



Algorithms help to prevent compressed air wastage



Wastage could be cut by up to 30 per cent: most compressor units run inefficiently. Numerous leaks allow air to escape, but detecting these is tricky. Researchers at the Fraunhofer Institute for Manufacturing Engineering and Automation IPA now propose to leverage the benefits of Artificial Intelligence to tackle this wastage.



Researchers at Fraunhofer IPA are proposing to use Artificial Intelligence to identify leakages in compressor units and bring an end to waste. To this end, they have constructed a demo prototype. (© Fraunhofer IPA/Photo: Rainer Bez)

Around 60,000 compressor units are in operation at German companies. Together, they use up 16.6 TWh of power each year, which equates to 7 per cent of the overall energy consumption of German industry. Professor Sauer, Head of Department for Energy Efficient Production (EEP) at Fraunhofer IPA and Head of the Institute for Energy Efficiency in Production at the University of Stuttgart, explains that "The costs for this could be reduced by up to 30 per cent per year". He believes that potential savings could above all be realized as the majority of compressor units currently in use operate inefficiently. The reason? They are full of leakages.

Holes and kinks in the pipes and loose connections: These can be hard to detect. After all, it is often the case that some compressor unit components are not easily ac-

cessible, something which can present danger, too. The leakages can also be so minute that they are incredibly hard to detect with the naked eye, while in some cases, they cannot even be detected at all. Up until now, companies have used an ultrasound measuring device, which has been able to uncover areas from which air is escaping at frequency ranges inaudible to the human ear. Most companies tend to only conduct these tests once a year, or simply resolve to live with the problem of leakages.

Holes, kinks and loose connections

Christian Dierolf and his colleague Christian Schneider intend to apply an approach rooted in Artificial Intelligence (AI) to identify leakages in compressor units and

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bring an end to waste. To this end, the two researchers have built a demo prototype as a first step.

They pump compressed air into the system using either an undamaged pipe or one featuring practically invisible holes, kinks or loose connections – the most common form of leakages for compressor units. While the naked eye is unable to detect the path taken by the compressed air, actuators are able to perform this task. The demo system therefore measures whether the air passes through the pipes with a greater or lesser degree of pressure, identifies the flow rate, the position of the actuators and the condition of the vents, as well as capturing the ultrasound signal.

Demo system as a database

All of this data is recorded and saved in the cloud synchronously. "The demo system essentially creates the basis for our data-led manufacturing research, for example by training self-learning algorithms", the researchers explain. These algorithms are then to be applied to industrial applications at a later date. In this context, they will then not only be able to identify and localize any leakages, but at the same time provide a description and the serial number of the affected component via an app in future as well. The person attending to the com-

pressor unit therefore no longer needs to search through a catalog. Instead, they can order a replacement in just a few clicks and keep the downtime to a minimum. "In addition to classifying the leakage, the focus is also on identifying the actuators present in the compressor network with minimal effort", Dierolf explains.

However, as is the case with many other ideas that researchers have come up with, this is still some way off being a reality. The seminar "Intelligent Compressed Air – identify potential and increase efficiency with Industry 4.0 methods", which is being held at Fraunhofer IPA in Stuttgart on November 6th, 2019, will showcase the methods that are already today being used to leverage efficiency potential and cut costs, with Industrie 4.0, among other concepts, playing a significant role in this.



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August 2019

Dear subscribers,

in the current issue of the cleanroom online newsletter you will find among others articles dealing with the following topics:

- **Algorithms help to prevent compressed air wastage**
- **Cleaning and disinfecting procedures for controlled environments**
- **Solvent based cleaning at high pressure**
- **FINAT Innovation Award for Smart Blister Pack**
- **First-class heat pump expertise**
- ...

I wish you an interesting reading and a cool head

Yours sincerely

Reinhold Schuster



Contamination Control

Cleaning and disinfecting procedures for controlled environments

In a controlled environment cleanliness is measured by the amount of airborne and surface particles present within the area. The highest contributing factor of contamination is caused by personnel in the form of fibers, hair, skin flakes and bacteria.

A person in a sitting position produces about 100 thousand particles, a person walking 5 miles per hour produces 10 million.

Effective contamination control procedures are key to a functional and efficient cleanroom. When choosing a mopping system for your facility there are many variables to keep in mind:

- What size is the area you are cleaning?
- Amount of contamination within the area?
- What level of classification is required?
- Do you need process validation?

Cleaning validation is achieved by demonstrating that the cleaning procedure consistently removes contamination to acceptable levels. Implementing validated standard operating procedures for specific cleaning techniques will guarantee the cleaning can be performed reliably and repeatedly to satisfy a certain level of cleanliness.

A reliable contamination control process requires high-quality cleaning equipment and specialized techniques. It does not mat-

ter how effective a cleaning agent is if the cleaning technique utilized by a cleanroom operator is poor. Today's critical cleaning professionals recommend the use of multi-bucket mopping systems for maximum cleanliness, efficiency, and removal of contaminants.

The following report explains how to control contamination in a controlled environment by utilizing TruCLEAN Mopping Systems and proper cleaning and disinfecting procedures.

TruCLEAN Mopping Systems

Designed to capture and isolate contaminants from cleaning and disinfecting agents, TruCLEAN multi-bucket mopping systems provide the ultimate in cleanroom cleaning technology.

Each mopping system component will play an important role in delivering the highest level of cleanliness. For example, our low-profiled swivel mop frame allows mopping in an "S" motion, uniformly applying cleaning and disinfecting agents. The stainless steel wringer has a unique wringing mechanism that exerts force evenly across the entire mop surface, extracting the maximum amount of soiled contaminants. Debris is re-

leased through hundreds of apertures combined with natural gravity flow, transporting contaminants from wringer into the waste collection bucket.

TruCLEAN mopping systems effectively:

- Remove non-viable and viable contamination
- Dislodge biofilms
- Remove residues
- Apply disinfectants or detergents
- Easy to use, ergonomic

Clean, Disinfect or Both?

