



Fast and affordable failure analysis

Bosch offers data mining as new pharma service

- Recognizing hidden connections and eliminating failure causes
- Industry 4.0 in practical use: profound data analyses enable efficient production processes
- Bosch Packaging Technology pools knowledge with Bosch Center for Artificial Intelligence and Corporate Research



New Pharma Service: Data Mining: The aim of data mining is to more effectively evaluate existing machine data in the sense of Industry 4.0 in order to identify and eliminate root causes. (Picture: Bosch)

At Achema, Bosch Packaging Technology presents its new data mining service, which has recently been added to the range of pharma services for solid dosage forms. The service is offered by the Bosch subsidiary Hüttlin. The aim is to evaluate existing machine data more effectively to identify and eliminate root causes. "So far, about 50 percent of deviations have been classified as 'human error,'" says Dr Marc Michaelis, expert for continuous production and process verification at Hüttlin. "Yet we assume that this is true for no more than ten percent. The rest is often misinterpreted due to missing information. As a matter of fact, there is already enough data available to get to the bottom of the causes. However, there is a lack of knowledge and time to read this data correctly." First projects have shown that new patterns and failure causes can be defined and remedied in the production process thanks to data mining, and can help to achieve a more stable product quality in the long run.

11th - 15th June 2018:ACHEMA, Frankfurt am Main (D)

Correct interpretation of machine data

Thanks to Bosch's data mining tool, it is now possible to examine large amounts of data for the smallest effects using statistical methods. In general, the data from two production batches is already sufficient to draw first conclusions. The more data is available for evaluation over a longer period, the more details can be identified. All it takes is machine sensors, which already collect data on almost all historical machines, as well as the right tool to disclose the data. "Large investments are not required to use the existing data more effectively. The key to success lies in merging knowledge from different disciplines," says Michaelis. "Bosch not only has the necessary technical expertise, but also extensive process knowledge in customers' product ma-

Fast and affordable failure analysis

manufacturing. To identify reasons for process deviations, which are not obvious at first sight, we teamed up with the statistics experts from our Bosch Center for Artificial Intelligence in Germany and the U.S. Together we will raise the data treasure.”

The potential of this approach has already been demonstrated successfully in different customer projects. For instance, when a customer suddenly produced a “out of specification” (OOS) batch, the Bosch

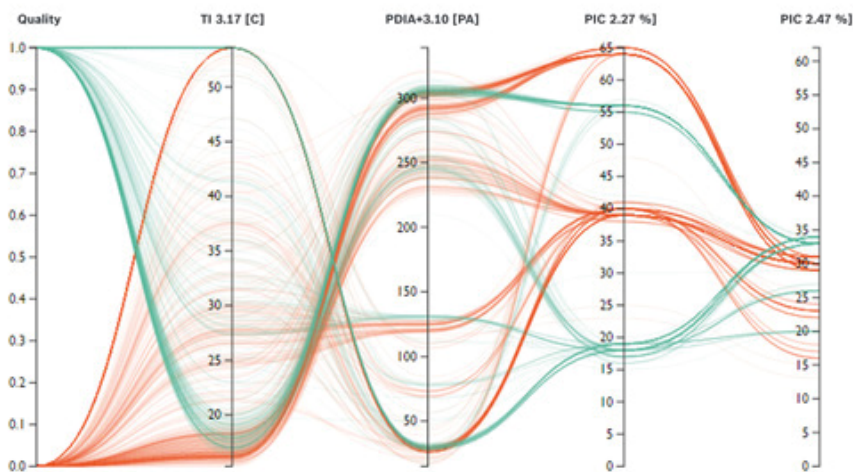
experts systematically got to the bottom of things. The recorded data showed that a particular valve was responsible for the deviation. However, the valve had been excluded beforehand since it was considered un-critical in terms of product quality. Thanks to the data analysis, deeper correlations and an undetected cascade of connections could be identified. “Eventually, we found out that the valve provided an indirect indication of a false gas flow in the system,

which was not visible at first sight. The problem could then be easily solved by re-calibrating the system,” Michaelis explains.

Maintaining consistently high quality

Consistently high product quality is a critical factor in the pharmaceutical industry, since authorities such as the FDA and EMA have strict guidelines for process understanding, monitoring and validation. “To make successful root cause analyses and process improvements, or to develop a control strategy as part of continuous process verification, we offer customers our new data mining service,” Michaelis says. “We are looking forward to further projects to pursue the path of industry 4.0 together with our customers.”

Multivariate Plot (dft: Parallel Coordinates Plot)



Examine large amounts of data for the smallest effects: Using the data mining tool developed by Bosch, feature extractions of machine data can be visualized. (Picture: Bosch)



Robert Bosch Packaging Technology GmbH
Stuttgarter Straße 130
D 71332 Waiblingen
Telefon: +49 711 811 0
Telefax: +49 711 81158509
E-Mail: packaging@bosch.com
Internet: <http://www.boschpackaging.com>



Dear subscribers,

when you look outside your window, you can see all the pollen flying around and maybe you can even feel them itching in your nose. We hope you can keep your working environment clean of pollen and particles, though. Meanwhile we recommend you to read the article on page 3 of this newsletter about an outstanding cleanroom planning method. Besides this, we have again collected as many bits and pieces of information concerning our cleanroom industry as possible in order to help you stay informed. Enjoy.

Yours sincerely,


Reinhold Schuster

BIM: The formula for outstanding cleanroom planning using a virtual roundtable

Building Information Modelling (BIM) comprises a virtual roundtable for architects, engineers, laboratory planners and cleanroom specialists, air-flow simulations, and much, much more. Superficially, these fields may appear to have very little in common, but that is not the case. Digital technology brings all of this together, and the VDI Association of German Engineers is already issuing new guidelines for its practical use. Current and future possibilities for the use of BIM in cleanrooms will be on display at the Cleanzone trade fair on 23 and 24 October 2018 in Frankfurt am Main.

It is not an uncommon experience: The architect utilises digital tools to design a building and prints out the CAD plan that will serve as the basis for the creation of an independent model by the structural engineer. The engineer responsible for building services engineering does the same, and this is followed by the addition of another expert specialising in cleanrooms. In other words, even in the planning phase, there are numerous points at which work may be duplicated unnecessarily, something that can lead to all manner of difficulties, such as a central ultrapure water supply line colliding with the extinguishing water line.

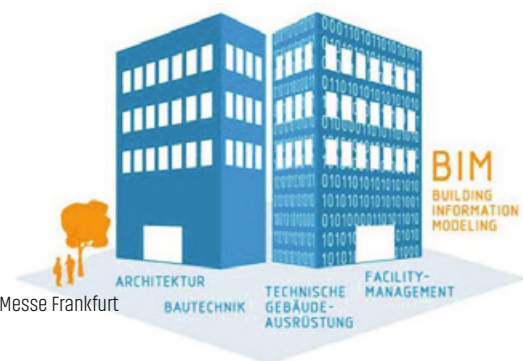
Digital technologies make it much easier to plan as a team

BIM (Building Information Modelling) is based on utilising a digital model so that everyone involved in the planning, construction and operation of a structure is able to work together. According to Frank Jansen, Technical Research Consultant for the VDI Society Civil Engineering and Building Services (VDI-GBG) in Düsseldorf: "This should result in a marked reduction in duplicate work and conflicts. Even so, the economic advantages do not appear for some time, at it is necessary in the beginning to invest more time in planning and communication amongst the various parties involved. It all pays off later, however, as implementation runs much more smoothly. Furthermore, financial savings will be generated in facility management throughout the service life of the facility, including through the ability to monitor and control performance data, as well as from the documentation of modifications and replacement of components. Most importantly, the quality of structures is improved."

The progress being made in the field of digital technologies is spurring greater use of BIM in the planning process. It is true that representatives of the various fields involved have always been able to collaborate in the planning processes using pen and paper, yet in practice the ability to quickly get together around a virtu-

al roundtable, in the cloud, for instance – even when everyone is physically far apart – has proven to be a big advantage. In addition to geometric data, BIM models also make it possible to address as many additional attributes as desired. These might include schedule proposals, cost specifications or even specific details (such as the configuration of an airlock system, performance data for ventilation systems in cleanrooms, materials utilised, even maintenance and hygiene plans).

All of these data are useful not only for the construction process, but also for any changes that might be made at a later date. Here, a good example is offered by the frequent repurposing that takes place in clinics and hospitals, including operating rooms, and the upgrades to cleanrooms that are necessitated by legal requirements, new VDI guidelines or increasingly demanding customers. In each of these cases, having a 'digital twin' of the structure in question that includes the specifications for the laboratory and cleanroom facilities is quite useful.



Picture: Messe Frankfurt

A ventilation technology example from actual practice

The fact that BIM is an open standard represents a key advantage in practice, for when architects and ventilation technology specialists work with different programs, it is still necessary to make every piece of the puzzle fit together.

Benjamin Zielke, Research Consultant for the Hermann-Rietschel-Institut at the Technical University of Berlin, explains: "With the BIM system, I simply program an interface for this purpose. One of the aims of the overall process is to be able to run simulations at the push of a button whenever modifications or changes are necessary. It will then be possible to more efficiently plan many things that are currently based on long years of experience – and to do so with tremendous precision. The installation of excess ventilation system capacity, for example, something that results in unnecessary additional costs during both construction and operation, could be avoided right from the start."

