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Caption: Reference project: IDT in Dessau, Germany

PURE SEATING PLEASURE

A cleanroom is only as good as the chair inside it. If you want to effectively prevent contamination, you need a workplace concept which is a perfect fit.

Very high demands are placed on every object used in a cleanroom. Even the smallest of particle emissions represent a threat to the quality of the products manufactured and the processes carried out in cleanrooms. It therefore goes without saying that you should only use workplace equipment that is proven to be free from emissions in cleanrooms. This applies particularly to workplace chairs. Given that they are objects made of different materials and which contain soft components that may therefore have an effect on the air quality, as well as the fact that they must also support people at work and move with them while they are seated, chairs are one of the more complex pieces of equipment found in a cleanroom.

Where are cleanroom chairs used? Not every laboratory is a cleanroom. However, virtually every cleanroom is a laboratory. „Clean“ or „sterile“ rooms are particularly indispensable in microelectronics, pharmaceuticals,

microsystem production, optics, medical engineering and healthcare.

Workplace chairs used in cleanrooms should have sealed upholstery, smooth, closed surfaces and enclosed mechanisms. They must consist only of materials which are suitable for cleanrooms and are largely free of emissions.

To meet air purity class 3 according to DIN EN ISO 14644-1, a chair must only emit a maximum of 8 particles of $\geq 1.0 \mu\text{m}$ in size per cubic metre of air or a maximum of 1000 particles of $\geq 0.1 \mu\text{m}$ in size. This ratio would be comparable to having a cherry pit in Lake Constance in central Europe. To meet these very strict requirements, Bimos – the leading manufacturer of laboratory chairs in Europe – has been working closely with industry and research for a number of years. This has enabled us to develop chairs which meet air purity class 3 according to DIN EN ISO 14644-1 and cleanroom class 1 according to the US Federal Standard 209E. In addition, all cleanroom chairs from Bimos have electrosta-

PURE SEATING PLEASURE

tic discharge capacities in accordance with EN 61340-5-1.

But what makes a workplace chair a cleanroom chair? The smooth, closed surfaces of the seat and backrest shell prevent any particle deposits collecting on the chair in working environments where the air is constantly swirled by the filter system. Synthetic leather, upholstery and upholstery supports are sealed and firmly attached to each



Caption: Reference project: Bosch in Reutlingen, Germany

other so that any particle emission is reliably avoided. The sealed design of the seat and backrest cover seals off all moving parts of the chair mechanism and this prevents an outward release of particles. These covers are manufactured from sheet steel and are therefore abrasion-resistant and robust. The synthetic leather covers used are non-slip and offer firm support even when you are wearing smooth cleanroom clothing. To protect sensitive components and to prevent dust from depositing, all of the parts of a cleanroom chair offer electrostatic discharge capacities and therefore provide reliable protection against electrostatic charge. All of the chairs are fitted with a polished aluminium, abrasion-resistant base.

However, there are also special requirements for cleanroom chairs with respect to ergonomics. Cleanroom chairs from Bimos are GMP-compliant without compromise and meet the EudraLex guidelines formulated by the European Commission.

For over 50 years, Bimos has ensured that seating keeps people productive, healthy and happy at every workplace. This is why, in addition to its high-end range of chairs for cleanrooms, Bimos also offers flexible and affordable solutions which are fully suited to cleanrooms.

Bimos - eine Marke der Interstuhl Büromöbel GmbH & Co. KG
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November 2020

Dear subscribers,

now, despite masks, distance and hygiene regulations, a second lock-down has reached us. It is called soft because it only concerns art and culture. And by culture I also mean eating and drinking culture. My appeal to everyone is therefore: after work in the clean room, do not cook at home as often as possible, but rather pick up your food from your favourite Italian. Or from a German, Greek, Spanish, Japanese or Turkish restaurant.

Canceled trade fairs are now being held digitally. More about this on the following pages. The last pages in the German Newsletter also contain a full calendar of events.

And then I repeat my last statement again:

We are currently working on the Cleanroom Yearbook 2021.

It will be published at the end of January 2021. There are still a few pages left.

Take the opportunity to present your company, products and services here.

Just get in touch with me. We will find solutions!

Remember: All those who don't go to fairs read the yearbook in their home office.

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

> **PURE SEATING PLEASURE**

> **Cleaning with CO₂ snow in cleanrooms using a dry and residue-free process**

> **Smart solution for efficient precision cleaning**

> **UHD resolution in cleanrooms**

> ...

Yours sincerely

A handwritten signature in black ink, appearing to read 'Reinhold Schuster'.

Reinhold Schuster

cleansman®

Expert in the cleanroom

People in cleanrooms - cleanroom online shows the people behind the standards and introduces a „cleanroom“ personality.



Joe Govier

1990 - 1994 London Metropolitan University
(Polymer Science and Engineering)
2013 University of Central Lancashire
(PGCert, Manager as Coach)
1998 – 2002 MD Detail Plastics
2014... Mentor Virgin StartUp
2002... CEO Connect 2 Cleanrooms Ltd

What did you want to be as a child?

I was the youngest of 2 and grew up with my mum and grandmother sharing the parental duties, male role models and influence was not a part of my younger days. As I used to fight for attention a natural opening came about for someone in the family to be able to fix things or wire a plug. The more I could fix and help the bigger the hugs so naturally I just wanted to make things and owning my first electric drill and tool bench at 8 years old was inevitable. So today I really am living my dreams.

What was your first car?

My first car was a VW Beetle 1970 as it had had a front-end crash and needed fixing of course.

What can you look forward to?

I like the discovery of the unknown in places and the physical challenges therefore keeping fit and healthy is important.

What achievement are you particularly proud of?

The biggest achievement is without doubt my children and watching them develop in to caring and hardworking adults.

Which technical achievement do you admire the most?

From a technical and controls perspective we were the pioneers and first to bring digital control and monitoring to cleanroom design with active air change rates and set back modes our PID controls were developed and launched back in 2010 and called ECO1 standing for Efficient Cleanroom Operation.

Who would you like to swap with for a month?

I'm happy with who I am but to spend a month in the shoes of Elon Musk would be fascinating.

In which country would you like to have a second home?

A second home near the Alpes would be perfect.

Who would you have liked to meet?

It would be amazing to meet Sir Edmund Hillary.

Which book would you recommend at the moment?

As a sailor I would recommend A World of My Own by Robin Knox-Johnston. It covers the first non-stop single-handed circumnavigation of the globe and it was a race.

What is your favorite food?

It's got to be fish and chips although having a business in the Netherlands I can't resist a stroopwafel with my coffee.

What is your favorite music?

It depends on my mood so it could be some old Motown or slightly more up to date Drake album Views from 2016.

What was the best advice you ever got?

The best advice was to check in with my wife as much as possible, it was another business owner who realized how important the people close to you are to achieve your goals and share the journey with.

Do you have a motto?

It has got to be "Aim for the stars and the moon is yours."



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Cleaning with CO₂ snow in cleanrooms using a dry and residue-free process

Parts cleaning is indispensable in the manufacturing industry to ensure high quality standards and cleaning processes are increasingly being carried out in clean environments. As far as the technique, design, process reliability and automation are concerned, the proven quattroClean technology offers many advantages.

Whether it's the automotive and supplier industry, optics, medical engineering, semiconductor industry or microtechnology – cleaning processes are key technologies that guarantee the quality and function of products in numerous industrial sectors. Cleanliness requirements vary depending on the product, the manufacturing phase and the following step in the production chain, such as coating, bonding, assembly or packaging. There is a growing demand for cleaning processes that are suitable for use in clean environments or cleanrooms.

The modular quattroClean snow jet technology from acp systems AG has proven to be an efficient, reliable and cost-effective

cleaning process. It is therefore being implemented more and more to replace conventional methods such as wet chemical cleaning. The reasons for this include its compact dimensions and lower investment and operating costs.

Four effects for clean, residue-free surfaces

The cleaning medium used for the process is liquid non-corrosive carbon dioxide which has a practically unlimited shelf life. It is created as a by-product of chemical manufacturing processes and biogas energy generation, thus making it environmentally

neutral.

The heart of the cleaning system is a wear-free two-component ring nozzle, through which the non-flammable and non-toxic carbon dioxide is fed. On exiting the nozzle, the carbon dioxide expands to form fine CO₂ snow, which is then bundled by a separate circular jacketed jet of compressed air and accelerated to supersonic speed.

