



# Micro injection moulding in a cleanroom - New machine interfacing concept



Micro-injection moulding processes enable precise and cost-effective production of the smallest plastic components. In order to meet the highest demands on product safety and quality, the production of medical products usually takes place in cleanrooms. Stamm AG has invested in a new cleanroom with a new approach to machine interfacing. The micro injection moulding machines are located partly within and partly outside the cleanroom.

At first glance, Hallau in Switzerland is a cosy wine producing town where the clocks seem to be slowing down a bit. However, as is often the case, medium-sized companies are hiding in these small towns, producing innovations of the highest standard worldwide. Stamm AG in Hallau is undoubtedly one of these creative, forward-looking companies. The plastics processors have dedicated themselves to the world of small and micro parts. And with great success. With the production of tiny components, such as gears, plugs or tips, the company in Hallau pushes the limits of the feasible. In the particularly sensitive field of medical technology, production takes place under controlled cleanroom conditions.

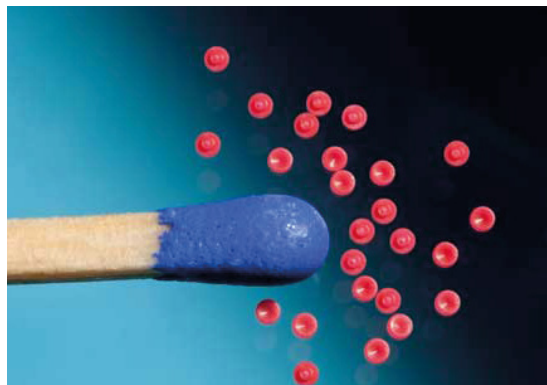
## Micrometer-precise work

The smaller the products, the more complex and careful the manufacturing process must be. Every speck of dust can lead to a functional impairment or even to a failure. If the products are also used in the medical sector, for example in minimally invasive surgery, absolute hygiene and contamination-free delivery must be guaranteed. Compliance with constant environmental conditions during production and packaging play an

important role here. For several years, Stamm AG has been pursuing the micro-injection moulding of medical-technical components under controlled cleanroom conditions. The Swiss company has invested in new micro-injection moulding machines and has now expanded its cleanroom capacity to include an additional cleanroom of the ISO 7 cleanroom class.

Detlef Moll, Managing Director of Stamm AG, explains the necessity of the investment: „We produce micro-components made of plastic. This requires the highest precision. Our technicians develop injection moulding tools that in micro-injection moulding move in the  $\mu$ -range. The details of the end products are often invisible to the naked eye and yet are important components in the overall concept of our customers. Any particle that contaminates the production can lead to failure of the sensitive components. In addition to the precision of the process, we therefore ensure a controlled production environment.“

Stamm AG first gained experience in cleanroom technology with a cleanroom tent a few square meters in size, which was used to control the parts produced. Convinced of the increase in quality, Hallauer soon invested in a complete cleanroom system, to which the injection moulding machines were docked. In this solu-



Micro-injection moulded medical components



Cleanroom solution with docked injection moulding machine

## Micro injection moulding in a cleanroom - New machine interfacing concept

tion, the machines were still set up as usual outside the cleanroom and provided with a laminar flow enclosure, which allows a controlled air purity within the closing unit. The injected micro-parts are then removed by robot and fed fully automatically via encapsulated cleanroom conveyor belts into the cleanroom, where the final inspection and packaging takes place.

### Innovative concept of injection moulding interface

With the expertise in highly sensitive manufacturing, the order volume of the Swiss plastics experts grew again, a further investment in two new micro-injection moulding machines with cleanroom production became necessary.

In collaboration with its long-standing cleanroom supplier SCHILLING ENGINEERING, the Swiss company opted for a new concept. In the newly commissioned, 60 m<sup>2</sup> cleanroom facility, which achieves ISO 7 class air purity, half of the machines are installed inside and half outside the cleanroom. For this purpose, a special outlet was constructed in the cleanroom wall. This variant has several advantages, as Detlef Moll explains: „The new compact solution saves space and transport routes. The injected products can be removed from the machine directly in the cleanroom. The injection unit itself is still outside the cleanroom, so that the heat loads do not occur in the controlled area. This has a positive effect on temperature control and air conditioning. This concept is brand new and was developed by our long-time partner SCHILLING ENGINEERING.“

### State-of-the-art, energy-efficient cleanroom system

The newly installed cleanroom system CleanCell4.0® guarantees a cleanroom air quality of the ISO 7 cleanroom class. Separate person and material locks with mutual door locking ensure safe inward and outward movement of the personnel and the packaged end product.

