A new study commissioned by DuPont reveals how laundering and sterilization affects the performance of reusable cleanroom garments over time. (Photo: DuPont)

Deterioration of reusable cleanroom garments could compromise cleanroom environments, says new study

A new study by DuPont Personal Protection which assesses the performance of reusable garments for cleanroom applications could lead to a radical change in controlled environment practices. The results, which the company has published in a whitepaper, confirm that reusable garments are vulnerable to damage from laundering and sterilization – and that the evidence that a garment has been compromised is often invisible to the naked eye.

The results could have far-reaching implications, particularly for those working in the medical devices manufacturing, pharmaceutical, biotechnology and research industries. Still a relatively new introduction, single-use textiles such as Tyvek® IsoClean® reduce the risk of contamination and will become an increasingly important element of any contamination control strategy.

Reusable garments used in sterile and aseptic production require repeated laundering and sterilization cycles to maintain their effectiveness, using such techniques as gamma radiation. Physical property data are often available for new cleanroom garments: however, there are less data available throughout the entire garment life. DuPont's new study is intended to address this information gap.

Says Jean-François Teneul, Global Business Manager for the Controlled Environments section of DuPont Personal Protection: "Most contamination within aseptic processing areas is caused by the humans working in the cleanrooms. When selecting reusable garments for use in controlled environments, it is important to understand how they will perform over their intended lifecycle. In addition, for potent product handling, cleanroom garments must perform a dual role: not only to protect the product from the operator, as with aseptic processes; but also to protect the operator from the hazardous chemicals. We felt it was necessary to provide these professionals with data on which to base a more informed choice."

DuPont conducted the study to map the properties of reusable garments typically used in cleanrooms when exposed to repeated laundering and gamma radiation, in order to learn how the performance of those garments changes with each cycle. The scientific study focused on fabric performance and examined garment properties such as polymer structure, permeation, tear strength and Bacterial Filtration Efficiency (BFE) to determine how they are negatively impacted by cleaning

and sterilization regimes over time. The tests, which were undertaken by third party laboratories, revealed significant impacts on critical aspects including protection of the process and the wearer, durability and comfort.

Among the key findings were:

- Changes in polymer structure: while gamma radiation is effective for sterilization it can also impact polymers that make up reusable garments. Changes to the polymer matrix will ultimately affect the properties of the fibres that make up the garments, and the garments themselves.
- Breathability and barrier: barrier decreases while air permeability increases, which means the garment is providing less protection over time.
- Particle shedding: as exposure to gamma radiation and laundering increases, so does the amount and variability of particle generation.
- Tear strength: increased gamma radiation and laundering exposure reduces tear strength.
- Bacterial Filtration Efficiency: with a BFE higher than 98%, single-use textile Tyvek® IsoClean® has the ability to better filter out bacteria compared to reusable cleanroom textile, which has a BFE below 70%.

These changes are not always visible to the naked eye, so visual garment inspection alone may not be sufficient to understand garment performance. Based on these findings, the study offers the following recommendations:

- Consider performance data over the entire garment life cycle.
- Enact testing protocols to monitor the performance of garments as they age, based on the risk assessments and needs of each individual cleanroom.
- Establish criteria for taking garments out of service when they no longer meet functionality requirements.

In conclusion, Jean-François Teneul says: "Based on the results of our scientific study - and in the context of the draft version of the revised GMP Annex 1, which includes more Quality Risk Management (QRM) principles – the focus will have to be not only on the behaviour and gowning procedure of the personnel, but also on the performance of the cleanroom clothing system and the specific risk assessment of cleanroom garments. The study data will allow the responsible person to make a proper assessment of the contamination risks and costs involved in their applications and to decide whether reusable cleanroom garments or single-use cleanroom garments are the right choice."

The whitepaper 'To Reuse or Not to Reuse: A Life Cycle Assessment of Reusable Garment Properties' contains full details of the methodology and results from the reusable garment study. It is available as a free download here: www.tyvek.co.uk/invisible

DuPont Personal Protection
2984 Contern, Luxemburg

Particle masses over Stuttgart

Dear subscribers,

we cordially welcome you in the new year and wish you twelve good months – whether in the clean room or outside. For us, at the editorial office in Stuttgart, the year 2019 began quite foggy, because the New Year's Eve crackdown wrapped the city in a thick cloud of fine dust and particles within minutes. Will the now imposed ban on diesel cars be of any help?

No matter how you travel to Karlsruhe, we are looking forward to your visit to our stand at the LOUNGES from 5 to 7 February. Hurry to save your free participation with our **code: rronline2019**
https://www.x4com.de/expo_lounges_besucher.

In our newsletter, we have again compiled all the important information from the industry for you. Have fun reading.

Sincerely,
Reinhold Schuster

Industry 4.0 Cleanroom for Promolding

Promolding approached Connect 2 Cleanrooms (C2C) to provide an intelligent cleanroom solution to protect a medical device manufacturing contract that is due to run until 2032.

Effective contamination control is critical, as Promolding is producing optical manifolds for an eye surgery machine. Designed to keep pressure on an eye during surgery when the eye lens is removed, these precision parts feature intricate veins and diaphragms.

Over 9 months, they collaboratively developed a reliable and intelligent cleanroom solution, which works in harmony with Promolding's ENGEL machines and robots.

The cleanroom is now safeguarding a long term investment, so design features have been optimised to guarantee cleanroom performance for years to come.

The process

1. One shot injection moulding machine (80 tonne) produces one plastics component
2. Two shot injection moulding machine (300 tonne) produces the 2nd component, made up of 2 plastics (injected, rotated then injected again)
3. Robots pick up moulded parts, drop them onto the motorised conveyor and transport them into the main environment
4. The two parts are then assembled and welded, then they progress to packaging

The solution

Each moulding machine has one fixed and one actuated, HEPA filtered, overhead canopy.

The automated, sliding HEPA-lite™ canopies provide overhead access for tool changes. They are driven by an actuator with two linear guides, one master and one slave. These drive the filter system to an open or closed position.

The canopies feature effective safety mechanisms, sending infra-red signals across the actuators. If the signals are interrupted, for instance by the robot or by operative's hands, the canopy will deactivate movement, preventing any accidents.

The canopies feed into the main cleanroom area, which houses assembly, the plastic welder and packaging.

Industry 4.0

Industry 4.0 is the 4th industrial revolution - the digital transformation. It is a term used to cover the use of automation, smart factories, digital systems, sensors and robotics, data and remote operations - with the goal of increasing manufacturing productivity, improving planning and forecasting, or giving a competitive edge.

Here, C2C applied Industry 4.0 techniques and designed a cleanroom with automated canopies to work in cooperation with Promolding's robotics. These reduce the risk of human error and improve the quality and consistency of the end product.

The cleanroom features an intelligent digital system, in the form of C2C's ECO control system. It is designed to ensure that the cleanroom operates at optimum effectiveness by constantly monitoring the operating conditions, in real time within the critical environment, raising alarms if any of these parameters vary beyond a user specified threshold.

All relevant control parameters for each three zones are graphically displayed on a HMI touch screen interface, allowing users full control and to locate faults and run diagnostics. All system performance data is logged and is downloadable.

The intelligent moulding machine recognises faults with a product and drops affected products into stainless steel drop drawers for inspection. The personnel door is interlocked with the moulding machine during manufacture. The sample drawers are accessible from outside the HEPA-lite™, meaning the faulty parts or samples can be safely removed without interrupting manufacture.

There are plans to have all the processes within the main cleanroom area to be fully automated in the future.

Challenges & Successes

The main cleanroom area was installed under a mezzanine, so the ceiling was fixed to the walkway above it and suspended via 56 drop rods. This secured the roof and ensured that no internal legs

Industry 4.0 Cleanroom for Promolding

were needed to support the room keeping an open plan layout.

C2C worked with a structural engineer, to develop the structural system. The 4 existing pillars supporting the building were used to feed the cleanroom's utilities - i.e. sockets, compressed air.

The HEPA-lite™ canopy system and main cleanroom area have been designed to accept two more injection moulding machines to feed into the main cleanroom as demand grows.

There was an effective collaboration with ENGEL allowing C2C to integrate the HEPA-lite™ with the injection moulding machines, so it wasn't necessary to use floor supports.

Support legs would have obstructed access compartments and the regular re-calibrations, so full access to the machine is hugely beneficial. Rubber mounts were used to absorb movement, so it doesn't affect the canopy.

Despite being a precision build, the main room was constructed in 4 week and the HEPA-lite™ canopies were constructed in 2 weeks.

- ISO 14644-1:2015 Class 7
- Overall footprint: 279.42m² (19.27m x 14.5m x 2.825m). Internal clearance of 2.5m
- Internal change area: 13.86m² (6.860m x 2.02m)
- 99no. air changes per hour at an air speed of 0.45m/s in the Main Area
- 70no. 20W LED light fittings (6500K light temperature) to match the current lighting used within Promolding's building
- 42no. variable speed controlled HEPA ceiling fan filters
- 4no. transaction drawers next to conveyor inlets
- 1no. roller door for goods in/out
- ECO Control System with automated sliding hatches on HEPA-lite™ units
- 2no. automated HEPA-lite™ canopies to supply clean air at the critical point of production and reduce contamination by significantly limiting exposure to the external environment during tooling changes.
- The cleanrooms which house the ENGEL machines and HEPA-lite™ canopies are 4.7m in height.
- The grey lid to the filter system houses cables, providing a cleanable surface and looks in keeping with the factory
- Pendant stations control each automated HEPA-lite on the injection moulding machines. Each have manual overrides for safety reasons
- Proximity switches to the side of the HEPA-lite have LED lights to give a visual indication when the HEPA-lite™ canopies are in situ. The canopies also feature a safety mechanism which deactivates actuators if the canopy is obstructed

C2C have 15 years' experience delivering contamination control solutions for mission critical environments in the engineering sector.