When the easily-focused jet of snow and compressed air impacts on the surface to be cleaned at a temperature of minus 78.5°C, a combination of thermal, mechanical, sublimation and solvent effects occur. The combined effect of these four mechanisms removes particulate and filmic contamination such as



The quattroClean system, which can be integrated into networked manufacturing environments, enables the partial or full-surface removal of particulate and filmic contamination from practically all technical materials in clean environments. (Photo source: acp systems AG)



The inner walls are made of electropolished stainless steel, thus ensuring extremely smooth and easy-to-clean surfaces. (Photo source: acp systems AG)



In a quattroClean system designed for a medical device application and integration into a cleanroom, a robot feeds the parts to the jet-cleaning process. (Photo source: acp systems AG)

Cleaning with CO₂ snow in cleanrooms using a dry and residue-free process

microchips, dust, abrasion, processing media residues, polishing pastes, separating agents, silicones, fluxes and smoke residues in a reliable and reproducible way.

During the cleaning step, the crystalline carbon dioxide is transformed from a solid to a gaseous state, with the result that the cleaned material dries instantly. Detached impurities are removed from the component surface by the aerodynamic force of the compressed air and transported away together with the sublimated carbon dioxide by an extraction unit integrated into the

cleaning module. The cleaning process is so gentle on materials that it can even be used to clean delicate and finely-structured surfaces. The dry cleaning process is suitable for workpieces made from practically all technical materials and material combinations.

Full-surface or partial cleaning with uniform results

The quattroClean system is scalable and can therefore be easily and space-savingly adapted to different component geometries

for partial or full-surface cleaning. Depending on the task, one or more single nozzles or a nozzle array are used. The patented technology ensures uniform cleaning results even where large surfaces are concerned.

Through pilot tests in the acp systems technical center, all process parameters, such as the volume flows for compressed air and carbon dioxide as well as the length of time and area the jet is applied to, are precisely tailored to the respective application. The parameters take not only material properties into account but also the type of contamination requiring removal. If desired, they can be filed as part-specific cleaning programs in the system controls.

To ensure a consistently high process quality, the supply of CO₂ and compressed air to the nozzles and the consistency and duration of the jet can be individually monitored and the values recorded automatically stored. The concentration of CO₂ around the inlet and outlet of the plant adjacent to the production environment can also be monitored with internationally-certified sensors.

Systems for manual, semi-automated and fully-automated cleaning

The criteria determining the design of the systems are the cleanliness and cycle times required. Based on these specifications, acp systems uses standard modules to develop customized manual, partially and fully automated plant concepts - both as stand-alone solutions as well as ones for integration into production lines and networked manufacturing environments. The latter is made possible by the system's industry 4.0 capability. Thanks to standardized interfaces, it is no problem to integrate the systems into higher-level master computers and to control them via these. To ensure complete documentation and traceability, all process parameters are automatically recorded, stored and transferred to the host computer.

Different concepts for cleanroom-compatible design

When production takes place under clean conditions, during the cleaning process it is essential that no contamination from the surroundings reaches the product or is released into the environment, and that recontamination of the product is reliably avoided. To meet these requirements, a corresponding system for preparing the liquid carbon dioxide and compressed air is integ-



To clean sensors, the CO₂ snow jet system was integrated into a standard module featuring a clean air supply and a media preparation system for the liquid carbon dioxide and compressed air. (Photo source: acp systems AG)

Cleaning with CO₂ snow in cleanrooms using a dry and residue-free process

rated into the plant. The air supply, extraction system and other features, such as components for automation and pick & place, are adapted to the respective cleanroom class. The design of the cleaning module also focuses on creating optimum airflow conditions in order to ensure fast and reliable removal of detached contamination. Different solutions are used to tailor the cleaning system to customer requirements and the space available.

The cost-effective solution: clean machine concept

For applications where only the cleaning process needs to be performed under clean conditions, the so-called "clean machine" concept is ideal. These systems are equipped with an encapsulation with integrated clean air supply. Positive pressure prevailing inside the cleaning module prevents contaminated air from entering from the environment. Since these systems are made from electropolished stainless steel, the interior surfaces are exceptionally smooth and easy to clean.

A sensor manufacturer uses this solution,

for example, to clean particles off sensitive sensors before packaging. The sensors are fed into the system by a drawer unit designed according to the poka yoke principle, with trays containing soiled sensors arranged in a specific way. As soon as the drawer is in position, a specially-designed holder mounted on a linear unit takes two sensors and transports them to the cleaning unit, where they are picked up by a special gripping mechanism. Two nozzles then blast a jet at a defined angle onto the sensors, which rotate during the cleaning process. Detached particles are removed immediately and effectively from the cleaning cell by an air extraction module. After cleaning, the gripper mechanism transfers the sensors back to the linear holder. The „dirty“ and „clean“ parts are kept strictly separate to prevent recontamination after cleaning. The sensors are placed on clean parts trays that are supplied via a second drawer system.

Cleanroom applications

Complete encapsulation is also available for systems that are integrated into a clean-

room. In this case, the clean air is supplied with negative pressure. Thus, air is sucked in from the cleanroom and removed via an extraction unit integrated in the cleaning module. This prevents particles or other forms of contamination from reaching the cleanroom environment.

This solution is used, for example, by a medical device manufacturer to clean stents. One of the challenges here was to optimize the cleaning process to the requirements of the extremely delicate components. On the one hand, the stent has to be held securely in place during cleaning. On the other hand, it may not be deformed and all adhering particles and filmic residues must be reliably removed. To achieve this, a special parts holder was developed that is fed to the cleaning jet by a robot.

A manufacturer of lithography systems for the semiconductor industry placed extremely high demands on the cleanroom-compatible design of the cleaning system. Among other things, these were met by equipping the media preparation system for the compressed air and liquid carbon dioxide with special filtration systems that guarantee a particle- and hydrocarbon-free media supply. The extraction unit for the removed contamination and sublimated CO₂ is designed as a three-step filter system.

The plant integrated into the cleanroom is used to clean optical components for EUV (extremely ultraviolet radiation) lithography, which are heavily contaminated with adhering impurities and smoke residues. A nozzle is utilized for cleaning, which is moved over the surface to be cleaned by a robot according to a specific motion sequence and at a precisely-defined distance. Compared to the wet chemical process previously used, the cleaning time could be significantly reduced and neither chemicals nor water are required. Furthermore, the cleaning process is gentler and produces better results.



The quality of the cleaning jet can be monitored with sensors and converted into a digital value which is assigned to each individual part and then stored and documented. (Photo source: acp systems AG)

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Thanks to the modular concept of the UCMSmartLine, multi-chamber immersion cleaning systems can be individually designed for a wide range of applications. The electrical and control system is already integrated in each module.

Smart solution for efficient precision cleaning

UCMSmartLine - highly flexible, modular ultrasonic precision cleaning system

In numerous industries and markets, companies are faced with increasing demands regarding the cleanliness of their parts. These can often only be met with high precision cleaning processes tailored to specific requirements. For such applications, UCM has developed the new cost-efficient ultrasonic cleaning series UCMSmartLine. Based on standardized modules, it includes integrated electrical and control systems for cleaning, rinsing, drying, loading and unloading processes, as well as a versatile transport system. The modules can be configured to create customized extendable systems for preliminary, intermediate and final cleaning.

The Swiss company UCM AG is a division of the SBS Ecoclean Group that specializes in fine and precision cleaning. With its newly-developed UCMSmartLine series of multi-chamber immersion cleaning systems, the company is responding to a trend that has been emerging for some time in a number of industries and which is increasingly gaining momentum. Due to new and more demanding product requirements, changes in manufacturing, bonding and coating technologies, as well as stricter environmental regulations in some sectors, the demands on component cleanliness are constantly increasing. Among others, companies from the medical sector, watch & jewellery industry, optics, precision & micro technology, automotive & supplier industries, machine tool manufacturers and the coating industry are faced with the challenge of meeting these stringent particulate and film cleanliness specifications with reliable processes at competitive prices. A similar situation can also be observed in the MRO (maintenance, repair, overhaul) sector from industries such as aerospace, electronics, medical engineering, etc.

Optimum adaptability and extensibility for future-proof operations

Thanks to the cleverly designed modular concept of the new UCMSmartLine, highly-compact ultrasonic multi-chamber immersion cleaning systems can be built with three to nine cleaning and rinsing stages for preliminary, intermediate and final cleaning. As a result, the system can be individually configured for a wide range of applications and adapted to changing market conditions at any time. Twin and triple modules are available for the process steps "cleaning & rinsing", or "cleaning, cleaning & rinsing" and can be combined as desired. With an additional module, a two-stage fine and precision rinsing processes can be integrated with cascaded reverse osmosis or demineralized water.