While BIM as an overall concept is still far from being a standard part of the cleanroom planning process, specific aspects of



Picture BIM Bildquelle: VDI

BIM: The formula for outstanding cleanroom ...

this concept are already in common use. One of these involves airflow simulations. Heimo Müller, who works for Carinthian Tech Research in St. Magdalen, Austria, knows from his own experience: "Today this is primarily utilised when there are specific difficulties that need to be remedied. A good example of this is offered by the occurrence of contamination or excessive particle concentrations. Airflow simulations allow us to gain a better understanding of problems in flues, glove boxes and the cleanroom as a whole, so that we can find solutions more quickly. Even so, trying to replicate an entire cleanroom using physical models and numerical procedures would take a great deal of time, which is why we take a step-by-step approach to address the key issue, by simulating the actual situation, taking measurements and performing comparisons with the model, then simulating various geometries in order to find a solution to the problem. I could imagine designing an entire cleanroom on the basis of pure simulations, but I do not believe it would make a great deal of sense.

There's a lot happening in the field of Building Information Modelling

There is still a huge gap between current practice and the

tremendous potential offered by BIM, but the VDI Association of German Engineers is already providing tools to close it. The VDI 3805 guideline series 'Product Data Exchange in Building Services' for this field has been in existence for decades, and it can justifiably be seen as a very early building block for the BIM concept.

There are currently eleven guideline projects related to BIM under way as part of the VDI 2552 series – these range from fundamentals, terminology and definitions to data management, data exchange and information requirements for the contracting party. Three to four new publications are planned for this year alone, and there is a continuous process of exchange with international standards committees.

The Cleanzone trade fair on Tuesday and Wednesday, 23/24 October 2018 in Frankfurt am Main, presents an excellent opportunity to find out more about the possibilities offered by Building Information Modelling for planning and upgrading cleanrooms.

cleanzone

cleanzone

Ludwig-Erhard-Anlage 1 D 60327 Frankfurt am Main

Telefon: +49 69 7575 6290 Telefax: +49 69 7575 96290

E-Mail: anja.diete@messefrankfurt.com www.messefrankfurt.com

Cleanroom technology: A key element for modern medical technology

Medical technology and cleanrooms are two sides of the same coin. In our interview, Professor Burkhard Stolz, Department Head and Course Advisor for Medical Technology at OTH – Technical University of Applied Sciences, Amberg-Weiden in Bavaria, discusses the importance of cleanrooms for his field.



Professor Burkhard Stolz,
Department Head and Course
Advisor for Medical Technology
at OTH – Technical University
of Applied Sciences,
Amberg-Weiden in Bavaria

Mr. Stolz, you are the Head of the Medical Technology Department. What is the importance of cleanroom technology to your course of studies?

Burkhard Stolz: "In the medical and pharmaceutical fields, cleanroom technology has become an established part of the production environments that are essential to a wide range of products. As a result, cleanroom technology is an important topic in both our bachelor's and master's degree programmes. Thanks to the fact that we operate an ISO class 7 cleanroom at the Weiden campus of

OTH Amberg-Weiden, we are able not only to explain this technology to them, but to let them experience it for themselves. It is an opportunity that we take advantage of by offering a course of practical training in the bachelor's programme. In the master's programme, cleanroom technology forms an independent module that addresses both the theoretical and practical elements."

What are the biggest challenges facing modern medical technology and what role does cleanroom technology have to play?

Burkhard Stolz: "Regulatory and quality requirements for medical products will only grow stricter in future, and that means that cleanroom technology will play a crucial role in ensuring product safety.

These special production environments are very cost-intensive, so the focus will be on measures to reduce energy consumption. People will naturally continue to be active in cleanrooms as well. This is an area in which the training and qualifications of personnel play a major role, as does the production environment itself. The key will be to make working in a cleanroom attractive – by designing more appealing settings and providing better training in all areas."

OTH Amberg-Weiden has already been an exhibitor at Cleanzone on multiple occasions. What is it about this trade fair that appeals to you?

Burkhard Stolz: "Cleanzone has established itself as an international meeting place for the industry in a central location that is an extremely good fit for the busy calendars of its visitors. I am very impressed by the event's concept, which combines a trade fair with specialist presentations and various fields of communication. It offers something for established firms, as well as for newcomers to the field of cleanroom technology. We also appreciate the event's professional planning and execution, as well as our good relationship with the trade fair team."

cleanzone

cleanzone

Ludwig-Erhard-Anlage 1 D 60327 Frankfurt am Main

Telefon: +49 69 7575 6290 Telefax: +49 69 7575 96290

E-Mail: anja.diete@messefrankfurt.com www.messefrankfurt.com

Purity by natural law



Ultrapure Water as a process medium

In research and production of electronic components for micro circuits, watches, medical devices or sensors and many more applications the requirements for ultrapure water as a cleaning medium are increasing more and more. This causes steadily growing demands for minimized ion and particle contents as well as for lowest TOC concentration in ultrapure water.

The applicable specifications are different and there are some overlapping directives, whereof VDI 2083, ASTM D5129 or ITRS (International Technology Roadmap for Semiconductors) are considered authoritative. Each of these rules differentiates again between different qualities depending on the intended purpose, thus e.g. in microstructure technology, according to the structure size range (1.2 down to 0.065 μm), eight different ultrapure water specifications may be consulted, while each of these distinguishes between up to 35 parameters for the evaluation of the water quality!

The production of ultrapure water takes several process steps, subdivided into the Make Up and the Polishing. The Make Up — the preparation of feed water until it gets to the storage tank — is realized almost invariably by a combination of conditioning, reverse osmosis and CEDI; the achieved quality is usually at $<0.20 \mu\text{S}/\text{cm}$, the storage tank is used to compensate for any consumption peaks. The 'polishing' then meets the requirements of microelectronics and microstructure technology as a final step. Since ultrapure water cannot be stored with 18.2 Mohm \times cm or $0.055 \mu\text{S}/\text{cm}$ without compromising the quality, the polisher must be designed to the maximum possible flow rate within the system (or the loop line itself). The polishing, if required, is again divided into various process steps: Immediately after the booster pumps a disinfection by UV light (254 nm) follows, mainly even as oxidation (185 nm) to reduce organic components. The following residual desalination down to the single-digit ppt range is ensured by a high-purity mixed bed ion exchanger, produced especially for this



©Werner GmbH 2018

application, by using semiconductor-grade ultrapure resin.

Particles are equally undesirable in the field of microelectronics and microstructure technology, so the last step is always a micro- or ultrafiltration. Microfiltration is used for particles sized between 0.2 and $0.05 \mu\text{m}$; higher demands on the minimization of particles are met by an ultrafiltration.

Werner Polishing Systems SUPER-AQUADEM® are being equipped individually for the specific customer needs, including all necessary process steps. The piping of the components and also the realization of the loop takes place at Werner by an experienced and trained team of plastic welders with computer-controlled welding machines, either in non-contact infrared welding or bead and crevice free BCF® welding technology. Depending on the applicable purity requirements beta-nucleated PP-H or PVDF have been established as materials.

Since the actual purification technology has not made any revolutionary progress

in the last years, the current requirements are specified rather by the purity of the materials used, the production techniques and by the sustainability of the water-waste-water-balance. Werner ultrapure water systems benefit from the hygienic design of the process technology in the pharmaceutical area for an extremely high quality of processing even at the microstructure level.

In addition to point-of-use compact systems for the production of ultrapure water for laboratories Werner GmbH provides a SUPERAQUADEM® ultrapure water system with components from the industrial high-end sector.

werner

Wilhelm Werner GmbH
Maybachstraße 29 D 51381 Leverkusen
Telefon: +49 2171 7675-0 Telefax: +49 2171 7675-10
E-Mail: barbara.traeger@werner-gmbh.com
Internet: <http://www.werner-gmbh.com>

Gerresheimer again recognized as a MINT Minded Company



Gerresheimer has been recognized this year as a „MINT Minded Company“ for the second time by audimax Medien GmbH and the „MINT Zukunft schaffen“ („Creating a MINT future“) initiative. MINT stands for the academic subjects and careers in mathematics, IT, science and technology. At its sites across Germany, Gerresheimer offers training programs in over 15 career pathways and in 12 dual degree courses, including their newest addition GxGo!, an 18 month trainee program for those who have completed their Master’s degree.

„We are so pleased to have been recognized as a MINT Minded Company again, and this confirms we are doing the right thing by supporting young talent from our own ranks. With GxGo! we are forcefully heading into the right direction,“ says Thomas Perltz, Global Senior Vice President of Human Resources. For years, Gerresheimer has been training young people in 16 career pathways and 12 dual degree courses and has been successfully running the new trainee program GxGo! for Master’s graduates for a year now.

Covering cough medicine and infusion bottles, ampoules and syringes, and even insulin pens and inhalers, Gerresheimer’s extensive range features several thousand packaging products that you probably see every day. Packaging that comes into direct contact with products, medicines in this case, is known as primary packaging. And Gerresheimer makes this using glass and plastic for its well-known customers in the pharmaceutical industry. Gerresheimer is also a leading manufacturer of cosmetics packaging, producing many well-known perfume bottles at its site in Tettau (in the Upper Franconia region of Bavaria).

