



THE GMP-EXPERT



Hans J. Michael GmbH

MT-Messtechnik



New brand illustrates company's new orientation

CWS is positioning itself as a system provider with a new identity

The CWS-boco Group is now operating under the shared roof brand CWS. As a system provider with six solution areas, CWS now stands for a shared vision: making the future healthier and safer. "The company has evolved. We have a new understanding of our market and have become opener and more modern. As of today, we will be communicating this development to the outside world too," explained Thomas Schmidt, CEO of the CWS-boco Group.

In future, CWS' offering will be divided into six solution areas: Hygiene; Floor Care; Workwear; Cleanrooms; Healthcare and Fire Safety. These solution areas will join forces in the mission to achieve the company's vision of a healthier and safer tomorrow. With innovative, sustainable and digital rental solutions in the fields of hygiene, workwear and fire safety, CWS makes an active contribution to safeguarding the health and safety of its customers and their employees. Complete hygiene solutions make it possible to contain the spread of infections and decrease sickness rates. Regularly inspected protective clothing can prevent occupational accidents and contribute to increased safety in the workplace.

"Our service and sales employees assist our customers in person and on site, so they are in an ideal situation to identify risks and potential," added Mr Schmidt.

"This allows us to offer solutions to problems before they even arise." The key aspect of the new CWS system offering is considering holistic offers from the customer's perspective. The Group is now underlining that approach with a new brand identity too.

New logo combines tradition and future

The letters and the red are reminiscent of the strengths of the well-known CWS brand – the familiar elements are complemented with new ones: Modern colours send out a clear signal. "We are opening a new chapter – CWS is more," explained Thomas Schmidt. Effectively, what was previously known as CWS has now become the solution areas Hygiene and Floor Care. These are additionally being complemented by the solution areas Workwear, Fire Safety, Cleanrooms

New brand illustrates company's new orientation

and Healthcare, which were operated under a range of regional brands in the past. The respected workwear division boco will offer complete workwear solutions and services as "CWS Workwear" in future. "We are bundling the expertise of a range of individual specialised brands under one roof brand - CWS. This will render our company's complete offering more transparent for our customers and open up new possibilities," said Mr Schmidt, explaining the strategy behind this decision.

Seen from the customer's perspective

The new logo concept shows: all solution areas share a common, strong foundation - symbolised by the red. CWS is a collective understanding of complete solutions, service and innovation. The six solution areas are experts in their markets and clearly identifiable to the outside world with their own colours. "The new visual concept makes it easier for the customers to find their way around the website and information materials, for example, and to identify the solution they are looking for quickly. At the same time, CWS is re-defining its role as a system provider offering customers a wide variety of solutions under one roof," reported Dr. Maren Otte, Group Director Corporate Communications & Responsibility and Brand Project Team Lead.

Gradual restructuring of the company

CWS-boco and Initial laid the foundations for a new, shared company with the launching of the joint venture in 2017. Mr Schmidt explained, "The evolution of the brand identity reflects the transformation of the company and its new culture. This divisionalisation has allowed us to become more agile and focused. This will gradually become evident at all customer contact points. Today we have made the start and we are looking forward to introducing the new CWS to our customers."



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may 2019

Dear subscribers,

today I will be attending the new trade fair „T4M - Technology for Medical Devices“ (07. - 09. May 2019) in Stuttgart in order to find out what's new in the field of clean rooms and medical technology. Cleanroom online will report on this in June.

For the current issue of our newsletter we have again compiled some interesting articles, among them:

- **Choosing the appropriate mop for cleaning and disinfecting in controlled environments**
- **Small, smaller, DEPRAG NANOMAT**
- **Pharmatag 2019: the whole world of filling technology**
- **Registration is available for Cleanroom Guangzhou Exhibition 2019**
- **Wet chemistry users from all over the world meet up in the hometown of AP&S**
- **The world's largest amorphous-metal component at Automate 2019**

I wish you all an interesting read and a pollen-free spring.

Yours sincerely,


Reinhold Schuster



Choosing the appropriate mop for cleaning and disinfecting in controlled environments

Selecting the right mop for contamination

Selecting the right mop for contamination control and cleaning efficiency is no easy task. The choice of mop head can be crucial to a successful cleaning process in any controlled environment. With more options available than ever it can be an overwhelming decision to make, especially when not aware of the advantages each mop contains. We'll make it easier to decide with the information provided in this article.

Cleanroom mops incorporate specialized fabrics to promote economical and consistent cleaning methods, leaving behind the least amount of residual contaminants. Mop heads are one of the most fundamental tools used to maintain ISO class or cGMP levels. A poor choice in mop head will compromise the results of bio-decontamination procedures. Critical areas will not be cleaned effectively and unduly high levels of microbial contamination will remain present.

Although commonly confused as the same action, cleaning and disinfecting are not exactly alike. Cleaning requires the use of a detergent to remove dirt and debris and must come before disinfection. The application of a disinfectant after cleaning serves as a disinfection procedure. Disinfecting controlled environments requires specialized mop heads to inhibit the growth of additional bacteria, contaminants or residues.

Ideally any mop used in a cleanroom environment will not add to contamination while performing the removal of dust particles and bioburdens. The most proficient cleanroom mops feature high-quality fabrics and woven or double-knit polyester fabric with minimal shedding and high degrees of strength.

Effective cleaning and overall contamination control is key to a functional and productive cleanroom. Cleanroom mops should arrive clean and leave dirty. Innovations in textile have aided in creating mops that are ideal for picking up particles and retaining them until the mop is removed. Selecting the correct mop for cleaning and disinfecting can determine whether a cleanroom meets required standards of cleanliness or not.



The following report details commonly used mops to assist in your selection of the appropriate mop for cleaning and disinfecting in controlled environments.

Flat Mops:

Efficient and versatile because they can be used on floors, walls, and ceilings. Flat mops are particularly suited for cleanroom cleaning because they provide thorough coverage and encourage proper technique.

TruCLEAN offers flat mops in a variety of materials, including polyester, yarn, polyurethane foam, and microfiber. The following cleanroom mops have been endorsed by cleaning professionals worldwide:

TruCLEAN Microfiber Mop

Small-loop microfiber provides exceptional results in removing liquids, residue, and other contaminants. TruCLEAN microfiber mops contain split-thread fibers made of polyester and polyamide combined. Split filament microfiber creates microscopic hooks that collect and hold dust particles more effectively than rounded fibers like cotton.

Split structure effective when used wet or dry, cleans mechanically by scraping the surface with microscopic fibers. Also, microfiber exerts a positive electrostatic charge and therefore attracts negatively charged dirt.

Advantages:

- High absorption capacity
- Mop-to-dry performance on wet surfaces
- Reduce chemical and water usage
- Easily removes residue, often without solvent
- Lightweight, Increased productivity
- Reusable, withstands repetitive laundering or autoclaving

TruCLEAN Sponge Mop

Manufactured with a specially formulated grade of polyurethane foam, ideal for applying cleaning and disinfecting solutions to floors, walls, and ceilings. Designed specifically for use in cleanroom environments with ultra-low particulate level requirements. Conforms to irregular surfaces,

Choosing the appropriate mop for cleaning and disinfecting in controlled environments

ensuring a uniform application of disinfectants and cleaning solutions. Exceptional surface coherence.

Advantages:

- Heat-sealed edge reduces risk of contamination
- Low-profile, easily cleans under equipment
- Thick-bodied, protects delicate surfaces
- Excellent chemical and abrasion resistance
- Utilize mop cover, extend use and reduce costs
- Compatible with gamma, ethylene oxide, and autoclave sterilization

TruCLEAN Sponge Mop with Fused Cover

Unique 2-in-1 product combines the TruCLE AN Sponge Mop and Mop Cover



into one effective instrument. Polyester covered polyurethane foam core creates a highly absorbent mop, with high quality fabric contacting the surface. Improve results of cleaning and disinfecting procedures without compromising particulate levels.

Advantages:

- High fluid retention properties reduce frequency of replenishment
- Excellent surface coherence
- Enhanced cleaning performance
- Low-profile, easily cleans under equipment
- Compatible with gamma, ethylene oxide, and autoclave sterilization

TruCLEAN Mop Frame

Clean or disinfect a 16" x 5" area in a single pass. Low profiled mop frame for easy cleaning under equipment or other hard to reach areas. Exclusive swivel joint allows mop frame to be easily maneuvered over floors, walls, ceilings, baseboards, and confined areas such as corners or stairs. Accurately balanced to deliver continual surface contact at any angle, permits mopping in an "S" motion. Swivel joint locks into position, allowing maximum contact pressure.

Features:

- Compatible with all TruCLE AN Mops
- Ergonomic design promotes good technique
- Quick-squeeze, frame-locking design allows for easy replacement of mop heads
- Compatible with gamma, ethylene oxide, and autoclave sterilization
- Suitable for use in high grade cleanrooms

Conclusion:

Assuring that required standards of cleanliness are achieved by using the appropriate mops can be a challenging process. For this reason, Perfex Corporation offers vast experience as a trusted manufacturer of high-quality cleaning tools. Our TruCLE AN line of cleanroom mops and mopping systems will surely meet your precise requirements.

TruCLE AN product line is methodically designed for all healthcare, cleanroom, and food service applications. TruCLE AN mop heads can be laundered and autoclaved repeatedly, providing both best practice and cost-effective alternatives.

