



How particle simulation will change process engineering for the long term

From the perspective of climate and environmental protection, or simply looking after resources in general, customers are increasingly asking whether the products they acquire have a sustainable life cycle. Since the Covid-19 crisis, critical discussion is also focusing on the supply chains. These are all good reasons for businesses to think carefully about the overall life cycle of their products in the future. They must consider not only the economic aspects but also environmental and social demands as a priority. The use of advanced simulation processes can contribute to more sustainable production, and this is one of the themes for the POWTECH Special Edition from 30 September to 1 October 2020. The Special Edition, adapted as a consequence of the global Covid-19 pandemic, focuses this year on knowledge sharing, including the area of simulation.

30th September - 01st October 2020: POWTECH 2020, Nuremberg (D)



In many sectors of industry, simulation is now considered a standard tool in product development and optimization. The finite element method (FEM) is routinely used to test the structural mechanics of components. Simulation provides important insights into the development process, and in many cases it has substantially reduced the development time for new products.

The situation with process engineering is quite different. The only routine solution in this area to date has been to optimize turbomachinery using computational flow dynamics (CFD). Now, the discrete element method (DEM) offers suitable state-of-the-art tools to simulate particle flows and mechanical process workflows. Dr Jorge Carregal Ferreira, head of the Rocky DEM unit at the Grafing office of CADFEM GmbH, an exhibitor at POWTECH, describes this in detail: "Physical simulation has previously been used only to a limited degree, if at all, in mechanical process engineering to date. Reliance is ge-

nerally placed on experience or on lab tests. But the limit is regularly reached when scaling up from test benches in the lab to large-scale plant intended for manufacturing, or when transferring from a familiar production plant to a new facility. In these areas, simulation lets us understand the key influences and make the right decisions regarding process parameters. The result is significant cost savings, since the risk of having to readjust the production plant is reduced. It is also possible to perform parameter studies, sensitivity analyses and optimization processes to establish the right process parameters."

Individually simulating millions of particles

Sustainable manufacturing therefore demands a sound understanding of the physical effects of the individual processes, or "unit operations", which add up to form the overall process. Here, too, physical simulation can lead

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to important insights and improve the manufacturing process. Mechanical process engineering is very strongly characterized by particle and material flows. Materials and bulk solids are crushed, transported, classified, mixed, separated and treated. Entire components are transported, sorted, treated and further processed. "Using the discrete element method (DEM), we can simulate these processes, and understand and optimize them," comments Dr Ferreira. "This takes account of the movements and contacts between all the particles. With a very large number of particles, often more than a million, this calls for suitably powerful hardware. Using GPU (graphics processing unit) technology, the DEM now lets us simulate a much larger number of particles and the actual particle shape."

Optimizing plants with particle simulation – from quarries to tablet production

Quality control in mixing processes is based on the quality of the mixture and throughput performance. In practice, measuring mixture quality is very difficult, since the plant must be stopped, and access allows for only a limited test sample. "This is where the DEM simulation helps to make the process transparent, since we can determine the quantitative mix quality at any time and at any location using the right statistical analysis. We can then determine the impact of the influencing parameters and input values, which will enable us to recommend the ideal operating parameters."

In the pharmaceutical industry, tablet coating is an important element in the tablet production process. Although the tablet contains the expensive active ingredient, for reasons of customer acceptance the coloured surfaces must be produced with a high level of accuracy

and no trace of damage. These coating processes are therefore crucial, since even a small number of tablets with damaged edges must be disposed of as waste, which incurs high costs. With DEM simulation it is possible to arrange the upscaling and process parameters to keep waste to a minimum.

"We assume that DEM simulation will become a standard tool in mechanical process engineering in the next three to five years," Ferreira sums up. "That is comparable with the situation in mechanical engineering, in which the finite element method has grown to become a standard tool in the past 15 years and is now used on a routine basis. And just like the situation with mechanical engineering, simulation will result in significant changes in process engineering."

POWTECH 2020 Special Edition: Safe Networking

The latest developments in simulation will also play a part at the POWTECH 2020 Special Edition – both in the trade forums and for the exhibitors. Following the global impacts of the coronavirus pandemic, this year's edition has a particular focus on knowledge sharing. At the heart of the POWTECH Special Edition are the trade forums, which will be held in two exhibition halls with due observance of all safety regulations. The accompanying exhibition will give all exhibitors the opportunity to present their innovations in an efficient and appealing manner. Predefined stand designs and spacious meeting areas will guarantee the observance of all hygiene and safety regulations. Following the event, parts of the programme will be made available online for participants.

NürnbergMesse GmbH D 90471 Nürnberg



August 2020

Dear subscribers,

the holding of trade fairs and other events is still restricted by legal regulations and official requirements. Movies can be a suitable means of filling the gap in company and product presentation.

A video can convincingly show what a product looks like, how it works, what advantages it has. A film can show applications and experiments, can teach learning contents and bring situations and moods closer. A movie can be factual or emotional and can promote the image.

At this point I would like to point out again that on www.reinraum.de a film can be „uploaded“ for each article in addition to the images.

Use this opportunity to strengthen the effect of your contributions!

If you have any questions about the „upload“ please contact me.

In the current newsletter you will find among others the following articles:

- > **How particle simulation will change process engineering for the long term**
- > **Artificial Intelligence for Medical Technology**
- > **ISO 45001: Global occupational safety and health are important to Gerresheimer**
- > **Cleanzone Award: Great ideas in the spotlight**
- > **Employee-focused workplaces increase productivity**


Yours sincerely
Reinhold Schuster

New MET ONE 3400+ Air Particle Counter automates routine environmental monitoring for GMP cleanroom compliance

Integrated electronic SOPs and maps are “all in the box” to help reduce errors

Beckman Coulter Life Sciences announced today that the MET ONE 3400+ portable air particle counter is now available to help GMP cleanroom users simplify their routine environmental monitoring and improve data integrity.

Lighter and “whisper-quiet,” the new instrument enables users to import their Standard Operating Procedure (SOP) routine environmental monitoring maps and sampling configurations into the counter itself. This helps reduce human error, which can improve data integrity. All electronic records inside the counter are reviewed and approved—using electronic signatures—via a web browser, then exported via Ethernet. In addition, Administrators can remotely manage SOP version control using a web browser.

“Because everything is ‘in the box,’ managing even the most complex SOPs can be greatly simplified,” says Senior Product Manager Carter Moursund. “Using a web-browser interface, our customers can customize their electronic SOPs and maps, and change or update them quickly and easily. Plus, thanks to a new ‘plug-n-play’ networking feature, all SOP modifications are automatically replicated on all counters the customer is using.

“What’s more,” he continues, “interactive, on-screen tracking in-



The new MET ONE 3400+ portable air particle counter is now available to help GMP cleanroom users simplify their routine environmental monitoring and improve data integrity.

stantly shows on-site users which locations have been sampled so they can monitor their progress at a glance.”

After on-site monitoring professionals “sign” sampling reports via their electronic signature, reports can be exported in a secure electronic format to the customer’s network or to a USB device. Thus, the MET ONE 3400+ supports compliance with the FDA’s 21 CFR Part 11 regulation, and it can help make data access fast and efficient during audits required to maintain GMP manufacturing status.

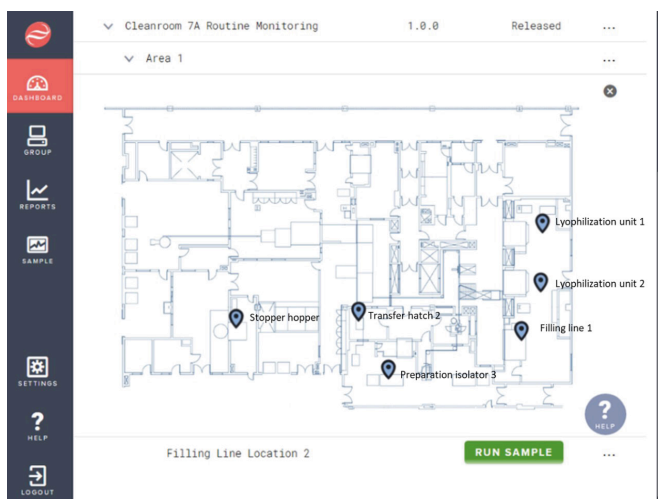
In addition, facility managers can always review their environmental monitoring data, including all sample results and alarms, via secure web access. No external software is required to use a fleet of MET ONE 3400+ counters.