The cleanroom system is equipped with high-performance fil-

ters of the ULPA class U15. An innovative recirculation and return air duct within the fully glazed cleanroom walls ensures precise cleanroom flushing and high energy efficiency, as the already filtered and cooled air is returned to the air circulation circuit. Wall and ceiling modules of the modular cleanroom are connected to a silicone-free GMP sealing-clip system.

Further safety is ensured by the integrated control system CRControl®. Using the interactive monitoring of the control system, interfaces are established to the connected probes that measure pressure, humidity and temperature, to filter modules, air conditioning cabinets, door and light functions and other components. All important functions are monitored and can be individually controlled and regulated. In this way, a simple remote maintenance is possible.

Detlef Moll is pleased about the new investment: „We were already able to commission the new cleanroom and it meets all our expectations. The installation of the injection moulding machines inside the cleanroom has proven to be a good advancement. The cleanroom runs trouble-free and safe as usual, it is also quiet and equipped with a very good LED lighting and full glazing, facilitating the working conditions for our employees in the cleanroom.“

The cleanroom was offered by SCHILLING ENGINEERING as a turn-key solution. Planning, production, installation and qualification were completed within two months.



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In the cleanroom CleanCell4.0®, the finished parts can be removed directly



The injection units with the high heat loads remain outside the fully glazed cleanroom

# Ulrich Rothgerber joins the Cleanzone team

Ulrich Rothgerber, an expert and highly influential figure in the German cleanroom industry, has joined Messe Frankfurt as a consultant with effect from 1 January 2019. He will be using his experience and network to continue strengthening Cleanzone's position as the leading platform for high-tech cleanroom production.

The Cleanzone team has become even stronger this year: Ulrich Rothgerber, a trade fair manager with in-depth knowledge of the German cleanroom industry, has joined Messe Frankfurt as a consultant. Iris Jeglitza-Moshage, Member of the Extended Board of Management of Messe Frankfurt: "We are pleased to report that Mr. Rothgerber will now be putting his industry expertise, experience and network to work for Cleanzone. We will be working with him to further strengthen the trade fair's position as one of the most important European platforms for high-tech cleanroom production."

Between 1997 and 2004, Rothgerber successfully established the Cleanrooms Europe trade fair for P.E. Schall / PennWell Corporation, which was held in a number of venues, including Frankfurt. Following this, Rothgerber took on executive positions with other large German trade fair organisers, and successfully implemented the topic of cleanrooms in the Lounges trade fair.

The Cleanzone cleanroom trade fair has been taking place annually in Frankfurt am Main since 2012, during which time the number of exhibitors has increased by 100 percent, from 39 at the debut event to 78 in 2018. In the rapidly growing cleanroom technology market, the trade fair networks international providers and

users of cleanroom technology, while the Cleanzone Conference and Cleanzone Plaza supply information on the latest trends, standards and innovations. Cleanzone 2018 drew newly 1,300 participants from 39 countries, with 38 percent of visitors coming from outside Germany. The 2018 trade fair for cleanroom technology had an even broader programme than in 2017, with over 30 percent more exhibition space.

he next Cleanzone will be taking place on 19 and 20 November 2019 in Frankfurt am Main. Cleanzone Middle East will also be returning once again in autumn 2019.

**19th - 20th November 2019: CLEANZONE; Frankfurt am Main (D)**

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## LOUNGES ante portas

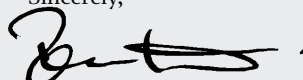
Dear subscribers,

it's really only a few days to go until the opening of the **LOUNGES in Karlsruhe**, where the whole industry will meet again. In this newsletter we have already compiled the most important facts and news for you so that you are well prepared.

Of course we hope for your visit at the booth of reinraum online - on one hand for a personal conversation about the most important and trend-setting innovations and on the other hand to provide you with our new yearbook. We think it has become one of the best issues since our magazine was first published and we are very proud of it. We are looking forward to your feedback, along with your wishes and suggestions, so that we can become even better.