Perfex Corporation
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Combined Expertise

"Pharmaceutical packaging of the future" serves more purposes than merely protecting and marking medicines. Smart packaging builds a digital bridge between the manufacturer, distributor and patient because, due to digital technologies, packaging is able to communicate. By means of diverse features, a demo version of a smart packaging solution jointly created by Schreiner MediPharm and the Edelmann Group shows pharmaceutical manufacturers the possibilities for authentication and tamper evidence of their products and thus for supply chain security and compliance with the EU Falsified Medicines Directives that has been in effect since February 2019.

BitSecure for Product Authentication

The BitSecure copy detection technology is a printed, digital security feature. BitSecure is based on a high-resolution, random pattern whose delicate details are not discernible by the naked eye. In an attempt to copy the small random pattern with a size of just a few millimeters, the printed image will suffer a loss in precision and optical details. The pattern can be authenticated quickly and flexibly on-site using a smartphone or handheld reader, and analyzed via related software. BitSecure is a reliable yet cost-efficient authentication technology. Due to its small size, it can be easily integrated into existing packaging or label designs.



The smart packaging solution developed by Schreiner MediPharm jointly with the Edelmann Group includes digital and analog technologies for product authentication and tamper evidence.

NFC Closure Seal for Tamper Evidence

The closure seal with a void effect and an integrated NFC chip is more than a conventional seal for folding boxes. It combines analog and digital technologies and offers double tamper evidence: Before the seal's initial opening, the user reads the NFC chip using a smartphone and related app to receive confirmation of the product's authenticity. If the seal is peeled off, an irreversible void effect will appear. If the user opens the packaging without previously peeling off the seal, the seal will break along the perforation. If the NFC chip is read again, a warning on the smartphone will indicate that the packaging has been previously opened. This makes any tampering attempt clearly visible. Additionally, interactive applications for patient information and assistance may be integrated into the NFC chip.

Schreiner MediPharm D 85764 Oberschleissheim

Drives from ebm-papst for New Servo Controller Family from Siemens

Drive solution for extra-low voltage

With Simatic Micro-Drive, Siemens has added a new member to its drive system line family in the safety extra-low voltage range for DC/EC motors from 24 to 48 volts. To satisfy customer requirements with maximum flexibility, Siemens is relying on drive solutions from ebm-papst.

Siemens introduced its new drive family member with ebm-papst drives at the Hannover Messe trade show for industry in April 2019. ebm-papst provides high-quality EC motors with output powers of 50 to 750 watts. In its modular system, EC motors with integrated encoders can be flexibly combined with transmissions and brakes for use in a range of applications.

Diverse applications for safety extra-low voltage

The combination with the Simatic Micro-Drive creates a compact drive solution in the safety extra-low voltage range. The servo drive system is suitable for a wide range of applications: for precise position-

ing tasks in shuttles for stacker cranes and storage rack systems, automated guided vehicles (AGVs) and medical technology, for example.

ECI series: compact, rugged and versatile

The ECI motor series in sizes ECI-42 and ECI-63 are predestined for these applications. The drives have highly dynamic, 3-phase internal rotor motors in EC technology with low cogging torque. They deliver high efficiency and high power density in compact design. A rugged, noise-reduced ball bearing system ensures a long service life. The basic motor with the K1 electronics module is designed for operation with

external control electronics, satisfies the requirements for degree of protection IP 54 and has an industrial plug.

About Siemens Simatic Micro-Drive

The individually combinable system with UL-certified components consists of flexibly usable drives, the PDC (ProfiDriveControl) servo controller and connecting cables. The system meets requirements for network-compatibility via a Profinet interface on the controller and Safety Integrated requirements with certified safety functions. Easy connection to Simatic controllers significantly shortens engineering time and integration into Siemens automation technology via the TIA portal simplifies commissioning and service. The seamless Simatic MicroDrive system is available in four housing sizes for motor powers between 50 and 1,000 watts. All Safety Integrated functions can be activated via the TIA portal.



Siemens' Simatic Micro-Drive relies on drive solutions from ebmpapst. Shown here: the ECI-63.XX-K1 with an industrial plug. (Photo: ebm-papst)

ebm-papst Mulfingen GmbH & Co. KG
D 74673 Mulfingen



The ECI motor series from ebm-papst in sizes ECI-42 and ECI63 with integrated encoders and industrial plug can be selected for the Simatic Micro-Drive servo drive system from Siemens. (Photo: ebm-papst)

Roots pumps of the HiLobe® series set new standards

Pfeiffer Vacuum introduces new high-performance vacuum pumps

- Suitable for many low and medium vacuum applications
- Short pump-down times – ideal for load-lock chambers or leak detection systems
- Powerful and energy-efficient series – compact design, intelligent interface technology

Pfeiffer Vacuum, one of the world's leading provider of vacuum technology, will be presenting new vacuum solutions at the ComVac, which will take place at the Hannover Messe trade fair from April 1-5, 2019. The special highlight at booth D 16 in hall 26 are the new Roots pumps of the HiLobe series. For the first time, Pfeiffer Vacuum experts will present these innovative vacuum pumps – in addition to their extensive product portfolio – which can be used for numerous industrial vacuum applications such as electron beam welding, vacuum furnaces or freeze drying. The pumps of the HiLobe series are of particular interest for fast evacuations (load-lock chambers or leak detection systems). Furthermore, they are suitable for use in coating applications.

Compact and powerful Roots pumps

The compact Roots pumps offer a wide nominal pumping speed range of 520 – 2.100 m³/h. This is made possible through the new drive concept in conjunction with

frequency converters. Thanks to their individual speed control, the pumps can be precisely tailored to customer-specific requirements. Thanks to this powerful drive concept, the HiLobe achieves approximately 20 percent shorter pump-down times than conventional Roots pumps. Rapid evacuation reduces costs and increases the efficiency of the production system.

Process-reliable and cost-efficient vacuum

The maintenance and energy costs of the HiLobe are >50 percent lower compared to conventional Roots pumps. The reason for this is a drive with energy efficiency class IE4 and the special rotor geometries of the pumps. The sealing concept also contributes to this. The pumps are hermetically sealed to the atmosphere and have a maximum integral leakage rate of $1 \cdot 10^{-6}$ Pa m³/s. Dynamic seals are eliminated and, as a result, maintenance is only required every four years. Due to the innovative sealing concept in the suction chamber, the use of

sealing gas is superfluous in most applications, which also has a positive effect on the operating costs. Since the operation of the HiLobe Roots pumps is possible even at ambient temperatures of up to +40°C with flexible air cooling, cost-intensive water cooling is unnecessary.

Control and communication are the essential factors for increasing system availability. The intelligent interface technology of the HiLobe allows very good adaptation and monitoring of the processes. This facilitates anticipatory and efficient work. By integrating such condition monitoring, information about the condition of the vacuum system is always available. In addition, condition monitoring increases system availability allowing users to plan maintenance and repair measures in a useful and anticipatory way and prevent cost-intensive production downtimes. These advantages lead to a long service life and maximum operational safety. Depending on their suitability for the existing system, the HiLobe vacuum pumps can either be aligned vertically or horizontally. This allows maximum pumping speed and a more customized and efficient use of space at the customer's production site.

“With the HiLobe Roots pumps our customers are able to reduce energy and operating costs and consequently make production more cost-efficient. For a sustainable reduction of energy consumption and operating costs, it is not enough to solely base it on the energy requirements of a vacuum pump. The type of cooling, the maintenance intervals and the control also have a decisive influence on the overall energy balance. We are proud to be able to offer our customers this holistic approach,” says Dr. Ulrich von Hülsen, CTO of Pfeiffer Vacuum Technology AG.





Closing completed: Apollo now part of the Freudenberg Group

New company Freudenberg Apollo Filtration Technologies Co., Ltd. kicks off in China

Effective as of 1 April, 2019, Freudenberg's Filtration Technologies Business Group has acquired a majority shareholding in Apollo Air-cleaner Co., Ltd. The purchase agreement was signed in December 2018. Chinese antitrust authorities have now approved the acquisition. The company is a leading provider of air and water filtration solutions in China. In 2017, Apollo generated sales of 750 million RMB (around 96 million EUR) with roughly 1,000 employees. Apollo will continue as a joint venture between Freudenberg (75 percent) and the previous sole proprietor Apollo Trading Group, Japan (25 percent), under the name Freudenberg Apollo Filtration Technologies. Freudenberg Filtration Technologies will bring its current consumer filtration business into the joint venture.

"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.

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."

Small, smaller, DEPRAG NANOMAT

Reliable assembly of tiny screws

Electronic components in computers and smartphones, or in household, entertainment and automobile technology, are indispensable in innovations relating to all areas of modern technology. Usually hidden from view beneath the product surface, extremely complex electronic systems must be designed, manufactured and launched onto the market in the shortest time possible at an acceptable price. They also need to be totally reliable and energy efficient products. Rapidly increasing capabilities and constant miniaturisation have characterised developments in electronics for decades.

DEPRAG SCHULZ GMBH u. CO. is known for continuous optimisation of their products and for leading the way with new developments in the assembly of miniature components. The screwdriving technology specialists have a specific screwdriver in their program especially for intricate assemblies – the NANOMAT. This screwdriver reaches highly accurate, extremely low torques from 8 Nmm to 300 Nmm at speeds of up to 1700 1/min – and that in four different speed ranges. The DEPRAG NANOMAT screwdriver has one of the smallest torques on the market and is available both for manual and stationary assembly tasks.