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Control of Chaotic Systems

The German Research Foundation approves a four-year extension of the Collaborative Research Center 910 on control of nonlinear systems. TU Berlin continues in the role of the host university.

The German Research Foundation has approved, for the third time, funding for the Collaborative Research Center 910 on control of nonlinear systems, with TU Berlin being the host university. Coordinator of the Collaborative Research Center is Professor Dr. Sabine Klapp. Professor Klapp is head of the Chair of Computer Simulations and Theory of Complex Fluids at TU Berlin. Eight million euros of funding has been made available for research over the next four years, thus bringing the total funding for the Collaborative Research Center over a twelve-year period to EUR 20 million.

The full title of the Collaborative Research Center 910 is "Control of self-organizing nonlinear systems: Theoretical methods and concepts of application" and its work focuses on innovative control strategies for systems on a range of scales. A new feature of the Collaborative Research Center in the third funding period is an integrated research training group.

Professor Dr. Sabine Klapp is coordinator of the Collaborative Research Center 910 on control of nonlinear systems. She is also head of the Chair of Computer Simulations and Theory of Complex Fluids at TU Berlin. (© TU Berlin/PR/Christian Kielmann)

Professor Sabine Klapp and Roland Aust are delighted that Collaborative Research Center 910 on control of nonlinear systems is being funded for another four years. Professor Klapp is coordinator of the Collaborative Research Center and head of the Chair of Computer Simulations and Theory of Complex Fluids at TU Berlin. Roland Aust is managing director of the Collaborative Research Center. (© TU Berlin/PR/Christian Kielmann)

Thematic focus and goals

The Collaborative Research Center (CRC) 910 focuses on dissipative, nonlinear dynamical systems beyond thermal equilibrium. Such systems are common in physics, chemistry and biology. Examples include open quantum systems, flowing liquids and pulsating heart tissue. A characteristic feature of such systems is self-organization, that is, the spontaneous emergence of temporal, spatial or temporal-spatial structures. The Collaborative Research Center's objective is to generate and control such self-organizing dissipative structures, e.g., for the optimization of specific material properties.

By combining an interdisciplinary team of applied mathematicians, theoretical physicists, and computational neuroscientists the CRC aims at developing novel theoretical approaches and methods of control, and demonstrating the application of these concepts to a selection of innovative self-organizing systems ranging from condensed hard and soft matter to biological systems. To meet these challenges, the CRC will merge and advance concepts from the control of nonlinear dynamical systems, the classical mathematical control and optimization theory, and coherent quantum control. The focus is on theoretical and methodological developments from a conceptual point of view and with a perspective on applications.

One of the key methods used by the CRC 910, which was founded 2011 by Prof. Dr. Dr. h.c. Eckehard Schoell, is feedback control where unstable states are stabilized adaptively. A specific example is time-delayed feedback control, which the Collaborative Research Center has successfully put forward to novel systems during the first two funding periods. The main areas of application in the third funding period are the control of dynamics in quantum nanostructures and topological quantum information systems, the control of complex and active fluids in non-equilibrium, and the control of excitable media, such as heart tissue and macroscopic brain networks.

Organization of the Collaborative Research Center

The Collaborative Research Center is divided into two project areas: theoretical methods (A) and concepts of application (B). These areas comprise 16 research projects, including a project in Russia. Project area A deals with theoretical and methodological development for self-organizing nonlinear systems, combining expertise from the research areas of theoretical physics and mathematics. The objective is to achieve a fundamental understanding of the successful control of self-organizing processes. Project area B focuses on the application of the control principles developed in project area A on paradigmatically selected, innovative model systems from physics, chemistry and biology. In particular, the control of excited quantum systems, colloidal matter, complex fluids, heart tissue, brain networks, lasers or chaotic oscillators will be explo-

Control of Chaotic Systems

red and developed. The dynamics in such systems include a wide spectrum of nonlinear phenomena on various spatial and temporal scales, which can be controlled using a range of strategies.

The research projects will be accompanied in the third funding period by an integrated research training group entitled "Design and control of complex systems" to be led by Professor Dr. Holger Stark, Dr. Alexander Carmele (both from TU Berlin) and Professor Dr. Alexander Mielke from the Weierstrass Institute for Applied Analysis and Stochastics (WIAS).

Promotion of young scientists

The promotion of outstanding young scientists as well as special measures concerning gender equality for scholars and the compatibility of academic and family life are an issue of particular importance to the Collaborative Research Center. Measures are planned on all stages of the academic career.

These measures include, for example, financial support of particularly innovative projects of young scientists, enabling them to build up an independent profile. Mentoring programs are being used to attract women to pursue an academic career and to assist the advancement of women within academia. Further, exchange and cooperation programs enable students to be involved at an early stage in their careers into international cooperation activities with leading research groups. The new integrated research training group offers doctoral candidates and scholarship holders within the Collaborative Research Center a structured doctoral program providing them with the best possible prospects for a successful start to their careers.

TU Berlin (host university) cooperation partners

- Freie Universität Berlin,
- Weierstrass Institute for Applied Analysis and Stochastic (WIAS)
- Physikalisch-Technische Bundesanstalt,
- Saratov State

Further information available from:

Professor Dr. Sabine Klapp
TU Berlin
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Technische Universität Berlin
D 10587 Berlin

New UV and Light Protection Labels from Schreiner MediPharm Offer Customized Protection for Sensitive Substances

UV and Light Protection for Liquid Medicines in Transparent Glass Containers

For UV and light protection of particularly sensitive medicines such as biopharmaceuticals, biosimilars, blood products, vaccines and vitamin preparations, Schreiner MediPharm developed three novel labels at various safety levels. They reliably protect liquid substances in transparent glass containers against the damaging effects of exposure to UV irradiation and light. At the same time, they make it possible to check the liquid in the container for its impeccable original condition.

Light-sensitive substances are often filled into brown glass vials in order to protect them against UV irradiation and light. The disadvantage is that in this case the original color of the preparation is no longer discernible and the medicine cannot be checked for particles or color changes before dispensing it. While transparent glass containers permit the liquids they contain to be inspected, they allow light and UV rays to pass through the glass.

Three different labels of safety levels 1 to 3 (from left to right) guarantee reliable UV and light protection for sensitive liquid preparations.

The specialty labels from Schreiner MediPharm for UV and light protection are designed for three safety levels: Level 1 labels have a transparent inspection window with UV protection. At level 2, the labels are equipped with a semi-transparent, colored window and a reclosable inspection window that protects against UV rays and blue light. Level 3 labels consist of an opaque label material for complete light protection; an additionally integrated, reclosable inspection window allows viewing the container content.

All three label concepts are adapted to the specific requirements of the respective substance, the individual containers as well as to UV and light requirements. Manufacturers of biologics and other sensitive products are thus able to effectively protect their highly sensitive substances against light and UV irradiation, avoiding potential health risks for patients due to medicines that have been damaged by light.

Schreiner MediPharm
D 85764 Oberschleissheim

Freudenberg strengthens filter business

Freudenberg Filtration Technologies signs contract to purchase majority shareholdings of Apollo Air-cleaner Co., Ltd. in China.

The global technology group Freudenberg is expanding its filter business. The Freudenberg Filtration Technologies Business Group has signed a contract in China to purchase the majority shares of Apollo Air-cleaner Co., Ltd. The company is a leading supplier of air and water filtration solutions in China. In 2017, Apollo had around 1,000 employees and generated 750 million RMB in sales (approximately 96 million EUR). The transaction still requires approval from competition authorities.

"By purchasing the majority stake in Apollo, we are strengthening our position in China's rapidly growing market for filtration solutions," says Dr. Mohsen Sohi, Freudenberg Group CEO.

Air and water filtration solutions are enjoying strong year-on-year growth rates, especially in China, thanks to legislation demanding stricter regulations and increased environmental awareness. Experts estimate that the global market for products of Apollo – filters for room air purifiers, decentralized ventilation systems and water treatment – will have a total value of some 5 billion USD by the year 2022.

"Apollo is a great fit for Freudenberg," says Dr. Andreas Kreuter, CEO of Freudenberg Filtration Technologies. "It is an innovative technology company that complements our own portfolio of filtration solutions for indoor air and water purification. The company also has first class production expertise and excellent networks in the industry."

The product solutions of Apollo keep air or drinking water free of (ultra) fine particles, dangerous gases, odors and microorganisms and protect health. At its production site in Shunde, China, the company has established high standards for product quality, process efficiency and workplace safety, and is certified to ISO 9001, ISO 14001 and TS 16949.

