply and as an option, are available with a thermostat. The programme also includes separate thermostats, with a switching range from -20°C to +40°C, which can control both heating elements and filter fans. The range of available control technology elements is completed by a hygrostat with an adjustable tripping value of from 40% to 90% relative humidity. In this way, filter fans and heating elements only work when cooling or heating is actually required. Energy-efficiency can be increased and costs can be decreased by the needs-based usage of thermostats and hygrostats.

Now, there is nothing standing in the way of achieving perfect climatic conditions in the control cabinet.

Weidmüller GmbH & Co. KG
D 32758 Detmold

Innovative Process Technologies for Improved Competitiveness

ENGEL at Chinaplas 2018

"Innovation is key to the future" – this is the motto of Chinaplas 2018 from 24 to 27 April in Shanghai. At its booth, ENGEL will be presenting many exciting applications and technology solutions to demonstrate how innovative injection moulding technologies can help build competitive advantage and secure future viability. When it comes to challenging plastic products, the injection moulding machine producer and systems solution provider based in Austria is among the preferred suppliers of the plastics processors in Asia.

Chinaplas 2018 is all about growth. "The investment climate in China is on a new high," reports Gero Willmeroth, President Sales and Service of ENGEL Machinery Shanghai, in the run-up to Asia's most important plastics trade show. "Chinaplas will give a further boost to this trend." Growing competition among the local producers of plastic components is another factor contributing to this positive development. Investment is being made in modernising machinery and new technologies that help to raise production efficiency and product quality.

Economical injection moulding of thick-walled lenses

The exhibition space dedicated to Automotive at the ENGEL booth reflects the trend towards the use of innovative process technologies. This is the first time that ENGEL is presenting a complex multi-component process with interlinked injection moulding machines at Chinaplas. Two duo injection moulding machines will produce LED lenses made of PMMA with a thickness of 22 mm for vehicle headlamps.

Plastic is increasingly being used to produce high-quality optical components. The polymer materials are lighter than glass and offer product designers more freedom. The challenge, however, is to combine high optical quality with highly efficient production. The optimelt multilayer technology developed and patented by ENGEL with external cooling meets precisely that challenge.

Initially, a preform is produced and further layers of the same material added to it in subsequent stages. Overmoulding compensates for any sink marks in the surface of the previous layer and achieves high optical quality. Optical tests have shown that the boundary between the layers has no influence on the performance and function of the lighting optics.

Because the cooling time in injection moulding increases with the square of the wall thickness, the multilayer technology significantly improves efficiency especially in the production of thick-walled components. Several thin layers cool in total faster than one thick layer. If, in addition, the base body of the lens is removed from the mould to cool, the cycle time is shortened further. Cooling in the air takes longer than in the mould, but it does not affect the cycle time.

During Chinaplas, the lens base bodies will be produced on a duo 1060/400 injection moulding machine in a 4-cavity mould. An easix articulated robot is integrated in the production cell and removes the four parts and passes them to an external cooling station. From there the robot takes four already sufficiently cooled preforms at a time and transfers them to the 4+4-cavity mould of the duo 600H/600H/500 combi multi-component machine with rotary table. There, two more PMMA layers are applied successively before easix removes the finished lenses. The cycle time is significantly lower than 3 minutes, although the preforms take around 30 minutes to cool. The cooling time can be controlled via the number of cooling positions in the external cooling station.

The combination of a standard injection moulding machine and a two-component machine is synonymous with very high production flexibility. Both machines can also be utilised independently of the other with different moulds.

ENGEL is presenting the exhibit jointly with system partners including Skymould (Ningbo/China), HRSflow (Hangzhou, China), Innolite (Aachen/Germany), Opsira (Weingarten, Germany) and Gimatic (Shanghai, China). In order to integrate other peripheral units and moulds alongside its own robots and process technologies, ENGEL has established a worldwide network of system partners. "We have very strong partners locally in China who, like us, are very familiar with the demands of local processors and translate them into optimal solutions," explains Willmeroth. "By working with local suppliers, we can also guarantee high cost efficiency for challenging applications and keep the delivery time short for the complete plant."