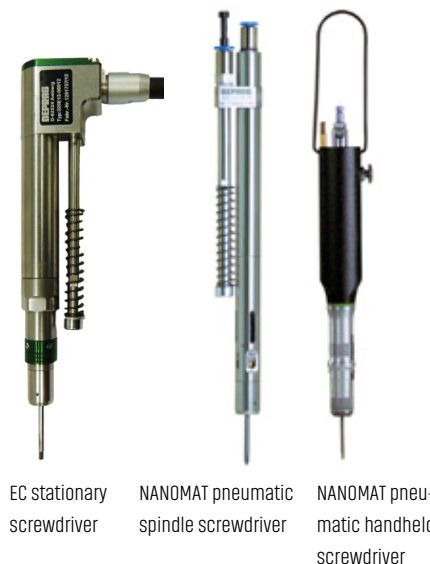
The NANOMAT has a wide range of applications: whether in medical technology for the reliable processing of hearing aids or pacemakers, in the watch industry or precision engineering for the manufacture of measurement devices. Another application area is the assembly of objectives, cameras and microscopes in the optical industry, where tiny fasteners must be assembled. In the production of electronic products and components, such as smartphones, games consoles and computers, the miniaturisation of devices has a great influence on the type of assembly required.

A flexible EC screwdriver for the highest standards

The NANOMAT-EC spindle screwdriver provides the highest possible processing reliability for industrial assembly due to its reliable and low maintenance brushless EC motor. It is designed with excellent dyna-



NANOMAT – The screwdriver for low torque applications (Copyrighted images: © DEPRAG SCHULZ GMBH u. CO.)



(Copyrighted images: © DEPRAG SCHULZ GMBH u. CO.)



Pneumatic spindle screwdriver NANOMAT
(Copyrighted images: © DEPRAG SCHULZ GMBH u. CO.)

mics and top torques to be the ideal driver for screw tightening. It features integrated torque recording based on precise motor current measurement and the evaluation of additional dynamic influencing factors, as well as torque measurement enabling exact control of multi-stage screwdriving processes and the documentation of screwdriving results.

DEPRAG screwdrivers are based on EC technology and can boast a torque accuracy of < 2% standard deviation which remains true for millions of cycles. Therefore, the machine capability index of ≥ 1.67 at a tolerance of $\pm 10\%$ relating to 6 Sigma is attainable. A cmk value of 1.67 means that the error percentage is under 0.6 per million screw assemblies.

Maximum flexibility and processing reliability with the sequence controller AST6

The sequence controller AST6 is the ideal controller for stationary screw assemblies used with the tried and tested NANOMAT-EC screwdriver. It guarantees highest precision at low torques, is extremely user friendly and allows precise monitoring of angle and torque. The sequence controller already contains standard screwdriving programs for assembly to torque and loo-

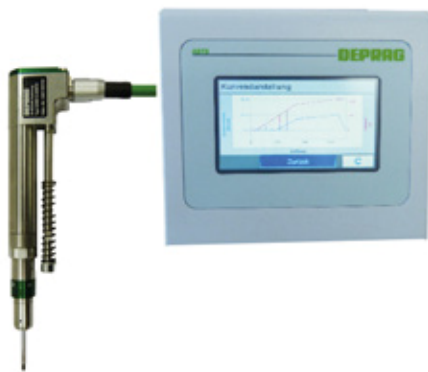
Small, smaller, DEPRAG NANOMAT

sensing to angle. Parameters can be adapted to the current screwdriving task via the touch screen and the AST6 enables free programming of screwdriving sequences.

The pneumatic screwdriver as a basic solution

The pneumatic NANOMAT is available as a handheld or spindle screwdriver for stationary use.

The NANOMAT screwdriver realises



NANOMAT-EC spindle screwdriver with AST6 (Copyrighted images: © DEPRAG SCHULZ GMBH u. CO.)

high precision torque control due to the solid principle of the mechanical decoupler and shut-off clutch. This high-precision shut-off clutch enables torque accuracy of less than $\pm 3\%$ standard deviation, even after millions of operating cycles. Under appropriate operating conditions the DEPRAG air driver with shut-off clutch attains a cmk value of ≥ 1.67 with a tolerance entry of $\pm 10\%$ relating to 6 Sigma in accordance with ISO 5393. Expressed a different way, a cmk value of ≥ 1.67 means an error percentage of only 0.6 per one million assemblies! The pneumatic screwdriver can quickly and simply be set to the required torque without the need for special tools.

Another advantage of the DEPRAG NANOMAT is the ergonomic handle enabling sensitive and precise screw handling. In addition, the integrated quick-change chuck allows fast, simple bit exchange without the need for tools. This means that standard bits with A3 connection in accordance with DIN ISO 1173 can be used. Vacuum suction via the integrated vacuum implement is also a plus point - eliminating any inconvenient hoses around the handle or screw.

The NANOMAT spindles can be easily integrated and are particularly small in size. Screwdrivers are available in right rotation, left rotation and reversible, with push-to-start or start via remote valve. The extremely slim-line design of the NANOMAT spindle screwdriver measures just 12 millimetres in diameter and is therefore perfect for small gaps between screw positions in stationary use.

Of course, the NANOMAT spindle screwdriver also benefits from the famous DEPRAG guidance system which regulates optimal pressure on the screw via spring tension.

DEPRAG consistently fulfils the high requirements for a complete solution provider, even for intricate assemblies. The NANOMAT screwdrivers are, of course supported by a whole range of peripheral devices, such as automated screw feeding systems, precise torque measurement instruments or reliable guidance stands for manual assembly.

DEPRAG SCHULZ GMBH u. CO.
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Succession now in place

Jürgen Höfling to become new CEO

Jürgen Höfling has been appointed new Chairman of the Management Board at CWS-boco Group, effective 1 June. He succeeds Thomas Schmidt, the incoming Chairman of the Management Board of Franz Haniel & Cie. GmbH, who is making a permanent move to the Holding Company where he will replace Stephan Gemkow from 1 July.

Jürgen Höfling (56) brings a wealth of experience in the hygiene and services sector to the CEO role at CWS-boco Group. A business administration graduate, he began his career in 1989 as a Marketing and Key Account Manager at Werner + Mertz, a German SME operating well-known consumer brands such as Erdal and Frosch. In 1995 he moved to Deutsche Post AG, where he held various management positions until 2009, most recently as CEO DHL Global Mail from 2007 to 2009. He left DHL in 2009 to form his own consultancy specialising in restructuring, at which time he was also a partner at Theron Management Advisors. In 2014 he was named Managing Director Europe at Rentokil Initial and responsible

for operations in 14 countries. In 2017 he was appointed to represent Rentokil Initial on the Shareholder Committee of the joint venture during the integration of CWS-boco and Initial. He is also a non-executive director on the Supervisory Board of Geopost.

"I'm convinced that Jürgen Höfling is the right choice for CEO to further the success of CWS-boco Group. As well as knowing the segment inside and out, his role on the Shareholder Committee included overseeing key steps in the process of the integration of CWS-boco and Initial", explains Thomas Schmidt.

Höfling will take over from current CEO Thomas Schmidt, who has served as CEO



Jürgen Höfling (Photo: Manfred Esser)

of CWS-boco Group and a member of the Haniel Management Board since February 2017 and is set to succeed Stephan Gemkow as Chairman of the Management Board of the Haniel Holding Company on 1 July 2019.



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Pharmatag 2019: the whole world of filling technology



Bosch Crailsheim to host expert panel

- Symposium with keynote by Ranga Yogeshwar
- Exclusive look behind the scenes: plant tour with live demonstrations
- Highlight from the Industry 4.0 portfolio: training services with Virtual Reality

Bosch Packaging Technology Crailsheim invites international pharmaceutical guests to its Pharmatag 2019 from May 21 to 22 under the motto „Expertise for the perfect flow“. Visitors to the traditional event will experience two days of exciting lectures, an exclusive plant tour and live demonstrations. „We are looking forward to welcoming our international specialist audience to our Pharmatag in Crailsheim for the ninth time,“ says Joachim Brenner, site manager Crailsheim.

Special guest: Ranga Yogeshwar

Bosch Packaging Technology was able to gain the renowned physicist, business journalist and television presenter Ranga Yogeshwar as a guest speaker. In his keynote, he examines the pharmaceutical world in times of digital change from an external perspective. At the symposium, customers will report about exciting projects and their experiences in working with Bosch Packaging Technology and provide insights into concrete application examples. The traditional plant tour focuses on new technologies for liquid pharmaceutical processing. Participants will get an exclusive glimpse behind the scenes, experience numerous machines in action and see the new developments from Bosch Packaging Technology on site.

Training in virtual surroundings

Bosch presents a highlight from its Industry 4.0 portfolio at the ALF 5000 filling and



Symposium with keynote by Ranga Yogeshwar: Bosch Packaging Technology was able to gain the renowned physicist, business journalist and television presenter Ranga Yogeshwar as a guest speaker. (Picture: H.G.Esch)

closing machine for vials and ampoules: a Virtual Reality (VR) application for training purposes. „With VR glasses, operators can practice how to change size parts without having to use the cleanroom,“ explains Tobias Goettler, product manager at Bosch Packaging Technology. „With these trainings, we support our customers in expanding their machine knowledge without great effort.“ The VR training service is not limited to the ALF 5000; it can also be applied to other machines from Bosch Packaging Technology.

Customer-specific line in action

Also live on show: a customer-specific line for the aseptic filling of biopharmaceuticals. As a special feature of the line, integrated robots reduce manual glove interventions as well as interventions for bacterial count monitoring. The line, which was developed together with a leading pharmaceutical manufacturer, enables flexible use of packaging materials with fast format changes and ensures precise, safe and clean handling of the containers.