The ultrasonic cleaning modules, which are heated and fitted with a filter circuit as standard, can also be adapted to suit a wide range of applications. This enables the use of single (25, 40, 80 kHz), dual (25/50, 40/80 kHz) as well as multi-frequency ultrasonics (40/80/120 kHz). The ultrasonic transducers are placed at the bottom and/or on one side of

Smart solution for efficient precision cleaning

the tanks measuring 370 x 420 x 390 mm (L x W x H). The parts are dried by infrared radiation heat, hot air or under vacuum. Depending on the application, these drying technologies can also be used in combination. The loading and unloading stations of the UCMSmartLine can be arranged either at the front or at the side, depending on the space available and plant layout for optimum material flow. These tasks can be performed manually or automatically.

For cleaning applications requiring an exceptionally clean environment, one or two HEPA filters can be installed on the top of the housing, depending on the length of the system. As a rule, two flow boxes are used; which creates a cleanroom atmosphere from the last rinsing station to the unloading station. The UCMSmartLine can also be connected to a cleanroom.

Designed for maximum process reliability as standard

Inside the system, the parts are conveyed by a standard automatic transport system with servo drive. This enables the transport speed to be adapted according to the parts being cleaned. As a result, the parts are handled extremely gently during processing. In addition to preventing damage and scratches on sensitive workpieces, it also prevents components from rising to the surface. If desired, speeds can be increased in most sections of the line to ensure a higher throughput. A further advantage of the servo drive is the part-specific lift-out from the last rinsing tank for pre-drying the parts. This helps prevent stains from forming during the subsequent drying process.

The standard version of the system has a static transport rack made of stainless steel that is designed for a maximum batch weight of 20 kg. In addition, transport racks that can be rotated along the longitudinal axis are available for bulk items requiring increased part agitation. Another type of transport rack can be rotated along the vertical axis at 200 rpm during wet processes and up to 1,000 rpm during the dry process. These racks are used, among other things, to clean microlenses in optics.

If higher throughputs are required, the system can be fitted with a second automatic transport system.

The spill-over tank developed by UCM also guarantees consistently good cleaning results in line with demands: In all of the cleaning and rinsing tanks, the media are introduced from below and pumped

to the top where they overflow on two sides. This creates a constant flow in the tanks and makes sure that the parts are thoroughly cleaned and rinsed. The flow also ensures that detached particles and other residues are removed immediately from the tanks, thus minimizing the risk of re-contaminating the parts when they are moved or lifted out. The tanks have been designed so that they can be drained quickly and completely, and that no pockets of dirt or contamination can form. The same applies to the piping of the cleaning system, which is designed for temperatures up to 70° C.

High flexibility through integrated electrical and control systems

The electrical and control technology is already integrated in each module of the new UCMSmartLine. This plug-and-play design plays a major role in reducing the amount of space required for the ultrasonic multi-chamber immersion cleaning system. It also eliminates the need for a separate control cabinet. As a result, the systems can be put in operation quickly and extra modules added at any time.

Impressive design with health, safety and environmental benefits

In addition to its performance and adaptability, the fully-enclosed UCMSmartLine made from electropolished stainless steel also impresses with its design. The standard front panels are made of high-quality safety glass and are not just an optical feature. They also prevent vapours escaping from the system into the surroundings, which could pose a health risk depending on the cleaning agent used. Compared to the many open systems available in the market, the panels also reduce heat loss, which cuts energy consumption. The covered dryers reduced energy costs even further and also increases throughput with shorter drying times.

The system's PC-based controller can be integrated into higher-level Manufacturing Executive Systems (MES) via interfaces.

Due to its modularity and high flexibility in terms of system configuration and process design, the new UCMSmartLine covers an extremely wide range of applications in high-tech industries as well as in the fields of MRO. At the same time, the modern modular concept means that the cleaning system can be manufactured cost-efficiently with short delivery times.



All wet-stage tanks of the system, which is entirely made from electropolished stainless steel, have a two-sided overflow which ensures the immediate removal of detached particles and other contaminants. This minimizes the risk of recontamination when the parts are moved. (Image source: UCM AG)

Ecoclean GmbH
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Up to nine cleaning and rinsing steps can be integrated into the cleaning system and variably equipped for use with single, dual and multi-frequency ultrasonics.

50 million euro investment in the medical sector

Ground broken at Neuhaus location for new production building

The Röchling Group is investing EUR 50 million in a new production building and production resources at its Röchling Medical site in Neuhaus am Rennweg, Germany. This is the world-leading plastics processor's biggest investment to date in buildings and machinery.

By making this investment, the Röchling Group is laying the course for the ongoing growth of its Medical division. The new building will create around 30 new jobs in Neuhaus, Thuringia.

Prof. Hanns-Peter Knaebel, President & CEO of the Röchling Group, said: "This is an investment in the growth of our Medical division. Demand for medical products has risen sharply in recent years. By building the new production building, we will be able to better serve our customers' requirements moving ahead while also expanding our market position."

At the groundbreaking ceremony, Joachim Lehmann, Director BU Medical Europe, highlighted the successful cooperation with the local government and neighbors in the industrial area: "I would especially like to thank the city of Neuhaus am Rennweg, in particular Mayor Uwe Scheler and Councilman Hans-Peter Schmitz, and our neighbors for working together positively. Thanks to them, we have been able to make our plans for expanding the location a reality."

The more extensive production capacity will create new perspectives for the city of Neuhaus am Rennweg. "We are delighted that the Röchling Group has decided to continue its growth in Neuhaus. This is also an acknowledgement of our urban and regional economic policies," said Neuhaus' Mayor Uwe Scheler. Councilman Hans-Peter Schmitz is also very pleased about the effect the plant will have: "The additional jobs will be a boost for the local economy and will help increase the appeal of the Rennsteig region."

Excavation work is scheduled to begin now that ground has been broken. Construction is set to start next year, and the expansion of the building and the clean room, in addition to the installation of the technical building facilities, should be completed by 2022. The new production building is expected to open for business in the first quarter of 2023.

Expansion of clean room production

A four-story building with a total area of 1,850 m² is to be built by the start of 2023, creating space for the necessary clean areas for extrusion blow molding production. The standout feature of the new production building will be the top floor with around 1,700 m² of class C and D GMP clean room production, of which approximately 500 m² will be in GMP high-level pharma standard C.

Sustainable and innovative

The building's design pays special attention to concepts such as automation, Industry 4.0, and sustainability (renewable energies). In addition to the location's environmental standards already certified to ISO 14001, the new building will feature an energy-efficient cold storage system to sustainably save on energy resources and reduce carbon emissions. Under this concept, the fire-fighting water tank in place for the sprinkler system, which has a volume of around 2,000 m³, will be reduced to a low temperature overnight as cold storage, in order to use the energy produced to provide the production lines with cooling water the next day.

The overall internal product flow will be managed by an autonomous transport system so as to optimize production workflows under clean room conditions and to avoid the contamination of products and the means of transport. The end product is coordinated by the entire process chain in a batch-clean and controlled manner throughout the building on the basis of the networked systems (Industry 4.0). This will satisfy the demands of the pharma and medical industry in terms of clean and fully monitored production.

Röchling SE & Co. KG
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3D view of the new Röchling Medical production building in Neuhaus am Rennweg.

UHD resolution in cleanrooms

When it is
beneficial to
have an
exceptionally
high-resolution
display?



Image 2: Single-display solution with WAVE 227 with UHD resolution for displaying two software systems in one screen. (Image Rights: Systec & Solutions GmbH)

What has long been the norm in home entertainment is also becoming increasingly popular in cleanrooms – cleanroom displays with a UHD resolution (3840 x 2160, 16:9). Systec & Solutions GmbH already offers two versions of their WAVE series in UHD resolution. In the following, you will see the special use cases and room situations for which they are beneficial.

Higher resolution in cleanrooms for better ergonomics and improved readability

An ultra HD resolution delivers four times more pixels than full HD and enables screen content to be displayed with significantly greater sharpness and detail. The true brilliance of ultra HD is especially apparent at close distances, as is common in the workplace. Thanks to the higher pixel density, even the smallest fonts and images are more easily recognizable to the eyes. The improved readability enables more and smaller content to be displayed. As a result, employees have all the important information at a glance without having to scroll. For users, this means working more efficiently and using the display more ergonomically.