Cleanrooms in pharmaceutical facilities must be kept in a state of microbiological control. This is achieved by using specific cleaning techniques along with the application of detergents and disinfectants. The object is to reach a specific level of cleanliness for the class of cleanroom for an appropriate period of time.

Cleaning and disinfection are commonly confused as the same action. Cleaning requires mechanical agitation and the use of a detergent to remove contaminants from a surface. After cleaning, the application of a disinfectant (chemical substance capable of eliminating bacteria or fungus) represents disinfection. If sanitation procedures are performed incorrectly, high levels of microbial contamination will remain and critical manufacturing areas become unstable.

It is important to acknowledge that all controlled environments are not created



TruCLEAN Sponge Mop



TruCLEAN Pro XL



TruCLEAN Mop Frame

Contamination Control

equal when it comes to proper cleaning methods.

We will now illustrate the appropriate procedures to use with your TruCLEAN mopping system for overall cleanliness and absolute contamination control.

Cleaning Procedure for Contaminant Removal:

1. Set up your three buckets.
Bucket 1: Mopping solution
Bucket 2: Clean water
Bucket 3: Waste collection (Below Wringer)
2. Submerge sponge mop into front bucket in order to activate all cells of the sponge mop. This should take no more than 3 minutes. Unlike disinfecting, cleaning requires firm mechanical agitation of the surface and thorough collection of contaminants. More frequent emptying of the waste bucket will be required.
3. Lift sponge mop out of cleaning solution and tilt mop frame on inside wall of bucket to remove excess solution. Sponge is fully loaded and ready to clean. Utilize the "Pull-Lift" technique - pulling the sponge mop towards you, lifting the sponge and overlapping the previous stroke (see illustration 1). Be firm, agitate the surface back and forth, staying within the unidirectional flow. The cleaning flow should always begin with the cleanest area to the dirtiest. Start with the ceiling, then the walls, equipment, and finishing with the floor. Apply solution as recommended by your chemical supplier.
4. Wring out sponge mop thoroughly. Do not apply unnecessary force on wringer handle.
5. Go back to the cleaned surface and wipe dry using the "Pull-Lift" technique without agitation (see illustration 2). The sponge mop will collect any remaining residue and dry the surface.
6. Rinse sponge mop in center bucket by patting the bottom of sponge on the surface of the rinse solution - then wring out. This process removes residuals from the bottom surface of the sponge mop and minimizes re-depositing contaminants. Do not submerge sponge mop in rinse solution.

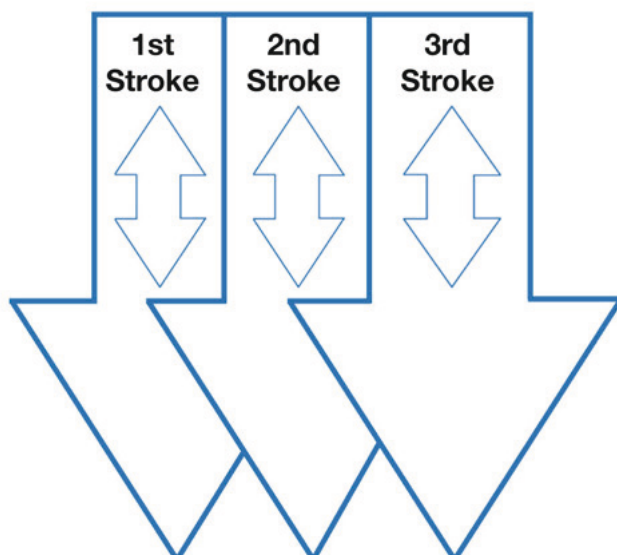


Illustration 1: "Pull-Lift" technique with agitation

7. Repeat steps 2 - 6.

8. When finished, thoroughly rinse entire system and wipe dry. Apply an approved disinfectant onto the entire system or autoclave at 250°F for 30 minutes.

Disinfection Procedure for Pre-cleaned Surfaces:

1. Set up your three buckets.
Bucket 1: Disinfecting solution
Bucket 2: Clean water
Bucket 3: Waste collection (Below Wringer)
2. Submerge sponge mop into front bucket in order to activate all cells of the sponge mop. This should take no more than 3 minutes.
3. Lift sponge mop out of solution and tilt mop frame on inside wall of bucket to release excess solution. Sponge is fully loaded and ready for application to floors, walls, and ceilings. If dosing surface with contact time of 7-10 minutes or greater proceed directly to surface without wringing. If dosing surface with contact time less than 7-10 minutes slightly wring sponge by applying minute force on the wringer handle. Do not apply excessive force since this will dry out the mop head and cause skipping of the sponge. More importantly, it will result in a non-uniform application of solution. Utilize the "Pull-Lift" technique, without agitation (see illustration 2). When disinfecting walls, never let the sponge mop touch the floor, you may transfer floor contaminants onto the wall. Apply solution as recommended by your chemical supplier.
4. After applying disinfectant, rinse sponge mop in center bucket by patting the bottom of sponge on the surface of rinse solution. Wring out sponge mop thoroughly. Do not submerge sponge mop in rinse solution.
5. Refill sponge mop in front bucket by submersing only the bottom surface of the sponge mop. Repeat steps 3 - 4.

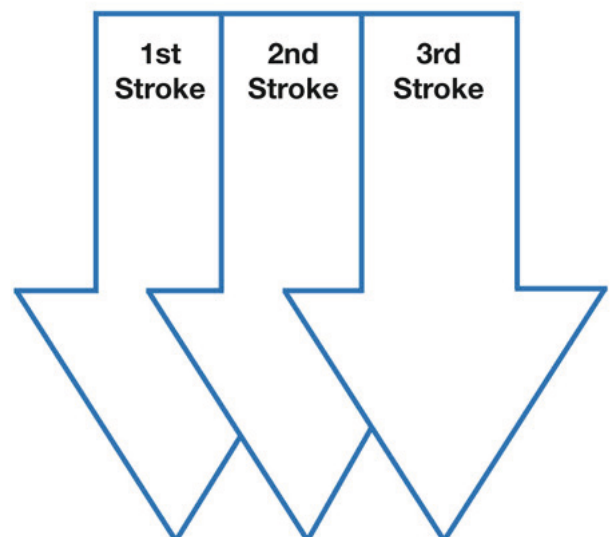


Illustration 2: "Pull-Lift" technique without agitation

Contamination Control

6. When finished, thoroughly rinse entire system and wipe dry. Apply an approved disinfectant onto the entire system or autoclave at 250°F for 30 minutes.