“We’re serious about ensuring data security and integrity,” Moursund says. “All data produced by the instrument is encrypted, and users are never permitted to delete sampling records for any reason.

“And we’re just as serious about making the new 3400+ model even more user-friendly,” he adds. “We designed it to be lighter so it’s easier to carry from location to location. The 10-inch touchscreen is highly sensitive so data entry can be trouble-free even when users are double-gloved. And an optional barcode reader can further expedite data entry and minimize potential errors.”

Cleaning the instrument is faster and easier, too, according to Moursund, because the stainless steel case is completely sealed, which means customers can lightly spray cleaning solutions directly onto it.

“To help simplify cleanroom monitoring for FDA and GMP compliance,” he says, “we’ve not only put a lot of valuable time-saving features into the box, we’ve made the box itself easier to use, carry and clean.”



The MET ONE 3400+ air particle counter lets users import sampling maps for their specific facilities, and integrate them with their particular standard operating procedures (SOPs) for all testing locations.



More ...

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Artificial Intelligence for Medical Technology

Small and medium medical-technology enterprises (SME) in Baden Württemberg are set to soon use artificial intelligence (AI) methods for the improvement and new development of their products. The expertise for this has been provided by the Project Group for Automation in Medicine and Biotechnology (PAMB) at Fraunhofer IPA and the Application Center for Intelligent Machines in Medical Technology (ANIMMED) at Mannheim University Hospital. As part of „Forum Gesundheitsstandort Baden-Württemberg“, the state of Baden-Württemberg is providing ANIMMED and a further seven projects with EUR 13.9 million in funding.

AI methods enable machines to autonomously operate, carry out analyses and make decisions in complex situations. These characteristics make AI systems particularly relevant for use in medicine. In diagnostics, AI methods already make it possible to analyse vast quantities of data in practice, which a human being would be unable to handle.

Medical devices can also be automated by using AI methods. Automated devices are significantly more efficient in clinical applications, supporting doctors more effectively. For current medical applications, the automation of medical devices seems only possible using AI methods. This is due to the natural diversity of the human organism, its susceptibility to injury and its complex biology. Humans can cope with this complexity and variability. With the help of intelligent machines, humans would still make the decisions and manage the clinical process, but they could use their resources significantly more efficient. Therefore, automation using AI systems is viewed today as the technological key to the efficient precision medicine of the future.

Despite these expectations, AI only features in clinical applications on rare and limited occasions, with the exception of a few areas of diagnostics such as radiology and dermatology. Yet the potential inherent in AI for the operation of medical devices currently remains largely undeveloped in clinical practice.

A range of aspects enable AI solutions to be implemented in medical technology. There are available AI software libraries and algorithms as well as ample storage capacity and the necessary computing power. In addition, efficient measuring technology and affordable computer technology as well as new materials, drive concepts

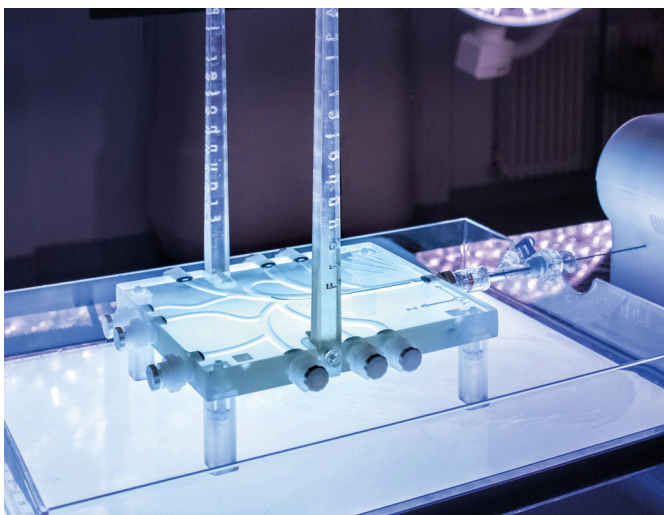
and clinical approaches all mean that AI can be usefully incorporated in medical devices and instruments.

Advantages of AI in medical technology

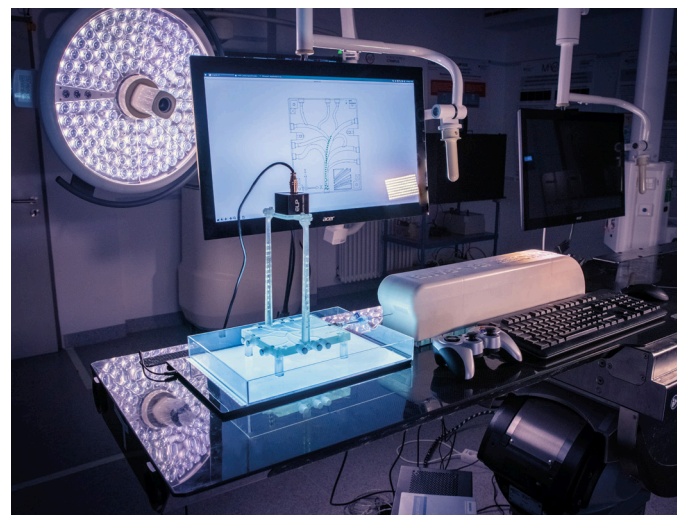
Various projects undertaken by the Mannheim Project Group have shown that AI is of the utmost importance in hospitals for the intelligent operation of machines, i.e. instruments, devices and systems such as robots. In future, with the use of AI, machines will be able to support doctors with critical tasks and managing complex procedures in hospital, in that it would even be possible to automate processes, relieving hospital staff of certain tasks where required. As a result, the optimum in care, diagnosis and intervention tailored to the individual patient can be achieved, enhancing the efficacy of these aspects of treatment. With this, medical care will remain affordable in the future despite the additional costs incurred for the digital infrastructure required.

Training data are the key

One of the key points of AI application for medical devices is access to training data, as adaptive AI systems for intelligent devices and instruments should be trained with large volumes of valid data. This means that the data represent reality with sufficient accuracy and the calculated result corresponds to reality. Especially for medical technology applications, such large volumes of data can only be obtained in everyday clinical practice or in extremely realistic scenarios and si-



Printed vessel phantom with guide wire for a catheter. (Source: Fraunhofer IPA; photo: Vanessa Stachel)



Testbench for the training and validation of AI for autonomous navigation of a guide wire. (Source: Fraunhofer IPA; photo: Vanessa Stachel)

Artificial Intelligence for Medical Technology

mulations. In most cases, the development of AI systems in medicine fails to meet this requirement. The costs are too high for companies and as a result, a vicious cycle is formed: a lack of available applications means that the feasibility and benefits of AI solutions cannot be sufficiently proven by practical example. This again makes it difficult to develop new applications.

Best practice demonstrators and development methods that reflect clinical practice

Using best practice demonstrators and the range of development methods that reflect clinical practice, ANIMMED is breaking this vicious cycle: using three demonstrators for medical AI systems, it evaluates its own AI development methodology and at the same time uses the results as reference projects. The close network of partners and their location on the campus of the Mannheim Faculty of Medicine (UMM) offers an optimal ecosystem for this purpose. The medical staff and facilities at UMM, the Heinrich-Lanz Center (HLZ) as specialists for data collection from clinical sources and the Fraunhofer Project Group for Automation in Medicine and Biotechnology PAMB with its experience as an AI application developer and operator at the Mannheim Medical Transfer Center M2TC are an established networked structure that forms the basis for rapid operational project implementation.

Application center for intelligent machines in medical technology (ANIMMED)

The development and application center, which is located on the site of the Fraunhofer Project Group and the HLZ facilitates the use of

AI for medical technology. At Mannheim University Hospital, ANIMMED supports medical companies in the development, training and adaptation of AI solutions for intelligent medical devices and instruments.

EUR 13.9 million for healthcare location Baden-Württemberg

In addition to the Application Center for Intelligent Machines in Medical Technology, the Ministry for Economic Affairs has provided a total of EUR 13.9 million to fund a further seven projects. Following approval of the funding by the Council of Ministers on April 21 as part of the „Forum Gesundheitsstandort Baden-Württemberg“, Minister for Economic Affairs Dr. Nicole Hoffmeister-Kraut explained the decision: “Innovative ideas and projects are the key to an effective healthcare sector. We should be constantly developing our skills precisely for times of crisis as well as for the future. With these first eight projects, we are significantly advancing these key technologies – for the welfare of our patients as well as for the benefit of the Baden-Württemberg economy.”