The seven Gerresheimer training centers in Germany offer training in the following MINT professions: electronics engineer for industrial engineering, system integration computer scientist, industrial electrician, industrial mechanic, mechatronics engineer, screen printing media technician, technical product designer, process engineer for glass technology, process engineer for plastics and rubber technology, tool mechanic and cutting machine operator.

Glass made in Germany – training to guarantee our future

Gerresheimer’s sites include Essen (North Rhine-Westphalia), Lohr (Lower Franconia, Bavaria), Tettau (Upper Franconia, Bavaria) and Wertheim (Baden-Württemberg). Every plant is equipped with modern and environmentally friendly production facilities. Gerresheimer’s produc-

tion processes are defined down to the last detail, ensuring safety and allowing its products to meet the high quality requirements of its customers, the majority of whom come from the pharmaceutical and cosmetics industries. Stringent, multilevel quality controls ensure that only flawless bottles and containers are supplied to customers. Gerresheimer’s stated aim is to achieve almost error-free production, which requires reliable, experienced and skilled staff more than anything else. That’s why the company also invests so heavily in training for its future specialist staff and managers.

Gerresheimer Medical Systems in Pfreimd and Wackersdorf, Bavaria

Gerresheimer Medical Systems, based in the Upper Palatinate region of Bavaria, manufactures high-quality plastic medical products, such as inhalers and insulin pens, for leading pharmaceutical and medical engineering companies. Among its high-tech range of equipment are state-of-the-art injection moulding machines, assembly machines and testing devices. Even more essential in terms of product quality, however, are the efficiency of its processes and the outstanding work of its staff. The center primarily trains process engineers for plastics and rubber technology.

The benefits of a dual training system are now generating a great deal of interest in the US too. Managers from three technical colleges in the US state of Georgia visited Gerresheimer’s sites in Wackersdorf and Pfreimd in December 2016. The aim of the visit was for Gerresheimer to introduce its American guests to the exemplary German training system with its close-knit network of schools, universities and companies in order to introduce a similar set-up at Gerresheimer’s site in Peachtree City in future. Since then, the team has been in discussions with the corresponding college to put the dual training system into practice.

Gerresheimer Bünde, North Rhine-Westphalia

Gerresheimer’s Bünde plant, based in East Westphalia, manufactures syringes and cartridges for pharma companies around the world, while training apprentices to become electronics engineers for industrial engineering and industrial mechanics, for example. The course combines theory with practice and enables students to progress towards a B.Eng.

Those who successfully complete their training, the dual degree course or the trainee program at Gerresheimer have every chance of being taken on after passing their exams.

MINT Minded Company

With the „MINT Minded Company“ initiative, audimax MEDIEN GmbH and the „MINT Zukunft schaffen“ („Creating a future with MINT“) association are casting the limelight on companies that are taking special measures to promote the next generation of MINT professionals, MINT talents and MINT specialists. By signing the 10-point declaration „MINT Welcome“, MINT Minded Companies are setting an example in terms of highlighting to society the vital need for MINT employees if Germany is to retain and develop its status and expertise as a center of industry.

Only nominated companies can be considered for the award and they cannot purchase it. Nominations can only be made by the target group of MINT students, MINT graduates and MINT talents. By taking part in this initiative, audimax MEDIEN hopes to set a trend in German corporate culture and underscore the role model status of responsible companies. The aim is to let the wider public know which employers are especially committed to promoting MINT talents in order to communicate this commitment to the outside world and to set these companies up as examples.

Gerresheimer AG
D 40468 Düsseldorf

Weidmüller PRO RM redundancy modules for decoupling the outputs of parallel switched-mode power supplies

Redundant power supply for the highest equipment availability. – Protection for power supply units and equipment against short-circuits and energy recovery.

With PRO RM, Weidmüller presents three new redundancy modules for decoupling the outputs of parallel switched-mode power supplies. The parallel switching enables a redundant power supply concept, resulting in the highest equipment availability. Devices from the PRO RM series are characterised by high performance in a very small space; their efficiency ratio is over 90%. They can be deployed around the world thanks to international approvals.

The switched-mode power supplies are ideal for supplying the power for controls and other comparable devices found in panels. With their efficiency ratio of over 90% and a long service life, they save on energy and on costs. High quality devices for industrial and data centre applications, like those from Weidmüller, offer MTBF (Mean Time Between Failure) times of > 500,000 hours and long service lives. The building-in of redundancies can significantly increase equipment availability for particularly critical systems, such as automotive industry production lines or processes in the chemical, pharmaceutical and process industries. In such cases, several power supplies are switched in parallel in order to guarantee operation even if one power supply drops out.

Switched-mode power supplies exhibit an issue inherent in the system though: when multiple secondary circuits are switched directly in parallel, an opposite negative influence can affect the individual circuit, which in a worst-case scenario can lead to the destruction of the devices. This however can be very easily and reliably prevented with Weidmüller redundancy modules (work like diode modules). They are positioned between the power supply outputs and the equipment that is to be supplied with power. This decouples the power supplies, and a short-circuit has no effect on the load any more. In addition, they offer protection against energy recovery. These modules are equally well suitable for redundant operations in the supply of critical components as for doubling the power increase.

Weidmüller is currently showcasing



Weidmüller PRO RM redundancy modules for decoupling the outputs of parallel switched-mode power supplies: redundant power supply for the highest equipment availability.

three new redundancy modules: the PRO RM 10 for input currents of up to 2 x 12 A and a permanent output current of 24 A, the PRO RM 20 with up to 2 x 24 A (in) and 48 A (out) and the PRO RM 40 with up to 2 x 48 A (in) and 96 A (out). The input voltage can be between 10 and 32 V DC. Devices from the PRO RM series are characterised by high performance in a very small space; their efficiency ratio is over 98%. They can be horizontally mounted, side-by-side on the terminal rail, without any gap between them. A gap of 50mm above and below to

allow for the flow of air is enough. Thanks to an LED display and status relay, they offer permanent status monitoring and rapid state diagnostics. This facilitates maintenance and ensures reliable operation. The PRO RM have many international approval certifications, e.g. cULus, Class I, Div. 2 and ATEX. This makes them ideal for many different automation applications.



New Gerresheimer Tubular Glass production plant in Kosamba, India

- Compliant to USP, EP, JP
- Clean-room production and state-of-the-art technologies
- Latest dimensional camera inspection systems
- Certifications ISO 9001-2015 and ISO 15378-2015
- Plant covered under US DMF Type-III and DMF Health Canada
- Other vial production sites in Europe and the Americas for risk mitigation

The new plant in Kosamba produces premium-quality Gx vials and ampoules.

New tubular glass production plant in India MultiShell vials for sensitive drugs

Gerresheimer at CPhI South East Asia

A new plant for manufacturing glass vials and ampoules in the Indian city of Kosamba and innovative plastic MultiShell vials with unique barrier properties: These were the news items and innovations that Gerresheimer was showcasing at CPhI South East Asia in the Indonesian capital Jakarta.

“Whether a drug is better off stored in glass or plastic depends on its active ingredient and its characteristics,” says Lars Priess, Vice President Sales & Business Development Asia Plastic Packaging, “Gerresheimer can provide packaging made from both materials. We want to give our customers solutions that are

best suited to their formulations.”

Gx vials and ampoules from Kosamba

Gerresheimer’s new glassworks in India will allow it to more than satisfy the strong demand for Gx vials. The vials made by Gerresheimer can hold between 1 and 50 ml. As

well as its vials, the company will also be showcasing other core products including ampoules, cartridges, flasks, and more specialty products made from various grades of borosilicate glass.

Gx MultiShell vials

Gx MultiShell vials combine the best properties of plastic and glass packaging for drugs in liquid form. They are available with a monolayer structure made from cyclic olefin polymer (COP) or with a distinctive multilayer structure featuring two layers of COP sandwiched around a central polyamide (PA) layer. The vials boast unique barrier properties that improve the drugs’ stability and thus extend their shelf life accordingly. Their multi-layered structure is incredibly resistant to punctures, preventing the liquid from escaping even under extreme mechanical loads and making the vials an ideal packaging solution for cytotoxic drugs. The vials are available in 2, 5, 10, 15, 50, and 100 ml sizes.



MultiShell® vials (COP, PA, COP):

- Unique barrier properties
- Superior break resistance
- Inert against high and low pH value (no delamination)
- Low absorption (protein derived active ingredients)
- No heavy metal ions release
- Available in 2, 5, 10, 50 and 100 ml
- Available in RTW, RTS, RTU

Monolayer vials (COP)

- Break resistance
- Inert against high and low pH value (no delamination)
- Low absorption (protein derived active ingredients)
- No heavy metal ions release
- Available in 2, 5, 10, 50 and 100 ml

Mobile leak detectors ASM 390 and ASM 392

For rapid pump down and short response times on large test objects

The ASM 390 and ASM 392 are leak detection solutions adapted to the semiconductor and display industries as well as to other demanding applications where rapid pump down and high sensitivity is key. Both models are Semi S2 compliant.

The leak detectors are fitted with a dry frictionless backing pump and a powerful high vacuum pump, making them the ideal tools for leak testing of various components in clean environments.

Equipped with an additional turbo-pump, the ASM 392 will speed up the leak detection process to reduce the downtime of the production equipment.