Conclusion:

Deciding which cleaning method is best for guaranteed compliance with today's cleanroom standards is a challenging process. For this reason, Perfex Corporation offers vast experience as a trusted manufacturer of high-quality cleaning tools. Our TruCLEAN line of

cleanroom mops and mopping systems will surely meet your precise requirements.

TruCLEAN products are methodically designed for healthcare, pharmaceutical, and life science applications. TruCLEAN mopping systems withstand repetitive autoclave sterilization procedures, providing economical advantages.

Perfex Corporation
NY13431 Poland Vereinigte Staaten

Improving your yield

Introducing AeroTrak+ Remote Airborne Particle Counters - Reliable Measurement. Confident Results.

Introducing AeroTrak®+ Remote Airborne Particle Counters (APCs)—offering cleanroom professionals top-notch reliability and no-hassle operation. They're designed to cover a wide range of particle sizes to meet the needs of your clean manufacturing environment. Rapid setup and ease of operation make them top-choice for saving time during installation while ensuring reliable measurements over the life of your clean facility. Typical applications include, but not limited to, pharmaceutical, electronics, semiconductor, and industrial manufacturing.

Critical Advantages to Increase your yield

- Reliable second-by-second sampling
 - Minimizes product risk-waste
 - Reduces manufacturing costs
 - Detects adverse trends to enable instant proactive response—before the end of the sample period
 - Instantly alarms upon excursion
- Simple installation options with power over Ethernet
- LoRaWAN wireless option to ease installation and flexible manufacturing
- Easy, rapid setup (all models) or relocation (6000 Series models) to save time and money
- Reliable laser technology backed by industry-best 5 year warranty

Available in two configurations

- 7000 Series—for facilities with external vacuum systems
- 6000 Series—for facilities without external vacuum systems or where retrofitting a flexible clean facility is not feasible

TSI GmbH
D 52068 Aachen



Solvent based cleaning at high pressure

Flexible 10 – 16 bar spray cleaning solution for solvent-based machines

Increasing demands on cleanliness, in terms of freedom from both particulate and film-type contaminants, call for the use of adapted cleaning solutions. These now include a new spray cleaning system for solvent-based cleaning machines by Ecoclean. With this process option, spray processes and injection flood washing can be performed at adjustable pressures between 10 and 16 bar via two spraying bars. The additional cleaning capability delivers markedly improved cleaning results on geometrically complex parts and bulk-cleaned items.

Spray cleaning systems are already a feature on many solvent-based cleaning machines today. However, their spraying pressure is commonly in the range of 2 – 3 bar. With densely packed bulk items and geometrically complex workpieces exhibiting undercuts, threaded holes and blind holes – and, at times, parts obtained by additive manufacturing – that pressure will not suffice to achieve increased standards of cleanliness, i.e., an effective removal of film-type and/or particulate contaminants. This is because downstream processes such as coating, adhesive bonding and heat treatment require significantly cleaner surfaces today. Ecoclean GmbH has responded to this trend by developing a so-called high-pressure spraying system for solvent-based cleaning machines. This system allows spraying processes and injection flood washing with hydrocarbons or modified alcohols to be conducted at 10 – 16 bar pressure.

Flexibly adaptable spraying processes

For the high-pressure spray cleaning option, the cleaning machine – e.g., an EcoCore model – is equipped with a high-pressure pump and additional spraying bars in addition to any 2 – 3 bar spraying device that may already be fitted. One spraying bar is mounted on the interior wall of the work chamber. The second is placed centrally in the work chamber to provide both interior or exterior spraying, either simultaneously or in an alternating pattern. The spray pressure is adjusted via the high-pressure pump, which is controlled by variable-frequency drive. The number of nozzles and the product movement can be conveniently adapted to optimize the spraying process for a given part size and geometry. Moreover, this sophisticated and easy-to-handle technology supports the use of various nozzles matched

to the specific application in terms of size and jet shape. As usual, the pressure, spray duration, spraying mode (simultaneous or alternating) and product movement can be defined in a part-specific cleaning program and stored in the machine controller.

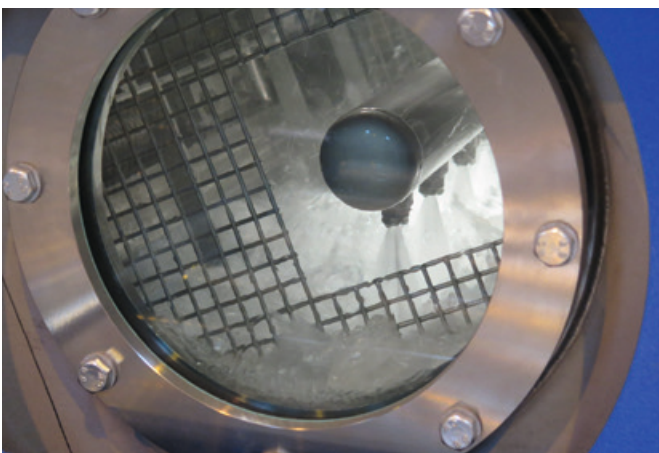
Enhanced cleanliness of oriented or bulk parts

For the interior and exterior spraying step, the parts – whether oriented or bulk – are positioned and secured in special carriers. With oriented parts the cleaning medium can thus be selectively directed at critical zones. Defined movements of the wash load carrier ensure that the spray jet will reach all areas. Throughout the process, contaminants become dislodged from the part surface by the spray jet's mechanical energy. At the same time, the high fluid exchange rate causes dislodged foreign matter to be flushed away from these areas so that a markedly improved cleaning result is obtained.