More ...

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Texwipe Launches Revolutionary Product Line

Texwipe® an ITW Company, based in Kernersville, NC, announces REVOLVE™, the first-ever complete line of cleanroom consumable products made from upcycled polyester. Using REPVE® yarn, a leading recycled fiber made from plastic bottles and created by Unifi, Inc (NYSE: UFI). REVOLVE™ is a new, environmentally conscious line of products. REVOLVE™ encompasses a full product line including cleanroom wipers that are sterile and non-sterile, dry and pre-wetted with 70% IPA / 30% DIW in various size configurations. In addition, a new, patent-pending mop cover and string mop for the cleanroom and critical clean market space will be offered. Each product label will indicate the number of post-consumer bottles used to make the contents of the bag.



The teamwork between Texwipe® and Unifi/REPVE represents a long-standing business relationship to provide the highest quality products to the cleanroom market with a commitment to eco-friendliness. Texwipe® has a long history of environmental consciousness, and the use of REPVE yarn

in REVOLVE™ products will enable Texwipe's customers to further support the achievement of their sustainability goals.

ITW Contamination Control
NL 2132 VZ Hoofddorp

ISO 45001: Global occupational safety and health are important to Gerresheimer

The Gerresheimer Group has declared DIN EN ISO 45001 to be the mandatory global standard for all its plants. It replaces the previously applicable standard OHSAS 18001 in the field of occupational health and safety.

„For Gerresheimer, healthy and motivated employees are the key to sustained economic success. We want all employees worldwide to go home exactly as healthy and unharmed as they came to work,“ says Katja Schnitzler, who as Group Senior Director EHS CSR OPEX is responsible for managing global implementation.

Even more safety in the workplace

ISO 45001 will become the international standard in occupational safety and health protection for the entire Gerresheimer Group. At the same time, the company wants to show that it is living up to its social responsibility by achieving internationally

recognized ISO 45001 certification. Gerresheimer makes every effort to demonstrably reduce the risk of injuries, accidents and work-related illnesses among its employees and is constantly improving occupational safety and health protection using suitable methods and instruments as part of its management system. ISO 45001 was published in March 2018 and will replace the previously most widely used standard BS OHSAS 18001. Gerresheimer employs employees at each location who are responsible for occupational safety and health.

Gerresheimer on the way to ISO 45001

The first Gerresheimer plants in Euro-

pe and Asia are currently certified. At most plants the measures for the forthcoming certification have been successfully launched or are nearing completion. The following plants have already received their certificate.

China: The Chinese plants of the Shuangfeng Group, i.e. Danyang I and II and Zhenjiang, which have been successfully producing glass containers for the pharmaceutical industry in China for decades, have been certified to ISO 45001 since 2018.

Denmark: Only recently the Gerresheimer plants in Vaerloese and Haarby have successfully completed their certification. At these plants primary packaging made of plastic of the well-known brands Duma and Dudek is produced.

India: In India, the plants in Kundli, which produces plastic containers, and the plant in Kosamba, where vials and ampoules made of tubular glass are produced, have currently received certification. The plant for the production of container glass in Kosamba is currently preparing for certification.

Germany: The German Medical Systems plants in Pfreimd, Wackersdorf, Regensburg and Bünde, as well as in Horsovsky Tyn in the Czech Republic, are already working with an Integrated Management System that has already certified the areas of environmental protection and energy management and also covers occupational health and safety standards. Fire protection also meets the legal requirements and applies in all MDS plants. The next important step is the implementation of the new ISO 45001 standard based on the Integrated Management System.



For Gerresheimer occupational safety plays a very important role in glass production for example. The new ISO 45001 will replace the old OHSAS 18001 standard and sustainably optimize the existing occupational safety and health protection.

Deltaray enables zero-defect product manufacturing

Deltaray, a spin-off of Antwerp University and imec – a world-leading research and innovation hub in nanoelectronics and digital technologies – is taking quality control to the next level with the introduction of its 'Accelerated 3D XRAY' technology. Deltaray's solution allows manufacturers to inspect products for possible defects up to 100 times faster and with a much finer granularity (up to 50 microns).

This speed enables total quality control, as every manufactured item is internally checked in a fully automated way. The spin-off's initial focus is on the medical devices, pharmaceutical and automotive industries.

"Inspecting larger numbers of samples using X-ray technology is one option to detect costly production errors, especially since products contain increasingly sophisticated components. Or one could decide to have all product runs manually inspected – which obviously comes at a high cost," says Dirk Hamelinck, CEO of Deltaray. "But now there is the Deltaray approach, using X-ray to accurately scan each product on the production line in detail and perform a full 3D quality check of every product without slowing down the production process."

Leading manufacturers into the Quality 4.0 era

"Our Accelerated 3D XRAY portfolio sets a new quality control standard for companies that want to deliver zero-defect products," says Hamelinck. "It detects production errors ten to a hundred times faster than existing computed tomography (CT) systems. And it accommodates a much finer granularity, measuring defects with an accuracy of up to 50 microns. Our initial focus is on the medical devices, pharmaceutical and automotive industries, enabling manufacturers to inspect complex and high-tech products such as syringes, implants, (petrol) pumps much more efficiently."

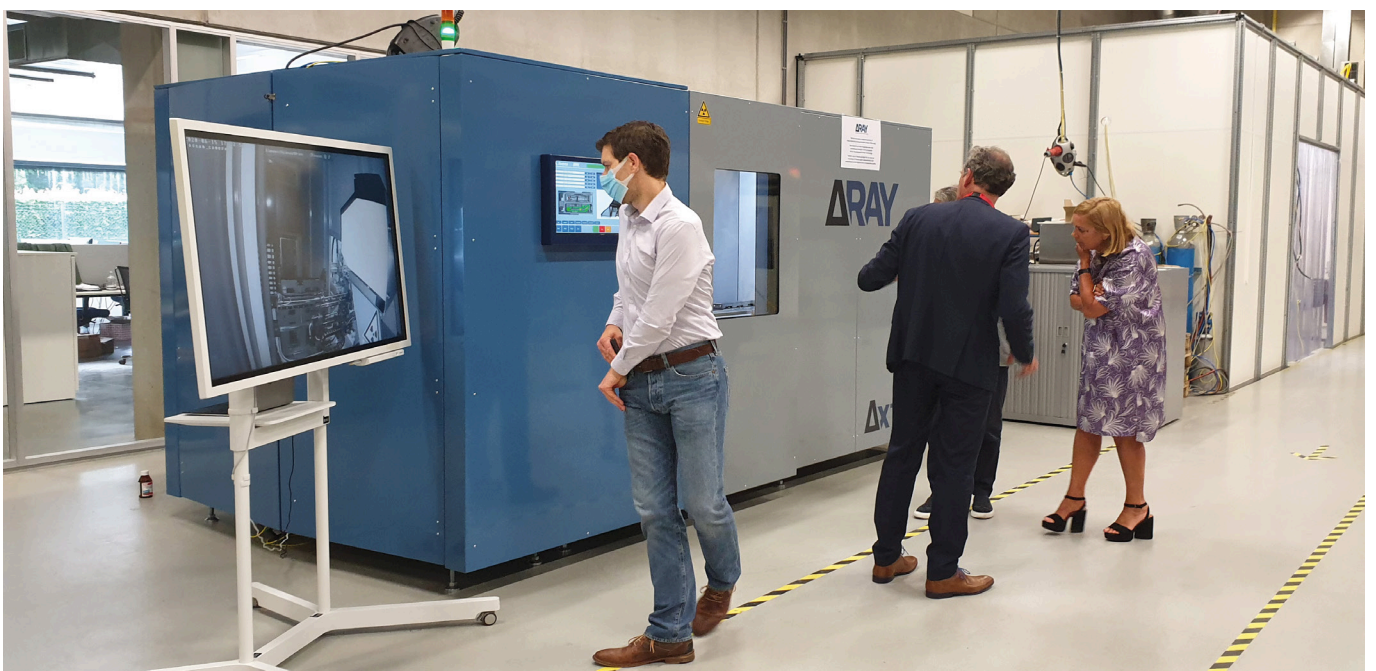
"Inspired by the digital revolution, manufacturing has recently un-

dergone a fundamental transformation – also referred to as Industry 4.0. Efficiency and productivity have increased dramatically, the customer experience is paramount and quality requirements are higher than ever before. Given this new business reality, the introduction of Deltaray's Accelerated 3D XRAY portfolio marks an important step forward when it comes to quality control. The technology enables manufacturing companies to enter the Quality 4.0 era," says Rudy Lauwereins, vice president of R&D at imec. "Since the Deltaray team has focused on international business opportunities from the start, the brand-new spin-off has received tailored support from imec's venturing team and the imec.istart accelerator program."