Apollo will continue as a joint venture between Freudenberg (major shareholder) and the current sole proprietor Apollo Trading Group, Japan, under the name Freudenberg Apollo Filtration Technologies. Freudenberg Filtration Technologies intends to bring its current consumer filtration business into the joint venture.

Manufacturing, R&D and Customer Services at both Freudenberg Filtration Technologies and Apollo will benefit from the transaction. Main examples are the complementary competencies in filter media and gas filtration, which is growing ever more important.

"For nearly 20 years, Apollo has been offering innovative filtration solutions, improving the quality of life in China," says Akihisa Yamamoto, CEO of Apollo Trading Group, and then adds: "The global development and production network and the more extensive portfolio of technological product solutions stemming from this joint venture will primarily benefit our customers."

Freudenberg Filtration Technologies SE & Co. KG
D 69465 Weinheim

Closer to the customers in Saudi Arabia

Endress+Hauser opens state-of-the-art calibration and training center

Endress+Hauser has invested roughly three million euros in a modern, state-of-the-art calibration and training center in the industrial city of Jubail, Saudi Arabia, thus strengthing direct contact with customers in the Middle East while supporting the country's economic development.

Saudi Arabia wants to expand the private business sector and become less reliant on oil production, two key goals of the Vision 2030 program. "It was this vision that inspired us to create the new calibration and training center," said Mohammed Abdellah, Managing Director of Endress+Hauser Saudi Arabia, during the inauguration ceremony. "With this new center, we are supporting the country to achieve these reforms and can also increase the local added value by offering local solutions," he adds.

Hands-on training programs

The training center features a classroom with interactive technology, an extensively equipped workshop and a field bus training lab. It offers practical, hands-on training programs designed to impart knowledge on measurement technologies and process control systems that are in demand by the hydrocarbon, power and water & wastewater industries. Young Saudi engineers and university graduates will be able to use the facility to acquire technical know-how in accordance with the latest international standards. Local technical resources can enhance their knowledge and stay competitive with the customized trainings offered in the center.

Endress+Hauser has opened a calibration and training center in Jubail, Saudi Arabia.

The new building offers practical, hands-on training programs designed to impart knowledge on measurement technologies and process control systems.

Cost-saving calibration services

The 2,700-square-meter facility houses a modern calibration center, the only vendor-managed gravimetric calibration facility in the region, from which Endress+Hauser will offer manufacturer-independent calibration services for measurement instruments. Endress+Hauser also offers reliable on-site calibration, leading to cost savings and a reduction in production downtime. "For us, it's important to be able to address our customers' needs in a flexible manner and to ensure that they are optimally managed," said Matthias Altendorf, CEO of the Endress+Hauser Group.

Strong presence in the Middle East

The new calibration and training center is part of the Group's strategy. Globally active, Endress+Hauser is continuously expanding its international footprint. For almost two decades Endress+Hauser was represented in the Kingdom of Saudi Arabia by a local representative, Anasia Industrial Agencies. To optimize customer support in the region, Endress+Hauser entered into a joint venture with Anasia in 2012, enabling the Group to be directly present and close to the customers in the region. Endress+Hauser Saudi Arabia currently has 50 employees. The goal of the new investment is to strengthen the Group's presence in the important Saudi Arabian market, as well as across the entire Middle East.

Endress+Hauser AG
H 4153 Reinach BL 1

Dedication ceremony in Saudi Arabia: Endress+Hauser inaugurates the new calibration and training center in Jubail.

Pfeiffer Vacuum welcomes this year's Röntgen Award winner, Dr. Lars von der Wense

- Outstanding contributions in the nuclear physics field
- The basis for the future development of a nuclear clock
- Pfeiffer Vacuum and Schunk Group have been promoting young scientists for many years

The Justus Liebig University Giessen (JLU) is awarding the Röntgen Prize this year to Dr. Lars von der Wense. The award winner is a research associate at the Faculty of Physics at the Ludwig Maximilian University in Munich. He is receiving the award for his outstanding contributions in the field of nuclear physics.

In the context of his dissertation, Dr. von der Wense has succeeded in directly detecting the thorium isomer Thorium-229m, which has been intensively searched for over 40 years. Dr. von der Wense laid the foundation for the future development of a nuclear clock. The isomer is characterized by the smallest known excitation energy of all atomic nuclei. A nuclear clock would use the low transition from Thorium-229m to the basic state as the clock. In contrast to optical atomic clocks, which use transitions in the atomic shell, a nuclear clock would allow much more accurate time measurement. The reason for this is that atomic nuclei are much less susceptible than the atomic shell to external disturbances such as electric and magnetic fields in the environment. A nuclear clock could even be used to investigate whether certain natural constants are actually constant or change minimally over time. A nuclear clock could be built relatively compactly and could then, for example, be sent into space in a satellite for the next-generation GPS navigator system.

Dr. Lars von der Wense received dissertation awards for his work from the Ludwig Maximilian University of Munich and the German Physics Society (DPG).

"Many research institutions have been Pfeiffer Vacuum's partners for decades. Our vacuum solutions are also being used successfully in the Faculty of Physics at the Ludwig Maximilian University of Munich, and we are pleased that Dr. von der Wense was able to confirm his theoretical assumptions there," said Dr. Ulrich von Hülsen, member of the Management Board of Pfeiffer Vacuum Technology AG, honoring the award winner.

The Röntgen Prize is awarded annually at an academic award ceremony at the Justus Liebig University for outstanding work on basic research into radiation physics and radiation biology. The award is named in memory of Wilhelm Conrad Röntgen, who was a professor in Giessen from 1879 to 1888. The award primarily distinguishes the work of young scientists. The € 15,000 prize is donated by Pfeiffer Vacuum and the Dr. Erich Pfeiffer Foundation and the Ludwig Schunk foundation. On November 29, one day before the award ceremony at JLU, Dr. Lars von der Wense visited Pfeiffer Vacuum and reported on his research findings.

Pfeiffer Vacuum GmbH D 35614 Asslar

Pfeiffer Vacuum welcomes this year's Röntgen Award winner, Dr. Lars von der Wense.

Optimized, digital and globally connected

Freudenberg Filtration Technologies expands filter-testing laboratory

The three-month conversion work has now been completed and the filter laboratory on the industrial park in Weinheim is shining in new splendor. In the newly named "Filtration Science Lab", Freudenberg Filtration Technologies will continue testing and investigating products for the automotive, industrial and consumer markets. Filters have been put to the test here for more than five decades. In the course of a two-stage renovation, what used to be a filter laboratory characterized by "functional industrial flair" has become a modern and innovative competence center – not just visually but also with optimized processes and improvements for the people who work there. The sum invested in the conversion works is in the six-figure range.

Innovative products are tested here in a facility that extends to around 1,000 square meters. Laboratory manager Matthias Schilling and his team are able to examine the performance of filters on more than 20 test benches. Has the filter reached its dust storage capacity? Can air still pass through it easily enough without using more energy than permitted? These are the sorts of questions to which the filter measurement team at Freudenberg Filtration Technologies finds answers. In 2017, around 10,000 measurements were carried out with the aim of finding concrete answers to customers' questions.

Nothing is left to chance

National and international standards play a decisive role, with the filters being tested precisely in accordance with DIN, EN or ISO specifications. The test benches and the substances used comply with all standards, down to the smallest grain of dust. In addition, the laboratory team carries out defined incoming goods inspections of the materials used, for example, the nonwoven filter medium or the activated carbon that binds odors and gases. Particularly selected filters are scanned before delivery to detect any possible damage. Last but not least, the product development team calls on the services of the laboratory when it comes to testing filter innovations or optimized products. "In general terms, the demand for measurement results is increasing. In this respect, we can draw on many years of experience and a wide range of skills. It is also important to us to respond flexibly to the concerns of our colleagues", Schilling explained.

Communication among colleagues is increasingly taking place digitally. An online platform allows both sides to view the status of orders. The test benches are also connected to the laboratory's IT infrastructure – everything is interconnected. Measurement results are fed directly into the company's internal network and can be exchanged internationally. The coordination of filter measurement technology at all locations is centrally coordinated in Weinheim. Further laboratories are located in Hopkinsville USA, Suzhou, China and Pyeongtaek in South Korea.

Freudenberg Filtration Technologies SE & Co. KG
D 69465 Weinheim

25 years of GEMÜ multi-port valve blocks

The valve specialist based in Ingelfingen is celebrating its 25th anniversary with high-quality multi-port valve blocks (M blocks) in stainless steel.

Originally, a pipeline construction consisted of welding simple investment cast or 2/2-way valve bodies together with pipe fittings. And these are to some extent still used today, but they have a substantial disadvantage due to the large deadlegs. It was for this reason that the first simple multi-port valve body was made in 1993 – the T valve, which was self-draining and featured integrated pipe fittings without any weld seams at all. Nowadays, the M blocks are the most advanced solution for dealing with the high, complex plant engineering requirements of the pharmaceutical, biotechnological, chemical and foodstuff industry.