Machines and lines in action: The traditional plant tour focuses on new technologies for liquid pharmaceutical processing, including the ALF 5000 filling and closing machine ALF 5000 with a Virtual Reality application for training purposes. (Picture: Bosch)



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Registration is available for Cleanroom Guangzhou Exhibition 2019

Cleanroom Guangzhou Exhibition, namely Asia-Pacific Cleanroom Technology & Equipment Exhibition (Formerly China (Guangzhou) International Cleanroom Technology & Equipment Exhibition) is scheduled to be held in Guangzhou, China during 16 -18 August.

Association Partners Scatter Across the Globe

Jointly held by Guangdong Association of Cleanroom Technology (GACT) and Guangdong Grandeur International Exhibition Group, Cleanroom Guangzhou Exhibition has developed into a primary event for global cleanroom industry after 4 years of dedicated efforts.

Long-standing supports from our association partners are another thing that makes the show a success. Our domestic association partners cover a dozen provinces with more than 1800 member enterprises in total, influencing the whole industry chain in China. Our overseas association partners also give us supports from more than 30 countries and regions, helping us strengthen our global presence.

We believe that with such staunch and international supports, a bigger crowd of professional buyers and premium exhibitors will be called together in the 2019 show!

2019 Guangzhou International Cleanroom Technology Summit

It is one of the most awaited live events of Cleanroom Guangzhou Exhibition, where like-minded insiders and industry top minds will gather to share state-of-the-art cleanroom solutions and study the industry's latest codes & standards.

Every year, a dozen of eminent experts speak at the summit, such as Wang Daqian, the Executive Member of International Confederation of Contamination Control Societies (ICCCS), Wang Yao, the Councilor of Chinese Contamination Control (CCCS), Zhang Liqun, Senior Engineer of China Electronics Engineering Design Institute and etc.

2018 Show Review

Thanks for the strong support of industry, 300 leading brands and 8,150 visitors participated in Cleanroom Guangzhou Exhibition 2018 and the total exhibiting areas reached 10,000 square meters. Partial feature exhibitors included Testo, Wohua instrument, ZJNF air contaminant control, Gerflor flooring, Zhongjing cleanroom equipment, Yuanda purification, Hydroflex cleanroom consumables, Shenda lighting, and etc. According to the survey, 88% of exhibitors consider Cleanroom Guangzhou Exhibition their top choice for exhibiting and 4/5 have attended the Show more than once!

Exhibition Scope

- Cleanroom Equipment
- Cleanroom Consumables
- HVAC System
- Cleanroom Framework
- Instrumentation Equipment
- Design & Certification
- Laboratory Equipment
- Other Related Products

Target Visitors by Sectors

- Pharmaceuticals
- Cleanroom Contractor
- Food & Beverage
- Electronics
- University & Research Institute
- Others

For booth reservation of Cleanroom Guangzhou Exhibition 2019, please contact Mrs. Mae Law by e-mail grand1@grahw.com!

**16th - 18th August 2019: Cleanroom Guangzhou Exhibition,
Guangzhou (China)**



Cleanroom Guangzhou Exhibition 2019
Asia-Pacific Cleanroom Technology & Equipment Exhibition 2019

Aug 16th - 18th, 2019 | China Import & Export Fair Complex

www.clcte.com



Guangdong Grandeur International Exhibition Group
Science City, Huangpu District, Guangzhou
China

Wet chemistry users from all over the world meet up in the hometown of AP&S

On 4th April 2019, with as many participants as never before, the important industry event for international silicon technology started in the Donauhallen in Donaueschingen in the middle of the Black Forest.

The co-jointed event „11th European Wet Users Meeting und 40th European



CMP Users Meeting“ is an annual high-level conference, which take place at changing locations. The event’s core focus lays on the surface treatment in the microchip production processes. Users Groups from China, Europe, Japan, Korea, Taiwan and the United States come together to listen specialist presentations about latest developments and challenges in the field of wet chemical processing and chemical-mechanical polishing of wafers (CMP).

The official organizer of the event is the German VDE / VDI Society for Microelectronics, Micro- and Precision Engineering in cooperation with zwickerconsult and Erzm-Technologies, organizational support has been provided by AP&S International GmbH this time.

“We really liked the idea to bring this event to Donaueschingen, therefore we have assured our full support to the main organizers. It’s our hometown and we are familiar with this region: whether it was about to find a location for the conference, to organize hotels for participants or to organize an attractive evening program – ever-

thing worked great and was just fun,” said Sinja Weißmann, Sales Assistant at AP&S.

“We know very well, that the Black Forest is absolutely IN, but the exceptionally high number of registrations exceeded our expectations. Especially when you consider that previous venues were cities like Dublin (Ireland), Amsterdam (Holland), Berlin and Grenoble (France). We were therefore, all the more delighted to welcome the guests in Donaueschingen,” added Tobias Bausch, AP&S VP Sales & Marketing, “The agenda included a total of 17 exciting lectures. As an expert in wet chemical processes AP&S contributed two presentations too, which were: „Development and Qualification of Flow Dynamics for eless UBM“ and „Impacts on Particle Qualification of Wet Process SC Equipment Prior to Delivery“. A varied addition was offered to the participants by the evening program, during which they could see some typical regional sights.”

AP&S International GmbH
D 78166 Donaueschingen

Morten Haure-Petersen manages Textile Care



The position of Chief Divisional Officer for the Textile Care Division of the CWS-boco Group has been filled: Morten Haure-Petersen takes over the management. He replaces the previous CDO Detlef Kröpelin, who retired as planned.

On March 1, Morten Haure-Petersen joined the CWS-boco Group and took over the workwear business from Detlef Kröpelin. Most recently, Haure-Petersen was Chief Commercial Officer of the Scandlines Group shipping company. From 2011 to 2019, he was responsible for the company’s departments procurement and supply chain as well as sales, marketing, trade and gastronomy.

Morten Haure-Petersen is German-Danish and holds an MBA from the Scandinavian International Management Institute in Denmark. He began his career in 1987 as General Manager at Scandic Hotels in Denmark and joined Choice Hotels International in 1991 as Senior Vice President.

In the course of his career, he gained extensive experience in the service sector and held various management positions in companies in the gastronomy and catering industry. He joined YUM! Restaurants as Managing Director in 1999, which runs fast food chains such as Pizza Hut, Kentucky Fried Chicken and Taco Bell. In 2003 he took over the role as Vice President Europe for Gate Gourmet, a global airline catering company, and subsequently headed the

European business of the catering company apetito as CEO for five years.

„We are pleased to have won Morten Haure-Petersen for the position as CDO Textile Care. With his profound know-how in the service sector and experience in the international business environment, he will further roll out the strategic orientation of the division and continue to strengthen the customer focus of the textile solutions,“ explains Thomas Schmidt, CEO of the CWS-boco Group.



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The world's largest amorphous-metal component at Automate 2019

A Milestone in additive manufacturing

Heraeus presents a world record additive manufactured gear wheel made of amorphous metals at Automate 2019 in Chicago. The gear wheel was printed in a standard SLM system with material from Heraeus. With this world premiere, Heraeus is breaking through the boundaries of 3D printing and opening completely new design possibilities for a wide range of industries – from automation solutions and robotics to aviation, medical technology and the automotive industry.

The gear wheel printed by Heraeus eclipses all previous results. Produced by additive manufacturing, this compact machine part weighs two kilograms. Due to the required high cooling rates of mainly over 1000 Kelvin/second, only small parts could be produced from amorphous metals previously. Because the topology of the gear was also optimized during development, material and process experts were able to reduce the weight by 50 percent compared to conventional manufactured versions. Heraeus has now redefined the existing limits of technology in terms of size and complexity, revolutionizing design possibilities, for example, in the automation industry as well as in robotics. Heraeus set this world record using a commercially available laser melt printer.

Amorphous metals allow completely new design possibilities and applications

In contrast to pure metals and classic alloys, amorphous metals are characterized by an irregular, non-crystalline structure. They combine properties within one material that normally are not feasible: extreme hardness and high yield strength with a high elasticity. Amorphous metals are characterized by good corrosion resistance, excellent wear resistance and the elasticity of polymers. They also have soft magnetic properties and are easy to magnetize and demagnetize. With this combination of properties, amorphous metals are superior to steel, titanium and many other materials.