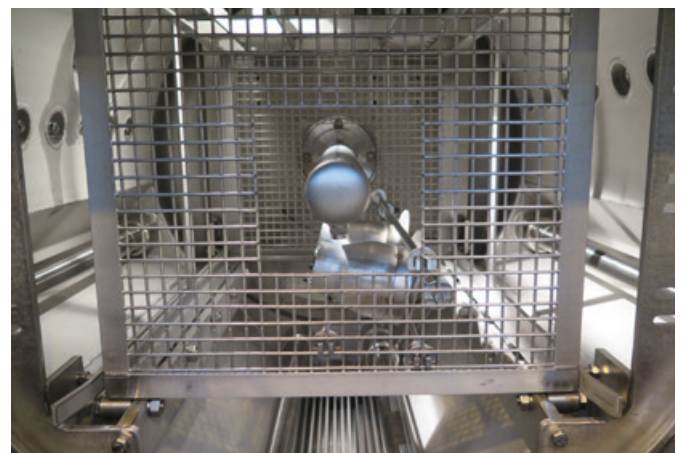
The high-pressure spray cleaning capability also offers advantages in cleaning densely packed bulk items. Due to the elevated pressure, an improved penetration of the packing will be achieved. Furthermore, the (high-pressure) injection flood washing cycle is performed with much more intense turbulences which, in turn, contributes to a higher cleaning quality.

For cleaning processes requiring only external spraying and/or no high pressure application, the central spray bar can be removed in a few simple steps. In this case the entire volume of the work chamber will be available to accommodate standard cleaning containers.

Ecoclean GmbH
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The new high-pressure spray cleaning option for solvent-based cleaning machines such as the EcoCore allows spraying processes and injection flood washing to be performed at adjustable pressures of up to 16 bars. Markedly improved cleaning results are thus achieved with geometrically complex parts and bulk-cleaned items. (Source: Ecoclean GmbH)



For the high-pressure spray cleaning option, the cleaning system is fitted with an additional high-pressure pump and spray bars. One of these is placed on the interior wall of the work chamber, the other is mounted at the center of the work chamber. This design supports both interior or exterior spraying, either simultaneously or in an alternating pattern. (Source: Ecoclean GmbH)

Satisfied customers through simple integration

Dialogue between manufacturers and users during the “Open Integration Partner Meeting”

35 Open Integration partners gathered together at Endress+Hauser in Reinach, Switzerland, to share their experiences and thoughts for the first time. A highlight of the event was a presentation from representatives of the chemical and pharmaceutical industries outlining how they benefit from the partner program during digitalization of their processes – and what they would like to see in the future.

The goal of the Open Integration program initiated by Endress+Hauser can be summed up quickly: the simple, fast and manufacturer-independent integration of components and devices into various automation systems. And, almost more importantly, satisfied customers.

While it sounds simple in theory, when it comes to day-to-day system operation, it's far from that. Even the most experienced automation specialists have great respect for multi-vendor systems. That also applies to complete solutions “from a single source.” After all, digital communications – a precondition for the extensive use of existing intelligence in field devices and systems – places serious demands on integration.

With its Open Integration partner program, Endress+Hauser is inviting providers of control technology, fieldbus infrastructure, measurement technology and actuator systems to test and document the interaction of their products even more extensively in the interests of their customers. The cooperation partners include Auma Riester, Bürkert, Festo, Flowserve, Hima Paul Hildebrandt, Honeywell Process Solutions, Mitsubishi Electric, Pepperl + Fuchs, Phoenix Contact, Rockwell Automation, Schneider Electric and Turck.

Open standards as a basis

The foundation of this effort is open communication standards (Hart, Profibus, Foundation Fieldbus, EtherNet/IP or Profinet), as well as open integration standards (FDT, EDD, FDI). With a nearly unlimited selection of options, the reference topologies represent practical

combinations suitable for applications in the chemical, life sciences, food & beverage, oil & gas, power & energy, primaries & metal and water & wastewater industries.

The reference topologies take into account industry-typical requirements such as explosion protection, availability and redundancy. Each topology is thoroughly tested and documented in the lab in Reinach in conjunction with the partners, after which the recommendations are published.

Interoperability tests create added value

And how do customers benefit from the Open Integration partner program? Every problem that the integration experts discover prior to commissioning can be resolved at a much lower cost compared to fixing the issue in the field at some later point. Customers receive concrete, validated recommendations for automating their systems, which go well beyond established conformity and interoperability testing while ensuring seamless integration. Last but not least, they save time and money.

With developments such as IIoT and APL, users will face new challenges, plus integration testing will be given added weight. This makes it even more important for the Open Integration partners to work together over the long term. The participating customer and provider representatives were in full agreement on this point. Cyber security, in addition to the issue of connectivity, will play a key role in the future. They furthermore agreed that effective strategies need to be developed to counter new entrants in the automation industry such as IBM or Amazon.

Customer-driven developments

One thing was clear during the get-together in Reinach in early June: the process control industry wants open, interoperable systems instead of proprietary solutions. One of the users wants uniform, structured access to static information via QR- and RFID-supported type plates in accordance with DIN 91406. Standardized diagnostics in line with NE 107 is also at the top of the wish list.

In the near term, Endress+Hauser wants to work with its partners to address these and other open issues with the aim of utilizing Open Integration to offer customers even more value-add during digitalization of their processes. The common goal: satisfied customers who can extensively utilize the opportunities that digitalization brings with little risk.



Dialogue between manufacturers and users. At the Open Integration meeting in Reinach, Switzerland, in early June, representatives from the chemical and pharmaceutical industries explained how they benefit from the partner program during digitalization of their process control systems.

Ground-breaking ceremony in Rocky Hill

Arburg expands its U.S. headquarters

- Thriving Arburg subsidiary in Connecticut will be expanded by around 2,100 square metres
- Significant investment in infrastructure at Arburg USA
- Even better customer support with turnkey systems, machines and spare parts

On June 14, 2019, Arburg, Inc. in Rocky Hill, Connecticut, officially began with the expansion of its US headquarters. In addition to Managing Director Friedrich Kanz and CFO Claude-Helene McIntyre of Arburg, Inc., William O'Sullivan and Larrye deBaer, representing the city of Rocky Hill, as well as the construction team of Tecton Architects and Nosal Builders, took part in the ground-breaking ceremony. In future, the subsidiary will offer some 2,100 square metres of additional space in a new hall, increasing the available floor space by more than 80 percent.