The Deltaray technology was developed within VisionLab, an imec research group at Antwerp University. "For more than ten years, we have been conducting extensive research into this technology," comments professor Jan Sijbers, co-founder and scientific advisor to Deltaray. "The underlying research track pursued a much quicker inspection of complex mechanical products, thereby offsetting manufacturers' concerns such as cost and the shortage of skilled employees. With our technology, we can screen a product in a very detailed way using just a few scans."

Deltaray has been selected to represent Belgium at EuroQuity, a prestigious online platform where promising companies and investors can meet.

IMEC Belgium
BE 3001 Leuven



Central material supply system for injection moulding machines for producing pharmaceutical grade packaging materials

Heinlein, a successful company based in the town of Ansbach in Franconia, Germany, produces a wide range of closures and dosing systems, some of which are patented and predominantly designed for the pharmaceutical and cosmetics industry. When it came to expanding its production facilities, Heinlein opted for a modern and efficient material supply system from motan.

The company manufactures its products in controlled sterile environments up to class 7 cleanrooms and operates its injection moulding machines in conditions that meet very high cleanliness stan-

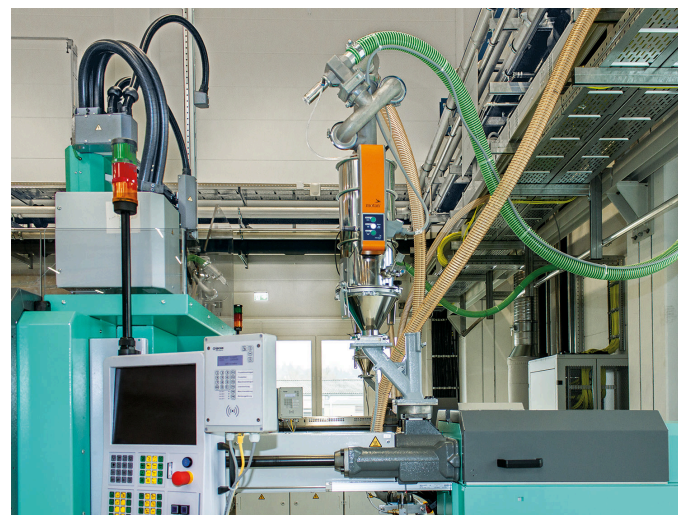


De-dusting modules enable the use of regrind without loss of quality. The dust is automatically separated into the central filter in a separate room. (Image: motan-colortronic)

dards. This alone would be sufficient reason to consider the use of a near dust-free central material supply system a must. However, the fact that a central material supply system also prevents the materials, which are primarily supplied directly from the silos, are mixed up and the fact that the automated system is highly efficient, are also important points for the company.

When Heinlein built a new production hall for 20 injection moulding machines with clamping forces of between 250 and 2000 kilonewton, it drew on its extensive experience with the material supply system already installed in its existing production hall when it came to selecting a material supply system. This hall contains a central material supply system manufactured by motan-colortronic that directly supplies 35 injection moulding machines with material from ten outdoor silos. Based on the company's positive experience with this system and its low maintenance needs, Heinlein opted for yet another motan-colortronic system for taking care of all of the materials handling in the new production hall.

The machines in its new hall are supplied with material – which primarily comprises polypropylene as well as HD and LD polyethylenes – from a total of twelve outdoor silos. All of these materials are 1 A pharmaceutical grade certified materials. The old and new material supply systems are furthermore connected to each other, which makes for greater flexibility and security. This is because, if needed, the new and existing silos can be used for supplying both the new



The MINIBLEND dosing devices are equipped with a number of exchangeable dosing modules. The picture shows a dosing device that is in the process of being fitted with a different module. This can be done in a few simple steps. (Image: motan-colortronic)

Central material supply system for...

and the existing production halls. The system was also equipped with a loading station for bagged materials for processing small quantities, such as e.g. TPE or various special types of polypropylene.

All of the system's pipes – from those leading from the silos to the automatic METROLINK distribution station to those leading to the machines – are made of stainless steel and meet Heinlein's high hygiene requirements. They were installed on predefined sections along the hall's walls specifically designed and built to support the entire supply infrastructure such as power lines, compressed air pipes as well as cooling water supply and return pipes.

The entire system revolves around the METROLINK – the distribution station, which, once set up, automatically and without any risk of contamination connects all of the relevant material supply system pipes with those of the relevant machines to be supplied. This means that there

is zero risk that a machine could be supplied with the wrong material. The material supply system chosen by Heinlein takes up very little space and has 2x10 material supply lines and 2x10 outgoing lines leading to the machines. In contrast to other distribution stations, there is no need for switching any connections or emptying operations during conveying thanks to the permanent pre-defined material allocations in the METROLINK system.

Heinlein also turned to motan-colortronic to meet its dosing needs and fitted its machines with volumetric MINIBLEND V disc dosing devices and METRO G conveying hoppers with de-dusting modules as the final items on the material conveying lines. These devices are of various sizes in line with the relevant throughput volumes. The system's two-component valves can be used to simply feed back any regrind material into the production process. The MINIBLEND V devices release the additives and colours into the base materials at the same time as they are drawn into the injection moulding machines. This means that there is no need for a mixer.

The company has also ensured that there is capacity for future expansion: The entire material supply system can easily be expanded to supply 40 injection moulding machines.



Heinlein-Plastik-Technik GmbH

Heinlein primarily specialises in multi-component and, in some cases, patented closures, dosing systems and drug administration devices. The company is currently also producing increasingly more complex products, such as tamper evident closures and/or child resistant closures and products in different colours. Heinlein predominantly supplies pharmaceutical companies, companies producing homoeopathic remedies, lifestyle and chemical companies. The company employs around 160 staff and has production facilities occupying 16 thousand square metres.

It currently exports over 60 percent of its products. Heinlein has tripled its output since 2008 and now produces up to 4,000,000 standard and custom-made closures a day over three shifts. The company is certified to ISO 9001, ISO 15378 and ISO 13485 and operates in line with the HACCP principles.



The METROLINK distribution station comprises two units that are able to automatically link ten incoming lines to ten outgoing lines respectively. The system has been designed in such a way that it can easily be expanded at any time.

(Image: motan-colortronic)

130 years of Pfeiffer Vacuum

- Pfeiffer Vacuum has been shaping the vacuum industry since 1890
- Vacuum technology is indispensable for many areas of life

Pfeiffer Vacuum has been setting standards in vacuum technology for 130 years. Science and industry have benefited equally from the numerous innovations developed and successfully brought to the market by this long-established company. The best example of this is the turbomolecular pump, which was developed by the company in 1958 and has been indispensable in the market ever since. Thanks to its expertise, Pfeiffer Vacuum is still the world market and technology leader in this field.

The vacuum specialist has been characterized by its pioneering spirit and passion from the very beginning. When Arthur Pfeiffer founded the company in Wetzlar, Germany, in 1890, he initially devoted his attention to the production of remote ignition systems for gas lamps. Once electric light bulbs had established themselves on the market, the company founder quickly turned his attention to the new lighting technology that led him to look at the vacuum technology used in its production. Arthur Pfeiffer quickly recognized the significance that vacuum technology could have in practically all areas of industry and research – and he subsequently concentrated entirely on this field.

Since then, Pfeiffer Vacuum has played a pivotal role in shaping vacuum technology.

Reliable quality for science and research

Today, Pfeiffer Vacuum products still stand for high-tech solutions with excellent reliability and efficient performance. Customers such as the Max Planck Institute, CERN, XFEL and EADS are proof of this reliability – vacuum pumps made by the Aszlar-based manufacturer are even in use in the ISS space station. There, as in many other applications, the customer's requirements are often very complex – not only with regard to the vacuum requirement itself, but also to the specifics of the system in question, the materials and products used or to be processed, and the process conditions. The focus here is always on quality. This is why vacuum solutions from Pfeiffer Vacuum undergo continuous optimization in close cooperation with customers from various industries and by means of ongoing development work. In this way, the perfect solution that meets all the requirements can be found.