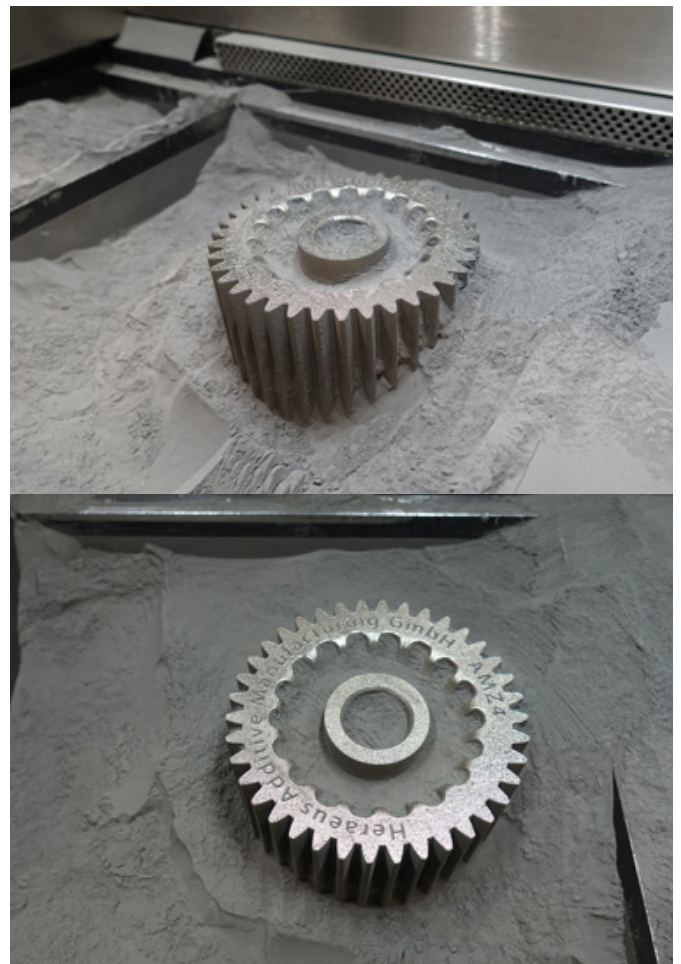
(Source: Heraeus)

Reduced weight thanks to precision manufacturing

High-precision layer-by-layer production with special materials from Heraeus also reduces material usage, saving weight and costs. Using 3D printing also reduces overall production costs. With conventional methods, making complex parts require numerous process and manufacturing steps. Several individual pieces have to be produced and then assembled into a unit. However, 3D printers accomplish this in a single process. Following assembly in the printer, moving parts are immediately ready for use and fully functional.

The world's largest printed amorphous-metal cog wheel can be seen live at the Heraeus booth at Automate in Chicago: April 8-11, 2019, McCormick Place, Booth 9619.

Heraeus Holding GmbH
D 63450 Hanau



Excellent outlook for MedtecLIVE 2019 in Nuremberg

21st - 23rd May 2019: Medtec-LIVE, Nuremberg (D)

The entire medical technology value chain will be represented at the Exhibition Centre Nuremberg for the international MedtecLIVE exhibition and the MedTech Summit Congress between 21 and 23 May this year. This top-level event is expected to attract about 400 exhibitors, with two packed exhibition halls and an appealing lecture programme: "From a standing start, MedtecLIVE will launch as an international networking platform based in southern Germany, and also as Europe's second-largest exhibition for medical technology," comments Alexander Stein, Director MedtecLIVE at NürnbergMesse. "That's clear from the many partner entities and associations that have committed to our event pairing."

Half of the exhibition area at the event in May will be taken up by companies in the fields of processing, manufacturing and mechanical engineering, while the other half will be split evenly between all other fields, from research to packaging and logistics in the medical technology sector. "The entire sector hopes to contribute to the success of MedtecLIVE and definitely wants to be a part of the innovation platform when it launches in spring," says Stein. "It's clear that we will achieve our goal of representing the entire value chain, from the initial ideas through to production and the downstream processes."

The free industry forums in the exhibition halls offer valuable knowledge, and plenty of practical tips drawn from experience. Many partner entities will be there with their expertise and will cover topics of current interest, from cyber security to the latest developments on all aspects of the European Medical Device Regulation (MDR), from hygienic design to artificial intelligence, recruiting skilled employees, and access to the international market. Young enterprises will introduce their developments at the Innovation Market Place, which is jointly supported by Medical Valley EMN and EIT Health, and VCLS Neighborhood from France. In pitch sessions during the start-up contest, founders will offer an insight into their developments and business models. The winners of the contest will be awarded top-quality prizes at MedtecLIVE, provided by NürnbergMesse and its partners.

On the second day of the exhibition, the industry's next generation will gather at the annual meeting of Young Professionals@Medtech, organized by the Association of German Engineers (VDI) as part of MedtecLIVE. This day will also include an intensive programme of lectures and workshops focusing on extremely popular

forward-looking topics such as bioelectronics and artificial intelligence, which will appear on the agenda alongside regulatory issues relating to the MDR and requirements of clinical studies, and how to develop a career in medical technology, one of the most exciting growth sectors. VDI is also actively involved in the latest industry topics in the exhibition forums.

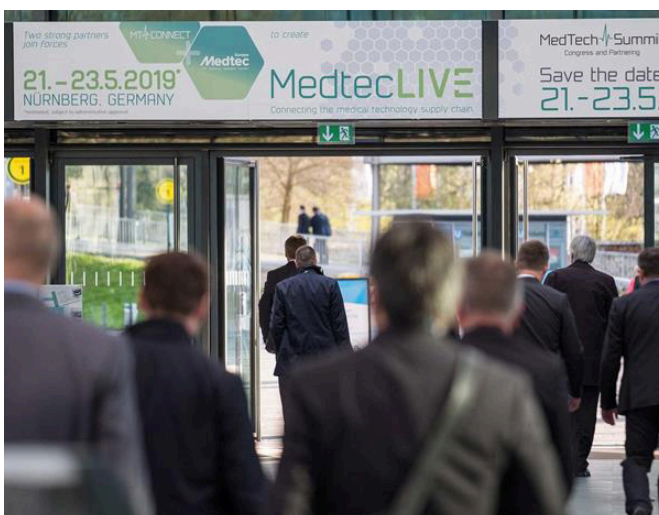
A "novelty stand" will give all visitors a rapid overview of the innovations being shown by the exhibitors. An attractive VIP lounge will also provide an exclusive setting for discussions in private.

The MedTech Summit provides the link between development and manufacture on the one hand and diagnostics and treatment on the other. For two days, this internationally renowned congress will bring together developers and users, with 70 lectures, workshops and interactive elements.

The partnering event is an opportunity for congress and exhibition visitors (tickets also available separately) to make appointments in advance and to engage in targeted, one-to-one discussions with potential business partners. These are just some of the ways in which MedtecLIVE and the MedTech Summit live up to their aim to offer the perfect location for new business contacts and partnerships, and for solution-oriented dialogue. The package of events will be further expanded by CARAT, the in-depth international conference on applied x-ray technology, to be held on 21 May. For further information on CARAT, see www.carat-conference.com.

About MedtecLIVE and MedTech Summit

MedtecLIVE is a leading networking platform for the international medical technology community. The trade exhibition's offering covers the full process chain in the production of medical engineering equipment, from prototypes to ready-for-market products. Leading companies, associations and institutions will engage in networking at MedtecLIVE to cultivate contacts, share ideas and create new innovations. At the prestigious MedTech Summit Congress & Partnering, experts and scientists will discuss future industry trends on an interdisciplinary basis. MedtecLIVE and MedTech Summit will be held from 21 to 23 May 2019 in the Nuremberg Exhibition Centre. The exhibition organiser is MedtecLIVE GmbH, a joint venture of NürnbergMesse and UBM. The MedTech Summit is organized by the Bavarian State Ministry for Economic Affairs, Energy and Technology, and run by Bayern Innovativ. Forum MedTech Pharma e.V. is the honorary sponsor of MedtecLIVE and MedTech Summit.



Certified training courses + exhibition, all in one

LABVOLUTION is an exhibition and much more. Running from 21 to 23 May in Hannover, Germany, the event features a new, two-day conference staged by the Berlin-based GLA “transparent laboratory” academy, consisting of a Lab 4.0 workshop for technical staff on 22 May and presentations on career prospects for Ph.D. and post-doctoral students in the life sciences on 23 May. Both conference days are free of charge for trade fair attendees.

The GLA „transparent laboratory“ academy will be appearing for the first time at LABVOLUTION in Hannover this May, featuring a rich program of further training courses. The Berlin-based qualification experts have succeeded in attracting experienced speakers from industry to report on the latest topics from the field. Both conference days will start late enough and end early enough to afford participants adequate time for a visit to the European trade fair for innovative laboratory equipment and optimized laboratory workflows.

On Wednesday, 22 May, the topic will be „Lab 4.0“. This German-language workshop is aimed at technical staff as well as life science laboratory assistants. The program kicks off at 10:30 a.m. with an introduction to automated liquid handling in the form of a practice-focused seminar led by Andreas Ehlke from Brand GmbH. Afterwards, Dr. Simon Bungers, CEO and founder of labfolder GmbH, will inform attendees about the digital lab book. The third part, lasting until 4 p.m., will be taken over by Dr. Michael Strehle of MDC, with his course on „CRISPR/Cas for Beginners“. People taking part in the conference day will not only go home armed with greater knowledge, but also with a GLA certificate in their pocket.