„In recent years, our business in the US has developed significantly better and faster than expected. Thanks to this dynamic development, we now face the fortunate problem that our US headquarters, which was newly built as recently as 2015, is already reaching its capacity limits,” explains Friedrich Kanz, Managing Director of Arburg, Inc. as the main reason for the expansion in Rocky Hill.

New hall and state of the art logistics

The new hall will have a floor space of around 2,100 square metres, which represents an expansion of more than 80 percent. This will create more space for building and acceptance testing complete turnkey systems, adapting stock machines to customer specifications and a significantly larger spare parts warehouse. The new building will be equipped with modern logis-

tics and a gantry crane with a lifting capacity of 40 tonnes. As a result, after-sales service of the Arburg subsidiary will also be improved. Moreover, further rooms will be available for customer training and technical seminars, as well as 25 additional office workplaces for employees, mainly from the Application, Turnkey and Service departments.

The existing building already includes a showroom for up to seven Allrounder injection moulding machines and a laboratory with two Freeformers for additive manufacturing.

US is Arburg's most important foreign market

Arburg has its own organisations at 34 locations in 26 different countries; together with its trading partners, it is present in more than 100 countries. The US is the most important foreign market for the German company with headquarters and central production in Lossburg, Germany. Arburg, Inc. – Arburg's North American subsidiary – was founded in 1990. The expansion of the facility in Rocky Hill represents another significant infrastructure investment. To ensure full regional support in the US, Arburg is also represented by two Technology Centers, the „ATC California“ in Irvine, CA (since 1993), and the „ATC Midwest“ in Elgin, IL (since 2007). With 105 employees, Arburg USA currently supports some 13,000 installed machines in the US, Canada and the Mexican border region.



Ground-breaking ceremony for the extension at Arburg's US subsidiary in Rocky Hill (from left): Jim Becker, Project Architect Tecton Architects, Claude-Helene McIntyre, CFO Arburg Inc., Friedrich Kanz, CEO Arburg Inc, William O'Sullivan, Deputy Mayor of Rocky Hill and Larrye deBaer, Chairman of the Economic Development Commission, Rocky Hill. (Photo: Arburg)

FINAT Innovation Award for Smart Blister Pack

First Place for Schreiner Group at FINAT Label Competition 2019 in Copenhagen

With the Smart Blister Pack from the Schreiner MediPharm business unit, Schreiner Group won first place in the 2019 FINAT Label Competition in the "Innovation" category. The high-tech company convinced the judges of the European association for the self-adhesive label industry (FINAT) again this year and was presented with the award on the occasion of the European Label Forum in Copenhagen.

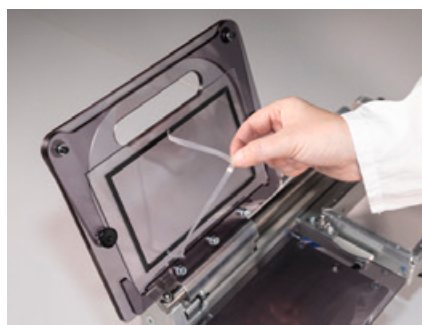
"We are delighted about the Innovation Award. It proves that innovation as one of our four corporate values is being lived in concrete ways and produces smart solutions that are trendsetters for our whole industry," President and CEO Roland Schreiner said in his comments about Schreiner Group's accolade. "All of our high-end high-tech solutions

are characterized not only by outstanding quality but, above all, by technological innovations, particularly in the case of new developments." On behalf of the company, Dr. Joseph Adelsberger, Team Leader Basic Technologies in Schreiner Group's Research+Development department, accepted the FINAT Label Competition award.

The growing trend toward Smart Packaging requires solutions in the area of Patient Compliance Monitoring, among other things. The Schreiner MediPharm business unit together with the Schreiner PrinTronics competence center develops customized applications with printed electronics that are precisely adapted to the respective packaging. The award-winning Smart Blister Pack enables electronic monitoring of medicine intake and thus supports the digitization of Patient Compliance Monitoring. It serves to check and track therapy adherence according to medical prescriptions as part of a therapy plan. In addition to the Innovation Award, the judges at the European Label Forum praised three other products from Schreiner Group: the ((rfid))-Digital Void Label, the (rfid))-DistaFerr WetDetect label and the Folding Frame Solution.



Award-winning Smart Blister Pack: Schreiner MediPharm develops smart solutions with printed electronics for diverse packaging concepts that enable electronic therapy monitoring.

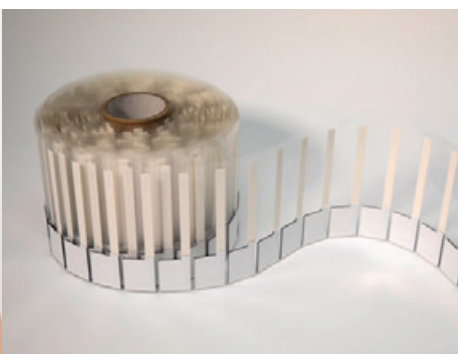


The Folding Frame Solution revolutionizes the joining of components - particularly for the automotive and electronics industries.

Schreiner Group GmbH & Co. KG
D 85764 Oberschleißheim



The ((rfid))-Digital Void Label enables smartphone-based electronic first-opening indication.



The ((rfid))-DistaFerr WetDetect Label combines RFID technology with a moisture sensor and thus provides an ideal method for leakage testing.



Dr. Joseph Adelsberger, Team Leader R+D Basic Technologies at Schreiner Group, accepts the Innovation Award on the occasion of the European Label Forum.

Opening Ceremony for the LIT Factory in Linz

June 5, 2019 was the date of the opening ceremony for the 8,000 m² LIT Open Innovation Center and the LIT Factory in Linz.

The goal of the Open Innovation Center is to bring research, business and industry closer together. In addition to other well-known companies, motan is a member of a consortium which will jointly promote process engineering innovations in the field of plastics technology and digitization. The LIT factory will not only be used as a learning factory for education and training, it will also serve as a showroom and testing center for basic research in the plastics processing industry.