A UHD display can be a good alternative to dual-screen solutions

In cleanrooms, it is common practice to simultaneously keep an eye on the MES and the Distributed Control Systems (DCS) or other applications. Dual-display systems are available for this purpose. They display

A comparison of the single UHD display solution and dual-display solution

DESCRIPTION	SINGLE UHD DISPLAY (OPERATING STATION/ SUPPORT ARM)	DUAL DISPLAY SOLUTION (OPERATING STATION/ SUPPORT ARM)	COMMENTS
Compact solution	++	+	The single-display WAVE 227 HMI system is a compact solution. The mobile version in conjunction with the TROLLEY LIGHT trapezoid is particularly space-saving.
Low energy consumption	++	+	Operating only one display in UHD resolution is more energy-efficient than operating two displays with full HD resolution.
Operating time with battery operation	++	+	A TROLLEY LIGHT combined with the WAVE 227 allows for roughly 30% - 50% longer battery operation than a dual-display solution (depending on the application).
Lightweight	++	+	A single-display solution with WAVE 227 weighs less than a dual-display system. This is beneficial with the low load capacity of the cleanroom walls.
Convenient operation	+	++	A dual-display system offers two fully-fledged HMI systems in 16:9 / full HD format, each with its own touchscreen.
Flexible solution	++	++	Both options can be configured as monitors, PCs with Windows 10 or an IIGEL endpoint / thin client.
Mounting on a support arm system	++	+	The lower weight of the WAVE 227 allows for installation on exceptionally flexible U-tube support arm systems, among others.
Installation on mobile operating stations	++	++	Both options are suitable for combination with mobile operating stations. An exceptionally stable 5-star base is available for the dual-display version. The compact trapezoid foot is a good choice for the single-display version.

UHD resolution in cleanrooms

one software application per screen. If there is enough space, this can be solved, e.g. by a mobile battery-operated workstation such as the TROLLEY LIGHT Duplex. A support arm system also allows two monitors to be arranged horizontally or vertically, although the weight makes it impossible to install via an exceptionally flexible U-tube support arm. Dual-display solutions are not ideal if space is constrained or if the walls have a low load capacity.

A single-display solution is more compact and lighter. The higher resolution of an UHD display makes it possible to simultaneously display both software systems in just one screen and still offer the best readability. With its 27 inches, the WAVE 227 is particularly well suited for this purpose. Choosing an

UHD display offers additional benefits. The lower energy consumption of a UHD display, for example, is reflected in the operating costs, although it also delivers a longer operating time for a battery-powered, mobile solution.

WAVE 227 and WAVE 255 cleanroom systems with UHD resolution

We offer a display in UHD resolution for the two WAVE 227 and WAVE 255 HMI clean-

room systems. Whereas the WAVE 227 at 27 inches offers a large-scale display for a wide range of cleanroom applications, the WAVE 255 at 55 inches is suitable for, e.g. training courses or displaying KPIs. Both versions are equipped with a multi-touch display that is embedded in an enclosed, IP65 stainless-steel housing. The WAVE 227 can be combined with various support arm systems or a mobile operating station. The WAVE 255 gives you the option of direct wall installation or setup using the provided stainless steel stand.



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Image 1: Dual-display solution with TROLLEY LIGHT Duplex for displaying one software application per screen. (Image Rights: Systec & Solutions GmbH)



High-volume line for the assembly of the Respimat® reusable inhaler housing module in a clean-room ISO class 8 in Pfreimd, Germany.

Development and production of the Respimat® reusable inhaler housing module

Gerresheimer has been commissioned by Boehringer Ingelheim with the development and large series production of the housing module for the new generation of Respimat® inhalers. This environmentally-friendly successor model to the established Respimat® inhaler can be successively loaded with up to six active agent cartridges, thus ensuring less waste and a considerably reduced CO₂ footprint during the product life cycle. Gerresheimer has developed the housing module for the new inhaler and built the pre-series and series molds, as well as the pre-series and series special-purpose machines. Gerresheimer is also carrying out the large series production.

The Respimat® is an inhaler for the treatment of respiratory diseases that is firmly established in the market. Patients with chronic lung diseases like COPD use bronchodilation drugs on a daily basis to relieve their illnesses. Correspondingly high is the consumption of inhalers, which usually need to be replaced when the active agent has been exhausted. Boehringer Ingelheim has therefore decided to develop a new, reusable version of the Respimat®. This further development of the inhaler takes the feedback of patients into account. Thus, with a view to the ergonomics

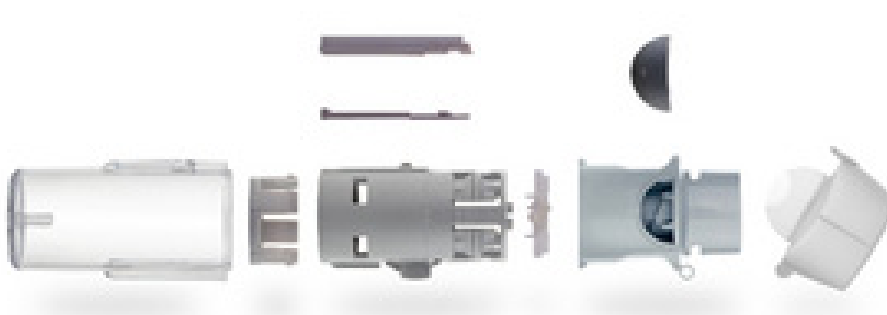
of the Respimat®, the grip has been further improved by an extension of the housing. The readability of the dosage display has also been improved.

Challenging for product development and industrialization was the necessity the new inhaler be immediately available in large numbers for its market launch. Gerresheimer, therefore, had to immediately transition from the development phase to a robust, high-volume, series production. In order to meet such a demanding schedule, the development phase and the creation of the equip-

ment for large series production were advanced simultaneously. The foundation was first established with low-cavity molds and semi-automated processes, on the basis of which the development of high-cavity molds and completely automated processes for high-volume, large series production were immediately commenced with. In this way, the development of the series equipment be initiated 10 months prior to the planned design verification. Also decisive for the success of the project was the availability of our own clean room production for small series, with which samples could be promptly tested under real conditions.

A risk-based approach that ensures the systematic mastering of all risks of the production process was used for the jump to large series production. Due to this robust development approach, all functional tests for the design verification of the low-cavity molds and later for the implementation of the high-cavity series molds were passed immediately. High-volume series production has also been running for several months now without problems.

Gerresheimer AG
D 40468 Düsseldorf



Cleanzone Digital Edition: Registration is now open

Exhibitors can now register for the digital edition of Cleanzone from **18 to 19 November 2020**. The new format is focused on generating new contacts, expanding knowledge through high-calibre presentations and the interactive presentation of innovations.

Cleanzone will be taking place as a purely virtual event in 2020 on account of the coronavirus pandemic and the travel restrictions that have been imposed as a result. Registration is now open for exhibitors at Cleanzone Digital Edition, where they will benefit from a variety of business functions. Exhibitors will have the opportunity to gain new contacts, interactively present innovations and expand their expertise through high-calibre presentations – the three main components of virtual Cleanzone. All content will be available throughout the two-day event, with some select content remaining accessible even after the event has concluded – interested companies and individuals around the globe can access the content

around the clock, day or night, from Asia, Europe and beyond. This means that participants and visitors at digital Cleanzone will be able to take full advantage of the cleanroom and contamination control expertise on offer. More information is available online at: www.cleanzone.messefrankfurt.com/digitaledition.

Products in the digital spotlight

Cleanzone Digital Edition offers companies lots of possibilities for showcasing their innovations. In addition to conventional product and company profiles, exhibitors will be able to present their latest products and innovations over live stream, where they can immediately react to questions and suggestions posed by participants. Manufacturers, associations and institutes can also use the event's digital conference rooms to discuss products and topics in exclusive groups. There will also be various advertising formats and sponsorship opportunities available.

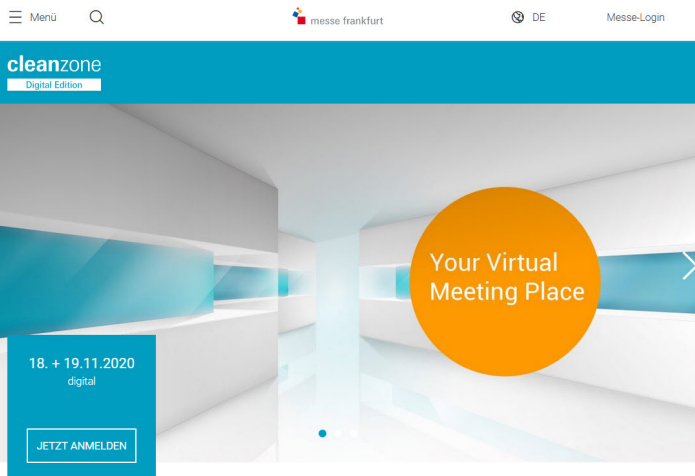
Contacts, contacts, contacts

The digital world opens up countless new ways in which to make contact with potential customers. Thanks to intelligent matchmaking, participants at Cleanzone Digital Addition will receive proposals for new business partners with whom they can exchange views in video calls or chats. Quickly discovering who the right partners are – that is the idea behind company 'speed dating', another AI-supported feature. Manufacturers and users are brought together in brief sessions, after which new meetings are set up with the most suitable contacts.