The event continues in English on Thursday, 23 May, with Ph.D. students and post docs invited to attend the conference day titled „Young Life Scientists – Business Orientation“. This event likewise begins at 10:30 a.m., with Professor Michael Hildebrand of Hilde-

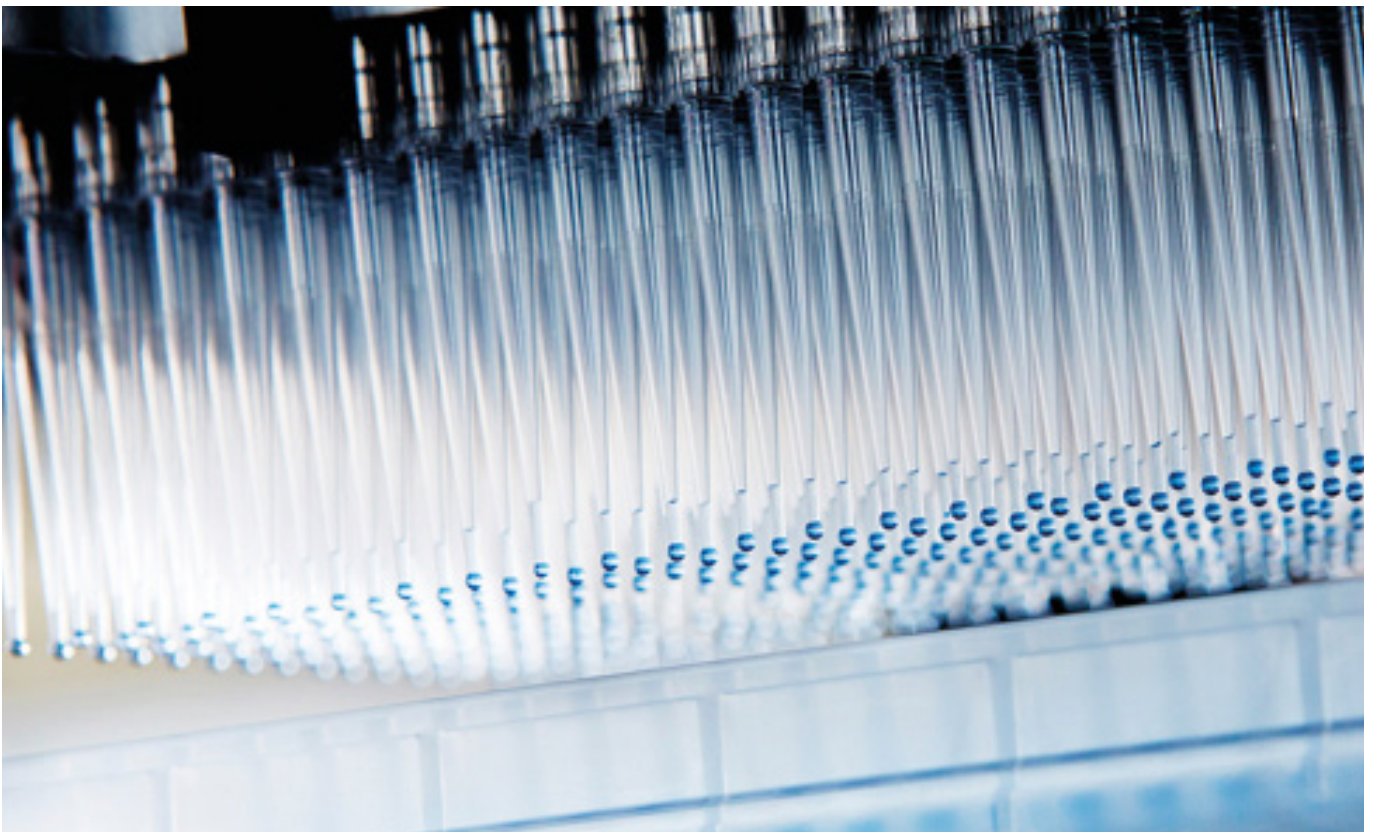
21st - 23rd May 2019: LABVOLUTION 2019, Hannover (D)

brand Pharma Consulting opening the proceedings with a report on „Life Sciences Go Industry – Challenges, Perspectives, Pitfalls“. This will be followed by the presentation „Clinical Development – Still a Professional Option for Life Scientists?“ by Dr. Wolf S. Richter of Pharmtrace GmbH. Dr. Michael Buchholz of Immutep GmbH will wrap up the proceedings with his talk on „GMP in Biotechnology – A Brief Overview“.

Both conference days are free of charge for LABVOLUTION attendees. Reservations are not necessary, but as the number of participants is limited to 50 per day, it is advisable to arrive in good time in the conference area of Hall 19/20.

For more than 15 years, the GLA academy has offered part-time qualifications for scientists and technicians active in the life sciences. GLA is located on the Berlin-Buch campus, putting it in the direct vicinity of approx. 45 innovative biotechnology and medical technology companies and renowned research institutions like the Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC) and the Leibniz Research Institute for Molecular Pharmacology (FMP).

Deutsche Messe AG D 30521 Hannover



Labvolution 2019 (Source: Gläsernes Labor Akademie)



International heat pump community gathers in Nuremberg

- Expert knowledge-sharing at the highest professional level
- Foyer Expo presents the latest products and innovations

On 22 and 23 October 2019, heat pump experts from around the world will gather for the sixth European Heat Pump Summit – powered by Chillventa at Exhibition Centre Nuremberg. The event facilitates professional dialogue on market developments, technology and application trends relating to all aspects of heat pumps. The accompanying Foyer Expo is a welcome enhancement to the European Heat Pump Summit that provides a platform for participating companies to showcase their latest products and innovations.

„Alternating with the biennial Chillventa trade fair, the European Heat Pump Summit in Nuremberg once again pools the expertise of the heat pump community in its high-calibre presentations and workshops. It provides international experts with the opportunity for intensive knowledge transfer on topics like industrial and commercial applications for heat pumps, residential construction, hybrid systems or components,“ says Daniela Heinkel, Senior Manager European Heat Pump Summit, NürnbergMesse.

Main congress themes 2019

The four main thematic blocks at the European Heat Pump Summit 2019 are market developments, R&D, development of components and products, and heat pump applications. Preparations for the event are already under way, and international heat pump experts have submitted a large number of abstracts e.g. on the following topics:

- National and international market developments, implications of European and global regulations and agreements
- Summaries of the IIR Conference in Montreal
- Research and development

Hybrid systems, water heating, nZEB, smart grids, refrigerants, apartment blocks systems, innovations, photovoltaics + heat pumps

- Development of components and products

Refrigerants – compressors – heat exchangers – fans – pumps – controls

- Use of heat pumps

Hybrid systems with heating and cooling, waste heat recovery/usage, high-temperature heat pumps, heat pump applications in commercial and industrial processes e.g. in the food industry, data centres, drying processes, metalworking, agriculture etc.

The Call for Presentations is available online from:
www.hp-summit.de/en/abstract

The internationally renowned speakers come from R&D establishments, universities, test centres and laboratories, energy utilities and associations, and in particular from component manufacturers.

They will address an international audience of industry professionals including technicians, designers, product developers, component manufacturers and suppliers, decision-makers and consulting engineers for product development, architects and planners working in all areas of heat pump production and applications in industrial and commercial environments.

Foyer Expo combines product information and professional dialogue

At the Foyer Expo, the focus will be on the latest products and innovations from the exhibiting companies. “Already, six months before the start of the European Heat Pump Summit, we are delighted to have received confirmations from numerous exhibitors and sponsors. We are very happy about this positive response,” explains Daniela Heinkel.

The European Heat Pump Summit is directed at researchers, manufacturers, designers, energy consultants and operators of municipal, commercial and industrial properties. The combination of high-calibre conference programme and Foyer Expo, and the biennial Chillventa trade fair which also provides comprehensive coverage of the topic of heat pumps, are what have made Nuremberg into the “Heat Pump City”.



22nd - 23rd October 2019: Chillventa, Nuremberg (D)

Large Freeformer 300-3X for the first time in America

Arburg at Rapid + TCT 2019



- **New large Freeformer 300-3X: Resilient hard/soft combinations made of three components**
- **Arburg Plastic Freeforming (APF): Processing of qualified original materials**
- **Freeformer for industrial additive manufacturing: Suitable for automated use in production lines**

Arburg will present its large Freeformer 300-3X for the first time in America: The new machine for industrial additive manufacturing can be seen from 21 to 23 May 2019 at Rapid + TCT in Detroit (Michigan, USA). At the trade fair stand in hall C, stand 1253, a Freeformer 300-3X will produce resilient gripper fingers in a hard/soft combination made of ABS, TPE and support material. A Freeformer 200-3X will also produce a part with honeycomb structures from an FDA-approved original TPE. The capabilities of Arburg Plastic Freeforming (APF) will be demonstrated by numerous functional components and at two interactive stations.



Lukas Pawelczyk,
responsible for global
Freeformer sales at
Arburg. (Photo: Arburg)

„We will be demonstrating the great progress we have made in Arburg Plastic Freeforming (APF) at Rapid + TCT. Our highlight is the Freeformer 300-3X – the world’s first machine capable of additively manufacturing resilient hard/soft combinations with support structure from three components“, emphasises Lukas Pawelczyk, Department Manager Sales Freeformer at Arburg. „With our know-how in plastics processing and the two Freeformers in sizes 200-3X and 300-3X, we offer attractive solutions to experts and newcomers for industrial additive manufacturing. The great advantage of the APF process is the ability to use qualified plastic granulates. Customers can therefore process the same original materials they would use in injection moulding and from this additively manufacture components with similar mechanical properties. This is particularly interesting for medical technology. The Freeformer is also in great demand for processing thermoplastic elastomers.“

Freeformer 300-3X expands application spectrum

The Freeformer 300-3X with three discharge units opens up a host of completely new applications. It is capable of additively manufacturing complex and resili-

**20th - 23rd May 2019: Rapid + TCT 2019,
Detroit (USA)**

ent functional components in hard/soft combinations, made from two qualified plastics plus support material – which is unique in the industry. The exhibit at Rapid + TCT 2019 will produce movable gripper fingers made of ABS, TPE and support material – in a single step and without requiring additional assembly effort.