A cleanroom solution with a tiny footprint

Another premiere is in Medical, where ENGEL is presenting a highly integrated production cell for manufacturing pipette tips under cleanroom conditions. This exhibit too, is the result of cooperation between Europe and China. ENGEL, Waldorf Technik (Engen, Germany) and Wellmei Mold (Dongguan, China) have combined their know-how and experience with medical precision parts and tailored the system solution exactly to the specific requirements of the Chinese processors.

Because the pipette tips are used in fully automated analytical

Innovative Process Technologies for Improved Competitiveness

systems in medical diagnosis, reproducible product quality is the highest priority. As mass-produced parts, however, they are also under especially high cost pressure. To achieve a stable process and high economic efficiency, the system partners integrate a tie-bar-less e-victory injection moulding machine from ENGEL with a 32-cavity hot runner precision mould from Wellmei and high-speed automation from Waldorf Technik in an extremely compact space. The free accessibility of the mould area makes it possible to move the automation particularly close to the clamping unit of the e-victory injection moulding machine.

The electric injection unit on the hybrid machine ensures very high precision when injecting the plastic melt. To additionally compensate for fluctuations in the ambient conditions and raw material, iQ weight control is also used. The assistance system from the ENGEL inject 4.0 programme analyses the pressure in real time during the injection process and compares the measured data with a reference cycle. For every shot, the injection profile, the switchover point and the holding pressure are automatically adjusted to the current conditions and the injected melt volume kept constant throughout production. This is a proactive way of preventing rejects.

The automation is another key to constantly high product quality in this application. The automation solution developed by Waldorf Technik removes 32 pipette tips from the mould in sync with the injection moulding process and loads groups of 96 pipette tips, sorted by cavity, into racks. Every 18 seconds, 96 pipette tips are discharged from the production cell, which is enclosed to create a cleanroom environment.

iQ weight control compensates for process fluctuations before rejects can occur. The intelligent assistance system is available for both electric and hydraulic injection moulding machines. (Image: ENGEL)

In practice, subsequent steps such as quality control or packaging are increasingly taking place immediately after the injection moulding stage. In place of the many different downstream processes, during Chinaplas a Sawyer collaborative robot from Rethink Robotics (Boston, USA) retrieves the loaded racks at the end of the production process. A special feature of collaborative robots is that they require no protective enclosure and can operate safely hand in hand with employees.

inject 4.0: consistent quality without specialist knowledge

With intelligent assistance systems such as iQ weight control, ENGEL makes it especially easy for its customers to ensure consistently high product quality, even without specialist knowledge. The iQ systems continually analyse critical process parameters and readjust them automatically, shot for shot. The result is a self-optimising injection moulding machine.

The growing intelligence of the machine control is a key feature of the smart factory, the goal of Industry 4.0. Networking of production systems and systematic use of machine, process and production data additionally help to raise the productivity, quality and flexibility of manufacturing. Under the name of inject 4.0, ENGEL already offers a series of mature products and solutions for digitalising and networking injection moulding production that have proven themselves in practice many times. These generate considerable benefits both in isolation and as part of a digitalisation strategy encompassing the entire production operation. “Step by step towards the smart factory, that is our customers’ strategy,” Willmeroth says.

ENGEL is demonstrating the great potential of the inject 4.0 solutions in the production of inject 4.0 logos on a tie-bar-less and fully electric e-motion 80 TL injection moulding machine. The CC300 machine control is capable of simulating process fluctuations so that the automatic readjustments by the intelligent assistance systems can be tracked on the display. While iQ weight control maintains consistent injected melt volume throughout the injection moulding process, iQ clamp control monitors the mould breathing in order to calculate and automatically adjust the optimal clamping force. “With the self-optimising injection moulding machine, we are making it especially easy for processors to exploit the full efficiency and quality potential of the machines and technologies,” says Gero Willmeroth. “The first machines with iQ are already in operation in China.”

ENGEL at Chinaplas 2018: Hall 5.1, Booth E71

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