See you in Karlsruhe on February 5th.

Sincerely,

  
Reinhold Schuster





In 1960, Fraunhofer IPA was located in the very cramped premises of Number 10 Keplerstrasse and the so-called „Alte Schlachthof“ at Hegelplatz. (© Lesebuch »50 Jahre IPA«, 2009)

# From Stuttgart to the world: Fraunhofer IPA turns 60



„Future is our product“ is the motto of the Fraunhofer Institute for Manufacturing Engineering and Automation IPA. The institute produces innovations and solutions for industrial applications and bridges the gap between science and practice. This is to be celebrated in 2019: 60 years ago – on July 1st, 1959 – the institute in Stuttgart began its work.

„Just how valuable Fraunhofer is for the German innovation system can be seen by the fact that other countries like Brazil, Great Britain or the USA are setting up organizations with similar structures to the

Fraunhofer-Gesellschaft“, says IPA Institute Director Professor Thomas Bauernhansl. For him, the Fraunhofer model, which combines application-oriented research for industry with preliminary research with uni-

versities and other research institutions, is the key to Germany’s innovative success.

As the largest manufacturing engineering institute of the Fraunhofer-Gesellschaft, Fraunhofer IPA doesn’t just deal with current topics, it also wants to set trends. „Especially in the automotive and mechanical engineering state of Baden-Wuerttemberg, there is a demand for us to play a pioneering role. In Industrie 4.0, i.e. the digital transformation, we were able to play a formative part. Right from the outset, we will also be involved in the biological transformation, which is becoming ever-more important“, explains Bauernhansl. „We have the advantage that we have always acquired new topics and thus new disciplines very quickly and flexibly – for example in areas such as medical engineering, biotechnology or cleanroom technology. We are used to collaborating on an interdisciplinary basis and bringing together the various technologies. Only with knowledge from different disciplines will we be able to find the best solution for all concerned“, he concludes.

Professor Fritz Klocke, who has sup-



Today, Fraunhofer IPA together with four other Fraunhofer Institutes is based at Nobelstrasse 12 in Stuttgart-Vaihingen. (© Fraunhofer IPA/Foto: Rainer Bez)

## From Stuttgart to the world: Fraunhofer IPA turns 60

ported the management of Fraunhofer IPA since July 2018, adds: „The close partnership with Stuttgart University’s Institute for Industrial Manufacturing and Factory Operation (IFF) and Institute for Energy Efficiency in Production (EEP) has contributed significantly to our own success. It goes without saying that we are much more successful working together than alone”. For Klocke, who worked at the Aachen uni-



Professor Fritz Klocke and Professor Thomas Bauernhansl are the directors of Fraunhofer IPA in Stuttgart. (© Fraunhofer IPA/Foto: Rainer Bez)

versity RWTH for a long time, Cyber Valley is also a great opportunity to bridge the gap between fundamental natural sciences and practical application sciences. In the future, this cooperation will be further intensified.

### International network as an important pillar

Fraunhofer IPA employs 700 scientists. In addition to branch offices and project groups in Bayreuth, Mannheim and Reutlingen, Fraunhofer IPA also has branches of varying sizes and structures in Austria, Hungary and Japan, all of which are linked to universities.

Fraunhofer IPA’s most recent international presence is currently becoming established in Shanghai/Lingang, one of China’s leading science and technology regions. The Project Center for Smart Manufacturing, a cooperation with Shanghai Jiao Tong University, works together with industrial partners to implement research projects on digital transformation.

### Strengthening Stuttgart as a business location

The institute wants to grow not only internationally, but also locally. „IPA 100 in the next two to three years is a realistic working goal for us. That means 100 million euros in sales per year – an increase of more than a third over today’s figures. In order to implement this, we need to adapt existing structures, develop new ones and, above all, involve and motivate our employees“, says Professor Fritz Klocke.