The designation 300 stands for the available platform surface area in square centimetres. This is just under 50 percent larger than on the proven Freeformer 200-3X. The build chamber of the large Freeformer offers space for larger small-volume batches and parts with dimensions of up to 234 x 134 x 230 millimetres. „3X“ stands for the moving axes of the part carrier in the x, y and z directions. A closed cooling system with an industrial cooling water connection is available as an option. This will enable materials to be processed at high build chamber temperatures of up to 200 degrees Celsius in the future. The two-piece build chamber door is another new feature and allows, for example, that the feed hoppers can be refilled during ongoing operation by opening the top half of the door. The heated build chamber now only needs to be opened for inserting the part platform



The new Freeformer 300-3X features three discharge units and a divided build chamber door. It is designed for industrial additive manufacturing and is suitable for automated use in production lines. (Photo: Arburg)



The Freeformer 300-3X can additively manufacture resilient functional components in a hard/soft combination from three components – e.g. movable gripper fingers made of TPU, ABS and support material. (Photo: Arburg)



Using the APF process, the density of the part can be systematically influenced. TPE Medalist MD 12130H (hardness 32 Shore A) is suitable for the production of honeycomb structures that can be used for lightweight construction or as filter elements. (Photo: Arburg)

Large Freeformer 300-3X for the first time in America

and removing the finished parts. Due to the automatic opening and closing function of the build chamber door, the Freeformer 300-3X can be integrated in IT-networked production lines.

A wide range for industrial additive manufacturing

With its Freeformers in sizes 300-3X and 200-3X, Arburg covers a broad spectrum for industrial additive manufacturing. The APF process is particularly suitable for industrial additive manufacturing of functional components. This includes individual plastic parts for consumer goods, spare parts made of original materials and implants for medical technology. FDA-approved TPE-S (Medalist MD 12130H) with Shore A hardness 32 can only be processed on the Freeformer. In Detroit, a Freeformer 200-3X with two discharge units will process the material to produce components with honeycomb structures that could be used for lightweight construction or as filter elements, for example.

Numerous components and interactive stations

Trade visitors to Rapid + TCT 2019 can also gain an impression

of the capabilities of the Freeformer exhibits based on numerous functional parts. Exhibited parts will include cable clips made from PP, transparent test discs made from PMMA and bellows made from elastic TPE.

Two interactive stations will be available where trade visitors can test the functionality and durability of selected functional parts for themselves. These will include a very thin and elastic „spider membrane“ made of medical TPE-S, screw caps made of PP and skull implants made of resorbable PLLA.

Benchmark parts for potential customers

In the Arburg Prototyping Center (APC) at the German headquarters in Lossburg, a number of Freeformers produce benchmark parts for prospective customers. Preliminary trials are conducted to determine whether the technology is actually suitable for the desired part, material and application. Further machines are used for the same purpose at the company's subsidiaries across the world, including in the USA.

ARBURG GmbH + Co KG D 72290 Loßburg

New technologies as drivers of innovation for a productive and responsible today, tomorrow and future



K 2019 Düsseldorf

K 2019, known as “The World’s No. 1 Trade Fair for Plastics and Rubber” and scheduled to take place in Düsseldorf from 16 to 23 October 2019, is fully booked. Over 3000 exhibitors from more than 60 countries have registered to participate. K will occupy the entire Düsseldorf exhibition grounds with some 175,000 m² of net exhibition space, and more than 200,000 trade visitors from all over the world are expected come to the event.

K is the performance barometer for the entire industry and its global marketplace for innovations. For eight days, the “Who’s Who” of the entire plastics and rubber world will meet here to demonstrate the industry’s capabilities, discuss current trends and set the course for the future. K 2019 underscores its special position not only through its popularity with the global industry but also by addressing the current challenges of our era and especially of its sector, first and foremost in regard to “plastics for sustainable development” and the “circular economy”. These not only will be among the hot topics touched on at the exhibitors’ stands at the upcoming K but will also be covered comprehensively in the supporting programme.

For example, the special exhibition “Plastics Shape the Future” also sees itself as a podium for solutions and answers to current social trends and discussions. Crucial topics will be discussed in detail, including packaging waste, marine litter and climate change on the one hand and resource conservation, energy efficiency and recycling on the other. “Plastics Shape the Future” not only will offer an international information and networking platform but will

also provide for greater involvement of policymakers and socially relevant groups in the form of keynote speeches and speed talks.

The Science Campus of K 2019 stands for the dialogue between science and industry, with sustainability and recycling management also being examined intensively. Last but not least, the joint appearance of VDMA (German Engineering Federation) and its member companies will also be focused this time on the topic of the circular economy.

Those who want to already now begin preparing for their visit to K 2019 in October can find the exhibitor database at www.k-online.com/1410. At the end of March 2019, the ticket office for K 2019 will also be launched on the portal. The eTicket also benefits you twofold by saving both time and money. Visitors can purchase their ticket online, print it out on their own printer or download it as a code and then travel to the trade fair free of charge by bus and train. In addition, the eTicket is much less expensive than one purchased on site. Those who are still looking for accommodation for K 2019 should make the most of the services offered by Düsseldorf Marketing & Tourismus (DMT), www.duesseldorf-tourismus.de/messe/k.

16th - 23rd October 2019: K 2019, Duesseldorf (D)

Messe Düsseldorf GmbH
D 40001 Düsseldorf



(Image Rights: Systec & Solutions GmbH)

New product: WAVE 227 – UHD quality with 27” for a truly brilliant picture in the cleanroom



Larger screens and better image quality in UHD are becoming increasingly popular – and not just in the Home Entertainment sector. Particularly for workstations where users are positioned close to the display, the benefits here are obvious.



Besides the monitor sizes 19“, 21“, 24“ and 55“, Systec & Solutions GmbH now also offers the WAVE HMI system in 27“. The WAVE 227 comes with an anti-glare multi-touch IPS display featuring UHD resolution (3840 x 2160, 16:9). This guarantees a brilliant image with especially high contrast plus low power consumption. The WAVE series is characterized by the stylish design of its stainless steel housing – absolutely on trend.

Offering four times as many pixels as full HD, Ultra-HD resolution results in a sharper and more detailed display of screen contents. The true brilliance of Ultra-HD is particularly apparent at close distances, as in the workplace. The greater pixel density means that even the smallest type can be read without difficulty. The improvement in readability and the larger display of WAVE 227 allows more content to be presented. So employees have all key information at a glance, without needing to scroll down. For users this means working more efficiently and ergonomic usage of the display.

Overview of product features:

- Versions: Industrial PC, thin client or monitor
- Display: 27“ IPS LCD display (16:9) with a viewing angle of approx. 178°, LED backlight
- Resolution: 3840 x 2160 UHD
- Touchscreen: Anti-glare PCT (Projected Capacitive) multi-touch with optical bonding
- Industrial PC: Intel® Core i5-7300U (7th gen.) 2.6 GHz / Turbo 3.5 GHz, dual-core or Intel® Core i7-7600U (7th gen.) 2.8 GHz / Turbo 3.9 GHz, dual-core
- System memory: RAM with 4 GB DDR4 to 16 GB DDR4
- Dimensions (approx. mm): W 690 / H 450 / D 55
- Housing: Stainless steel 1.4301
- Protection class: IP65



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Cleanroom hardware FAQs: **Frequent questions asked by our customers about cleanroom keyboards and our answers**

In the cleanroom hardware FAQ series, Systec & Solutions GmbH presents the questions which are faced by businesses when selecting cleanroom hardware. The company shows the most frequent questions with which it is confronted regularly, as well as answers to these.

We use ethanol/isopropanol/chlorine as cleaning agents - is that a problem? Is there anything particular to look out for on cleaning?

The keyboards of Systec & Solutions were specially developed for use in cleanrooms with stringent hygiene standards. The keyboards were designed to satisfy the particular requirements associated with cleaning and resistance to chemicals by making the surfaces as smooth and easy to clean as possible. Almost all the cleaning agents and disinfectants generally employed in the pharmaceutical industry can be used. The keyboards comply with IP65 or better, which means that nothing can ingress into the keyboard on cleaning.

The front fascia of the membrane keyboard is a biaxially oriented polyester film. It therefore exhibits greater resistance to solvents than conventional films. A resistance list in accordance with DIN 42 115 Part 2 can be provided on request.

The materials used for the glass keyboard, stainless steel and glass, offer excellent mechanical and chemical resistance properties. Thanks to the back-printed capacitive glass operating panel, the legibility of the key labels does not suffer even over many years of use with regular cleaning. To facilitate cleaning, the cleaning function simply has to be activated. The keyboard then remains disabled during the cleaning



(Image Rights: Systec & Solutions GmbH)

operation to avoid any inadvertent entries being made.

Is it not possible to just make use of a conventional keyboard/medical keyboard/silicone keyboard?

Commercially available keyboards are not suitable for use in cleanrooms, as dirt accumulates under the keys. What's more, the design and materials do not permit regular cleaning with aggressive agents. Systec & Solutions strongly advises against improvised solutions, for instance simply



(Image Rights: Systec & Solutions GmbH)



(Image Rights: Systec & Solutions GmbH)



(Image Rights: Systec & Solutions GmbH)



(Image Rights: Systec & Solutions GmbH)

Cleanroom hardware FAQs

encasing a conventional keyboard in plastic or covering it with film.

The hygiene regulations for GMP environments are considerably more stringent than in hospitals or doctors' surgeries. Close attention must be paid to design, connections, materials, resistance and service life before making use of medical or silicone keyboards.

Design/connection: The more protrusions and recesses there are in a keyboard, the more complicated and time-consuming thorough cleaning becomes. Dirt can accumulate at USB interfaces and on externally routed cables.