Expanding knowledge day and night

Sharing expertise: it is more important than ever in the innovative cleanroom industry. The Cleanzone Conference has established itself as a top-quality venue, and this year it will be focusing on modular cleanroom systems in the life sciences, as well as the latest developments and technologies in micro-production facility design. Participants will be able to follow the conference programme throughout the two-day event. Furthermore, those who are unable to view one or more of the presentations will also be able to watch the recorded content afterwards. Digital Cleanzone will also be focusing on presenting the nominees for the Cleanzone Award and on the award ceremony.

The ticket shop will be open to visitors to the digital edition of Cleanzone from 20 October. Everyone who takes part in Cleanzone during the year of the coronavirus will benefit from a once-only offer of a free ticket – a savings of 45 euros.



+++ Cleanzone goes digital +++

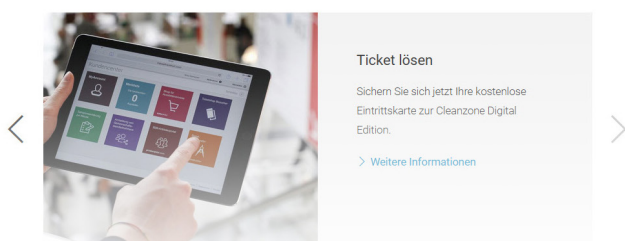
Die Cleanzone, internationale Fachmesse für Kontaminationskontrolle und Reinraumtechnologie, wird am 18. und 19. November 2020 digital stattfinden.

Dazu hat sich die Messe Frankfurt im Schulterschluss mit der Branche und der Strategiekommision entschieden. Steigende Fallzahlen der COVID-19-Pandemie sowie verschärfte Reisebeschränkungen machen es Ausstellern und Besuchern, vor allem auch aus dem Ausland, schwer bis unmöglich, physisch an der Cleanzone teilzunehmen.

Jedoch: Die Reinraum-Community und ihre Anwenderbranchen aus allen Hightech-Industrien brauchen im Herbst einen internationalen Treffpunkt, um sich über die aktuellen Entwicklungen in der Kontaminationskontrolle auszutauschen und Innovationen gemeinsam voranzutreiben. Aus diesem Grund bietet die digitale Version der Cleanzone viele spannende Möglichkeiten: neue Businessfunktionen, die Gelegenheit ihre Produkte multimedial zu präsentieren und sich mit ihren Kunden durch KI-gestütztes Matchmaking aktiv zu vernetzen.

Bei Fragen zur Cleanzone Digital unterstützen wir Sie gerne.

> [Zum Cleanzone-Team](#)



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Chillventa eSpecial was a resounding success

The international refrigeration, AC, ventilation and heat pump community just wrapped up three days packed with fascinating presentations, new products and intense interactions. The Chillventa eSpecial, which was accompanied by the Chillventa CONGRESS, featured many highlights from 13 to 15 October: 30 presentations at the Chillventa CONGRESS, 75 product presentations, over 300 roundtables held by 207 exhibitors and altogether more than 6,800 active participants from 113 countries who engaged conversations at the highest professional level in over 100,000 instant messages and 1,200 video calls. All of this shows that the industry very much needed an event of this kind. The feedback has been incredibly positive. Preparations for the next milestones are now getting underway with fresh momentum: the European Heat Pump Summit will take place on 26 and 27 October and the Chillventa is scheduled for 11 to 13 October 2022.

"We are really happy with the large exhibitor and visitor turnout at the Chillventa eSpecial! Initial positive feedback during the event demonstrates that the refrigeration, AC, ventilation and heat pump sectors were very pleased with the digital opportunities that the Chillventa eSpecial afforded. The networking and matchmaking opportunities and the high calibre of congress presentations and exhibitors' product presentations earned particularly high praise. The commitment that the industry has displayed is now driving us forward as we prepare for the European Heat Pump Summit 2021 and Chillventa 2022, both of which will be back at Exhibition Centre Nuremberg," Petra Wolf, Member of the Management Board at NürnbergMesse, said, summing up the Chillventa eSpecial.

Covid-19 is a key issue for refrigeration experts too. The topics covered by the Chillventa CONGRESS and product presentations at the Chillventa eSpecial spanned the entire spectrum of recent developments related to refrigeration, AC, ventilation and heat pump technology from research, development and real life, along with the current policy framework.

The coronavirus was a major topic that was addressed in detail in all segments of the industry at both the Chillventa CONGRESS and presentations. As a critical link in feeding the world's population, the refrigeration chain was also presented and analysed in depth. One particularly informative presentation with facts and figures was devoted to hydrogen. This objective information helps to view the current hype surrounding this issue in the right light. Refrigerants, in particular the circular economy, illegal imports and low-GWP refrigerants, were

described and discussed comprehensively.

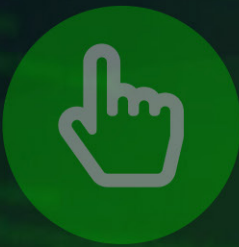
More than ten presentations explored heat pumps, from tumble dryers to applications in the district heating network. Talks about hybrid systems (that can heat and cool at the same time) were also extremely popular. Five presentations looking at the situation at computer centres in Germany, including the impact of the coronavirus pandemic, delved into the latest figures, trends, challenges and current and future solutions.

Save the date – European Heat Pump Summit 2021 and Chillventa 2022. The next milestone now is the European Heat Pump Summit, a congress for the international heat pump community that will be held in Nuremberg from 26 to 27 October 2021. At this event, renowned speakers will meet with international decision-makers from industry, trade and the research community to discuss the latest market developments, research and development issues and trends in heat pump applications. The next regular Chillventa is scheduled to take place at the exhibition centre Nuremberg from 11 to 13 October 2022.

"Following the success of the Chillventa eSpecial, we are now optimistic about the future and kicking off preparations for the European Heat Pump Summit and the next Chillventa full of energy. We look forward to welcoming the community back to Nuremberg in person soon," notes Daniela Heinkel, Chillventa Exhibition Director at NürnbergMesse.

NürnbergMesse GmbH
D 90471 Nürnberg





Digital Days CLEANROOM PROCESSES

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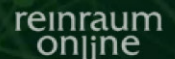
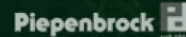
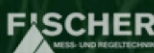
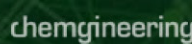
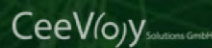


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LDC's Top 50 Most Ambitious Business Leaders

Joe Govier ranked among UK's Top 50 most ambitious Business Leaders

Joe Govier, CEO and Founder of Connect 2 Cleanrooms, has been named as one of LDC's Top 50 Most Ambitious Business Leaders for 2020.

Now in its third year, the programme, which is supported by The Telegraph, celebrates the inspiring leaders behind some of the UK's most successful and fast-growing medium-sized firms.

Connect 2 Cleanrooms was founded in 2002. Its turnover grew by 40% over the past year and Joe is now looking to expand his business into new international markets.

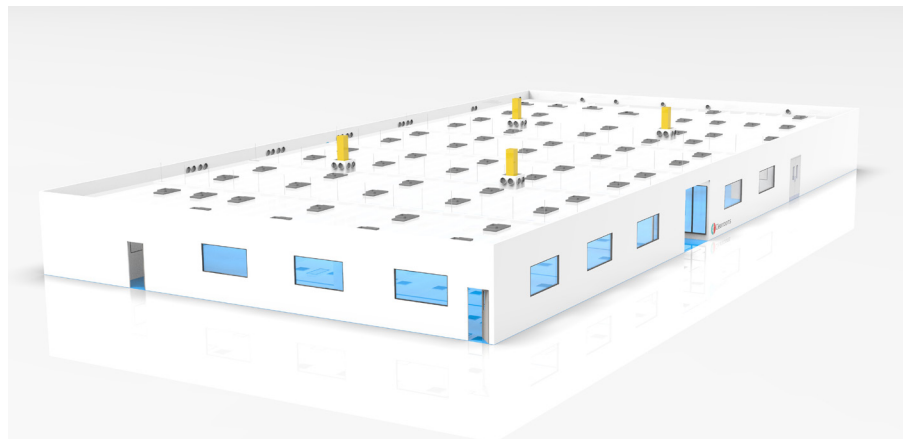


Joe says: "We crept into this market by doing small projects. Now we build multi-million-pound facilities for pharmaceutical and aerospace giants.

Connect 2 Cleanrooms has grown through two recessions and a pandemic, all the while supporting my family and creating opportunities for the people who come and work here.