Unlike the time-consuming welding configurations, M blocks are manufactured entirely in stainless steel block material. As a result, they have a compact and multi-functional design, greatly reduced deadlegs, a reduced hold-up volume and improved protection of expertise for plant operators. Furthermore, product reliability is increased since there is no need for any weld seams. In addition to all current connection standards, even special process connection such as Tri-Clamps or hygienically compatible seal contours can be incorporated directly into the valve bodies. The experienced developers at GEMÜ know virtually no limits when it comes to the customized design of the M blocks. More than 1200 different designs with over 25,000 specific customer solutions in a wide range of stainless steel alloys have already been implemented.

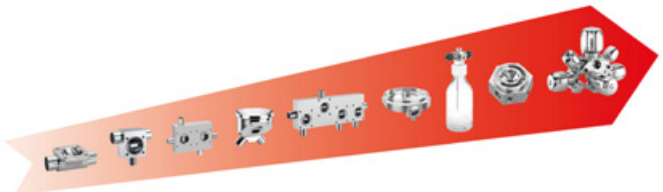


Figure: Evolution of diaphragm valves – 25 years of M blocks.

In addition to the classic M block with diaphragm valve seats, various shut-off concepts and sealing principles such as globe valves and the award-winning GEMÜ PD design can also be combined. Plastic M block solutions are also available in the standard version and their material properties mean that they can be used in semiconductor systems, for (waste) water treatment or in the chemical industry. The valve specialist is already concentrating on innovative manufacturing methods such as Laser Additive Manufacturing (3D printing) in order to support customers with expertise and innovative capacity both now and in the future.

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

PaintExpo 2020 with Strong Demand for Booth Locations

The 8th World's Leading Trade Fair for Industrial Coating Technologies in Karlsruhe (Germany) from 21 to 24 April 2020 is Right on Course

PaintExpo

Just a few months after the seventh edition of the world's leading trade fair for industrial coating technologies closed – which achieved new record-breaking numbers with regard to exhibitors, visitors and internationalism – firm bookings for booth floor space at PaintExpo 2020 have already been submitted by 304 companies from 19 countries. At a current level of 124,000 square feet (11.536 square meters), net exhibition floor space already amounts to more than 74% of the level reached at the last event. This is a strong indication that the upcoming PaintExpo will once again be larger than ever before.

For the eighth time, PaintExpo will showcase innovations, applications, future technologies and trends covering all aspects of coating from the 21st through the 24th of April, 2020. It presents the full spectrum of international product and service offerings in the field of industrial coating technology throughout the entire value creation chain. This internationally unique concentration of companies from industrial coating technology is the basis for the event's strong ability to attract users from job-shop coaters and companies with in-house painting operations from around the globe. 11,790 expert visitors from 88 countries travelled to Karlsruhe in 2018 (representing a 12% increase). More than one third of the visitors came from countries other than Germany. Most of the visitors brought concrete tasks and projects along with them. "We participate at numerous trade fairs – in Asia and America too – but where the quality of the exhibitors and visitors are concerned, as well as product quality and coverage, PaintExpo is the global leader. That's why we'll exhibit in 2020 again," explains Frank Berg, Managing Director of Caldan Service GmbH. Professor Dr. Nils A. Reinke, CEO of Winterthur Instruments AG in Switzerland, has already made firm plans to participate as well: "We've been exhibiting at PaintExpo ever since our company was founded seven years ago, and participation at the trade fair has had a significant impact on the development of our business. It provides us with an ideal platform for the presentation of our products. Aside from this, we gain a great deal of input for the further development of our products thanks to the broad spectrum of visitors."

A look at the exhibitor list, which is already full of world-class enterprises 17 months before the trade fair opens, makes it apparent that these assessments coincide with those of many other companies: 304 companies from 19 countries have already made firm bookings for their booth floor space at the world's leading trade fair in 2020, and they enjoyed a full range of options in selecting their booth locations. The list includes nearly all of the national and international market and technology leaders from the various exhibition segments. At a current level of 124,000 square feet (11.536 square meters), net exhibition floor space already amounts to more than 74% of the level reached at the event in 2018. The strong demand for booth floor space long before the event opens once more underscores the outstanding position enjoyed by PaintExpo as a global industry meet.

(Bildquelle: PaintExpo)

Focus on Future-Oriented Coating

Jürgen Haußmann, managing director of trade fair promoters FairFair GmbH, is convinced that PaintExpo will continue to experience strong development where visitor numbers are concerned as well: "Even if requirements and developments differ in the various user sectors and countries – as key technologies, painting and coating are an important success factor." And it's correspondingly important for companies with in-house painting operations and coating job-shops to prepare themselves for new requirements. In addition to ever stricter customer demands for quality, economy and flexibility, this also involves more efficient use of materials and resources, as well as sustainability. Additional issues include advancing digitalisation and networking of production processes, the use of new materials and material combinations, and the trend towards individualisation.

"Regardless of whether coatings for metal, plastic, wood or wooden materials, glass, composites or other materials are involved, visitors to the upcoming PaintExpo will once again be presented with correspondingly adapted product, process and problem solutions thanks to the unique, future-oriented offerings shown by the exhibitors," says Jürgen Haußmann with confidence already today.

The exhibition programme of the world's leading trade fair for industrial coatings technology covers coating equipment for liquid, powder, UV, immersion and coil processes, paints and enamels for all processes, application systems, spray guns and atomisers, automation and conveyor technology, cleaning and pre-treatment, drying and curing, environmental technology, pneumatics, compressed air supply and exhaust purification, water treatment, recycling and disposal, accessories, masking, measuring and test technology, quality assurance, identification, paint stripping, job-shop coating, services, packaging and technical literature.

21st - 24th April 2020: PaintExpo 2020, Karlsruhe (D)

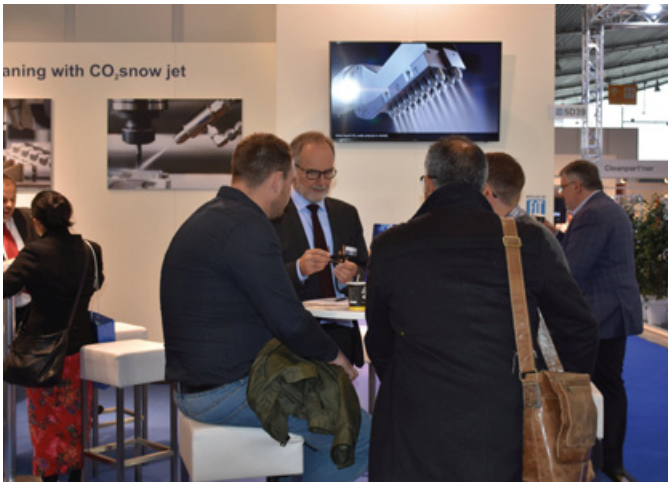
FairFair GmbH
D 72644 Oberboihingen

parts2clean 2018: First-class contacts, projects and contracts

- Cleaning of parts and components increasingly important in many sectors
- Keen interest in automation and digitization (Industrie 4.0)
- Trade show attracts numerous decision-makers willing to invest

The 16th parts2clean proved to be a complete success. From 23 - 25 October 2018 the 240 exhibitors at parts2clean transformed Halls 3 and 5 of the Stuttgart Exhibition Grounds into an international hub for the industrial components and surface cleaning sectors. Companies from 16 countries exhibited at the event, including 26 percent from outside the host nation Germany. Approx. 4,500 trade visitors from 42 countries attended, a response that underlines the consistently sound performance of this international flagship event. Some 21 percent of the trade visitors came from outside Germany, including 76 percent from member nations of the EU and a further 18 percent from non-EU European countries. Germany, of course, accounted for the largest contingent of visitors. This year the biggest groups of visitors from outside the host nation came from Austria, followed by Switzerland, France, the Czech Republic, Italy and the Netherlands.

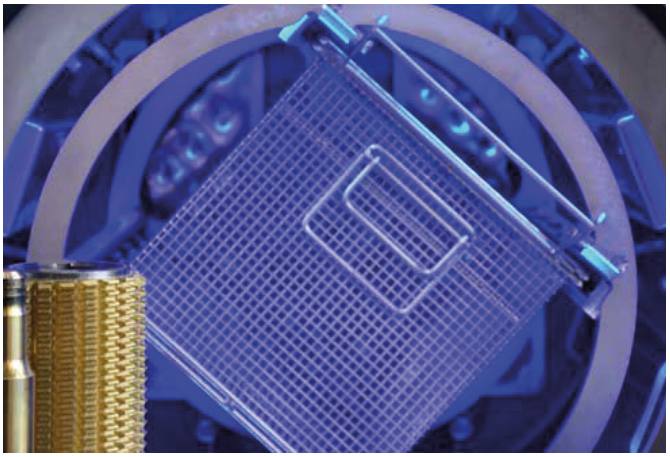
„We are entirely satisfied with the results of parts2clean 2018“, says Olaf Daebler, Global Director parts2clean at Deutsche Messe AG, adding: „Many exhibitors noted a further improvement in terms of the quality of the visitors.“ This view was shared by Jens Emmerich, Product Manager for R&D, Surface Technology at BCD Chemie GmbH: „The number of contacts made at our stand was slightly down on the previous year, but quality clearly made up for quantity. In the past, some of the discussions at the stand tended to be a bit cursory, but this year we were able to talk in more depth. These discussions led to concrete projects, dates for visits and even some tests of our cleaning technology. We will definitely be exhibiting at parts2clean 2019.“



Decision-makers welcome this platform for information and acquisitions

The 16th parts2clean clearly showed that more companies from different sectors are beginning to recognize the important role played by industrial parts and surface cleaning in maintaining quality standards in diverse stages of production. This was made evident not only by the extraordinarily high proportion of professionals who attended the event (99 percent), but also by the decision-making competence of the visitors within their companies. One in two visitors came from management and 85 percent of all visitors stated that they played a role in their company‘s investment decisions. It was also clear that the visitors to parts2clean were keen to invest. No fewer than 82 percent of them came with clear ideas on acquisition and investment, a figure that was slightly higher than at last year‘s trade show. Some 41 percent of these potential investors had an investment budget of over 100,000 euros at their disposal. In other words, many of the trade visitors arrived at the International Trade Fair for Industrial Parts and Surface Cleaning with clear intentions and concrete projects in mind.