Professor Thomas Bauernhansl adds: „One of our biggest lighthouse projects is the technology and innovation campus ‘S-TEC’ in Stuttgart. Its purpose is to network companies with the highly diversified research landscape in Stuttgart and to advance future-oriented research topics. These include topics such as additive manufacturing, cybercognitive intelligence, cyberphysical systems, digitized battery cell production and ultra-efficiency, as well as frugal products and manufacturing systems that are organized in centers and supported financially by the state government“.

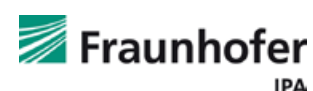
For Bauernhansl and Klocke, S-TEC is a huge opportunity to develop the science location of Stuttgart into a lighthouse that can be seen from afar, thus making it attractive for young scientists.

### Giving a face to the people shaping the future

Fraunhofer IPA’s most valuable asset is its employees. Representing the entire institute, the anniversary website therefore features 60 people telling 60 stories from the last 60 years. After all, these are the people who are turning „Future is our product“ into a living reality. An anniversary song specially composed by employees of the institute portrays the diversity of research tasks and describes everyday working life, at times in a serious and at others in an ironic way.



The scientists at Fraunhofer IPA conduct research into cyber-physical production processes of the future. (© Universität Stuttgart IFF / Fraunhofer IPA, Foto: Rainer Bez)



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# Dry cleaning can counteract adhesion problems

## CO<sub>2</sub> snow jet cleaning prior to painting plastics

Before coating, more and more plastic parts are being cleaned with CO<sub>2</sub> snow jet technology, such as the proven quattroClean system from acp systems AG. Besides the significant cost, space and resource savings, as well as the ease with which the cleaning system can be integrated into painting lines, coating aspects also speak in favor of the dry cleaning solution.

As with metallic components, plastic components have long been cleaned with powerwash systems prior to painting. The components first pass through a cleaning step with a mostly alkaline medium, followed by several rinsing zones, an adhesive water dryer and a cooling zone. Cleaning not only takes up a lot of production space, but also consumes large quantities of resources. Furthermore, plastic components behave differently from their metal counterparts. The heat introduced during the cleaning step causes the plastic parts to expand, with the result that water is stored. During the drying process, the parts are heated once again. This could be one reason why some of the ingredients used to make the plastic, such as separating agents, additives or fillers, which have migrated upwards from deeper layers, can later be found on the cleaned surface and impair paint adhesion.

### Dry cleaning with consistently good results

In contrast to wet-chemical processes, the quattroClean system from acp systems AG, which has been used frequently for this task for years, uses a dry cleaning technology. The cleaning medium is liquid carbon dioxide, which has an almost indefinite shelf life. It is environmentally neutral, generated as a by-product in the chemical industry, as well as when energy is generated from biogas.

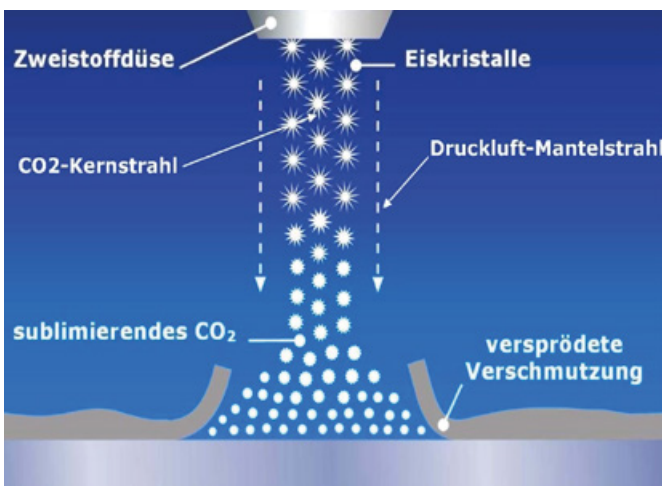
The non-combustible, non-corrosive and non-toxic carbon dioxide is fed through the acp system's non-wearing two-component

ring nozzle and expands on exiting to form fine CO<sub>2</sub> snow crystals. These are then bundled by a jacketed jet of compressed air and accelerated to supersonic speed. When the non-abrasive 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. Thanks to these four effective cleaning mechanisms, the quattroClean system reliably and reproducibly removes particulate and filmic contamination from the entire surface or, if required, only from a specific area. The cleaning process is so gentle on materials that it can even be used to clean delicate and finely-structured surfaces.