The ASM 390 and ASM 392 have been developed to provide full confidence in leak testing regardless of operator know-

ledge. They deliver accurate results in minimal time, making them highly efficient in the field.

ASM 390 and ASM 392 are uniquely ergonomic with a convenient size and height, a secondary handle in the front, a fully rotatable, removable display, an inlet in the front for easy connection to test ports and maneuverability for access to all testing areas, even in tight spaces.

Thanks to a wide, clear color touch panel display, an integrated toolbox with modular compartments and storage space for vacuum bellows, leak detection can be very easy.



Pfeiffer Vacuum mobile leak detectors ASM 390 and ASM 392 for rapid pump down and short response times on large test objects.

Pfeiffer Vacuum GmbH
D 35614 Asslar

New clean rooms are taken into operation

Extension of clean room production capacities costs EUR 1.2 million

Manufacturer of plastic components for the medical industry Riegler GmbH & Co. KG based in Mühlthal/Ober-Ramstadt, Hesse, strengthens its market position and takes two new certified clean rooms into operation. On an area of 700sqm the company produces high-precision plastic components. Since 1994 Riegler has been producing in class 7 clean rooms according to DIN EN ISO 14644. The new clean rooms conform to ISO class 8 and can be upgraded to ISO class 7, if required.



Andreas Oswald

Customized system solutions and assemblies under controlled conditions

Riegler GmbH & Co. KG extends its clean room capacities further to be able to master an increasing order volume of customized system solutions and to meet any clean room hygiene requirements in the future as well. "We consciously focus on extending our German plants but also on an international customer orientation", says Dr. Thomas Jakob, head of the Medical Technology business unit. Presently, Riegler GmbH & Co. KG produces high-precision injection molded- and extrusion blow molded components and component assembly on a total clean room area of more than 3,000sqm. Production sites are in Röhrstraße street and Bahnhofstraße street in Ober-Ramstadt and An der Papiermühle in Mühlthal.

Clean room concept tailored to process and product

The project was completed on schedule within one year, from the construction plan development at the beginning of 2017 to the start of construction in October 2017 up to the qualification of the clean rooms in April 2018. Already when planning the project Riegler focused on an energy-efficient and economic implementation. "When planning new clean rooms it is particularly challenging to consider manufacturing influences and normative clean room requirements", says construction project manager Andreas Oswald. In addition to the extension of its clean room capacities the company optimized all material flows and modernized plastic granule feeding.

Riegler GmbH & Co. KG
D 64367 Mühlthal



Focus on the process



Harro Höfliger atACHEMA 2018

In Hall 3.0 Booth F47, at the center of their trade show attendance, Harro Höfliger Verpackungsmaschinen GmbH will present visitors with production processes at every automation stage. In Frankfurt, the machine manufacturer will show new administration forms and corresponding production solutions along the entire value creation process.

Lab to Production

Harro Höfliger has always been offering an extensive range of machines and comprehensive services for LabScale Equipment. The company supports customers from the laboratory to high-performance production to scale processes efficiently, economically and with the least possible risk.

Pharma Laboratory

When it comes to powder dosing, the physical characteristics of the filling medium significantly influence the selection of the right dosing system. Based on years of research, Harro Höfliger's Pharma Services have developed a powder database that allows the reliable classification of the powder to be processed. The appropriate filling system can be identified rapidly and efficiently. Additional

table-top units substantiate Harro Höfliger's wide range of upscalable test machines for laboratory and galenics.

Semi-automatic processes

Harro Höfliger will present the Drum Lab, a semi-automatic powder micro-doser with drum filling technology. With one machine each for the assembly of injectors and the production of the XStraw®, Harro Höfliger proves their capabilities for entering into the manufacture of medical and pharmaceutical products.

Device Services

Device Services is the latest addition to Harro Höfliger's comprehensive range of services. The experts in this area work with customers to determine the requirements for new developments of device systems and medical products. They analyze the feasibility and expected performance with regard to design and process. The Device Services portfolio also includes the creation and implementation of functional and stability tests.

High Flexibility in Capsule Filling Media

Whether under containment, in cleanrooms or in barrier-free production – the modular capsule filling machines of the Modu-C family with their proven trolley system always enables fast format changeovers and easy cleaning. At theACHEMA, Harro Höfliger will show the entire range of available dosing trolleys. Interested visitors can obtain information about the multifaceted possibilities of in-process control and add-ons for capsule filling with customized media.

Containment for Capsule Filling

When processing active and highly active ingredients, barrier technology for the protection of operators and the environment



Focus on the process

plays a crucial role. The containment solutions for the capsule filling machines of the Modu-C series guarantee this protection. With an output of 25,000 capsules/h, the Modu-C LS (Low Speed), the smallest member of the Modu-C series, marks the entry into the fully automatic capsule filling under containment. The Modu-C MS (Mid Speed) with an output of up to 100,000 capsules/h provides the next higher production level and also includes a sophisticated barrier concept.

Aseptic liquid filling

A system for the aseptic liquid filling of flexible plastic bags will be on display. The complex processes are exactly tailored to the requirements of the product and underline the company's credo: "The product defines the process".

Award-winning line expertise

Harro Höfliger's understanding of turnkey production solutions is affirmed by an exhibit for web processing and end packaging. The design, which has received the Red Dot and iF Gold Award 2018, emphasizes the symbiosis of the PMK and MKC turnkey solution and represents the company's line expertise.

Well connected

Thanks to the inter-company and networked cooperation of the Excellence United members, customers are provided with optimally coordinated solutions, a comprehensive range of services and a rich pool of knowledge. Using machine interfaces, the Excellence United Service Portal offers fast help worldwide or onsite training from one source. In a common area, visitors can experience what Excellence United means.

Digital showcase

When ideas become reality. The result of decades of research and development is the undisputed expertise in the production of pharmaceutical, medical and dedicated consumer products. The interactive control unit of the digital showcase enables interested visitors to easily navigate through the comprehensive product and service world of Harro Höfliger.

11th - 15th June 2018: ACHEMA, Frankfurt am Main (D)

Harro Höfliger Verpackungsmaschinen GmbH
D 71573 Allmersbach im Tal

Top marks for Cherwell's Redipor® prepared microbial media products



UK & Euro versions of new Redipor price list released as customer base grows across Europe

Cherwell Laboratories, specialist suppliers of products for environmental monitoring and process validation, announces that a recent customer satisfaction survey has affirmed that the vast majority would recommend Cherwell and its Redipor® microbiological media products to a colleague. Value for money, excellent customer service

and product quality were all key factors contributing to the very positive outcome of this survey. These results are evidenced by Redipor's growing user base within the pharmaceutical and associated industries both domestically and across Europe. Therefore, to accommodate all customers, Cherwell has just released both UK and Euro versions of its 2018/19 Redipor Prepared Media price list, now available to download from Cherwell's website.

Redipor prepared media products scored highly with customers in Cherwell's recent survey to achieve an impressive Net Promoter Score of +76 (from a range of -100 to +100). Customer comments as to 'Why Cherwell?' included: "The excellent service; great pricing; exceeding expectations with delivery times; helping us out in a crisis; flexibility by preparing bespoke media; pragmatic advice; and realistic timeframes. What more could anyone want?"

Meeting varying customer needs, such as for environmental monitoring, sterility testing and validation applications, the new Redipor price list details the extensive range of ready-to-use culture media available

in bottles and plates. Cherwell provides a selection of the most commonly requested types, many of which are available from stock for next day delivery. In addition to those included in the price list, Cherwell offers many other bespoke products which are made to order with short lead times and small minimum order requirements. Discounts are available for high volume and standing orders.

"With customer satisfaction and ease of access in mind, we have laid out our new Redipor price list to enable straightforward reference of ordering information and products," said Andrew Ramage, Cherwell's Microbiology Product Specialist. "And if customers can't find exactly what they need, we'd like to hear from them as we frequently adapt to meet specific requirements, be it the media formulation, format, packaging or quantity. We are also very happy to provide rapid quotations and flexible delivery schedules."



The Redipor® prepared microbiological media range is available in a wide variety of formats.

Cherwell Laboratories Ltd
OX26 4XB BICESTER
Vereinigtes Königreich



Focus on Personalized Medicine

Trend Report Life Sciences

The healthcare market is booming: growing health awareness, specific prevention and healthy nutrition are just a few of the keywords here. Cross-sectoral concepts and specific nutritional supplements significantly contribute to the development of customized solutions for the areas of fitness, sports, wellness and healthcare. And in case of illness, increasingly individualized therapies are demanded.

With the decoding of the human genome nearly 20 years ago and the resulting previously unimaginable possibilities for personalized healing successes, such as vaccination against cancer, this trend was significantly accelerated.

Not infrequently, however, false hopes and expectations were and are still being raised. Depending on diagnosis and corresponding tests, administration of drugs is now indeed more optimized in terms of tolerability and effectiveness. However, therapeutic concepts often target patient subgroups. In a wide range of areas, research focuses on the development of novel diagnostic procedures and innovative drugs for tailor-made treatment approaches. Indi-

vidualized or so-called personalized treatment methods are being used successfully in tumor diagnostics and tumor therapy. Tissue diagnostics permits tumors and metastases to be precisely identified, allowing more accurate monitoring and opening perspectives for customized treatment. Various factors influence the development and progression of a disease, among these age and gender of the patients. Knowledge of genetic data may allow earlier and more accurate diagnosis, more effective prevention, and optimized treatment. This success is considered to be founded on modern biotechnology, which plays a key role not only in the medical field. Biotechnological bases are setting the course for novel developments in many sectors, such as synthetic biology and bio-based materials, but also for the food industry and agriculture, as well as for pharmaceutical research and point-of-care diagnostics.