We are extremely adaptable so we can flip to focus on sectors when confidence and growth is high. The opportunity is phenomenal."

John Garner of LDC added: "The UK has a long-standing reputation for its entrepreneurial endeavour, but there has never been a more important time to recognise or back ambition in British business. The LDC Top 50



Most Ambitious Business Leaders aims to do just that. All of the inspiring leaders featured in our Top 50 this year have driven their business forward during a period of adversity, whether by expanding internationally, delivering real innovation, showcasing resilience or making a difference in their communities. They all deserve their place and I look forward to seeing their continued success."

LDC is the UK's leading mid-market private equity firm. Backed by Lloyds Banking Group, LDC is committed to investing £1.2bn over the next three years to support the ambitions of management teams leading mid-market businesses across the UK.

Connect 2 Cleanrooms is an integrated cleanroom solutions provider. Since 2002, the company has become a trusted partner to over 6000+ clients worldwide.



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formnext connect: Presenting the special capabilities of the Freeformer

When it comes to demanding AM parts, the Freeformer is in its element. The Arburg Plastic Freeforming (APF) process with the Freeformer is predestined for medical technology, the processing of soft materials and PP, as well as for the additive manufacturing of multi-component parts. High-temperature plastics can also be processed using the open system. All these special capabilities are shown by Arburg during the formnext connect 2020, also in three expert presentations. In addition, Arburg presents the integration of the Freeformer into the digital customer portal arburgXworld as special titbit.

The Freeformer in sizes 200-3X and 300-3X process plastic granulates of the kind also used in injection moulding. This makes the open systems very economical and also enables a big variety of materials to be used. This also makes it possible to process bio-compatible, absorbable and sterilisable as well as FDA-approved original materials to be used. This in turn opens the door to new possibilities, also for human applications.

AKF for all kinds of implant

"In medical technology, we can also accomplish very demanding applications with the AKF process that other processes simply cannot handle", explains Lukas Pawelczyk, Head of Freeformer Sales at Arburg. As an example, he names absorbable implants. As well as Resomer Composite LR 706 S B-TCP, a product similar to human bone that promotes bone formation, the Freeformer was recently used to process another innovative material from Evonik: The polymer from the Resomer-C family is used in the soft tissue sector.

Great variety of materials

With the additive AKF process, it is possible to produce parts from soft materials in virtually all Shore hardnesses.

In relation to mechanical load-bearing capacity, recoil characteristics, UV stability and endurance strength, these parts share almost the

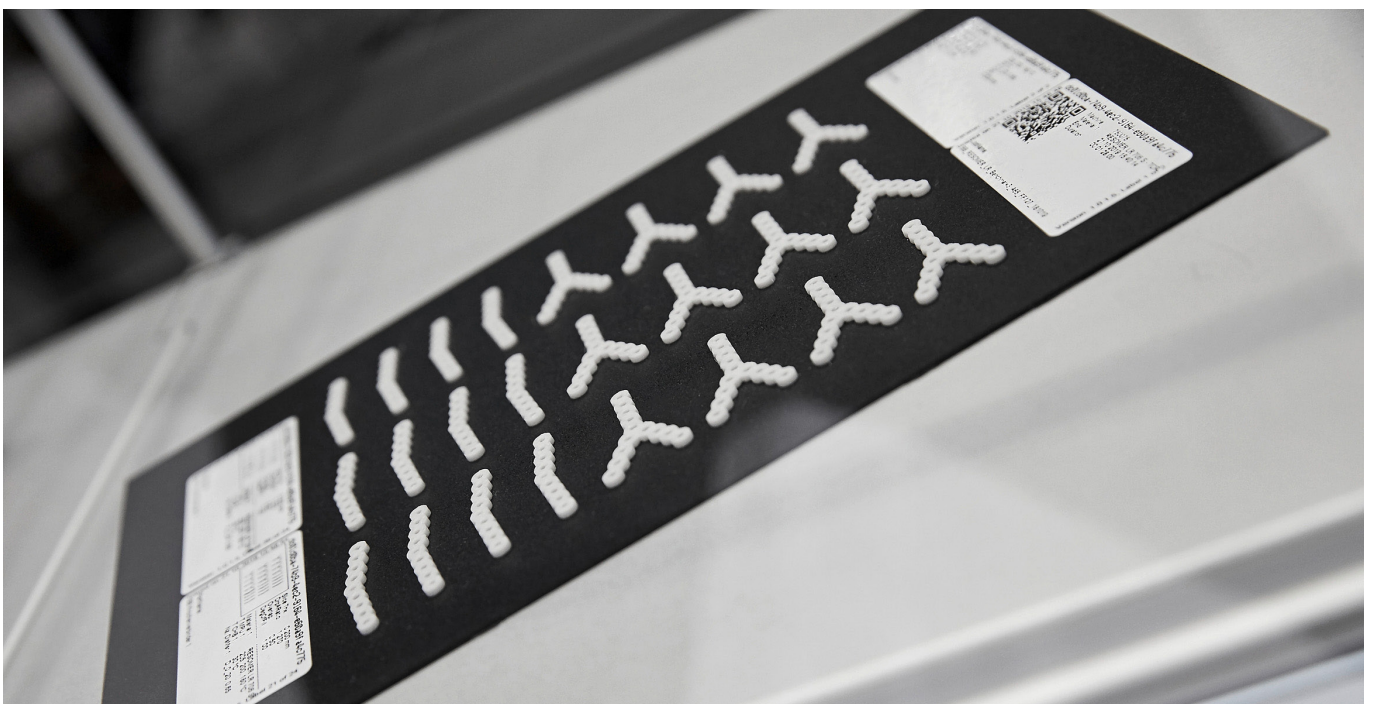
same properties as injection moulded parts. With the slicing parameters, various material densities can be achieved within a part.

"Completely functional prototypes made of soft thermoplastic elastomers are mainly in demand in the automotive industry", explains Lukas Pawelczyk. During the digital event in Frankfurt, Arburg does not only present automotive parts but also shows the production of a flexible shoe sole and, as an impressive example of multi-component injection moulding, the production of a functional part made of semi-crystalline PP and flexible TPE as a classic hard/soft-combination. The production of medical and technical parts from high-temperature plastics rounds off the spectrum.

Integration into the customer portal arburgXworld

Arburg is not only focussing on the production of an AM part but the additive manufacturing is also considered a process that has to be integrated into the whole production environment of the companies. In this context, the successful and continuous process monitoring and documentation plays a decisive role. During the formnext connect, Arburg therefore shows the integration of the Freeformer into the customer portal arburgXworld and the retraceable documentation of process data.

ARBURG GmbH + Co KG D 72290 Loßburg



In the AKF process, original absorbable material can be processed. The company Samplast, for example, manufactures bone-like plate implants, which are gradually replaced by the body's own tissue. (Photo: Arburg)

Valves for high and low temperatures

Both check valves are designed for use in industrial applications, particularly in chemical engineering, water treatment, mechanical engineering or in energy and environmental technology. They can be used for liquids, gases and vapours.

GEMÜ R90

In addition to the main function of the GEMÜ R90 as a non-return check, the valve can also be used as a gravity circulation check in cooling and heating circuits. For pump systems, it can be used as a short circuit check or to protect containers and piping as a vacuum breaker. Special disc guidance prevents the valve plug from tilting. The GEMÜ R90 is available in the nominal sizes DN 15 to 300 as an intermediate flange solution in accor-

dance with the ANSI, ASME and EN standards. ATEX, FDA or KTW compliant versions are also available for the GEMÜ R90.

GEMÜ R91

The GEMÜ R91 dual plate check valve comes with two semicircular plates and is distinguished by its low flow resistance. The dual plate check valve can be used as a non-return check in piping systems or also as a short circuit check for pump systems. The GEMÜ R91 check valve also has the advantage that the dual-plate design with springs guarantees a controlled open pressure of the plates. The GEMÜ R91 also has WRAS approval for use up to + 60 °C and is available in the nominal sizes DN 50 to 600 as an intermediate flange solution in accordance with the ANSI, ASME



GEMÜ R90 and GEMÜ R91 check valves

and EN standards.

Both check valves have standardized lengths in accordance with DIN EN 558-1, Series 49 or DIN EN 558-1, Series 16. Different materials are available for selection, depending on the customer requirement. With soft-seated sealing, the new check valves in accordance with EN 12266-1/P12 achieve leakage rate A.

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

Plastic waste as a valuable resource

SÜDPACK invests in joint project with RECENSO

SÜDPACK advocates the establishment of chemical recycling as a complementary technology to mechanical recycling, which has not been suitable for processing the complex laminated films of the packaging industry. Collaboration with RECENSO, a specialist in the implementation of systems for resource recovery, marks an initial pioneering step by the leading film manufacturer towards an efficient circular economy in the market.