The LIT factory is equipped with a motan drying, conveying and gravimetric dosing system for supplying two Engel injection molding machines. In the future, the plant will be expanded for a Leistritz extruder. The plant contains various motan components from the areas of drying, conveying, controls, dosing and mixing. The plant has been designed to provide the materials and throughputs associated with a



Left to right: Thomas Luger (Luger GesmbH), Knut Hilgert (motan holding) and Horst Bar (Luger GesmbH) in front of a motan system at the LIT Factory in Linz.

research facility's flexible operation. New product developments for motan devices can also be initiated and tested at the factory in the future.

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First-class heat pump expertise



- High-calibre congress with international speakers
- International Foyer Expo with key players from the sector

The European Heat Pump Summit – powered by Chillventa – will deliver professional expertise at its finest on 22 and 23 October 2019, focusing on professional knowledge-transfer at the highest level. Over the two days of the event at the Nuremberg exhibition venue, heat pump experts from around the world can enjoy in-depth, wide-ranging professional exchanges, discuss research results, and find out about the latest trends and developments in a compact format. The accompanying Foyer Expo, which is of an equally high standard, provides the appropriate practical context.

22nd - 23rd October 2019: EUROPEAN HEAT PUMP SUMMIT, Nuremberg (D)

For the sixth time now, the European Heat Pump Summit – powered by Chillventa – will offer heat pump experts an interesting, high-calibre congress programme. It will focus on the commercial and industrial use of heat pumps and provide detailed descriptions of the applications involved. In addition, there will be an in-depth exploration of the markets in Europe and worldwide.

As well as looking at innovative technologies in component manufacture and the specific use of heat pumps in commerce and industry, the summit will also explore topics such as refrigerants, the use of hybrid systems, and high-temperature heat pumps. The congress is aimed at researchers, technicians, product developers, decision-makers and consulting engineers, component manufacturers and suppliers, designers and architects, and operators of heat pumps in industrial and commercial environments.

“The European Heat Pump Summit has become established as a major event in Europe on the topic of heat pumps. The dynamic interplay between the theoretical, highly technical knowledge transfer in the congress, the chance to expand your international network at the get-together and the practical context provided by the Foyer Expo is what makes this event such a special highlight for the international heat pump community,” says Daniela Heinkel, Senior Manager European Heat Pump Summit, NürnbergMesse.

First-class congress programme – professional expertise at its finest!

The two-day congress offers a wealth of presentations in an extensive programme that is available to download now. More than 30 prominent German and international speakers will be available to answer questions about the status quo and importance of the heat

pump. A broad range of topics will be covered:

- Information about the challenges and opportunities in the heating and refrigeration sectors will be provided directly by the European Partnership for Energy and Environment (EPEE), which will provide an overview of European and global developments.
- The Swedish association of research institutes RISE will report on the use of heat pumps in humid climates, while the University of Rapperswil in Switzerland will show how heat pumps can be integrated into nZEB (nearly zero energy buildings). The University of Maryland in the USA will explore the options for “low GWP” refrigerants for use in heat pumps.
- Among other things, presentations by component manufacturers will show how heat exchanger design is moving towards the use of small refrigerant charges in line with safety classes A2L and A3. The use of refrigerants in hot water heat pumps will also be discussed.
- The Austrian Institute of Technology (AIT) will explore the successful use of industrial heat pumps for industrial drying at temperatures of up to 160°C, while the French research institute EDF will examine their application in a high temperature district heating network. The industrial drying process is an especially effective use of heat pumps, as the University of Ghent in Belgium is demonstrating through the use of a test bench.

For further details of all lectures and speakers please go to: www.hp-summit.de/en/events

Foyer Expo offers a high-calibre complement to the congress

The lectures are complemented by the accompanying Foyer Expo with product presentations by renowned companies and associati-

First-class heat pump expertise

ons from the international heat pump sector. For details of exhibiting companies and organisations please go to: www.hp-summit.de/en/foyerexpo

hp-summit.de/en/participation/congress

Ticket prices for the European Heat Pump Summit 2019

The early bird discount ends on 13 September 2019, so act quickly to benefit from a reduced ticket price of EUR 490 compared with the standard ticket price of EUR 545. The price includes participation in the summit, congress catering including lunch, the get-together at the end of the first day of the event and access to the Foyer Expo.www.

Strong partners guarantee heat pump expertise

NürnbergMesse organises the European Heat Pump Summit in close collaboration with sponsors and partners from industry and the research community, including AREA, bwp, DKV, ehpa, EPEE, HPT TCP Heat Pump Centre, IZW, VDKF and ZVKKW.

NürnbergMesse GmbH
D 90471 Nürnberg

2nd International Conference on UV LED Technologies & Applications – ICULTA 2020 | Call for Abstracts



26th - 29th April 2020: UV LED Technologies & Applications, Berlin (D)

Two years after the first successful 'International Conference on UV LED Technologies & Applications (ICULTA)' the next conference will be held from April 26 to 29, 2020 at the MELIÄ Hotel in Berlin, Germany. Once more, it will bring together pioneers, leaders, and experts from science and industry to discuss latest progress and innovations in the development of UV LEDs and their broad spectrum of applications. The conference is jointly organized by the German consortium Advanced UV for Life and the International Ultraviolet Association (IUVA).

UV LEDs produce narrow-band radiation and can be tuned to cover almost the entire ultraviolet spectral range. Their performance characteristics strongly depend on their emission wavelength: the shorter it is the higher are the scientific and technical requirements for material development and LED device technology. Applications of the compact sized, eco-friendly, and flexible light sources range from disinfection of water, air, and surfaces to medical diagnostics, plant growth lighting, and curing of various materials.

ICULTA 2020 offers an international platform for experts in UV LED technology and applications, inviting them to be part of the conference as speaker, attendee, exhibitor, and/or sponsor.

Submission deadline for oral and poster presentation abstracts: November 30, 2019.