Drug Discovery: Will biopharmaceuticals dominate the future?

As a supplement to traditionally synthesized active ingredients, biopharmaceuticals are becoming increasingly important due to their high specificity of activity. The expiring patent protection of so-called blockbusters furthermore opens up new market potentials. Today, efficient development of highly effective substances is possible only in state-of-the-art, high-tech laboratories with powerful automated device systems and high-throughput sequencing. Synthesis success depends crucially on high-resolution analytical methods and meaningful analytical results. This is how analytics drives drug development. Targeted investigations of drug interactions and drug-target binding would not be possible without automated procedures such as high-throughput screening. In order to meet the increasing demands and improve flexibility in the laboratory, the individual processes must also be optimized. Sophisticated laboratory concepts, automation of work steps, and intelligent device systems support the operators in their daily labora-

tory routine. Automation and digitization are not only aimed at increasing throughput, precision and quality in the laboratory; they also help to prevent sources of error and routine errors, ultimately increasing efficiency and reducing costs.

Personalized approaches appear promising in regenerative medicine as well. Gene therapies, tissue engineering and bioprinting create new vistas in tissue and organ research. Functional organ structures even allow novel in vivo treatments. Thanks to microfluidics, the functionality of physiologically active cells can already be studied on a chip.

There is no large-scale application yet, but the research potential is great. An abundance of genetic and biological processes still remain to be elucidated, molecular structures and switches to be deciphered, and mechanisms of gene expression understood, in order to successfully use further bespoke therapy concepts. The way there is going to be very research-intensive. Validation and implementation of disease-specific biomarkers also pose a challenge to scientists, not only from a regulatory perspective.

analytica: the meeting place for life Sciences and personalized medicine

Novel developments in biotechnology, genetic engineering and diagnostics, as well as high-performance analysis methods and high-throughput procedures, will drive innovation and challenges in the Life Sciences and especially in personalized medicine. The latest trends will be presented to the experts at the analytica 2018. The industrial fair comprehensively presents cutting-edge technologies and future-oriented methods. Internationally renowned specialists like Dr. Friedrich von Bohlen and Halbach, Managing Director and co-founder of dievini Hopp BioTech holding GmbH & Co KG, and global players will meet in Munich for an exchange of experience, where the expertise of the industry and the latest state of the art will be exemplarily demonstrated.



Dr. Friedrich von Bohlen und Halbach



Focus on Personalized Medicine

What future-oriented developments in the life Sciences are going to be presented at the analytica 2018?

From sample preparation techniques and liquid handling through single-use systems and disposables to the full gamut of instrumental analytics with appropriate linkage to mass spectrometry and imaging techniques – the trade fair visitors can get an idea of the developments. Methods in immunology and molecular biology, bioreactors, assays and chip technologies are trade fair highlights just as much as high-throughput screening, sequencing, and laboratory automation are. In a well-structured and comprehensive manner, practical system solutions are presented to the used that allow achieving shorter analysis and assay times, as well as better interpretation of the measurement results and central availability of meaningful data.

Next-generation technologies will provide new impetus in diagnostics as well as

in tissue and organ research. The goal is to enable previously unimaginable therapeutic approaches in general and vascular surgery, tumor therapy or even dermatology. How can this be achieved? The patient's immune system is to be directed to react specifically to the individual tumor. Endogenous repair mechanisms ought to be specifically activated. Faster diagnoses and better therapies are expected to increase treatment successes in medicine and make therapy more reliable.

Data as a driver of personalized medicine

Computer-aided drug design and next-generation ultra-high-throughput sequencing methods quickly generate massive amounts of data. Meaningful evaluations and sustainable interpretations, rational data handling and the need for archiving and storage of sample materials, raw data and results, as required by applicable laws and established standards, pose particular

challenges for researchers. In the laboratory of the future, apart from the “actual” research project the focus will be on fast data availability, a significant increase in efficiency and safety. Here, biobanks and peptide libraries are indispensable tools, especially against the background of increasing digitization. According to Tom Hudson, the director of the Ontario Institute for Cancer Research, this development has long been overdue, as he explains in an interview with the Süddeutsche Zeitung about the decoding of the human genome: „If I could turn the clock back to the year 2001, I would invest much more into the development of databases with detailed case histories and long-term observations.”

31.03. - 03.04.2020: analytica, Munich (D)

Messe München GmbH
D 81823 München

New Bosch processing system for the flexible production of injection solutions

Digital connection with filling machine

- SVP250 LF processing system minimizes product loss thanks to conical vessel shape
- Seamless connection with ALF 5000 filling and closing machine for vials and ampoules ensures rapid processing
- Connection between preparation system and filling machine enables optimal production planning

11th - 15th June 2018:ACHEMA, Frankfurt am Main (D)

At Achema 2018, Bosch presents its new flexible processing system for an economic production of injection solutions. Above all, the system is characterized by its modular design. “Depending on customer preferences, the design allows the system to be expanded with additional process vessels, and modules to be flexibly exchanged,” explains Dr. John Medina, sales director at the Bosch subsidiary Pharmatec, who was involved in designing the SVP250 LF. The seamless transport of the product from the processing machine to the ALF filling machine can be tracked using a LED visualization. Further, Bosch shows how data from the processing and filling machines is fed into a single system and visually displayed in an Industry 4.0 application.

Processing system with modular design

The SVP250 LF processing system on display is designed for injection solutions (Small Volume Parenterals, SVPs) with small batches ranging from 15 to 250 liters. The system includes both a preparation and a storage vessel. Depending on the desired volume, these process vessels can be expanded to four each, in a range of different sizes. “Moreover, the vessel's conical shape minimizes product loss during the emptying process. Given the costly materials the system handles, that translates into a concrete financial benefit,” says Medina.

The preconfigured architecture allows processing modules to be easily and flexibly installed or exchanged, for instance for different temperature-control concepts or the feeding of different media like powders, liquids or gases. Liquid ingredients are automatically dosed by a pump. Since the process vessels are equipped with a gassing module for nitrogen, production can also take place

New Bosch processing system for the flexible production of injection solutions

under low-oxygen conditions.

Complete separation of technical and cleanroom area

The system features a module for two-stage sterile filtration for aseptic preparation, which is situated between the preparation vessel and storage vessel. It is also equipped with an optional laminar flow hood, which generates a low-turbulence air flow to prevent particles from entering the filling area. An integrated cleanroom wall completely separates the process vessels from the system's technical area. As a result, the cleanroom area is compact and easily accessible. Between production batches, an integrated CIP module cleans and sterilizes the system. For applications involving highly potent APIs, a containment flap is used, which also allows aseptic processing.



Processing system SVP250 for the production of injection solutions: The new Bosch SVP250 LF processing system is designed for small batches ranging from 15 to 250 liters. The system includes both a preparation and a storage vessel. (Picture: Bosch)



Bosch ALF 5000 for a maximum of flexibility: In the combi configuration, the ALF 5000 filling and closing machine not only processes ampoules but also injection bottles. (Picture: Bosch)

In line: communication between processing and filling machines

As a special highlight, visitors to the trade fair can expect to see a sample line configuration consisting of an SVP preparation system and ALF 5000 filling and closing machine. "The liquid product is directly transported from the storage tank to the filling machine," says Medina. "We have developed preconfigured concepts that ensure even special products like suspensions can be safely transferred with minimal product loss." The ALF 5000 continues to process the fluid immediately.

"Production on the processing system is already digitally controlled, as a higher-level control system communicates with the preparation system and monitors the entire process," says Medina. "The processing and filling machines exchange information through their HMIs, allowing them to coordinate each batch." In addition, data on the machine status or process parameters from both systems can be recorded, stored and visualized, which leads to improved transparency in production and shorter response times. The primary goals are optimal production planning and maximum capacity utilization.

Filling system for high process reliability

In addition to its suitability for Industry 4.0 applications, the ALF 5000 filling and closing machine delivers a high degree of process reliability and flexibility. In the combi configuration, the machine not only processes ampoules but also injection bottles. It can be equipped with all standard filling systems and four, six, eight, ten or twelve filling heads. A carrying walking beam system can be used for especially gentle handling. Here, the glass containers are lifted slightly so as to ensure they are not damaged by rubbing along the machine guides. Without sacrificing product quality, the ALF 5000 delivers output rates of up to 600 containers per minute.

As Tobias Goettler, product manager at Bosch Packaging Technology, explains, "The machine can be variably integrated into existing production processes and, just like the processing system, can be flexibly adapted to meet specific customer needs." According to Bosch's pharmaceuticals line competence, the system can easily be combined with upstream or downstream machines. Customers who order both their preparation and filling machines from Bosch receive a coherent overall concept and a number of further advantages: during project implementation, Bosch attends to the complete coordination of interfaces between systems, which fosters efficient planning and smooth processes. During the design phase, Bosch can already offer solutions to concerns like cross-contamination and sterile connections, together with uniform documentation and system qualification.