Maximum product protection, which means maximum consumer protection, makes the use of laminated films essential. These films are composed of multiple layers of different polymers and ensure, among other things, a long shelf life and low packaging weight. Unfortunately, traditional mechanical recycling has its limitations in dealing with these materials. As a result, this valuable packaging cannot be made part of a closed loop.

The engineers of RECENSO have developed a process that also makes it possible to convert mixed plastic fractions into a liquid and universally usable hydrocarbon mixture, which can then be reused by the chemical industry as raw material for producing plastics of the highest quality. The innovative plants for direct oiling work according to the CARBOLIQ process and are unique in the world. An industrial-scale pilot plant was created at the waste management center in Ennigerloh. "The design complies with international stan-

dards for industrial applications and is used for the testing and further development of chemical recycling in Germany," explained Christian Haupts, Managing Partner of RECENSO GmbH in Remscheid.

The collaboration that was recently concluded between the two leaders in technology, SÜDPACK and RECENSO, now aims to convert production-related reusable materials into high-quality pyrolysis oil on an industrial scale. The produced pyrolysis oil will be supplied to the plastics industry as raw material for producing high-quality granules of virgin-grade quality. The goal is to use this material for producing product packaging in industries with high quality and hygiene standards, such as the food and medical product industries.

Dirk Hardow, who is responsible for the collaborative project at SÜDPACK, views the investment in the innovative project "as an initial pioneering step as a manufacturer of high-performance composite materials to

making a significant contribution to a functioning circular economy in the plastic packaging industry. Chemical recycling makes it possible to meet the ambitious recycling rates of the EU strategy for plastics and of the German Packaging Act – and allows us to support our customers in meeting current and future market needs. SÜDPACK is playing a pioneering role in the area and will further strengthen this innovation through investments in the future as well."

Plastic products made from chemically recycled material can be recycled again after use. The more often chemical recycling is performed (with material that has already been chemically recycled), the more CO₂ is saved that would have otherwise been produced in the refining of crude oil as a resource and the incineration of the plastics after use. Last but not least, chemical recycling makes a particular contribution to closing loops and reducing greenhouse gases in the packaging industry.

Dirk Hardow is convinced that "the technology will also establish itself in the packaging industry." Christian Haupts is extremely pleased about the commitment of his company's new collaborative partner: "I am very proud to have SÜDPACK as a partner that so strongly advocates the use of chemical recycling as a sensible, supplementary component for sustainable waste management and a sustainable, circular economy."

SÜDPACK Verpackungen GmbH & Co. KG
D 88416 Ochsenhausen

Romaco implements new sustainability strategy

Romaco has appointed a Sustainability Officer and defined goals for the company's climate-friendly development. Not only is the manufacturer seeking to enable more sustainable production by its customers; Romaco is also keen to improve its own carbon footprint.

The Romaco Group has a new central corporate objective: sustainability. To enable climate protection measures to be formulated and implemented at each of its various facilities, the Romaco Board of Management has just appointed Andreas Detmers as its first Group Sustainability Officer. Andreas Detmers is Head of the Research & Development department at Romaco Pharmatechnik GmbH in Karlsruhe, where he was most recently responsible for the „Climate-neutral machine“ project. „We pursue two approaches in implementing our sustainability strategy“, he explains. „On the one hand, Romaco is developing technologies that enable our customers to produce in a more sustainable way. On the other, we're seeking to improve our own carbon footprint step by step.“The pharmaceutical machinery manufacturer is guided by the principle „avoidance is better than reduction is better than offsetting“ in its efforts to systematically reduce carbon consumption. Andreas Detmers will be supported by sustainability experts at Romaco's four production sites in Germany and Italy.

Offsetting – first climate-neutral blister packaging line from Romaco Noack

In the production process for Romaco's new Noack Unity 600 blister packaging line, the emphasis is on offsetting. The certified calculation of the carbon footprint and the downstream cartoner involved assessments of around 4,700 different components. ForestFinest, a consultancy service provider specialised in climate protection, determined the total energy consumption required to manufacture and assemble the blister packaging line on Romaco's behalf. All in all, some 48 tons of carbon equivalents are generated during the production of the Noack Unity 600. The greenhouse gas emissions which are released along the way are offset by sponsoring a non-governmental climate protection project in Panama. Every customer who opts for one of Romaco's climate-neutral blister packaging lines is sent a certificate to prove it. Romaco has plans to extend the carbon-neutral machine concept to all product lines in the medium term. Several tablet presses from Kilian as well as various Noack blister packaging lines and



ROMACO 
Sustainability Enabler

Romaco is committed to sustainable production with its technologies.

Promatic cartoners are already available in a sustainable version today.

Reduction – Push Packs: Romaco Siebler's new, recyclable strip packaging

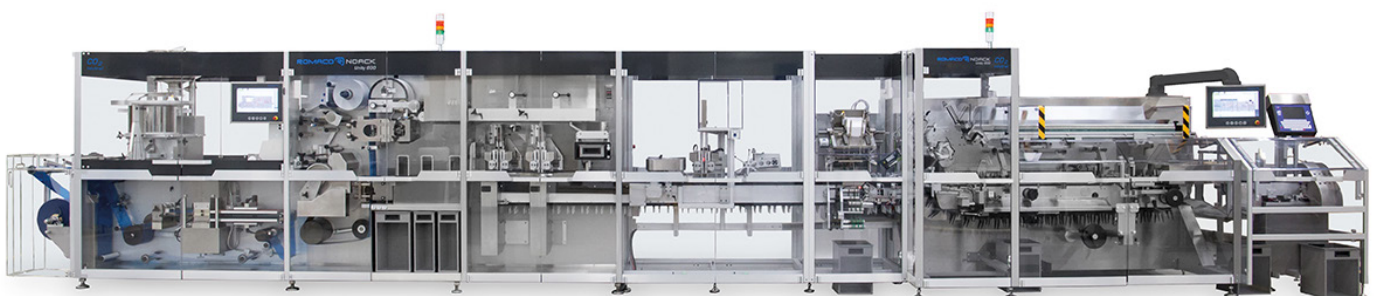
Together with film and foil specialist Huhtamaki as its industry partner, Romaco has come up with the first recyclable strip packaging for pharmaceutical solids. More than 90 percent of the components which are used to make Push Packs from polyolefin laminate belong to the same material class (PE and PP). The result is a recycling rate of over 70 percent. This alternative packaging form developed jointly by Romaco and Huhtamaki enables the pharmaceutical industry to significantly reduce the amount of residual waste.

The innovative sealed strips have a push-through function and are manufactured on heat-sealing machines in Romaco Siebler's HM 1 series. Siebler's unique QuickSeal technology ensures safe processing of the special foil in conformity with the pharmaceutical industry's cGMP standards. „So far, the market has reacted overwhelmingly positively to the Push Pack technology's launch“, Andreas Detmers confirms. „Several interested customers are currently testing pushthrough sealed strips as packaging for their products at our PacTech laboratory in Karlsruhe.“ Users can choose between standard, barrier and eco Push Pack versions.

Push Packs have a much lower material consumption compared to Al/Al blisters. Despite providing identical barrier properties, they are less than half the weight of Al/Al blister packs, which is additionally reflected in the costs: Push Packs are up to 60 percent cheaper than their Al/Al counterparts. All Push Pack models are made from PVC-free material. Thus, the use of the plastic, which has been the subject of public criticism for many years due to its environmental impact, is completely avoided.

Avoidance – Romaco Kilian and Innojet reduce product losses

One of the stated development goals in the design of Romaco Kilian's tablet presses is minimal product loss. Amongst other things,



Romaco Noack's climate-neutral Unity 600 blister packaging line.

Romaco implements new sustainability strategy

this is achieved through precision-manufactured die-tables with hardly any radial run-out. Magnetic product scrapers simultaneously reduce product loss during tableting by enabling further processing of the powder. Kilian moreover shortens the run-in times for its tablet presses by means of start-up dosing control based on the filling, resulting in even lower material consumption.

The careful use of valuable raw materials is likewise a top priority for the designers of the fluidised bed systems in the Romaco Innojet VENTILUS® series. Thanks to the SEPAJET® system, any particles which are retained by the filter during production are constantly returned to the process. And when it comes to energy consumption, the air flow bed technology developed by Dr. h. c. Herbert Hüttlin is superior to traditional fluidised bed processes. The processing time for hot melt coating applications is consequently up to 85 percent shorter and the carbon footprint of the VENTILUS® machines markedly improved.