Conference topics include:

UV LED Technology:

- Epitaxy
- Chip Technology
- Packaging
- LED Modules & Luminaires

UV LED Applications:

- Disinfection
- Water Treatment
- Sensing & Analytics
- Life Sciences
- Horticulture
- Medical Applications
- Curing
- 3D Printing
- New Applications
- Regulations & Standardization

Advanced UV for Life is a consortium of 49 German industrial and academic partners working together in the development and application of UV LEDs. The consortium originates from a research program funded by the German Federal Ministry of Education and Research.

The International Ultraviolet Association (IUVA) is an international organization of UV industry, educators, consultants, utilities, and research professionals, with a mission to make the use of ultraviolet light a leading technology for public health and environmental application.

Advanced for Life
D 12489 Berlin

K 2019 in Düsseldorf: Plenty of services for a successful trade fair



**Hot topics at K with dedicated microsite - Interactive hall plan
- My Organizer - New Matchmaking Tool - K App - K Newsletter**

16th - 23rd October 2019: K2019, Duesseldorf (D)

It is now only four months before K 2019 opens its gates again – the World's No.1 Trade Fair for Plastics and Rubber. From 16 to 23 October the Düsseldorf Exhibition Centre will be fully booked, with over 3,000 exhibitors from 60 nations. If you're a trade visitor, you may like to start planning your visit now, so that you can make the best possible use of everything that K 2019 has to offer. K 2019 has a variety of services to support visitors from the entire world, enabling you to make the most of your time in Düsseldorf.

Hot topics at K 2019 on K-online.com

Four hot topics have been chosen for K 2019 by the academics and experts from the K 2019 Innovation Group: Plastics for Sustainable Development & Circular Economy, Digitisation and the Plastics Industry 4.0, System Integration: Functionality through Material, Process and Design, and Young Talents in the Industry.

These hot topics now have their own dedicated microsite on the K Portal with continuous video interviews, articles and news items based on each topic. A great place for visitors to start planning their visit to the trade fair.

Interactive hall plan

The interactive hall plan covers both indoor and outdoor premises and is an ideal way to find your way round the exhibition centre. Each hall can be accessed with a simple tap, and a continuous zooming function allows you to focus on individual stands, where you can view all the information about exhibitors and their products. The new exhibitor search function covers the entire K database and displays results directly on the hall plan.

My Organizer

Using the My Organizer function, visitors just need a few taps/clicks to compile a list of interesting exhibitors, so that they can plan their route through the halls in detail before they arrive. After registration, My Organizer can be used in the Ticket Shop with a personal login, although it is also available without registration. Login permits convenient use on a variety of devices (e.g. smartphones and PCs)

over a long period of time. Once a list has been compiled, it can be edited or amended every time it is called up.

New Matchmaking Tool

One major element of K in Düsseldorf is international networking. But what's the easiest way for exhibitors and visitors to make contact in our digital age? The new smart Matchmaking Tool provides an ideal platform for finding new contacts quickly and conveniently and for networking with them. Trade visitors and exhibitors at K 2019 can already search for contacts and products they find relevant and interesting. The tool suggests suitable contacts straightaway, enabling you to get in touch with them and arrange to meet during the trade fair. Access is via the web portal, at <https://www.k-online.com/matchmaker2> for visitors, and at https://www.k-online.com/matchmaking_exh_2 for exhibitors, or via the K Matchmaking app on IOS and Android. The tool quickly matches your interests and presents recommendations and personalised suggestions of contacts.

The K App: The entire K world to take home

The K App makes all the important information about K available on a mobile device in English and German, providing exhibitor and product searches (also off-line), trade fair and exhibitor news, specials and the interactive hall plan, as well as the My Organizer and matchmaking functions. The app is free and can be downloaded via the AppStore or Google Play. Together with the K Matchmaking app, it offers the best way to prepare for the trade fair.

The K Newsletter

The K 2019 Newsletter provides detailed information in the run-up to the trade fair itself, featuring exhibitors' news together with innovative products, all sorted thematically or according to application, e.g. medical engineering, vehicle construction or packaging. The K Newsletter will be available for subscription via k-online.com from August.

Le nouveau salon leader de l'industrie manufacturière se tiendra à Berne



Les deux associations nationales de la branche, tecnoswiss et Swissmechanic, concluent un partenariat avec BERNEXPO : le nouveau salon leader de l'industrie manufacturière verra le jour en mars 2021 à Berne, où il se tiendra à l'avenir tous les deux ans.

Avec ce nouveau salon leader, tecnoswiss, Swissmechanic et BERNEXPO s'adressent à tous les membres des associations et représentants concernés de la branche des machines et de la métallurgie ainsi que du commerce des machines-outils et d'outils y afférent.

Ensemble, ces trois partenaires visent une offre de salon réunissant les toutes dernières évolutions, les nouveautés en matière de produits et des informations déterminantes. Berne occupe une position centrale en Suisse et BERNEXPO offre l'infrastructure idéale ainsi qu'une équipe engagée et motivée.

Un signal fort pour le marché suisse

Du point de vue de l'association, les trois organisations donnent un signal fort : «En tant que plate-forme nationale pour la branche, ce nouveau salon leader représentera et renforcera tous les participants importants du marché de l'industrie métallurgique en Suisse», déclare Pirmin Zehnder, vice-président de tecnoswiss et président du groupe professionnel de la métallurgie. tecnoswiss est née de la fusion des sociétés commerciales suisses pour les machines-outils, les équipements et les outils.

Pirmin Zehnder poursuit : «Ces derniers 18 mois, nous avons travaillé intensivement sur le thème du salon. Nous avons évalué plusieurs organisateurs de salons, interrogé nos membres et cherché une solution commune avec les associations partenaires les plus importantes. Grâce à cette approche pragmatique et cohérente, nous avons réuni des faits et nous sommes parvenus à la conclusion que le futur salon de référence de l'industrie de transformation doit être organisé à Berne par BERNEXPO et se tenir les années impaires en mars».