Consequently, the exhibiting companies were able to report some excellent contacts, new projects and even contracts negotiated at the trade fair. „We could convert high-calibre contacts into potential new customers at this year‘s parts2clean and were able to conclude a big order almost on the spot. That is relatively rare at



parts2clean 2018: First-class contacts, projects and contracts

a capital goods fairs such as parts2clean," explained Carola Maurer, Market Development Assistant, Hobart GmbH. Similarly, Peter Ruoff, Head of Marketing & Sales and a member of senior management at MAFAC – E. Schwarz GmbH & Co., enthused about an order for the company's latest cleaning system: „parts2clean 2018 proved better for us than last year's event, not simply because we concluded a direct sale of a cleaning system at our stand, but also due to the number of enquiries received from new contacts. The conversations with trade visitors revealed that the trend towards increased industrial cleanliness continues unabated. The main focus of interest is in the removal of particulates, residues and film-like contaminants."

This positive experience was echoed by Raffaela Tessari, Sales and Customer Care with the Italian manufacturer of cleaning plant and systems, NOVATEC S.r.l.: „We have been exhibiting successfully at parts2clean for many years and 2018 was another success. This trade fair only attracts serious trade visitors interested in concrete business and it gives us the time to discuss their requirements and specific objectives with them in detail. parts2clean is always a great opportunity to meet first-class contacts and convert them into potential new customers, as well as nurture existing customer contacts and business partners." Elia Bosco, Sales, Everest Elektromekanik Makine Ve Sistemleri Sanayi ve Tic Ltd. Sti., Turkey, also considers parts2clean an ideal platform for initiating new business: „parts2clean offers an excellent opportunity to promote our products and new developments among the right audience. The quality of the international professional visitors is outstanding and we will definitely exhibit again at next year's parts2clean."

The manufacturers of cleaning plant were not the only exhibitors to register overwhelming satisfaction with their trade fair participation. Suppliers of equipment from other areas of industrial cleaning were also impressed. For example, Sandra Gruber, from Sales & Marketing at SensAction AG, said: „The number of visitors at our stand was similar to last year, but the quality of the contacts made was higher. We are therefore expecting good post-fair business." Hans-Jürgen Oberdiek, Sales Marketing Manager, Carl Zeiss Microscopy GmbH, was also optimistic: „The visitors approached us with a quite diverse range of interests and requirements, which really underlines the growing importance of clean parts and surfaces within an increasing number of sectors. Accordingly, we were able to make a large number of new contacts at parts2clean, and this could generate more orders."

Florian Weber, Sales Director of Weber Ultrasonics AG, had the same experience: „Yet again, we are very pleased with this trade fair. The number of trade visitors and the quality of the contacts was excellent. parts2clean is the only trade fair in this sector and we will be back next year." Likewise, Tobias Jessberger, managing director of Dr. Jessberger GmbH, reported: „Due to the extremely high quality of the contacts and the international outreach of the trade show, parts2clean has a firm place in our trade fair schedule." Anja Wächter, managing director of Metallform Wächter GmbH, came to the same conclusion: „Our trade fair participation has again paid off 100 percent. The outcome of this year's parts2clean justifies our decision to exhibit at this trade fair every year."

Focus on trends and future requirements

A tour of parts2clean showed that this flagship event is not solely focused on current needs and demand for clean industrial components and surfaces. As parts2clean organizer Daebler pointed out: „We established that digitization and automation are making rapid inroads into industrial components and surface cleaning." The organizers responded, therefore, by including new display formats, special presentations and various exhibits covering these future-focused areas. „This year, by exhibiting combined preliminary solvent treatment and plasma technology, as well as our digitization solutions, we addressed the core needs of many users. We received an excellent response from the visitors, particularly from customers and existing business partners with high expectations and requirements in specific areas such as film-like residual contamination or the digitization of cleaning processes. We were able to give them a clearer idea about the direction that this sector is taking", said Rainer Straub, Board of Management, Vice President Sales & Customer Service, Ecoclean GmbH. His comments were echoed by Andreas Rosenbusch, Business Development Manager at Stäubli Tec-Systems GmbH Robotics: „parts2clean has signposted the role of Industrie 4.0 in the cleaning of industrial parts and surfaces. The digitization of cleaning plant and processes, as well as the acquisition, evaluation and use of data are huge topics that will assume greater significance and for which we can offer an array of solutions." However, many sectors are still seeking a solution to their specific needs, for example with respect to both the partial or complete removal of residual, film-like contamination of surfaces, as Karl-Hein Menauer, Senior Manager Sales & Technologie at acp systems AG, reported: „Compared to last year, the number of leads was up by about 30 percent. These were primarily contacts from the automobile and components industries, aerospace and electronics. The most frequent issue was the partial removal of film-like contaminates, a challenge for which many companies do not yet have an adequate solution."

A cross-section of sectors and materials

The cleaning of industrial parts and surfaces involves an extremely broad range of tasks and requirements, and this diversity is matched by the number of sectors from which the professional visitors at parts2clean came. The sector with the biggest contingent of visitors this year was the automobile industry with approx. 42 percent, followed by mechanical and plant engineering, metalworking and metal processing, electrical engineering and electronics, precision engineering, optics, pharmaceuticals, chemicals and production technology. The verdict of the visitors at parts2clean was positive. An overwhelming majority stated that the event covered almost every aspect. Nine out of ten visitors are confident that they will again attend the International Trade Fair for Industrial Parts and Surface Cleaning in the future. The next parts2clean will take place from 22-24 October 2019 at the Stuttgart Exhibition Grounds.

22th - 24th October 2019: parts2clean, Stuttgart (D)

parts2clean

Deutsche Messe AG
D 30521 Hannover

The future was omnipresent once again at the COMPAMED

Developments from the suppliers deliver valuable stimuli for the tech world

It's been a well-known secret for ages: Anyone that wants to know what the future holds in store in terms of innovation in medical care should take a look at the new products and achievements of the suppliers of the medical technology industry. They are providing valuable technological inspiration, react quickly to trends and offer their industrial partners high-tech solutions that are made to measure. This was confirmed once more at the COMPAMED in Düsseldorf, the international leading trade fair for the medical technology supplier sector. COMPAMED, which is always held alongside the world's biggest medical trade fair MEDICA, was on top form once more this year (run time for 2018: 12 - 15 November). Halls 8a and 8b of the Düsseldorf trade fair centre were completely full, holding 783 exhibitors from 40 countries (making this COMPAMED more international than ever before). Once more, COMPAMED saw 20,000 professional visitors, which put the cherry on the cake.

The business field peripheral to COMPAMED is also experiencing a positive boost: According to the German Electrical and Electronic Manufacturers' Association (ZVEI), turnover for German medical technology providers grew by 2.5% in 2017, to almost 30 billion Euro, with the foreign market constituting almost 19 billion Euro. The number of employees in this segment also grew by 3.9%, to 137,900. Every single trade association assumes that it will experience further growth for the current year and for 2019, which could even be up to 6% when considered globally. Medical technology suppliers will also benefit from this. A quick tour through the COMPAMED halls showed that their business is also soaring due to trends and figures that are actually not particularly positive...