Robert Bosch Packaging Technology GmbH
Stuttgarter Straße 130
D 71332 Waiblingen
Telefon: +49 711 811 0 Telefax: +49 711 81158509
E-Mail: packaging@bosch.com
Internet: <http://www.boschpackaging.com>



Flexible and secure packaging solutions for the pharmaceutical industry



MULTIVAC at ACHEMA 2018 in Frankfurt (Hall 3.1, Stand C47)

At this year's ACHEMA, which takes place from 11 to 15 June in Frankfurt, MULTIVAC will be presenting integrated solutions for packing medical and pharmaceutical products, as well as demonstrating its comprehensive expertise in automation. The focus will be on the automatic infeed and packing of sensitive products, as well as packaging solutions for small batches and for labelling and identifying products during the packaging procedure.

**11th - 15th June 2018: ACHEMA,
Frankfurt am Main (D)**

The highlights of the trade fair will include a thermoforming packaging machine in GMP design with a single-side chain guide for packing syringes. The machine is equipped with an automatic syringe infeed, which ensures that up to 300 prefilled glass or plastic syringes per minute can be transported and monitored with great process reliability. The special infeed system ensures that the sensitive products

are gently separated and orientated, before being loaded into the pack cavities. The system's high level of flexibility enables different types of products and pack sizes to be handled reliably. Fast and reproducible conversion of the thermoforming packaging machine is achieved through special die changing systems and the use of a complete cutting tool, which can be changed easily and quickly. The proven chain guide on the thermoforming packaging machine ensures that there is simple line clearance.

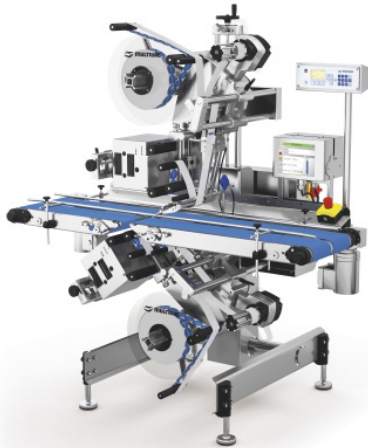
The monitored web advance contributes to a low level of start-up loss after batch changes for example. The function for running the machine empty is also designed to be very simple. This means that this concept is particularly well-suited to small product series and frequent batch changes. At the trade fair a special design with a single-side chain guide will be shown, which enables rigid film in various web widths to be used very flexibly.

As regards the traysealer sector, MUL-



Flexible and secure packaging solutions for the pharmaceutical industry

TIVAC will be showing the semi-automatic T 260, which is specially designed for packing sensitive products in small batches. The compact model, which is mobile and can therefore be used very flexibly, is suitable for running a wide spectrum of trays. The T 260 offers companies packing small to medium-sized batches a high degree of



process reliability, reproducibility and above all flexibility. The sealing die provides controlled sealing pressure and precise temperature distribution, so that a reproducible packaging procedure is assured.

MULTIVAC will also be presenting the C 300 TC chamber machine from its wide range of chamber machine products. This model enables pharmaceutical products and sterile medical items 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.

Using the example of the L 300 conveyor belt labeller, which can be used very flexibly, MULTIVAC will also be showing at ACHEMA, how packs containing pharmaceutical and medical products can be labelled reliably and very efficiently. This model

applies labels to the top and bottom of packs as well as over the edge of the pack, and it can therefore be used for all standard labelling tasks. Thanks to its own MC 08 machine control, this model can not only be used in a packaging line but also as a stand-alone labelling solution.

In the sector of inspection solutions, the I 410 for visual inspection tasks will be presented at the trade fair. The areas of application for the I 410 range from completeness checks on the packs, through presence and position inspection of the labels, and right up to checking the print - and this includes pattern and character recognition, character verification and inspection of legibility and codes. Thanks to the high-resolution line scanner and powerful image processing for both top and bottom scanning, it performs highly reliable inspection of pack quality and labelling.

MULTIVAC Sepp Haggenmüller GmbH & Co. KG
D 87787 Wolfertschwenden

New Bosch GKF 720 capsule filling machine ensures the highest safety

High containment for highly potent pharmaceuticals

- Best practice high containment solution meets OEB5 requirements
- Height-adjustable pellet station and new, highly automated weight control processes
- Interchangeable modules ensure maximum flexibility

11th - 15th June 2018: ACHEMA,
Frankfurt am Main (D)

At Achema 2018, Bosch Packaging Technology presents a fast high-precision capsule filling machine for small batches. Thanks to the specially designed platform for a fully automated washable containment process, the new GKF 720 ensures efficient and resource-saving processing for all types of hard capsules. "The system has been specially tailored to the demands of manufacturers of highly potent solid pharmaceuticals," says Benedict Kleine-Koenig, product manager at Bosch Packaging Technology. "During the development, the focus was on satisfying their high safety requirements, as well as process precision

and stability. The OEB5 containment ensures the highest protection for the operator, machine and product, while its minimal water requirements, 100% defective capsule detection and compact design translate into additional cost savings." Building on many years of experience with the 702 ProTect and 1700 HiProTect series, the GKF 720 completes the Bosch containment portfolio with an output of 720 capsules per minute.

Washable containment with minimal water consumption

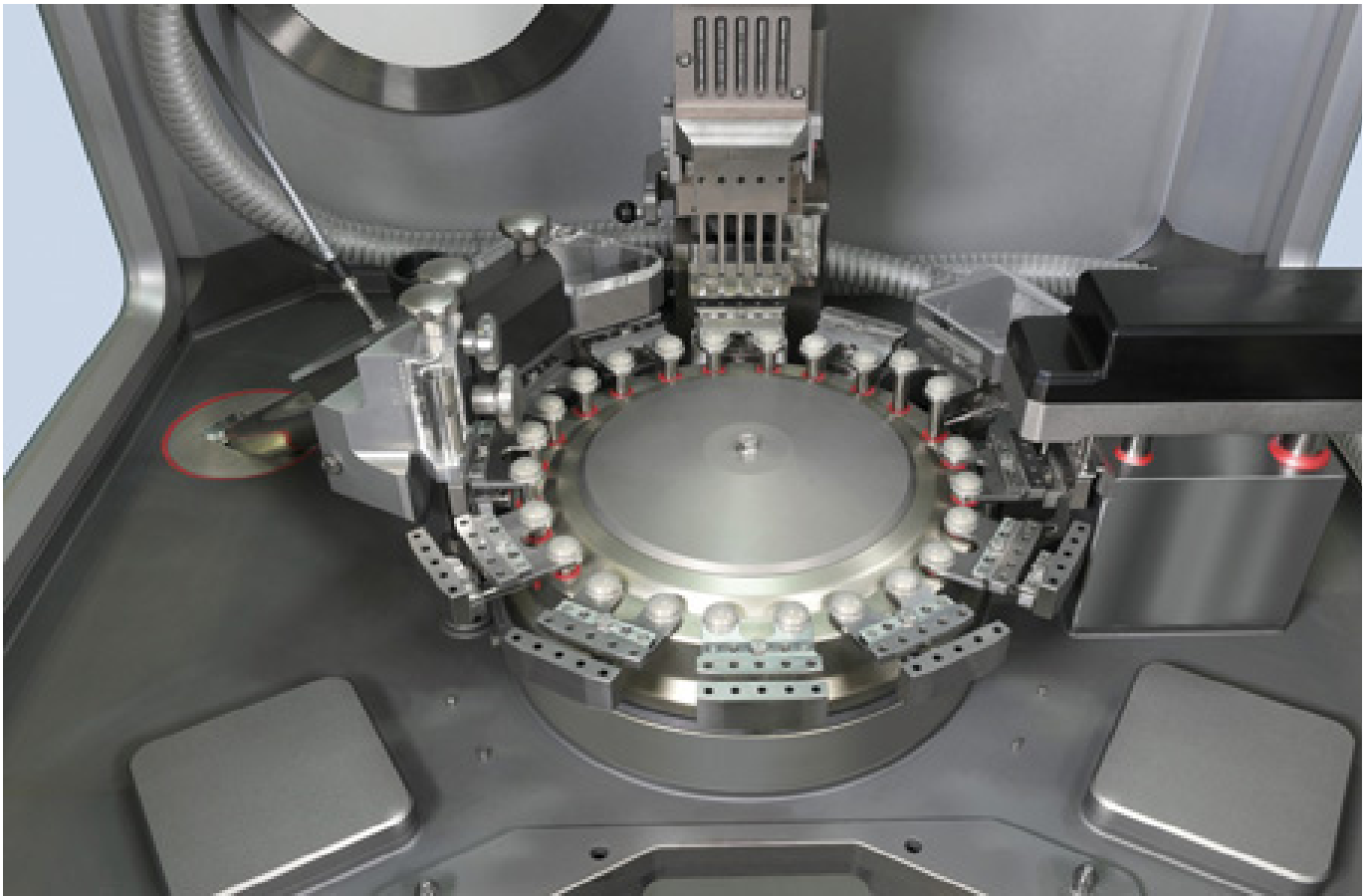
In the first cleaning stage of the GKF 720, the components that come into contact with the product are automatically cleaned from above with 200 milliliters of water,

binding the highly potent residual dust. In the second stage, the processing area is manually flushed with ten liters of water maximum, quickly and completely ridding it of any product residue. The specially designed tabletop and the new dosing stations make sure that no water penetrates the machine room during cleaning. "Thanks to the reduced water consumption, the machine can be operated independently from the customer's water system without a separate water connection," explains Kleine-Koenig.