Applications in all areas of life

Automotive components, smartphones, pacemakers, textiles – vacuum technology is used for all these products. Pfeiffer Vacuum solutions also play an important role in food production and in the pharmaceutical industry. Without them, it would not be possible, for example, to freeze-dry products such as instant coffee or powdered milk under vacuum.

As the only supplier of vacuum technology, the company offers a comprehensive product portfolio: from individual components to complex vacuum systems. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems.

Products and solutions from Pfeiffer Vacuum are developed for the fields of analytics, industry, research and development, coating systems and semiconductors and are optimized for the specific application.

Dr. Eric Taberlet, Chief Executive Officer of Pfeiffer Vacuum Technology AG: "With our durable products and customized vacuum solutions, we are able to satisfy practically every customer requirement and to establish relationships that will endure for years to come. At Pfeiffer Vacuum, 'sustainability' is not just an empty word. We are aware of our responsibility. And this is why, at all our locations around the world, we establish the necessary conditions to make sure that our staff enjoy working for Pfeiffer Vacuum. We are socially committed, because we want to give something back, and we produce our products in the most energy-efficient and environmentally-compatible manner possible. We have been living and breathing sustainability – by tradition – for 130 years."



Pfeiffer Vacuum company building.

Cleanzone Award: Great ideas in the spotlight

With the Cleanzone Award, Messe Frankfurt and Wiley-Verlag are helping companies in the cleanroom industry obtain international publicity for their innovations. The award will be presented at Cleanzone, the international trade fair for contamination control and cleanroom technology, on 19 November. The deadline for submissions is 15 August.

18.11. - 19.11.2020: Cleanzone 2020, Frankfurt am Main (D)

In the rapidly growing cleanroom and hygiene market, innovations are the key engine for success. To help promote innovation within the industry, Messe Frankfurt is once again joining forces with the publisher Wiley-Verlag and its ReinRaumTechnik trade journal to present the Cleanzone Award at Cleanzone 2020, which is taking place on 18 and 19 November. The competition is open to companies, scientific institutions and individuals whose innovations help to increase efficiency and sustainability in cleanroom production processes. Anyone who would like to apply for the Cleanzone Award must submit their innovations to Messe Frankfurt by no later than 15 August. You will find registration forms and additional information at www.cleanzone.messefrankfurt.com/award.

A five-person panel will select the five most pioneering concepts amongst all submissions.

The panel of judges includes:

- Josef Buchta, Ingenieurbüro & Reinraumservice Egon Buchta
- Anja Diete, Messe Frankfurt
- Josef Ortner, Ortner Reinraumtechnik
- Dr. Roy Fox, Wiley-Verlag
- Prof. Dr. Andreas Schmitt, Albstadt-Sigmaringen University

The finalists will present their innovations at the international Cleanzone trade fair on 18 and 19 November both as part of a special poster exhibition and in a live presentation at the Cleanzone Plaza, making the award a magnet for international trade visitors and the trade press. The highlight is the presentation of the award on the second day of the trade fair to the winner chosen by the trade fair public. The award, which was established by Frank Duvernell, has been presented at the Cleanzone trade fair since 2012.

Cleanzone is aimed at decision-makers from all industries that use or build cleanroom production facilities or that are considering their future use to ensure high product quality – from the pharmaceutical and medical technology industries to the food industry, the field of microtechnology and the automotive industry.

[More ...](#)

cleanzone

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The presentation of the Cleanzone Award is always a crowd-puller. (Messe Frankfurt/Sandra Gätke)

SurfaceTechnology GERMANY and parts2clean cancelled for 2020

After intensive discussions and considerations, it was decided: The trade fairs SurfaceTechnology GERMANY and parts2clean, which were scheduled for October in Stuttgart, cannot take place this year. Both events will return to regular rotation.

05th - 07th October 2021: parts2clean 2021, Stuttgart (D)

The uncertainty caused by the coronavirus pandemic, extensive restrictions and hygiene regulations for holding trade fairs in Baden-Württemberg, and limitations on international travel have led to a situation where SurfaceTechnology GERMANY and parts2clean, which were scheduled for 27-29 October, will not be held this year. The decision was made by the organizer in close coordination with the trade fair advisory boards.

"We fought hard for both trade fairs, but in the end there's no alternative to cancellation," says Olaf Daebler, Global Director SurfaceTechnology GERMANY and parts2clean in the team of Deutsche Messe AG. "Under the given circumstances, it would not have been possible to successfully stage the two trade fairs in Stuttgart in October. Companies need reliable planning, which called for a prompt decision. We will now invest all of our energy in restarting parts2clean in October 2021 and SurfaceTechnology GERMANY in June 2022. Once the current situation has been overcome, both events will be needed more than ever."

In numerous conversations with companies and associations, an increasingly distinct picture has emerged in recent weeks: Due to the economic crisis in which some companies are struggling to survive, there are currently other topics on the agenda than attending a trade fair. However, the question of health and protection against infection is still very important. Whether for business or private reasons - much of the population is minimizing travel and contact. Especially international travel is more difficult. Furthermore, hygiene concepts and political guidelines for holding trade fairs would have significantly affected the usual appearance of the events. For trade fairs in Baden-Württemberg, for example, plans permit one person per 10 square meters in each exhibition hall.

A visitor survey last week finally tipped the scales for the cancellations. According to this survey, around 60 percent of the previous visitors of SurfaceTechnology GERMANY have either excluded or at least questioned a visit under the current circumstances. For parts2clean, this figure is even higher at 65 percent. The reason for this is very clearly the corona pandemic. The effects of the pandemic on staging trade fairs, fear of a possible infection, and limited travel opportunities are the main reasons for visitor skepticism.

SurfaceTechnology GERMANY, the international trade fair for surface technology, was originally scheduled for June 2020 and had therefore already been postponed to this autumn. The surface technology industry will now meet again at SurfaceTechnology GERMANY from 21 to 23 June 2022 in Stuttgart. Next year, the SurfaceTechnology AREA will also be part of HANNOVER MESSE in April 2021.

The leading international trade fair for parts and surface cleaning, parts2clean is an annual trade fair. Its next date is 5 to 7 October 2021.

For exhibitors of both trade fairs and visitors who had already purchased a ticket, the cancellation will result in questions and a need for further information. For all participants the most important details will soon be available on the trade fair websites. For everything else, the team will be ready to help.

Statements on the cancellation of SurfaceTechnology GERMANY and parts2clean:

Christoph Matheis, Chief Executive Officer, Central Association for Surface Technology (ZVO):

"Deutsche Messe AG's decision to cancel Surface Technology GERMANY 2020 is the right one considering the present fragile corona situation with numerous requirements regarding hygiene, distance regulations and the bad economic conditions at the moment. Ultimately, the top priority for all of us is to take responsibility for the health and safety of exhibitors, visitors and employees. The need for personal interaction will return and will probably be greater than ever before. That is why we are pinning our hopes on a slowdown of the pandemic and an economic upturn in the second half of 2021 latest, so that we will then be able to organize a successful Surface Technology GERMANY 2022 with strength and optimism. The German Surface Technology Association and its numerous exhibitors will participate."

Dr. Thomas Schröder, Managing Director, Air-Handling Technology Association within the German Mechanical Engineering Industry Association (VDMA):

"The cancellation of Surface Technology Germany 2020 is a pity, but in view of the current situation it is the right and responsible decision by Deutsche Messe AG to avert economic risks for all parties involved. The decision is thus a logical consequence of the postponement of almost all trade shows of relevance to the mechanical engineering industry in autumn 2020. For companies, the key issue in the coming months is to be able to survive the period until a sustained economic recovery. SurfaceTechnology GERMANY 2022 is expected to be held at a time of economic upswing and then return to its usual strong position as the marketplace for surface technology."

Arndt Striso, Technical Sales, Dr.-Ing. Max Schlötter GmbH & Co. KG:

"Since its introduction in 2006, Surface Technology GERMANY has been a regular event in the exhibition calendar of Dr.-Ing. Max Schlötter GmbH & Co. KG. After the original date of the fair had been postponed, we also believed in the fact that Surface Technology GERMANY 2020 would be held in October. We did not expect that Deutsche Mes-

SurfaceTechnology GERMANY and parts2clean cancelled for 2020

se AG would have to cancel this year's fair, which is so important for the surface coating industry. However, we fully support the decision, as we believe that the trade fair could have taken place only under very limited conditions regarding hygiene and distance regulations. We also think that many companies and customers are currently occupied with existential problems and therefore do not find the time to attend trade fairs. The expected lower number of visitors would not really have justified the financial and material expenditure of this fair. This is another reason why we support the decision and are looking forward to a SurfaceTechnology GERMANY 2022 in Stuttgart in two years, which can then certainly be held under better conditions than this year."