The aerodynamic force of the compressed air carries away the detached impurities, which are then extracted by an integrated suction unit to prevent recontamination. Since CO<sub>2</sub> sublimates instantly at atmospheric pressure, at the end of the cleaning process components are dry, enabling them to be ionized, activated or painted straightaway. A further advantage of the dry cleaning process is the resulting greater design freedom for parts because geometries where fluid could become trapped are no longer a problem.

### Major savings and fully-automated operation

In addition to the high and consistent cleaning performance, significantly lower investment and operating costs, as well as much less space, are required for the chemical-free quattroClean process.



Liquid CO<sub>2</sub> is fed through a non-wearing two-component nozzle and expands on exiting to form fine CO<sub>2</sub> crystals, which are bundled by a circular jacketed jet of compressed air. This patented technology ensures consistent cleaning results. (Photo source: acp systems AG)



The cleaning process can be easily integrated into the painting line, as well as controlled by a production control system. (Photo source: acp systems AG)

## Dry cleaning can counteract adhesion problems

It can be space-savingsly integrated into a cabin - comparable to a spray booth.

Another advantage of the cleaning system is its modular design, which allows it to be optimally adapted to any application. Depending on requirements, one or more nozzle arrays are used when the system is integrated into a painting line. The cleaning process can be automated using robots, linear or gantry systems. All process parameters, such as the consumption of compressed air and carbon dioxide, blasting time, blasting angle and motion sequence - including 3D movements - can be precisely matched to the respective

part to be coated and stored as cleaning programs in the control system. Since the cleaning process is very similar to the painting process with robots, almost identical programming solutions can be used. In addition, the effective range of the nozzle array can be automatically scaled according to the geometry of the workpiece concerned. Via interfaces such as Profibus or Profinet, the industry 4.0-capable cleaning system can also be integrated into the painting line's control system, or into the production control system.

acp - advanced clean production GmbH D 71254 Ditzingen



The cleaning process is very similar to the painting process with robots, enabling almost identical programming solutions to be used. (Photo source: acp systems AG)



All process parameters can be precisely matched to the respective part to be painted and the effective range of the nozzle array automatically scaled according to the geometry of the workpiece. These data can be filed in the control system as cleaning programs. (Photo source: acp systems AG)

## Management changes for Sumitomo (SHI) Demag

### Ohira new COO, Kuroiwa responsible for Global Planning

Shoichi Ohira will join the management board of Sumitomo (SHI) Demag Plastics Machinery as COO (Chief Operation Officer) and Head of Production, effective 15 January 2019. Chief Collaboration Officer Hideki Kuroiwa will change into management and return to Japan shortly, where he will be responsible for Global Planning, and coordinating future joint projects within Sumitomo (SHI) Demag Group.

Ohira is a certified production expert. He has become established as an injection moulding machine expert with the Japanese parent company Sumitomo Heavy Industries in Japan, China and the US; his most recent positions, which he held for many years, were Head of Production and Quality Management. With his new responsibilities he will focus on further optimising

production efficiency and significantly reducing cycle times, which he considers his first priority.

"Following the rising growth rates we experienced in recent years, we are now focusing on increasing production performance and stabilising production capacity on the high level," says Gerd Liebig, CEO Sumitomo (SHI) Demag. "Mr Ohira has



Gerd Liebig, CEO Sumitomo (SHI) Demag, and Shoichi Ohira, COO Sumitomo (SHI) Demag.

valuable experience in the optimisation of complex production processes. He will follow through with the already initiated investments in our facilities in Schwaig, Wiehe and Ningbo."

Sumitomo (SHI) Demag  
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# Quantity and quality

## Breakthrough to new method in laser optics

LIMO GmbH, a manufacturer of high-precision micro-optics for laser systems, has achieved a process-engineering breakthrough in the production of FAC lenses for all types of diode-pumped laser sources. The Dortmund-based company has made it possible to mass-produce the lenses with superior precision.

FAC lenses for laser systems are a key component in many innovative technologies. They are already used in the aerospace industry, medical technology, photovoltaics, display manufacturing, and materials processing, but batch sizes are expected to see another major increase thanks to the use of the lenses in additive manufacturing (3D printing) and LIDAR systems (laser-based Light Detection and Ranging). The LIDAR systems for autonomous driving are a component that is particularly important to safety, and are also used in harsh ambient atmospheres. Aside from high quality, they also need to deliver reliable operation with long-term stability. The only way to meet these requirements is with laser systems that utilize high-end glass micro-optics.