Integrated 100% weight control for pellets and micro-dosed powders

The GKF 720 is designed for processing powders, pellets and tablets. For

New Bosch GKF 720 capsule filling machine ensures the highest safety



GKF 720 capsule filling machine for washable containment: The specially designed tabletop and the new dosing stations of the GKF 720 make sure that no water penetrates the machine room during cleaning. (Picture: Bosch)

pellets and micro-dosed powders in particular, it features a patented, automatic height-adjusting pellet station and a manually height-adjustable dosing disk. Together with the Net Weight Detection System (NWDS) and the integrated gravi-

metric checkweigher, these features allow consistent in-process control (IPC). The regular adjustment of dosed amounts via IPC ensures a stable, capacitive measuring process throughout the production cycle. "Depending on the product properties, the NWDS can achieve and constantly maintain a high measurement capacity - with a relative standard deviation of less than one percent," says Kleine-Koenig.

Highly modular for quick product changes

The GKF 720 is equipped with an extremely flexible plug-and-play station, which supports rapid switching, for instance from pellets to powders. "For our customers, the growing trend toward dosing different solids in small batches of capsules means frequent product changeovers at relatively short intervals," says Kleine-Koenig. "The machine's modular design offers them the highest possible flexibility: the system can be converted in less than five minutes. Moreover, the exchange of the modules is so simple and failsafe that even an inexperienced operator can do it."

Extended service portfolio supports with process optimizations

Customers can also take advantage of an extended range of services for the GKF 720. In addition to operator training and the proven after-sales services, Bosch also offers an Engineering Pharmaceutical Service (EPS) for process optimization. Here, Bosch experts share their extensive product expertise, for example in dosing difficult products.



GKF 720 ensures the highest safety: The OEB5 containment of the new Bosch capsule filling machine GKF 720 ensures the highest protection for the operator, machine and product. (Picture: Bosch)



Robert Bosch Packaging Technology GmbH
Stuttgarter Straße 130
D 71332 Waiblingen
Telefon: +49 711 811 0
Telefax: +49 711 81158509
E-Mail: packaging@bosch.com
Internet: <http://www.boschpackaging.com>

Room Sensors Become Digital



The EE10 room sensors from E+E Elektronik measure accurately the relative humidity and temperature in commercial and residential buildings. Besides existing versions with analogue outputs, the devices are now also available with Modbus RTU or BACnet interface, which facilitates integration into modern climate control systems. The functional enclosure allows for fast and easy installation.

The EE10 room sensors family includes models for humidity and temperature measurement as well as for temperature measurement only. Featuring analogue (current/voltage) or digital (Modbus RTU / BACnet) outputs, EE10 is particularly versatile.

Digital EE10 devices calculate additional physical quantities such as absolute humidity, mixing ratio, enthalpy, frost point tem-

perature and water vapor partial pressure. The analogue models are optionally available with a passive temperature output.

The stylish, functional enclosure offers significant advantages during installation. The back cover with the screw terminals can be mounted and wired first. At a later moment, the front cover containing all measuring electronics simply snaps onto the back cover. This way the electronics is never exposed to construction site pollution. The active part of the device can also be replaced in just a few seconds without tools, while the wiring remains intact.

The EE10 sensors are available in two sizes (EU and US standard) and in three different colours. The measured data can be read directly on the optional LC display.

The EE10 room sensors are now also available with a Modbus RTU or BACnet interface.

(Photo: E+E Elektronik Ges.m.b.H.)



E+E Elektronik GmbH

Langwiesen 7 A 4209 Engerwitzdorf

Telefon: +43 7235 605 0 Telefax: +43 7235 6058

E-Mail: info@epluse.at Internet: <http://www.epluse.com>

Reliable even at high operating pressures

The GEMÜ 790 ball valve series stands out thanks to its compact yet robust design. At the same time, it is suitable for use up to a pressure rating of PN125.

Ball valves can be used in a wide variety of applications in industrial processes, and in water supply and water treatment systems in particular. One of the most efficient filtration procedures in water treatment is reverse osmosis. During this procedure, the unclean water is pressed through a semi-permeable diaphragm at high pressure. This filters unwanted substances out of the water. The differing electrolyte loads of the raw water fundamentally determine the treatment process with regard to the water quality that must be achieved. The higher the concentration of electrolytes, the higher the pressure must be in the system. Thus, the operating pressure range for ball valves in industrial waste water treatment, for example, is 60 to 70 bar; by contrast, it is between 60 to 80 bar for sea water. A ball valve which is installed in the raw water supply or clean water drain outlet must be able to sustain these demanding operating parameters in order to ensure a safe process sequence.

High operational safety due to low maintenance engineering

The highly polished and precisely manufactured GEMÜ 790 series ball fits snugly and air-tightly into the internal seal contour. A discharge slit in the seal ensures pressure relief in the valve flow. This not only reduces the seat wear but also lowers the actuating torque required to rotate the ball. This enables both cost-effective and energy-efficient system operation. The additional pressure relief hole in the ball enables pressure compensation, preventing a potential failure due to an internal build-up of pressure. Blow-out protection in the shaft ensures maximum operational safety. The antistatic device provides a permanently conductive connection between the ball and the shaft. A tongue-and-groove-style connection between the shaft and the valve body enables full earthing of the ball valve during installation in the system. This also ensures that it is safe for use in ATEX areas.



The stainless steel ball valves of the GEMÜ 790 series are designed to enable quick and easy servicing of internal wearing parts at all times. The generous valve neck extension has a top flange in accordance with EN ISO 5211. This standardized interface enables the user to fit the ball valve with various different actuators. The solid design of the body with an additional enclosed body seal enables use at pressures up to 137 bar as well as in vacuum applications. Depending on customer requirements, the ball valves are available with full or with reduced through flow.

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
D 74653 Ingelfingen

REFCOLD INDIA 2018 on November 22 – 24, to set all new standards for Cold Chain Industry business

Come November 2018, the Refrigeration & Cold Chain industry in India would witness a pristine scale and focus of bringing together the best of technology and business. The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) and NürnbergMesse India have launched a brand new exhibit for the Refrigeration & Cold Chain industry and it is called REFCOLD INDIA.

REFCOLD INDIA will be one-of-its-kind exhibit whose sole objective would be to ensure a well-rounded growth of the Refrigeration & Cold Chain industry in India. There would be augmentation in business, innovations, technology and sustenance.

The event, in effect, would be an endeavor to cover all the varied sections of the refrigeration & cold chain industry and bring together the vast base of business prospects under one roof. It will also be the arena for the global investment community to connect with stakeholders in Refrigeration & Cold Chain sector in India.

REFCOLD INDIA would mark its debut on November 22, 2018. It would be a three-day event that will close on November 24, 2018. The venue, Mahatma Mandir Convention Cum Exhibition Centre in Gandhinagar, Gujarat, is aptly chosen for its size, grandeur, technological preparedness and the distinct character reflecting the prosperity of Gujarat. All details with regards to the event can be looked up on the live website: www.refcoldindia.com

A hugely successful launch indicates an equally positive debut

REFCOLD INDIA got launched on January 10 at The Hyatt Regency in Ahmedabad and got an impressive turnout of over 300 professionals and veterans from the industry. The launch show generated a very encouraging response, with industry leaders confirming their partnership. Some of the allies already on board are: Carrier Commercials as the Curtain Raiser Partner, Emerson as the Awards Night Partner, Natural Storage Solutions Pvt. Ltd. as the Cold Chain Solutions Partner, Volga Freeze as the Gold Partner.

Confirming the above associations, Mr. Pankaj Dharkar, Chairman of REFCOLD INDIA excitedly mentioned, “We are thrilled to have finally launched REFCOLD INDIA. The Refrigeration & Cold Chain industry in India needed a symposium where the focus would lie solely on this sector. From its debut year itself, REFCOLD INDIA would cover all aspects of the industry, which mainly are – the resources (cold chain services), the process (cold transportation & equipment) and the products (cold storage & equipment). I welcome all associates, partners, visitors and media to this promising platform and I am confident that it would help us take the industry to the next level of knowledge and business exchange”.



22nd - 24th November 2018: REFCOLD INDIA, Gandhinagar, Gujarat (Indien)

In global terms also, the Cold Chain Industry in India is developing at a much faster pace, owing to the general change in the business outlook. While earlier, the focus at all times would be on increasing the production level, the market now is concerned about optimizations in terms of better storage and transportation facilities for their respective commodities. Hence, Cold Chain management has now become an integral part of the supply chain industry comprising of refrigerated storage and refrigerated transportation. This makes it essential for all businesses to invest in infrastructure that should help reduce wastage. With this promise and prospect, the cold chain industry in India is forecasted to grow at a CAGR of 19% during the period of 2017-2022.

“As a country, India is much ready for a consortium of this level which shall be the launch-pad for potential business-enabling collaborations, as well as the live resource pool and aggregation of Cold Chain products, services and solutions”, Mr. Vishal Kapur, ISHRAE National President expressed his enthusiasm with this event. “I am absolutely convinced that REFCOLD INDIA in November 2018 will be a greatly successful show that would leave a mark on the Refrigeration & Cold Chain market in India”, said Mr. Kapur.