Around the world, the number of people with high blood pressure is increasing further – one in every three people in the world now has high blood pressure. Due to this, millions have cardiovascular disease, which is among the most common causes of death. As high blood pressure is often symptomless, having blood pressure taken regularly is very useful in diagnosing it. Considering this, the CiS Forschungsinstitut für Mikrosensorik GmbH (CiS Research Institute for Microsensors) has developed a non-invasive method for monitoring blood pressure via the ear. This is based on an optical sensor which was created based on methods which analyse pulse waves. Here, visible or infrared light is emitted into the skin and the reflected component is measured. The levels of intensity recorded enable conclusions to be drawn on blood pressure fluctuations in the skin. This compact sensor system is worn inside the ear (in the auricle) and is adapted to the individual. "Now, we can determine blood pressure at specific times and also provide continuous monitoring of fluctuations in blood pressure" remarked Andreas Albrecht, Project Engineer at CiS, with delight. The data

The future was omnipresent once again at the COMPAMED

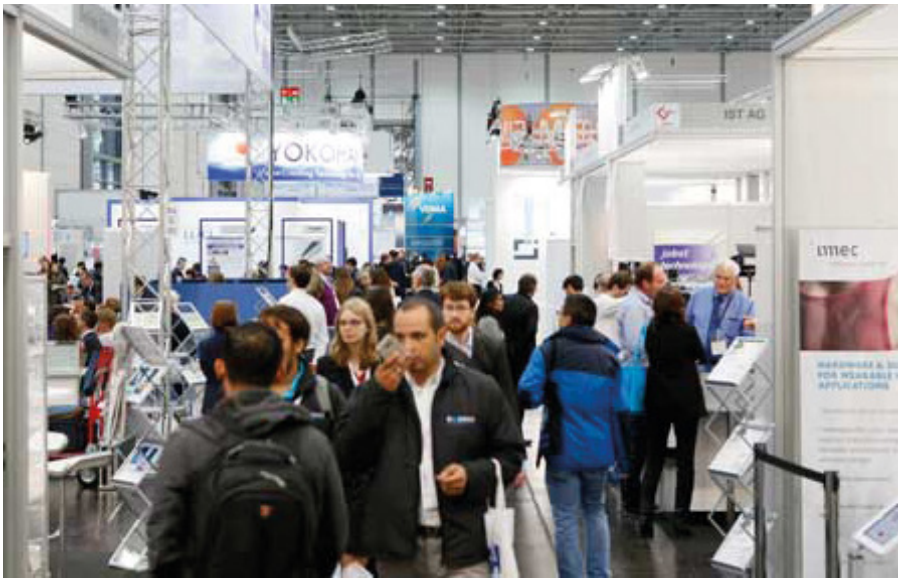
on the blood pressure trend are determined via a patented mathematical algorithm. The researchers from Ilmenau are now simply seeking an entrepreneur who will bring their development onto the market. The potential here is huge, as this new method is far more precise than the classic blood pressure cuff.

The trend for miniaturisation continues

The Fraunhofer Institute for Electronic Nano Systems (ENAS) is also following the trend for miniaturising medical technology. Endoscopes can be fitted with a special microsystem (an array of ultrasonic transducers). With this support, it is possible to stimulate diseased tissue both locally and selectively, in order to supply medication in a better and more targeted manner. This means that treatments with a large range of potential side effects can be done away with. Currently, this conservative endoscopic procedure is being used in the fight against colon and prostate cancer or to treat myoma. ENAS is working on minimally invasive, miniaturised, capacitive ultrasonic transducers for microendoscopy in this sector. „We want to use our method, which functions using a similar method to hyperthermic therapy for specific types of cancer, to improve the therapeutic applications", said Andreas Morschhauser, of the Department for Multi-Device Integration at ENAS. The objective here is to eliminate tumours with therapy that is less harsh on the patient, through membrane stimulation and increasing the metabolism of the pathological cells.

Flow sensors that can even detect heartbeat

Trends such as patient-friendly point-of-care applications, improving patient compliance, complex administration of medication and wearable device design mean that smart medical devices need to be developed. Sensirion, one of the leading manufacturers of digital microsensors and systems, presented new flow sensors in the LD20 series for high-volume applications in medical technology at COMPAMED 2018, among other elements, to support these trends. "This sensor enables bidirectional measurement of flow rates of a few millilitres per hour up to 1000 ml/h and can simultaneously detect typical issues such as occlusion, free flow or air bubbles with unprecedented speed and sensitivity", commented Barbara Thurnherr, who is Project Leader for Marketing and Communication at Sensirion. Thanks to Sensirion's CMOSens technology, the LD20 is sensitive enough to detect even the slightest change in the flow rate. This means that the sensor can even detect the oscillating back pressure of the patient's venous pulse; in other words, it can feel the patient's heartbeat. Detecting the heartbeat on the flow rate is a direct indication that there is an intact connection between the infusion cannula and the vein of the patient. The LD20 series enables medication administration to be measured precisely and in real time, which means that therapies elicit better treatment results and safety, effectiveness and reliability are all improved, which benefits patients and medical staff alike.



Problem-free MRIs with new implants

Active implants such as pacemakers, neurostimulators or medicine pumps are increasing in number. This means that requirements for them to be MRI compatible are also becoming more prevalent. The German Federal Ministry of Education and Research (BMBF) is supporting the MRI-compatible implant joint project (MR-Implant) with almost two million Euro. This project focuses on researching and developing an electronic neural implant system. The coordinator of the joint project is CorTec, a company which has already presented electrodes and its Brain Interchange technology at COMPAMED in the past. "Ultimately, the end goal is a neural implant system which is safe and has expanded functions, which will enable MRI diagnosis to be carried out on patients wearing the implant for the first time", stated Dr. Fabian Kohler, Head of Reliability Engineering at CorTec. The company's system primarily targets conditions such as Parkinson's, epilepsy and strokes. The implant systems will exchange data at high speeds, record neural activity and also provide stimuli. Simultaneously, they must enable the patient to undergo MRI investigation without causing any issues. "Today, we are still seeing problems caused by the heating effects, currents and artifacts: we want to change this", said Kohler. The MRI-compatible implant project has been underway since March 2018 and will run for three years.

High-quality products need proper packaging

In addition to microsystems and sensors which come with a wide variety of shapes and characteristics, sophisticated packaging solutions are always a prime point of interest at COMPAMED. Inpac Medizintechnik is a one-stop service provider for cleaning, assembly, packaging and sterilisation of medical products. "Our mission is to create tailor-made solutions for our customers while working under our motto: 'All from one source'", said Dr. Ralph Hermann, the CEO of inpac. High-quality products such as bone screws, stents and implants require suitable packaging. Inpac works across 1,700 square metres of clean room space which complies with ISO Class 7. In addition, each packaged product is examined under an illuminated magnifier. Ten percent of the staff are engineers and scientists, who are primarily focused on the

The future was omnipresent once again at the COMPAMED

validation process. The simulation of the entire process is becoming more and more important. Here, transport, mechanical durability and ageing. Additional requirements also result from a new definition of cleanliness which expands the scope of the previous definition considerably, including bacteria, particles, endotoxins (by-products from bacteria), cytotoxic substances and chemicals. Inpac is ready to take on these challenges.

Special cables and special adhesives for medical technology

E&E Kabeltechnik is also taking on special tasks for the medical technology industry: These specialists from Westphalia came up with a three-pole, biocompatible cable for the Plasmapatch wound dressing from Coldplasma Tech, a start-up. This cable is not only plasma and autoclave compatible, it is also very flexible. "We can therefore ensure that the connection between the plasma source and application is never kinked and remains break-proof," explained Ole Tiedt, who works in Sales and Marketing at E&E. The cold plasma destroys bacteria, other pathogens and fungi, stimulates the body's own capacity to heal and does not induce any side effects or antimicrobial resistance. The luminous blue gas is a ray of hope for patients with bedsores. This development has recently been awarded the German Prize for Innovation in the Start-Up category. The E&E cable specialists also played a significant role here.

The adhesive specialist Henkel attended COMPAMED for the first time. This Düsseldorf-based company showcased a new acrylic ester adhesive which offers many advantages for design and manufacturing. Two of these products were specially designed for flexible applications with thermoplastic elastomers (TPE) and thermoplastic polyurethane (TPU). These are substrates which are increasingly requested in specifications in medical technology. As a low-viscosity, LED-curing and highly flexible adhesive with a non-stick surface once it has set, high ductility and excellent bond strength, for polycarbonates, PMMA and other rigid plastics used in this market. "Curing via LED saves costs as the lamps can be switched on and off. In addition, the narrow range of light wavelengths without infrared emissions enable the manufacturers to reduce their energy consumption and minimise the heat produced, which needs to be dissipated. This is particularly important for clean room applications", stated Andrés Bultó, Business Development and Key Account Manager for Medical at Henkel. Examples of uses for the new adhesives include connecting tubing and infusion sets, catheters, ventilator systems, caps for cannulas and fluid collection devices. The new adhesives are certified for biocompatibility and have proved that they can withstand the current established sterilising processes.

Top speed ahead for samples

Schneeberger is a leading provider of linear technology. For years, the miniature guideway system MINIRAIL, available in a range of widths and carriages, has also proved its worth in transporting and positioning samples and other elements in medical technology, in laboratories and in clean rooms. "MINIRAIL are miniature guideways which are perfectly suited to reliably providing the highest level of precision in the smallest spaces," stated Andrè Butrin, the Regional Sales Manager at Schneeberger. The carriages can accelerate at up to 300 metres per second² at a maximum speed of five metres per second. As a new development, Schneeberger showcased its first miniature guideway with an integrated optical distance measuring system, called MINISCALE. This means that all expenditure for additional separate distance measurement systems are dispensed with, and less components are required which makes construction far easier. This miniature measurement system is particularly well-suited to use in small installation spaces, as is often the case for optical devices within medical technology.

Compact device for fast analysis - one device covers everything

Helmut Hund GmbH is also focusing on sample carriers, even though the circumstances are slightly different. At COMPAMED, they showcased the Lateral Flow Tester, LFT100, a mobile compact device for fast diagnostics on blood and other bodily fluids. The star feature of this hand-held device is that it can measure sample carriers from all popular manufacturers. "Our system therefore ends incompatibility with the numerous shapes and sizes of test strips which often make medical diagnostics difficult, time-consuming and expensive in the prevalent forms of lateral flow tests," said Peter Nadler, Sales and Marketing Manager for Instruments at Hund. Test strips with single or multiple samples of up to 90 x 60 millimetres can also be analysed by this innovative device without any issues. Thanks to a mains supply and battery, the LTF100 can be used both on the go and fixed in one place. The sample is taken in, measured and analysed within seconds. This occurs via the highly precise optics, without any mechanics, inside the device.