Ulrike Kunz, Head of the Technical Centre, SurTec Deutschland GmbH:

"SurTec has been participating in the parts2clean trade fair from the very beginning. The trade fair was and is a very important event for us and our industry, due to the unique character of its offerings. I am not aware of any other trade fair that covers the field of industrial parts cleaning in such a complete way. I therefore find it extremely unfortunate that the event cannot take place this year due to the exceptional circumstances caused by Covid 19. However, the decision is quite understandable, because a trade fair thrives on direct dialogue, on people meeting in person, and this would not have been possible to a sufficient extent this year. We are now facing the future, and are already looking forward to next year's parts2clean. You can manage a lot via Internet and digitally, but a trade fair - and this trade fair in particular - will never be replaced by this."

Professor Dr. Lothar Schulze, Chairman of the Industrial Parts Cleaning Association (FiT):

"It is a pity that parts2clean has to be cancelled this year. The FiT, with its service offerings covering advanced training, qualification and consulting, is very well prepared for trade fair enquiries from cleaning system operators. However, since the given general conditions do not allow convenient discussions on problem solving, the decision made is reasonable and acceptable. Therefore, we look forward to next year's parts2clean with great confidence. With our initiative 'QSREIN 4.0: Opportunities for Cleaning Technology' we will demonstrate the current innovative and customized process solutions for component cleaning in the future."

Florian Weber, Vice President Sales, Weber Ultrasonics AG:

"The effects of the corona pandemic are occupying us all more strongly and longer than expected. Unfortunately, it is not possible to offer visitors an exciting and successful trade fair experience as usual under the current official regulations. For exhibitors, planning and preparation under such uncertain conditions is almost impossible. We are very much aware of our responsibility towards our co-exhibitors, visitors and staff members, and will therefore concentrate on parts2clean 2021. We want to use time until then to develop a resilient trade fair concept and exciting new formats."

Deutsche Messe AG
D 30521 Hannover

ZVO Surface Days 2020 (Düsseldorf) cancelled

The ZVO Surface Days 2020 scheduled for 16-18 September will not take place. Board and management of the Zentralverband Oberflächentechnik e.V. (ZVO) have just cancelled the congress. At present, with all the requirements regarding hygiene, keeping distances, room capacity restrictions and the current economic conditions, the ZVO Surface Days cannot be sensibly realised this year. The health and safety of speakers, exhibitors, participants and employees is a top priority for the ZVO.

The ZVO board made its decision also on the basis of the results of surveys conducted by its members and last year's congress participants and also took into account the numerous personal feedbacks from the industry. The alternative of holding the ZVO Surface Days as a virtual conference was also dropped, as 72% of the survey participants questioned did not want such a conference.

Today's decision was not an easy one for those responsible for the ZVO. Since the end of April, the situation has been assessed in a total of three board video conferences in the light of the prevailing political conditions. The ZVO is interested in an event at which the participants can exchange information without any restrictions and feel „comfortable“. This is definitely not possible under the current conditions and the fragile situation.

The board and management of ZVO express their hope that the new start with the ZVO Surface Days 2021 from 22-24 September 2021 in Berlin can succeed without restrictions and at the same time ask for understanding for their decision today.

Zentralverband Oberflächentechnik e.V.
D 40724 Hilden

Start-ups launch at MEDICA - the creative founder scene is more in demand than ever right now

16th - 19th November 2020: MEDICA + COMPAMED 2020, Duesseldorf (D)

The MEDICA, the world's leading medical trade fair held in Düsseldorf, was one of the very first events across all industries to offer young companies in their founding phase special programme formats to present their concepts many years ago. It has subsequently become the international number one for health start-ups too. The creative and predominantly digitally driven start-up scene will be the centre of attention once again at MEDICA 2020 (run time: 16 to 19 November). This is because, following the Corona pandemic, mobile and easily applicable solutions for linking the actors in the healthcare system have become even more important.

"Start-ups pitch up" is the motto for the MEDICA CONNECTED HEALTHCARE FORUM once more. In daily sessions, multiple young companies explain their latest developments in a nutshell using a punchy, brief format. Two highlights which encapsulate this are on the programme for the first two days of the event: the final of the 9th MEDICA Start-up COMPETITION and the 12th Healthcare Innovation World Cup.

The MEDICA Start-up COMPETITION started life as an app competition and currently offers top innovators the perfect platform for showcasing their solutions in diagnostics, artificial intelligence and robotics, in addition to the health app area. The Synphne Pte Ltd. team from Singapore won us over last year with a system for mobile stroke rehabilitation.

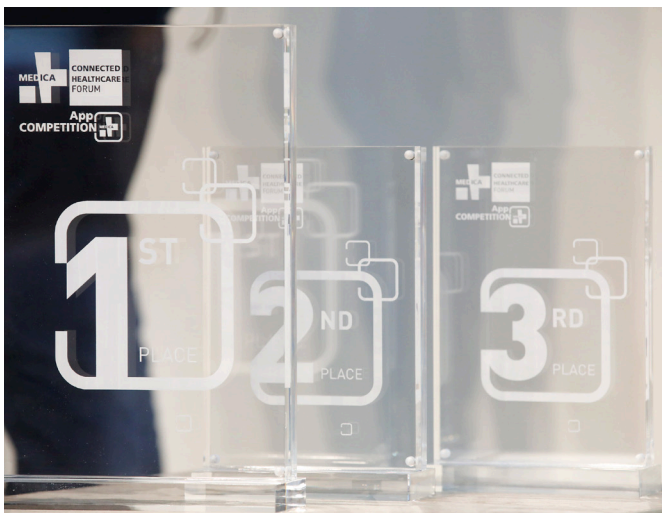
"During the Corona lockdown, we have implemented our digital solutions in order to ensure that patients remain compliant with their therapy," states Dr. Subhasis Banerji, the founder of Synphne. His innovative device captures brain and muscle signals simultaneously. It consists of a specially developed headset with neuronal sensors and an arm sleeve with muscle activity sensors. The patients use this to

perform tasks that are shown to them in videos. Movements and brain signals are thus synchronised in realtime. First, the patient practices in an inpatient setting. Then the patient continues their treatment independently in an outpatient setting, with digital remote care provided by the doctor.

"Winning the start-up competition at MEDICA last year really gave us a confidence boost and confirmed that we were moving in the right direction with our innovative device for stroke rehabilitation," synopsis Dr. Banerji. The online presence and media coverage of the victory at MEDICA was apparently brilliant. "In Europe, we're now part of the digital hub 5-HT.com and have had a multitude of offers for marketing our products, which we are currently evaluating," states Dr. Banerji. Since the win, business in India has also grown for Synphne. The start-up has also set its sights on another market. Dr. Banerji tells us more: "We founded our USA branch of the company in March 2020."

The race is on for 2020

The objective of the MEDICA Start-up COMPETITION is to drive the start-ups' development of innovative products forward by bringing them into contact with potential cooperation partners and users at MEDICA. The race is on for the 9th MEDICA Start-up COMPETITION. Submissions may be made up until 23 September 2020 (participants can register online at: <https://www.medica-tradefair.com/MSUC2>). All English-speaking applications will be evaluated by the competition jury based on the following criteria and a number of them will be selected to participate in the finale (on 17 November) free of charge: Degree of innovation, commercial potential, technological feasibility,



Winner cups of the MEDICA App COMPETITION 2019



Start-ups launch at MEDICA

marketing approach, time required until launch, required investments.

12th Healthcare Innovation World Cup & other highlights

The finale of the 12th Healthcare Innovation World Cup is part of the MEDICA CONNECTED HEALTHCARE FORUM program and is held on the first day of MEDICA 2020. Start-ups, scale-ups and SMEs present their solutions for the "Internet of Medical Things" live in pitch format - from wearable technology to digital biomarkers and from intelligent patches to smart implants. You can submit your entry free of charge up until 23 September 2020 at: <https://www.innovationworldcup.com/categories/healthcare>.

Another highlight for start-ups is REVERSE PITCH, the accelerator programme for big companies. Flipping the script on its head, accelerator programmes try to find favour with the start-ups before the start-ups fight it out for glory in the MEDICA Start-up COMPETITION on Tuesday afternoon, 17 November 2020.