The Indian Edge – Some facts

- Second largest arable land in the world
- Largest producer of milk & second largest producer of fruits and vegetables
- Largest livestock population
- Rising consumption expenditure
- Strategic geographic location in terms of exporting processed foods
- Favorable government policies to boost the cold chain industry
- The state's focus to increase the export produce and reduce wastage

Also present at the event, Ms. Sonia Prashar, Chairperson of the Board & Managing Director of NuernbergMesse India Pvt. Ltd. mentioned, “There would be representation and participation from all possible arteries of the industry. We are anticipating a great response across the food industry, trading and distribution sectors, transportation lines, storage companies, shipping and ports, pharmaceuticals, hospitality, horticulture departments and the whole range of researchers and innovators. We strive to achieve this and mark a successful debut as we collaborate efforts with regards to planning, implementation, marketing and value creation for our exhibitors and visitors alike. I urge everyone to follow this event and participate with full force.”

Arburg: Around 40 experts attend the Freeformer User Day 2018



- Expert conference in Lossburg: Exchange of experiences with Arburg Plastic Freeforming (APF)
- Freeformer: Participants from Europe learn about technical progress
- Focus: New materials and their qualification in theory and practice

Around 40 experts in additive manufacturing from Germany, France, the UK and Switzerland came to Lossburg on April 10 for the Freeformer User Day 2018, which was held at Arburg's German headquarters. The focus was on the exchange of experience in the field of Arburg Plastic Freeforming (APF) with the Freeformer. Arburg's APF experts first explained new hardware and software features and offered tips on additive manufacturing with the open system, before the participants split into groups to examine the finer points of material qualification for themselves in the afternoon.

„We have achieved a great deal in the past few months and are pleased to present further major advances in Arburg Plastic Freeforming today,“ said Eberhard Lutz, Director of Freeformer Sales at Arburg, welcoming around 40 participants to the Freeformer User Day 2018.

Advances in Arburg Plastic Freeforming

In four specialist presentations, the APF experts explained the progress they have made in industrial additive manufacturing with the Freeformer. Thus, for example, the updated slicing software, now available to all Freeformer customers free of charge as an update, was introduced. Interesting innovations include the „smart“ automatic generation of a support structure adapted to the part, a filling speed adapted to the line length, a pressure-regulated strategy to improve the adhesion of the first layer to the base plate and many more features. Moreover, there is a redesigned, more user-friendly Freeformer control system interface, as well as optimised support structures and new or revised material profiles. Overall, the improvements lead to a very high level of process stability and part quality. „We can already provide standard profiles for a number of materials, which can be used to produce functional components that have 100 percent the same mechanical properties as injection-moulded parts in the horizontal build orientation,“ explained Dr Agnes Kloke, Plastic Freeforming Technology Develop-

ment at Arburg. The open system will of course continue to support the customer-specific adaptation of process parameters according to requirements.

Material qualification in practice

After the participants had received a theoretical introduction to material qualification and the current range of materials, the next step was to put what they had learned into practice. For this purpose, the guests worked together with the APF experts in five workshops. The task was to prepare the machine and materials, determine the optimum temperature and droplet geometry and then additively manufacture and analyse test parts. During these activities, there was ample opportunity for the participants to discuss their own tasks and challenges.

As part of the final discussions to round off the successful User Day, Dr Eberhard Duffner, Director Development and Plastic Freeforming, provided insights on the innovations that his development team is currently working on. The participants were highly impressed with the current and planned further developments in hardware and software and took away a host of tips and recommendations for achieving even better results with the Freeformer in the future.

ARBURG GmbH + Co KG D 72290 Loßburg



Patric Kaisers and other APF experts presented the latest further developments at the Freeformer User Day 2018. They have, for example, made a significant step forward with the new update to the slicing software. (Photo: Arburg)



The theory was followed by a practical demonstration: five Freeformers in the Arburg Customer Center (photo), Prototyping Center and in the clean room offered the participants at the Freeformer User Day 2018 ample opportunity to qualify materials and exchange experiences. (Photo: Arburg)

Increasing part quality and time efficiency via Autonomous Optimization



New SIGMASOFT® technology brings injection molding simulation to the next step

In 2018 SIGMA Engineering exhibits for the first time at Plast show with their own booth. During the show it presents its SIGMASOFT® Virtual Molding technology and the new Autonomous Optimization to the Italian market. The Autonomous Optimization brings out a completely new simulation approach to optimize plastic and rubber applications.

At Plast 2018, taking place between May 29th and June 1st, 2018, in Milan, Italy, SIGMA Engineering GbmH, Germany, showcases its SIGMASOFT® Virtual Molding technology for plastic and rubber applications in hall 11 at booth A167. SIGMA is exhibiting for the first time with its own booth, thus deepening its commitment to the Italian market and strengthening the relationship with local customers.

During the show Italian molders have the opportunity to learn first-hand about the capabilities of SIGMASOFT® Virtual Molding and the Autonomous Optimization technology and their benefits for the daily work of injection molders. SIGMASOFT® Virtual Molding converts the computer into a virtual injection molding machine, on which the part, mold and process can be developed and evaluated without wasting resources. Additionally, the real injection machine is available for production and not occupied with trial-and-error.

In a present where molding applications need to be up to very high standards regarding part quality as well as time and cost efficiency, SIGMASOFT® Virtual Molding can be the ideal assistant in finding the optimal solution for a specific problem. Until now, the simulated injection molding partly consisted of trial-and-error, just as the process in reality does as well. The user needed to provide material and geometry data and configure the process data to get a result for this one defined input combination (Fig. 1). Especially

if the optimal solution consists of an unusual parameter combination, it may be unlikely or very time-consuming to find this set-up via trial-and-error.

This is where the new Autonomous Optimization comes into play. Instead of testing different approaches, the definition of a certain objective, e.g. minimal warpage, and the possible variances of material, geometry and process variables forms a sufficient basis for the software to find the ideal parameters leading directly to the desired goal. Therefore, this new technology completely reverses the traditional approach by starting from the former goal (Fig. 2), is able to autonomously calculate the optimal process set-up and the user can also determine the process window for production after just one calculation run. This does not only save much effort and time but also simplifies the discovery of innovative approaches which can greatly increase the part quality.

29th May - 01st June 2018: plast 2018, Mailand (I)

SIGMA Engineering GmbH
D 52072 Aachen



Figure 1 - With conventional approaches for injection molding simulation the user provides a combination of geometries, materials and process set-up and receives a result for this specific point inside the process window.



Figure 2 - In the Autonomous Optimization technology the user defines which specifics he wants to optimize for his part and process, afterwards the software provides the ideal set-up to reach this optimum.



Endress+Hauser innovators were honored this year during the Innovators' Meeting held in Denzlingen near Freiburg, Germany.

Innovation spirit remains at a high level

Endress+Hauser Group filed 261 patents in 2017

Endress+Hauser submitted 261 patent applications in 2017. The company owns a total of 7,479 active property rights around the world. Innovators are honored at the Group's annual Innovators' Meeting.

In 2017 the Endress+Hauser Group once again invested more than seven percent of sales in research and development. "With 261 patent filings, as well as 467 approved patents, we are innovating at a high level again this year," says Angelika Andres, head of the patent law department at Endress+Hauser. Many of the developments stemmed from liquid analysis, level and flow measurement technologies.

"In order to strengthen the Group's position in this competitive environment, we protect our innovations with patents in the very early stages," says Dr Andreas Mayr, Corporate Director Marketing and Technology at Endress+Hauser. 2017 saw several new innovations, as Endress+Hauser introduced 57 new products to the market, including the self-calibrating iTHERM TrustSens thermometer and the Promass Q, which delivers highly precise mass flow, volume flow and density measurements.

Strengthening the spirit of innovation

Apart from the extensive research and development activities,

close cooperation with select universities and research institutes is another factor that helps the Endress+Hauser Group maintain a high level of innovation. The company also established a sensor automation lab on the campus of the University of Freiburg, Germany, where a team of scientists, researchers and developers will be tasked with creating innovative sensor technologies for the Group.

Annual recognition

Endress+Hauser, a provider of measurement and automation technology, has traditionally placed a high value on research and development. Employees who make significant contributions to a patent filing are invited to an annual Innovators' Meeting. Patents with particularly high business impact are recognized with special awards. This year's event was held in mid-April in Denzlingen near Freiburg, Germany.

Endress+Hauser AG
CH 4153 Reinach BL 1

Impressum:

cleanroom online / W.A. Schuster GmbH · Mozartstrasse 45 · D 70180 Stuttgart · Tel. +49 711 9 64 03 50 · Fax +49 711 9 64 03 66
info@reinraum.de · www.cleanroom-online.de · GF Dipl.-Designer Reinhold Schuster · Stgt, HRB 14111 · VAT DE 147811997

Original texts and images

The contributions mentioned by name are the responsibility of the particular author. Reprinting, also of extracts, are permitted only with the approval of the editor and with reference to the source. The publisher does not accept any responsibility for unsolicited manuscripts and illustrations. The publisher is granted the exclusive, spatial, temporal and contentual limited right to freely use the article in unchanged or edited form for all purposes as often as desired or to transfer it to third parties for use. This right of use relates to print and electric media (Internet, databases, data carriers of all kinds).