"Enzyme-linked Immunosorbent Assay", this mouthful of a phrase represents a medical achievement that saves lives every day: the ELISA test. With this antibody-based procedure, diagnostic companies can detect life-threatening illnesses such as the HI virus. The ELISA test kits consist of (auxiliary) reagents and microwell plates. Optima Life Science already has a machine solution at hand for coating microwell plates. At COMPAMED 2018, this specialist machine builder has now also developed a solution for filling reagents. The new filling system, called "OPTIMA ImmuFill" automates a process, namely filling the (auxiliary) reagents for ELISA test kits, which many diagnostic companies are still doing manually or using very simple device solutions. "We're filling a gap in the market with this solution," said Wolfgang Pyrags, the Sales Director for the company, who is very pleased with the solution.

Microsystems and sensors, active implants, special adhesives, linear technology, packaging and high-tech machine construction and even 3D printing: COMPAMED 2018 offered full halls, but more importantly, it offered a wide spectrum of innovative solutions for medical technology. In addition to the exhibition area, two established forums presented the trends in the supplier field of medical technology: At the COMPAMED SUPPLIERS' FORUM (sponsored by the DeviceMed trade publication), the main focal points for this year were: Additive manufacturing, cybersecurity, regulatory affairs and wearables. The COMPAMED HIGH-TECH FORUM presented by the IVAM Association for Microtechnology places key focus on microsystem technology, nanotechnology and production technology and process control.

18th - 21st November 2019: COMPAMED 2019, Duesseldorf (D)

interpack alliance develops MEA Region with New Trade Fair

pacprocess MEA to be held annually in Cairo from December 2019

The interpack alliance of Messe Düsseldorf expands into the Middle East Africa (MEA) region – its "pacprocess MEA" will be held annually at the Egypt International Exhibition Center in Cairo starting in December 2019. The trade fair can count on broad-based support from numerous partners from business and Egyptian government organisations and/or associations.* The debut event is scheduled for 9 to 11 December 2019 and will run concurrently with FoodAfrica, the leading food trade fair in the region.

pacprocess MEA will be held in cooperation with the organisers IFP Egypt and Konzept that also organise FoodAfrica. The fair addresses the eight core target groups of the interpack alliance: food, beverages, pharmaceuticals, cosmetics, confectionery and bakery, non-food and industrial goods – and all of these across the entire value chain. It also targets the suppliers of packaging means, packaging materials and the associated manufacturing technology. Recycling and environmental technology also play a role here.

"For pacprocess MEA there will be an advisory board composed of high-calibre representatives of international companies from the food, pharmaceuticals and confectionery/pastry industries as well as from numerous Egyptian state organisations and associations – which is a first for a trade fair held outside our homebase in Düsseldorf. This is how we bring together decision-makers and their know-how for a strong trade fair," says Bernd Jablonowski, Global Portfolio Director Processing & Packaging at Messe Düsseldorf. The close connection with Egyptian government organisations is also underscored by the meeting between Werner M. Dornscheidt, President & CEO of Messe Düsseldorf, and the First Undersecretary of the Ministry of Trade and Industry, Sami Ahmed Younis, as part of the launch event of pacprocess MEA in Cairo on 10 December.

Entry Market for a Whole Region

The MEA region and the Egyptian market, in particular, are rated as dynamic and highly attractive not least by international groups. This still young democracy provides a gateway to the African world because it maintains extensive free-trade agreements with other states in the region and is a focus of German development policy. It is open to foreign investors, which is why large corporations such as Coca-Cola, Nestlé, and Mondelez have invested hundreds of millions over the past few years. Even the Egyptian domestic market is attractive: spending on food and beverage in Egypt is expected to rise by 60% in the period 2013 to 2020. In the pharmaceuticals segment Egypt ranks among the biggest producers and most important sales markets in the MEA region. Here growth is estimated to reach 8% by 2020. The packaging sector is predicted to expand by as much as 35% between 2015 and 2019. The driver of this development is a young, growing and spend-happy population with rising education levels and growing disposable incomes.

Special Themes innovationparc and SAVE FOOD

As an interpack alliance member pacprocess MEA will also introduce its visitors to innovationparc and SAVE FOOD, special themes that have been established features at the flagship fair in Düsseldorf. With its conference programme and serving as a platform for knowledge transfer and exchange, innovationparc picks up on industry trends of relevance to this region. The SAVE FOOD Initiative is a joint project of the Food and Agriculture Organisation of the United Nations (FAO), the United Nations Environmental Programme (UN Environment), and Messe Düsseldorf and aims to reduce international food losses and waste. The plan is to establish the initiative in Egypt via pacprocess MEA. The African continent, in particular, is suffering from a high percentage of food losses – often caused by a lack of processing technologies and suitable packaging for perishable harvested products.

Interested companies can register for pacprocess MEA at www.pacprocess-mea.com from mid December.

09th - 11th December 2019: pacprocess 2019, Kairo (Egypt)

Messe Düsseldorf GmbH
D 40001 Düsseldorf

IPB China ends on a high note

The International Powder & Bulk Solids Processing Conference & Exhibition (IPB), held in Shanghai on 17-19 October 2018, once again demonstrated the professionalism of the POWTECH World family of events in the areas of powder and bulk solids. IPB China continued its 16-year history of success with strong growth in both exhibitor and visitor numbers. The event closed with new record figures of 15 percent growth in exhibitor numbers, and an impressive market-oriented supporting programme with top-level participation.

This year's International Powder & Bulk Solids Processing Conference & Exhibition brought together 163 exhibitors in Hall 4 of the Shanghai World Expo Exhibition & Convention Center (2017: 143). Bulk solids and process engineering firms from 12 countries were represented, with about one-third of the exhibitors (57) coming from outside China. The product range included machines and plant for grinding, separating, mixing, transportation and storage of bulk solids, and for analysis and metrology. Almost every aspect of the key topic of "mechanical process engineering" was covered. Following the event, 88 percent of exhibitors described themselves as happy, and 81 percent hoped to attend again in 2019.

The organizer, NürnbergMesse China, counted a total of 8,596 trade visitors at IPB 2018, a significant increase compared to 2017 (7,906). Most represented the chemical industry (35 percent), followed by the pharmaceutical (12 percent), food (11 percent) and energy sectors (10 percent).

IPB China grows and impresses

The comprehensive supporting programme developed by the organizers, NürnbergMesse China and the Chinese Society of Particuology, contributed to the further growth in the appeal of this year's IPB. Experts in bulk solids and particles from around the world shared their knowledge in five series of seminars. In the session on powder processing for the pharmaceutical industry, for example, the presentation by Dr Martin Bornhöft of the International Association for Pharmaceutical Technology (APV) on "Continuous manufacturing of solid dosage forms" met with strong interest. Further seminars looked at particle measurement and characterisation, particle and powder technology for pharmaceutical production, handling of bulk solids, and explosion protection. "Year after year, IPB China draws more visitors and exhibitors, and provides an important contribution to the development of the process industries throughout China," comments Kate Yuan, IPB Event Manager at NürnbergMesse China. "Anyone in China looking for, or offering, expert knowledge and the latest technology in powder and bulk solids processing will go to IPB." The next IPB will take place from 16 to 18 October 2019.

IPB China 2018 closed with new record figures.

Global process technology

POWTECH World is a global network of trade fairs and conferences relating to mechanical process engineering. The events at POWTECH World form the ideal platform for sharing knowledge at an international level, as well as new, global business relationships. Forthcoming POWTECH World Events:

- POWTECH
The Leading Trade Fair for processing, analysis, and handling of powder and bulk solids, Nuremberg, 9-11 April 2019
- PARTEC
International Congress on Particle Technology, Nuremberg, 9-11 April 2019

16th - 18th October 2019: IPB, Shanghai (China)

NürnbergMesse GmbH
D 90471 Nürnberg

Vertical and Electric Allrounders in Use

Arburg at Plastec West 2019

- Allrounder 370 A: Electric machine in clean room version
- Allrounder 375 V: Automated overmoulding of inserts
- Turnkey "Made in USA" expertise from Arburg

From 5 to 7 February, Arburg will present two sophisticated injection moulding applications at Plastec West 2019 in Anaheim/CA, USA: At stand 4001 in hall B, a turnkey system built around a vertical Allrounder 375 V will produce radius gauges in fully automatic production. The second exhibit, an electric Allrounder 370 A in clean room version, will be shown with a medical application.

"With our headquarters in Rocky Hill and the two Technology Centers – Midwest and California – we have a strong presence in the USA," emphasizes Friedrich Kanz, Managing Director of Arburg Inc. "Our team of experienced application technology specialists, project and service engineers uses its extensive know-how to create sophisticated turnkey systems in close cooperation with customers. In Anaheim, we will show a 'Made in USA' production cell with a unique space-saving design, used to overmould metal inserts to produce radius gauges, as well as a machine in clean room version for medical applications."