There are even more contact points for those interested in start-ups at MEDICA 2020. The MEDICA START-UP PARK has now firmly established itself as a central presentation area and is closely thematically linked with the start-up pitches (e.g. it is also included in the daily format of MEDICA DISRUPT) in the neighbouring MEDICA CONNECTED HEALTHCARE FORUM. This also applies for the WT Wearable Technology Show. This specifically focuses on wearable technology, for which the healthcare sector is one of the most important key markets.

All information on the programming and exact location of the programme highlights for MEDICA 2020 that have been mentioned here and on the hygiene and safety concept of the show can be viewed online, where they are also constantly updated: <https://www.medica-tradefair.com> and <https://www.medica-tradefair.com/mchf2> (MEDICA CONNECTED HEALTHCARE FORUM).

Messe Düsseldorf GmbH
D 40001 Düsseldorf

analytica 2020: Great exhibitor resonance for the autumnal fair

- More exhibitors from other European countries
- Trade fair to implement the government's protection and hygiene concept
- Exhibitors emphasize the importance of analytica

After the postponement to the fall, there are now increasing signs for a success of analytica in October. The number of exhibitors has currently almost reached the level of the previous event. Most recently, the Bavarian State Government has cleared the way for analytica: From September 01 onwards, trade fairs may again be held in Bavaria. To this end, the government has adopted a protection and hygiene concept, which analytica is now implementing.

19th - 22nd October 2020: analytica 2020, Munich (D)

Not quite four months before the next trade fair (October 19 to 22), analytica is recording growth in particular from European countries that have already been well represented, such as France (area bookings up by 8%), Austria (up by 10%) and Italy (up by 22%). Switzerland likewise continues to be one of the most strongly present exhibitor countries.

In total, almost as many exhibitors have registered by now as did back in 2018 – at that time, there were 1168 exhibitors. This proves that companies and partners of analytica continue to support the COVID-19-related post-pone ment from the March date to the fall.

Protection and hygiene concept

In addition, on June 23 the Bavarian State Government created the legal requirements for analytica: From September 01 onwards, trade fairs may again be held in Bavaria. To this end, the state government has adopted a protection and hygiene concept for the trade fair and congress business. This provides safety for exhibitors, visitors and service providers, but at the same time leaves all participants with a maximum of freedom.

The guidelines are similar to the rules that currently apply in pub-

analytica 2020: Great exhibitor resonance for the autumnal fair

lic life, and are based on three cornerstones: Distance requirement, hygiene, and traceability of the participants. Hygiene measures include, among other things, more closely timed cleaning cycles and installation of sufficient numbers of disinfectant dispensers for all the participants. As for a possible requirement to wear mouth and nose covers: In September, before the start of the autumnal fairs, the government will ascertain once more whether this is really necessary. In any case, however, the mouth and nose cover may be removed when talking to customers at tables – a similar regulation also applies in the catering trade. “This is the current state of affairs,” emphasizes Dr. Reinhard Pfeiffer, Deputy Chairman of the Executive Board of Messe München: “However, we hope that there will be further easing in the course of a continued favorable course of the pandemic.”

analytica can support economic recovery

The recent abrogation of travel restrictions is giving the trade fair additional impetus. Positive signals were also received from the recent meeting of the exhibitor advisory board. Dr. Pfeiffer is therefore optimistic about the event: “We are pleased that even in these difficult times our customers continue to rely on analytica as the most important platform for laboratory innovations. In Q4, there may be a significant economic upturn if investments are made up for that have not been made recently. analytica can support this process sustainably.”

Exhibitors at analytica emphasize the importance of the autumnal trade fair for overcoming the economic doldrums: “Despite alternative formats and possibilities, analytica remains indispensable as a

distribution channel for us. We are looking forward to presenting our innovations live in fall, and to resuming direct exchange with our customers,” says Dr. Jürgen Blumm, Managing Director of Netzsch Gerätebau GmbH.

Exchange of knowledge on coronavirus

However, the world’s leading trade fair for laboratory technology, analysis and biotechnology is doing more than just setting economic beacons in the current stagnation, as Siegbert Holtermüller, chairman of the analytica exhibitor advisory board and Head of Sales Life Sciences at Olympus, emphasizes: “analytica is the meeting place for top experts from analysis, quality control and life sciences. This year, in addition the exchange of knowledge about the coronavirus will play an important role. For months, exhibitors and visitors of analytica have been making enormous contributions to the fight against the COVID-19 epidemic with their innovations and know-how.”

The trade fair supports this exchange of knowledge with an extensive supporting program. “All the events that we had prepared for the March date are now going to take place on the new date – enriched with sessions dealing with the current situation regarding the coronavirus,” announces analytica Exhibition Director Susanne Grödl. “Thus, analytica 2020 will once again be the most comprehensive meeting place for the laboratory industry worldwide.”

Messe München GmbH
D 81823 München



Circular Economy 4.0 – a megatrend for mechanical engineering and plant construction

POWTECH 2020 Special Edition

Almost all transformational industries rely on mechanical procedures for processing powders, granulates and bulk solids. Such procedures are also an established element in the treatment processes used in recycling. In a current study by German Mechanical Engineering Industry Association VDMA, Dr Eric Maiser, head of the VDMA Future Business Competence Centre, and other specialists have analyzed this field, which is much broader than mere recycling. The result of the study outlines a megatrend for mechanical engineering and plant construction – Circular Economy 4.0. This challenge is also being addressed by POWTECH, the leading exhibition for mechanical process engineering. The Special Edition of POWTECH, adapted as a consequence of the global Covid-19 pandemic, will be held in Nuremberg from 30 September to 1 October 2020, and focuses this year on knowledge sharing, including the question of the circular economy.

30th September - 01st October 2020: POWTECH 2020, Nuremberg (D)

The facts are there to be seen: waste volumes are on the rise at a global level, resources are dwindling, and the climate balance is sounding the alarm. The concept of the circular economy is therefore gaining in importance, both for society and politics, and for companies in every industry. Drawing a lesson from material flows in nature, this involves prolonging the useful life of the product to include extensive re-use. "That goes far beyond mere recycling," comments Maiser. "Reduce, repair, re-use and refurbish are all key stages before material becomes waste. Digitalization is a tool that can help to turn this vision into reality and also make it happen faster."



Greater independence from raw material markets

The circular economy is doubly relevant for mechanical engineers and plant manufacturers, since they are both customers and solution providers. "For businesses, the circular economy is hugely important, not only from the perspective of energy and resource efficiency, corporate social responsibility and climate protection: it is also important for sustainability to make economic sense. Going easier on resources makes businesses less dependent on volatile raw material markets and curbs costs," explains Frederike Krebs, Adviser Technical, Environmental & Sustainability Affairs in VDMA's Europe office and VDMA Coordinator for the Circular Economy.

Although the circular economy offers huge environmental and economic potentials, these are still far from being used to the full.

"Currently, only 14 percent of the raw materials used in industry are recycled materials, or recyclates," says Professor Anke Weidenkaff, Director of the Fraunhofer Institute for Materials Recycling and Resource Strategies (IWKS). "Too little use is still being made of the possibilities available for repairing, re-using and refurbishing materials. That is especially the case with plastics and composites or electronic waste. New technologies like self-healing processes, debonding and sorting can produce critical improvements. There are still barriers, however, in the form of insufficiently scalable process technologies, quality standards for secondary raw materials and excessive costs."

Battery recycling as a textbook example

An example of how this can work very well is provided by Pallmann, a POWTECH exhibitor, which offers systems for processing car batteries. Since car batteries have an average service life of just 3½ years, separation by type and proper disposal of harmful substances play a vital role. With an average weight of 15 kg and a recoverable lead content of around 55 percent, the lead component adds up to more than 100,000 tonnes per year in Germany alone. The recovery process keeps this lead in the cycle. The acid is collected and processed, and the plastic casings are shredded. The polypropylene and polyvinyl chloride that are recovered are regenerated and used as secondary raw materials.

Digitalization can be a catalyst for the circular economy

Industry 4.0 and Big Data now offer a range of opportunities to improve the suitability of products for the circular economy along the entire value chain. When gathering and marketing data on the composition of secondary raw materials, for example, or when supply and demand are brought together via an automated market and logistics platform. "Digitalization creates incentives for companies to participate and can act as a driver," comments Maiser. "A coordinated digitalization offensive could inspire all players: hardly any leading environmental market benefits from digitalization as much as the circular economy: it has the potential to be the key tool for spreading and

Circular Economy 4.0

accelerating the circular economy and creating new opportunities through new business models."