Outlook

"We're well aware that we're only just getting off the ground with our sustainability strategy", Andreas Detmers concludes. "It's now up to us to consistently realise the objectives we've set ourselves and take further action on that basis. I firmly believe that, through a series of small steps, our company can make a lasting contribution to climate and environmental protection."

In short, the systematic reduction of raw material, energy and material usage will therefore determine the agenda of the Romaco Group even more in the future – from the development of new technologies through the implementation of internal measures like facility management to the digitalisation of services.

Romaco Group
D 76227 Karlsruhe

Rapid test production for the detection of SARS-CoV-2

A quick and early diagnosis at first symptoms of illnesses, such as with a suspected coronavirus infection, can save lives and reduce the risk of spreading. The faster an infection screening is carried out, the earlier treatment measures can be implemented purposefully in the case of a positive result. Due to the corona pandemic, some customers have required new supply chains and have asked for powerful suppliers with fast and flexible development and production. By the example of a corona rapid test production, the entire team of Wirthwein Medical GmbH & Co. KG was able to meet these challenges in a short period of time under controlled production conditions and additional hygiene measures.

Due to the corona pandemic, the customer needed a flexible, reliable, and experienced partner in the field of diagnostics / point of care. After only a few days, the first rapid tests were manually assembled in controlled production areas. Special attention was

paid to controlled humidity conditions with corresponding monitoring. Step by step the processes were partially automated and the output quantities of the SARS-CoV-2 rapid test production were successively increased. In addition to the preparation of documen-

tation and implementation of all assembly services, Wirthwein Medical rounded off the entire range of services, such as sealing in a special primary packaging and complete labeling of the corona rapid tests.

The entire assembly process was optimized according to customer requirements and always in close cooperation with the customer. The whole process development was based on DIN EN ISO 13485. In addition, the function of the SARS-CoV-2 rapid test was verified by an external specialized test laboratory during series production. Customer-specific final packaging as well as logistics and supplier management round off the services of the medical technology expert Wirthwein Medical. The company has already worked out further modular and customized expansion stages to increase automation for a possible future increase of the number of units, which, depending on the development of the pandemic, may become necessary even at short notice.



Customized point of care rapid tests/ diagnostic solutions under controlled clean room conditions.

Wirthwein AG
D 97993 Creglingen

Apple iPad and Microsoft Surface in stainless steel housing for cleanrooms

New features for even greater cleanroom conformity

Systec & Solutions offers two cleanroom-compliant IP65 stainless steel housings that are equipped with a seamlessly integrated Microsoft Surface Pro or Apple iPad Pro. Systec & Solutions has developed new features for both housing versions and made improvements to make them even more suitable for demanding cleanroom and GMP environments.

Apple iPad and Microsoft Surface for cleanrooms

The Surface is available in 12.3 inches and the iPad in 11 inch. Both have a multi-touch display, which is additionally secured with an extra protective glass and can be operated with standard cleanroom gloves. With a fully enclosed, stainless steel housing and the protective glass, the tablets are designed for a great deal of cleaning cycles. Thanks to the smooth surface, they can be thoroughly and safely cleaned with almost all standard detergents and disinfectants in no time at all. The housing's special design has no dead zones. An on/off button and volume buttons are located on the front of the unit and conform to IP65. The external buttons on the Microsoft Surface enable secure sign-in (Ctrl + Alt + Del), even without a keyboard.

Cleanroom-compliant charging and data transmission

The openings of plug contacts such as USB or power connections in particular are usually a non-cleanable weak point, since sensitive technology is small and difficult to access and it must not get wet. By developing the new CLEANROOM CONNECTORS, Systec & Solutions has developed the perfect solution for cleanrooms. The CLEANROOM CONNECTOR is an IP65 charging contact that is flush with the stainless steel housing. It can be cleaned easily and thoroughly using spray or wiper disinfection. A special USB-C-compatible connection cable is magnetically docked and held in place for charging. If necessary, the CLEANROOM CONNECTOR can also be used as a USB-A socket to transfer data via a data cable. This allows for a USB stick, Ethernet adapter, or another suitable device to be used. The CLEANROOM CONNECTOR is currently available for the Microsoft Surface Pro and will be available shortly for the Apple iPad Pro.

Ergonomic use of the stainless steel tablet

The stainless steel housing for the Microsoft Surface Pro and the Apple iPad Pro can be optionally equipped with a handle. In addition, it is also possible to select a holder that enables installation on a bench or mounting on the wall. The standardized Vesa hole pattern (75x75 mm) enables the holder to be attached to standard support arm systems. Thanks to the flexible design of the holder it enables the tablet to be attached as required with a screen inclination of approx. 30° or approx. 60°. Once the tablet has been inserted and secured using the clamp, the user can operate it safely without it slipping, and it can be charged if necessary.



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Image 1: Microsoft Surface Pro for cleanrooms
(Image Rights: Systec & Solutions GmbH)

Image 2: CLEANROOM CONNECTOR
(Image Rights: Systec & Solutions GmbH)

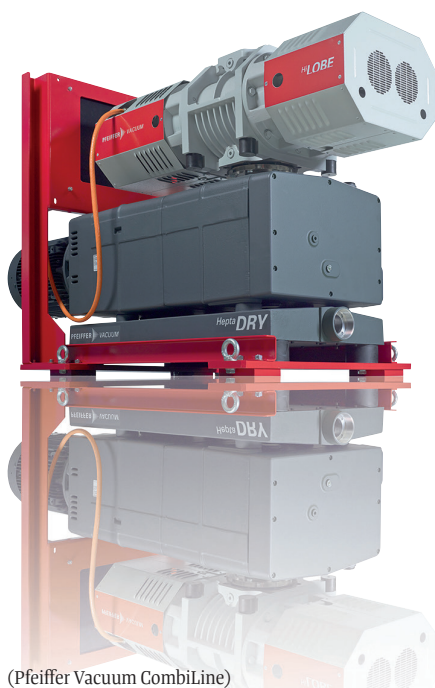


Image 3: Tablet holder
(Image Rights: Systec & Solutions GmbH)

Expanding the HiLobe line of intelligent high-performance Roots pumps

- Diverse applications in the low and medium vacuum range
- Large variety of Roots pumping stations
- Wide nominal pumping speed range up to 6,200 m³/h

Pfeiffer Vacuum, one of the world's leading providers of vacuum technology, has expanded its HiLobe series. These Roots pumps are available in a broad spectrum of pumping speeds and applications. The innovative pumps can be used for numerous industrial vacuum applications, including electron beam welding, vacuum furnaces and freeze drying. HiLobe Roots pumps are particularly suited for rapid evacuations (lock chambers or leak detection systems) and as well for general coating applications. With their individual speed control, these vacuum pumps can be adapted to customer-specific requirements.



(Pfeiffer Vacuum CombiLine)

Compact Roots pumps handle a wide range of nominal pumping speeds up to 6,200 m³/h. Thanks to their powerful drive concept, they achieve around 20 percent shorter pump-down times than conventional Roots pumps. Rapid evacuation also saves costs and increases the efficiency of production systems. The HiLobe series boasts an over 50 percent reduction in maintenance and energy costs compared to conventional Roots pumps. This is due to the use of energy-efficient drives that already meet the future IE4 energy efficiency class. The reduction is also contributed to the optimized rotor geometries of the pumps and by the unique sealing concept.

The pumps are hermetically sealed from the atmosphere and have a maximum integral leak rate of $1 \cdot 10^{-6}$ Pa m³/s. Dynamic seals are eliminated, thus making maintenance only necessary every four years.

Cost-intensive water cooling is not necessary since HiLobe Roots pumps can also be operated at ambient temperatures of up



(Pfeiffer Vacuum HiLobe)

to +40 °C using flexible air cooling.

The intelligent interface technology of the HiLobe ensures optimal process adjustment and condition monitoring. This facilitates proactive and efficient operation. The integrated condition monitoring provides information on the state of the vacuum system at all times. Condition monitoring also increases system availability since maintenance and service work can be planned expediently and with foresight to prevent cost-intensive production downtimes. These advantages result in a long service life and maximum operational reliability.

The vacuum pumps can be mounted either vertically or horizontally to suit the existing system. This maximizes pumping speeds and makes more efficient and customized use of the available space at the customer's production facility.

Vacuum pumping stations consist of various pump combinations augmented with suitable components, valves and gauges. Pfeiffer Vacuum has a large variety of Roots pumping stations with different backing pumps, gradations and accessories. Roots pumping stations are used in low and medium vacuum applications and are a reliable solution offering high pumping speeds in the transition range from atmospheric pressure to 10⁻³ hPa. The right combination of different vacuum pumps creates a perfect solution for applications in production and research.

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