At Plastec West 2019, a vertical Allrounder 375 V will produce radius gauges in fully automatic production. Handling is performed by a Multilift Select placed on the machine to save space. (Photo: ARBURG)

Automated overmoulding of inserts

Arburg offers a wide range of automation solutions from a single source. These solutions cover everything from simple pickers to six-axis robots and complex turnkey systems. At Plastec West 2019, the company will present a production cell developed by Arburg's automation experts in the USA.

A vertical Allrounder 375 V with 500 kN (55 tons) clamping force and a size 170 (3.7 oz) injection unit will be used for the automated production of radius gauges. The required handling tasks will be performed by a Multilift Select linear robot system positioned on the machine to save space. In two mould cavities, the metal inserts will be overmoulded with 30 percent fibreglass-reinforced PA 6.6 using two different methods – in a cycle time of around just 45 seconds. For the first version, the robot system first subjects the metal components to a plasma pretreatment and inserts them into the first mould cavity, where the plastic is moulded onto the plasma-pretreated surface. In the second version, an untreated insert is placed into the second cavity and the plastic is moulded onto the metal component on both sides, creating a mechanical connection. The finished parts are removed from the two-cavity mould and placed in a part exit chute.

An electric 370 A in clean room version produces „lever bolsters" for medical technology. (Photo: ARBURG)

Allrounder for medical applications

In addition to the standard range, Arburg offers special clean room solutions. The modular product range enables Allrounder injection moulding machines and production cells to be very precisely tailored to customer requirements and the application at hand.

At Plastec West 2019 an electric All-

In two mould cavities of a vertical Allrounder 375 V, metal inserts are overmoulded with plastic to produce radius gauges in a cycle time of approximately 45 seconds. (Photo: ARBURG)

Vertical and Electric Allrounders in Use

rounder 370 A of the high-performance Alldrive series in clean room version will be showcased that produces lever bolsters (medical components for minimally invasive surgery). A clean-air module with air ionisation above the clamping unit provides for low-particle air in the working area. It allows to develop a clean room environment inside the clamp area. Thanks to preliminary and HEPA filters, the clean room module ensures a high level of air circulation and neutralises electrically charged moulded parts. The machine can be docked to a clean room via a conveyor belt.

The electric Allrounder machines from the Alldrive series are characterized by speed, precision and energy efficiency. The main axes for injection, dosing, and opening and closing the mould are servo-electrically driven. High acceleration and final speeds combined with simultaneous machine movements result in greater cost efficiency by reducing the cycle time. The closed servo electric drives are liquid-cooled, direct driven, operate quietly, and prevent exposure to dust caused by abrasion.

05th - 07th February 2019: PLASTEC WEST, ANAHEIM, CA (USA)

ARBURG GmbH + Co KG
D 72290 Loßburg

Solutions for digital and electronic drug delivery products with micro rotary piston pumps

Pharmapack 2019

On February 6 and 7, Gerresheimer will be showcasing its products at the Pharmapack in Paris with its new subsidiary Sensile Medical AG for the first time. In July of this year, Gerresheimer acquired Sensile Medical, expanding its business model to become an original equipment manufacturer (OEM) for drug delivery platforms with digital and electronic capabilities. The company works closely with pharmaceutical and biotech companies to develop devices to deliver liquid drugs. At Pharmapack in Paris, Porte de Versailles, Sensile Medical will be at Stand A94 and Gerresheimer at Stand B62.

"Sensile Medical specializes in the development of key technologies for the patient-oriented delivery of liquid drugs," says Sandra de Haan, Chief Business Officer at Sensile. Sensile Medical's leading position in micro pump technology combined with drug delivery devices featuring electronic and connected capabilities for medical applications is progressing to market readiness in specific customer projects with pharma companies. The company is involved with pharma companies in the early stages of drug and therapy development. Sensile Medical is to become the Development Division, covering the field of development devices for the entire Gerresheimer Group. It is already working very successfully on projects with customers to develop devices for diabetics and patients with heart disease and in other treatment areas such as Parkinson's disease.

The micro rotary piston pump – small and precise in dosage

Sensile Medical AG has developed a new kind of patented micro pump, which is the key component of all product platforms. SenseCore is small and very precise in dosage. Consisting of only two plastic parts, it can be produced at a low cost. Thanks to its high degree of flexibility, it is compatible with a variety of drugs.

Wearable micro pump certified to EU standards for Parkinson's treatment

A wearable micro pump of this type designed specifically for the treatment of Parkinson's received the EU certificate only recently. A European pharmaceutical company has obtained the CE declaration and will now launch the product on the market. This is makes it the first micropump by Gerresheimer's subsidiary Sensile Medical to be used commercially. The micro pump is used in advanced Parkinson's treatment.

06th - 07 th February 2019: Pharmapack, Paris (F)

Gerresheimer AG
D 40468 Düsseldorf

From left to right: Small-volume infusion pump, large-volume patch pump, reconstitution system, and pen.

Humidity Transmitters with Stainless Steel Enclosure

The EE310 humidity and temperature transmitter and the EE360 moisture in oil transmitter are now available with stainless steel enclosure.

The high-end EE310 and EE360 industrial transmitters from E+E Elektronik are now available with stainless steel or with polycarbonate enclosure. The EE310 humidity and temperature transmitter is dedicated for demanding industrial processes control. The EE360 measures the moisture content of industrial oils and thus enables predictive maintenance of machines and plants.

Display with Data Logger Function

Both devices feature an optional 3.5“ TFT color display, which offers an optimal view of the measured values and facilitates the commissioning and configuration. The built-in data logger can save 20,000 values per measurand. The recorded data can be displayed as a graph directly on the display or downloaded via USB interface for further analysis.

Image 1: EE310 humidity and temperature transmitter for demanding industrial applications. (Photo: E+E Elektronik GmbH)

Image 2: EE360 moisture in oil transmitter for oil condition monitoring. (Photo: E+E Elektronik GmbH)

Analogue Outputs and Digital Interface

The measured data is available on two analogue outputs and on the optional digital interface (RS485 with Modbus RTU or Ethernet with Modbus TCP). An optional relay module can be used for alarms and process control.

Easy Installation and Service

The enclosure design facilitates installation and maintenance. The front cover, which accommodates the electronics and the probe, can be replaced within seconds, while the wiring inside the back cover remains intact.

Humidity and Temperature Measurement up to 180 °C

The EE310 measures relative humidity and temperature in the range -40 °C...180 °C (40...356 °F) and calculates further physical quantities such as dew point temperature, absolute humidity or mixing ratio. The transmitter is available for duct or wall mount, as well as with remote probes.

Reliable Oil Condition Monitoring

The EE360 measures water activity and temperature and calculates the absolute water content of transformer, lubrication and hydraulic oil, as well as of diesel fuel. The sensing probe can be employed up to 180 °C (356 °F) and 20 bar (290 psi). The ISO or NPT slide fitting and the optional ball valve facilitate the installation.

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Extended actuator and nominal size range of GEMÜ 567 BioStar control valve

The aseptic GEMÜ 567 BioStar control valve is now available up to a nominal size of DN25, thus allowing a maximum flow rate of 15 m³/h. At the same time, the selection of motorized actuators for this valve has also been extended.

In order to expand the product range of valves for hygienic, sterile and aseptic applications to include a highly precise control and regulating valve, GEMÜ, one of the world's leading manufacturers of valves, measurement and control systems, first developed a completely new sealing technology that provides the optimal addition to the established aseptic GEMÜ valve range. With 567 Biostar control, based on GEMÜ PD design, this novel generation of valves has been designed specifically for the control of small flow rates in the pharmaceutical, food, and biotech sectors.

The PD design means that the moving parts of the actuator are hermetically separated from the product area. This hermetic separation also enables the actuator to be replaced under pressure, with no risk of media contamination.

pneumatisch betätigtes Regelventil
GEMÜ 567 BioStar control mit Bypass

elektomotorisch betätigtes Regelventil
GEMÜ 567 BioStar control

In addition to existing commercially available versions with manual and pneumatic actuators, the new motorized versions have now been fully developed for the market. The motorized version of the GEMÜ 567 Biostar control valve is the world's first real-time-enabled control valve. The combination of PD design and electric actuator as a stainless steel version makes this valve a top choice for the control of small volumes in the pharmaceutical and biotechnological industries, in applications without compressed air, or particularly for applications with stringent precision and speed requirements. The running times of the plants can be greatly extended thanks to the long service life of the PD diaphragm (more than 7 million cycle duties), the low-maintenance design and the operator replacement when medium is present. With the expansion of the range of nominal sizes to include DN 25, GEMÜ has now extended the kv range up to approx. 15 m³/h.

The GEMÜ 567 Biostar control valve is intended for all control processes in hygienic and sterile areas, right up to aseptic plants in the pharmaceutical, biotechnology, and food and beverage industries, as well as for industrial processes and corrosive media. The PTFE seal system means it is perfectly suited and completely harmless to be used with media containing oil and fats. The valve is suitable for the precise control of small quantities in medical and food engineering (milk, yoghurt, cheese production), the pharmaceutical industry, and in cosmetics. Due to the wide variety of combination possibilities of actuators, bus systems and controls, it can also be adapted for all possible processes according to customer requirements, including real-time applications.

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