Un regard tourné vers l'avenir

Roland Goethe, président de Swissmechanic, est convaincu que ce nouveau salon industriel créera de précieuses synergies du côté des visiteurs comme de celui des exposants. «Nous créons une plate-forme servant de point de rencontre de la branche et offrant simultanément un aperçu représentatif des toutes dernières offres et tendances». Swissmechanic est l'association des employeurs et l'association professionnelle des entreprises de taille moyenne de la branche des machines, de l'électronique et de la métallurgie.



Le nouveau salon leader de l'industrie manufacturière se tiendra à Berne

Berne en tant que plaque tournante de l'industrie et la technique

«L'objectif de BERNEXPO est d'offrir des valeurs ajoutées exceptionnelles à l'industrie manufacturière tout en développant une plateforme attrayante et porteuse d'avenir avec des partenaires forts», déclare Pascal Blanc, directeur du secteur industrie et technique chez BERNEXPO.

Il se montre absolument ravi de cette nouvelle coopération qui, selon lui, renforce les associations participantes et leurs membres et confirme le statut de BERNEXPO en tant que principale plaque tour-

nante de la branche de l'industrie et la technique en Suisse – qui compte, entre autres, dans son portefeuille SINDEK ou encore BLE.CH.

Le nouveau salon leader de l'industrie manufacturière élaborera son image de marque, son programme détaillé ainsi que son éventail d'offres exact au cours des prochains mois. Les entretiens avec d'autres partenaires de coopération battent leur plein. À partir de 2021, le salon se tiendra tous les deux ans au mois de mars.

BERNEXPO AG
CH 3000 Bern 22

Registration is open for the UK's only lab-dedicated exhibition Keynote speakers announced for Lab Innovations 2019

Lab Innovations, the UK's only trade show dedicated to the laboratory industry, has launched free advance registration for all visitors at www.lab-innovations.com. Returning to the NEC, Birmingham on 30 & 31 October, Lab Innovations enables laboratory professionals across all sectors to source new products, network with peers and earn CPD points in the free-to-attend conference programme.

Celebrating the International Year of The Periodic Table, The Royal Society of Chemistry returns with its own dedicated theatre hosting two exciting keynotes and leading CPD accredited content. Speakers focus on elements of the periodic table, so visitors can learn how to recycle elements efficiently and discover more sustainable alternatives to elements commonly used in the lab. This year's keynote speakers will be physicist, presenter and stand-up comedian Helen Arney and synthetic inorganic chemist and presenter, Andrea Sella.

Appearing on TV, Radio and in theatres across the world with her unique science infused comedy, Helen Arney is renowned for her witty comedy songs, explaining physics while riding a rollercoaster and singing the periodic table. Andrea Sella, teacher of chemistry and presenter of chemistry on stage, radio and television, focuses on materials and inorganic chemistry selection. He will demonstrate why scientists should stop using mercury in lab equipment and the available alternatives.

"We are thrilled to announce two interesting, entertaining and influential keynote speakers,

Helen Arney and Andrea Sella," commented Alison Willis, Divisional Director, Lab Innovations. "Visitors can also source the latest products from the UK's leading suppliers before anyone else, network with fellow scientists, but importantly the learning opportunities allow visitors to keep up with their peers with the many professional development options."

Two additional free-to-attend theatres provide more than 35 hours of educational CPD accredited seminars. Content curated by Laboratory News Magazine, for the Insights and Innovation theatre sponsored by PerkinElmer, focused on lab management. Industry professionals will explore the uses of AI in research, virtual reality in laboratories and sustainability. Visitors can keep up to speed with hot topics affecting the laboratory and learn how to meet sustainability standards.

In association with Cleanroom Technology Magazine, the Cleanroom Hub will focus on regulation and legislation in the cleanroom, and how to ensure sterilisation in environments where contamination needs to be controlled. Visitors can learn how to successfully prepare for audits, to ensure proper quality and specifications are being met.

Lab Innovations have increased the floor-space from 2018, to accommodate leading laboratory brands, as well as smaller companies bringing new technologies to market. Major exhibitors such as PerkinElmer, Analytix, IKA, Eppendorf, Cole-Parmer, Shimadzu and Thermo Fisher Scientific are joined by new suppliers including Merck, Kimberley-Clark Professional, VICI AG, Peak Scientific and Vitlab.

30th - 31st Oct. 2019: LAB Innovations, Birmingham (United Kingdom)



Cherwell Laboratories Ltd
OX26 4XB BICESTER
Vereinigtes Königreich

Highly Accurate Low Differential Pressure Sensor



The EE610 is ideal for reliable and precise measurement of low differential pressure. It features selectable ranges for ± 25 , ± 50 , ± 100 and 0...100 Pa.

With the EE610, E+E Elektronik offers a new sensor for low differential pressure up to ± 100 Pa with an accuracy of ± 0.5 Pa. Due to selectable measuring ranges and versatile configuration options, the EE610 is suitable for a variety of applications in air as well as in non-flammable and non-aggressive gases.

The EE610 is dedicated for medical, pharmaceutical and clean room applications. For instance, the sensor can measure the differential pressure between clean rooms, surgery rooms or isolation chambers. The non-flow through design excludes cross-contamination.



EE610 differential pressure sensor for low pressure. (Photo: E+E Elektronik GmbH)

Selectable Measuring Ranges

The EE610 enables unidirectional or bidirectional differential pressure measurement within a selectable measuring range of 0...100 Pa or ± 25 , ± 50 and ± 100 Pa. The long-term stable, piezo-resistive pressure sensing element provides a high accuracy of ± 0.5 Pa

Analogue Output and Display

The measured data is simultaneously available as current and voltage signals at the spring loaded terminals. The illuminated graphic display shows the reading in Pa, mbar, inch water column or mm H₂O.

Fully Configurable

The EE610 can be easily configured on site. Pressure range, time constant, output signal, display units and backlight can be set via DIP switches on the electronics board. The zero and span point adjustment can be performed with push buttons.

Easy Mounting

The functional IP65 / NEMA 4 enclosure facilitates mounting the sensor with closed cover. This saves time and also protects the electronics from construction site pollution and mechanical damage during installation. For wiring the EE610 features both a cable gland and a knockout opening for a 1/2" conduit adapter.



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