Materials/resistance/service life:

Silicone can be wiped and disinfected. Frequent typing and cleaning does however lead to the surface of the soft silicone keys becoming rough and worn far more quickly, thus shortening the service life. In contrast to glass and stainless steel, some silicones also only offer restricted resistance to the standard cleaning agents used in cleanrooms. Outgassing may be a further problem with certain silicones, making them less than ideal for cleanroom applications. It is essential to find out beforehand.

Which of your keyboards would you recommend to me?

Glass keyboards are the most advanced means of text entry. They have progressively taken over from the popular membrane keyboards over the past two years. In the final analysis, both technologies are suitable for use in cleanrooms and for high hygiene standards.

The right choice is sometimes just a matter of what best suits the requirements. Glass keyboards operate on the capacitive principle with audio feedback, whereas membrane keyboards feature finger placement and tactile feedback.

The keys of a membrane keyboard have to be slightly pressed down to make entries, requiring a certain amount of finger pressure. Rapid ten-finger typing, for example, is not so easy. On the other hand there is less likelihood of pressing a key by mistake, and the tactile feedback provides distinct confirmation.

With the glass keyboard, entries are made by capacitive touch sensing, i.e. a finger touching a key produces a change in sensor capacitance. It is therefore not necessary to exert any particular pressure on the keys - just touching them is sufficient.

The absence of normal keys can be a bit off-putting at first. Users do however say that they soon become accustomed to this and are even able to type with ten fingers. It is possible to set the operating sensitivity individually.

When particularly high standards of hygiene are required with a large number of cleaning cycles, glass keyboards are usually the best option. Their smooth surface makes them easier to clean. They are also better able to withstand cleaning agents and chemicals than membrane keyboards, which are more susceptible to wear. Users who consider it an advantage to have tactile feedback and somewhat firmer, more active key operation may however prefer a membrane keyboard.

Membrane keyboards are often favored in the food and beverage industry, e.g. for the production of baby food, where glass could be a source of risk. For customers who nevertheless prefer capacitive text entry, the glass keyboard is also available on request with a laminated protective film to guard against splinters of glass.

To find out which keyboard is best for the particular application, it is recommended trying out the keyboards wearing the gloves used in the production environment.

We are looking for a keyboard with trackball.

Do you supply anything like that? Can you use it with a mouse?

Systec & Solutions is always being asked about trackballs. The decision not to offer these as they are not ideal for cleanrooms was deliberately taken. Dirt builds up around the trackball, where it is very difficult or even impossible to remove.

A mouse is not recommended, as this involves having a cable lying around or connection via Bluetooth. Both options require a USB interface, where dirt can accumulate. Dirt can also gather in the bottom part of the mouse. With a Bluetooth connection, the mouse is battery-operated. A flat battery can affect production processes. Thought should also be given to the surfaces on which the mouse is to be used, as reliable operation cannot always be guaranteed, on stainless steel for example.

To nevertheless ensure simple control, the keyboards are provided with a touchpad and Multi-Touch HMI systems can be supplied. The combination of touch screen and touchpad permits uncomplicated, ergonomic operation without the need for a mouse. To make entries, users do not scroll

to a field with the mouse but rather simply click the field on the touch screen with a finger. That is much faster than using a mouse, by the way.

Is keyboard user identification possible?

Can a card reader be integrated?

If required, the glass keyboards can also be used with an integrated RFID/NFC or smart card reader for user authentication.

Does the keyboard lock automatically to prevent unintentional text entry?

Systec & Solutions will gladly supply the glass keyboards equipped with an optional auto-lock function. After 30 seconds of inactivity, the keyboard then locks automatically and no further input is possible until it has been released again.

We require a special language layout.

Is that possible?

As standard, the language layouts DE, FR, DK, UK, US, BE, NL, CH and IT are offered. Other language layouts can be implemented on request.

We use special gloves. Does that pose a problem for working with your keyboards?

The glass and membrane keyboards have been tested with up to three layers of cleanroom gloves made of nitrile/latex, and that works without any problem. For working with glass keyboards wearing the snuggest possible gloves to ensure good conductivity is recommended. It is not possible to use non-conductive gloves, such as thick fabric gloves. The keys of glass keyboards and the touchpad also do not react to a stylus or other objects. If special combinations of gloves are used, possibly with undergloves made of other materials, it should always be tried out beforehand.

As a special option for the membrane keyboards resistive touchpad for specific applications can be offered. The touchpad can then be operated by applying pressure, which makes it possible to work with very thick gloves as well.

The touch sensitivity of the glass keyboard can be adjusted to suit the number of layers of gloves worn by workers. The volume of the audio feedback can also be set to the best level for the particular purposes.

We do not want any connecting cables. Is a Bluetooth connection possible for the keyboard?

The drawback to Bluetooth-connected keyboards is that they are battery-operated.

Cleanroom hardware FAQs

ted. Production processes may be affected if the battery has not been charged or needs replacing. Bluetooth connections are also often subject to interference. In the interests of guaranteeing reliable operation Systec & Solutions advises against using Bluetooth. Whether or not cables are visible largely depends on the chosen type of installation. If the decision is made in favor of installation directly on the HMI system or on the wall, the cable will be routed out of sight inside the adjustable torque hinge.

In cases where external cabling cannot be avoided, for example if a bench-mounted HMI system and keyboard are required,

Systec & Solutions employs special IP65 connections. This avoids having any openings which cannot be cleaned.

Can I continue to work with my existing keyboards? Can I use external keyboards?

Systec & Solutions does not generally recommend doing so, as seamless integration with HMI systems with torque hinge and internal cable routing is only possible in conjunction with the keyboards of Systec & Solutions. If it can't be avoided using a different keyboard, a tray for fitting to the HMI systems by way of a torque hinge can be offered. The hinge allows setting of

the tray angle to suit each individual user. Without Bluetooth it is then however not possible to avoid an external cable.



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Safe solutions for oxygen applications

The Ingelfingen-based valve specialist GEMÜ is expanding its product range for oxygen applications

GEMÜ is expanding its product range for oxygen applications, offering globe and control valves for applications with gaseous oxygen in addition to its multitude of diaphragm valves with immediate effect. For safe plant operation, GEMÜ is placing particular emphasis on the selection of suitable materials for all media-wetted components. In the case of oxygen applications, this primarily concerns auxiliary and seal materials. This is why, for example, the spindle seals of all GEMÜ globe valves that are suitable for applications with gaseous oxygen are manufactured from PTFE, as the material is difficult to ignite.

Oxygen is considered a critical working medium, since many materials burn intensely and quickly with compressed or pure oxygen. For this reason, special care must be taken for areas of application in which gaseous oxygen is used. In Germany, the Federal Institute for Materials Research and Testing (BAM - Bundesanstalt für Materialforschung und -prüfung) tests and evaluates whether certain materials are suitable for use with the critical medium.

GEMÜ offers a wide range of valves for oxygen applications. These include, among others, the GEMÜ 550 globe valves, which feature a uniform stainless steel design; the GEMÜ 554 type, which is distinguished by its particularly compact design; and the motorized GEMÜ 549 eSyDrive type. All these valves use auxiliary and seal materials that have been deemed suitable for use with gaseous oxygen by the BAM. The GEMÜ 601 diaphragm valves for small nominal sizes, the GEMÜ 650 BioStar for small to larger nominal sizes and the GEMÜ 660 filling valve are also type-tested and certified by the BAM.



Thanks to its difficult-to-ignite PTFE seals, the GEMÜ 554 control valve is perfectly suited to oxygen applications.

Heated CO₂ Probe with Replaceable Sensing Module

EE872 is a highly accurate CO₂ probe for demanding applications. The heated CO₂ sensing module improves the measurement performance at high humidity.

E+E Elektronik's new EE872 CO₂ probe measures CO₂ concentration up to 5 % (50000 ppm) and features active pressure and temperature compensation with on-board sensors. The heated, replaceable CO₂ sensing module and the long-term stable dual wavelength NDIR operation principle lead to outstanding measurement performance even under harsh and condensing conditions.

Accurate and Long-Term Stable

With its temperature range -40...60 °C (-40...140 °F), the EE872 is appropriate for most CO₂ monitoring applications. The multi-point CO₂ and temperature adjustment ensures best accuracy over the entire working range. The probe incorporates the E+E dual-wavelength NDIR CO₂ sensor, which is highly insensitive to pollution. Due to auto-calibration, the sensor also shows excellent long-term stability.

Pressure and Temperature Compensation

On-board sensors compensate the effect of temperature, altitude or weather changes on the CO₂ measurement. This leads to highly accurate CO₂ reading independently of the environmental conditions.

Heated, Interchangeable CO₂ Sensing Module

The heating prevents condensation inside the sensing head. Thus, the EE872 is appropriate for use in in high humidity and condensing environment. The modular design facilitates the replacement of the interchangeable, pluggable sensing module.

Robust and Well Protected

The robust IP65 stainless steel or plastic enclosure and the replaceable PTFE filter cap provide optimum protection against contamination. With a special catalytic filter, the CO₂ probe is suitable for applications with periodic H₂O₂ sterilization.

Analogue or Digital

The EE872 provides the CO₂ measured data simultaneously on current and voltage outputs or via RS485 interface with Modbus RTU protocol.

Configuration and adjustment can be performed comfortably with the free configuration software and an optional adapter cable.



EE872 CO₂ probe with stainless steel or plastic enclosure. (Photo: E+E Elektronik GmbH)



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