Fundamental change

The form the circular economy could take in the mechanical engineering and plant construction industry by 2030 was the subject of the scenario study "Circular Economy 4.0", published in 2019 by VDMA Future Business in collaboration with the Fraunhofer Institute for Systems and Innovation Research (ISI). This suggests mechanical engineers and plant manufacturers are facing a fundamental change: "The circular economy of the future will go far beyond today's waste and recycling economy," observes Dr Björn Moller of Fraunhofer ISI. "After all, the circular economy is based on the entire value chain. That means there will be a major need for new collaborative arrangements in the future. But all manufacturing businesses will also have to review their business models and turn them on their head if necessary."

POWTECH 2020 Special Edition: Safe Networking

The Special Edition of POWTECH 2020 will also reflect these new challenges associated with Circular Economy 4.0, and exhibitors will be able to discuss potential solutions with the trade visitors. Following the global impacts of the coronavirus pandemic, this year's edition has a particular focus on knowledge sharing. At the heart of the POWTECH Special Edition are the trade forums, which will be held in two exhibition halls with due observance of all safety regulations. The accompanying exhibition will give all exhibitors the opportunity to present their innovations in an efficient and appealing manner. Pre-defined stand designs and spacious meeting areas will guarantee the observance of all hygiene and safety regulations. Following the event, parts of the programme will be made available online for participants.

NürnbergMesse GmbH D 90471 Nürnberg

Expanded range of motorized valves

Ingelfingen-based valve specialist GEMÜ is further expanding its product range of motorized globe, angle seat and diaphragm valves.

With immediate effect, the GEMÜ R629 eSyLite motorized diaphragm valve is also available in diaphragm sizes MG 10 and MG 40, covering nominal sizes DN 12 to 50. The GEMÜ eSyLite is available alongside the GEMÜ eSyStep and GEMÜ eSyDrive motorized valve range as a basic actuator for open/close applications in the entry-level segment. An optical position indicator and a manu-

al override are installed as standard on the GEMÜ eSyLite, and an integrated emergency power supply module is optionally available. The GEMÜ R629 eSyLite motorized 2/2-way diaphragm valve is a cost-effective alternative to solenoid valves made of plastic or to motorized ball valves made of plastic. Due to the GEMÜ HighFlow body, the valve has good flow characteristics and is insensitive

to particulate media. Furthermore, the GEMÜ eSyLite actuator can also be mounted on M-block valves.

The GEMÜ eSyStep universal actuator has also been extended by one size. This means that the GEMÜ 543 and 533 eSyStep globe valves are available in the nominal sizes DN 6 and 15 to 50 with immediate effect. In the future, the nominal size range from DN 4 to 32 will be covered with the GEMÜ 639 and R639 eSyStep diaphragm valves. Valves with the GEMÜ eSyStep actuator are available in open/close or positioner versions. An IO-Link interface allows process data and parameter data to be exchanged easily. This means they are perfect for both open/close applications and simple control applications. Thanks to its slim design, the GEMÜ eSyStep actuator is also perfect for use on M-block valves.

By expanding the range of motorized valves to additional nominal sizes, GEMÜ is further extending its offering of energy-efficient alternatives to compressed air systems.



New motorized valves: GEMÜ R629 eSyLite and GEMÜ R639, 639, 543 and 533 eSyStep (left to right).

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

Employee-focused workplaces increase productivity

In order to design assembly workplaces in a more employee-focused manner, a researcher from the Fraunhofer Institute for Manufacturing Engineering and Automation IPA has not only determined the requirements of people, but also evaluated machine data. With this approach, the researcher's aim is to increase the efficiency, effectiveness and satisfaction of employees.

Every developer of assembly workstations has different ideas of the target group and sets different priorities. Time and again, this leads to misunderstandings within the team. »Products are improved and workbenches and other assembly workstations remain serviceable for longer when the designer knows exactly what the target group needs and takes it into account in the design«, says Saskia Wiedenroth from the Image and Signal Processing department at Fraunhofer IPA. Otherwise, features may be developed that the user ultimately does not need.

In order to avoid such undesirable developments and shorten development times, it is advisable to collect and evaluate user data. Thus, there are a number of issues to be resolved, such as what result are technicians aiming for at the end of the day? At which points do errors most frequently occur? How can the machine software be made more intuitive? Saskia Wiedenroth is working on clarifying these and other issues as part of the »Data Driven User Needs Assessments« (D²UNA) research project, which is supported by the Future Work Lab.

Eye-tracking systems reveal eye tracking at work

In order to determine the requirements, Saskia Wiedenroth goes on site at the factory with a sensor case. This contains, among other items, eye-tracking systems, screens, cameras, sound recording devices and QR codes. She uses the cameras to record where the fitter intervenes manually and which tools he uses. While Saskia Wiedenroth records every step of the work process, the fitters give a running commentary on what they are doing. The eye-tracking systems reveal which areas of the workplace fitters look at for longer, which they only glance at and which they do not observe at all. The QR codes correspond to the eye-tracking systems and show line of sight correlations.

At the same time, researcher Wiedenroth records the machine data via individually

developed interfaces. Using Blickshift analysis software, she links the machine data with the user data. »This shows, for example, that after twelve seconds, the welding machine is put into operation and at the same time, the robot arm moves without the technician noticing,« she explains. Saskia Wiedenroth then analyzes such occurrences and uses them to create an index of how serious the shortcomings discovered are.

Saving time and costs during training

Finally, a heat map is created from all the data collected plus the index, i.e. a representation of the entire workplace with a chronological sequence of every work step and the potential error locations. »I can see from this that at a certain point, an error occurs, but the fitter does not even notice it because at the time, he is distracted at another point,« says Wiedenroth. Based on the results of the analysis, she creates a report from which she derives optimization measures and a worker profile. These profiles allow developers to design workplaces in a more targeted and user-oriented manner.

Workplace optimization, which the developers can carry out with the aid of Saskia

Wiedenroth's analyses, not only increases assembly-line productivity, but also saves time and costs when training new fitters. The foremen are relieved of the burden of training and the new employees work more quickly and productively.

User analysis as a service

Saskia Wiedenroth plans to offer the user analysis as a service in the future in order to further refine its methodology. To this end, it is looking for industrial partners who have recognized the importance of user centricity and who wish to design their assembly workstations more individually.

More ...

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The eye-tracking systems show which areas of the workplace fitters look at for longer, which they only glance at and which they do not observe at all. (© Fraunhofer IPA)

Pfeiffer Vacuum introduces OmniStar® and ThermoStar® next generation gas analyzers

- Quantitative and qualitative analysis of gases at atmospheric pressure
- Easy operation with new software
- Compact design and low detection limit

OmniStar and ThermoStar GSD 350 are compact, portable benchtop analyzers for analyzing gases at atmospheric pressure. They are particularly used for applications in chemical processes, in the semiconductor industry, metallurgy, fermentation, catalysis, freeze-drying and environmental analysis. The gas inlet is fitted with a heated capillary for use at up to 350°C. This prevents vapors from condensing



Pfeiffer Vacuum compact benchtop instruments for gas analysis.

during process gas analysis. Thanks to the two-stage inlet system, an almost segregation-free gas supply is possible.

The ThermoStar solution was specially developed for coupling with thermo balances. The inlet system with a quartz capillary and a platinum orifice ensures that even the smallest concentrations can be analyzed.

The OmniStar was developed for a wide range of applications and uses a stainless steel capillary as well as a valve which can interrupt the sample gas stream. Unlike other analytical methods such as FTIR or GC-FID, the two new devices allow simultaneous detection of all gases within the mass range.

With the new PV MassSpec software, it is possible to perform qualitative and quantitative analyses. This software offers a clear and user-friendly platform for recording and displaying measurement data and parameter settings. Even complete measuring procedures can be programmed and automated. With a variety of equipment variants available, the mass ranges of 1 to 100 u, 1 to 200 u and 1 to 300 u are covered.

The two new models differ from comparable devices by their compact size and easy operation using an integrated 7" touch display or a web user interface. The device can be fully controlled and the user can also perform simple measurements without a PC or PV MassSpec via a smartphone or tablet.

The low detection limit (depending on the mass range) of up to <100 ppb, the low gas consumption of 1 - 2 sccm and the fast measuring time (up to 1 ms/u) characterize the new analytical instruments. For extended process customization, an integrated mass calibration device or a controlled purge gas system for corrosive gases are available.

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