The component most critical to the quality of these systems is the fast-axis collimator lens (FAC lens), which is manufactured from high-grade glass and has an acylindrical surface. However, currently available production methods have yet to demonstrate that they are capable of producing quantities on the order of several tens or hundreds of millions of pieces at a consistently high optical quality, and at attractive prices. But now, LIMO has succeeded in making the process for manufacturing FAC lenses that provide the demanded quality suitable for high-volume production.

### 140-mm wafers for the production of FAC lenses

LIMO GmbH produces the FAC lenses on wafers, which allows several thousand lenses to be fabricated from high-grade glass in a single step. When mass-producing highly complex glass optics, ma-

nufacturers face the challenge of processing large wafer areas with a consistently high level of precision. With a wafer size of 140 mm x 140 mm, the Dortmund-based manufacturer has now achieved a breakthrough to a method capable of extremely large quantities. And, according to sources within LIMO, the company already has the next, even bigger wafer generation waiting in the wings.

In the glass molding process that has typically been used up to now, glass lenses are processed at high temperatures of approx. 600–800 °C. However, in order to produce lenses of high optical quality, the glass must be heated and cooled slowly. Considerable precision must be used in configuring the cooling process, in order to prevent undesired stress in the material. In addition, where larger glass areas are used, temperature fluctuations occur during the heating process, and these fluctuations can only be minimized by implementing very costly process-control measures. Because of these limitations, this “hot” production method has a number of drawbacks where large quantities are involved, and is not fully scalable.

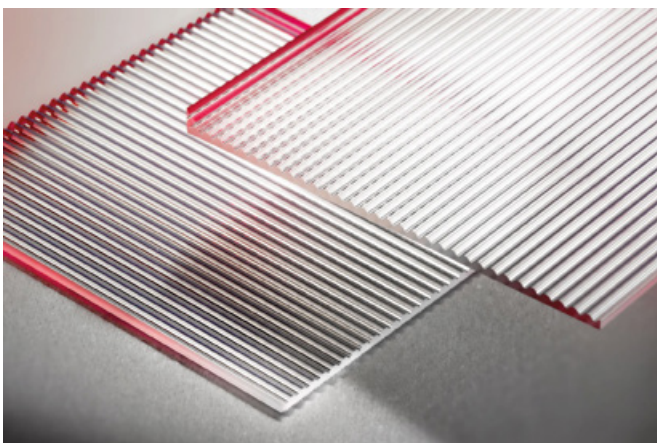
The unique feature of the LIMO method is that the glass lenses are produced at room temperature. The company was able to increase the wafer size while also reducing the cycle time per wafer to under 60 minutes. The advantage of this “cold” method is that, since the glass is processed at room temperature, a higher production rate has no adverse impact on the quality of the lenses. LIMO is the world’s only manufacturer to have mastered this technique in high-volume production.

### The secret to quality: a high-precision grinding process

“We have the ability to process 140-mm and larger glass wafer discs without stress, in large quantities. To do so, we make all of the tools and nearly all of the machines used for the fabrication process in-house. This gives us maximum flexibility when it comes to the geometries and the design of the lenses. To ensure extremely high lens quality in high volume production, we have developed an automated high-precision grinding process. There is nothing else like it in the world,” says Dirk Hauschild, Chief Marketing Officer (CMO) at LIMO GmbH.

Using the cold grinding and polishing method developed by LIMO for cylindrical lens arrays, up to 20 thousand lenses can be processed simultaneously in a single step with a wafer edge length of 140 mm. The method makes it possible to freely choose from refractive acylindrical lens shapes, which can be symmetrical and asymmetrical as well as wavelike or non-periodic optical elements.

In a single grinding process, up to several millimeters must be removed from the glass surface with an accuracy of just a few na-



LIMO is the world’s only manufacturer with the ability to produce FAC lenses from glass on wafers measuring 140mm x 140mm. (Image: LIMO)



## Quantity and quality

nometers. The lenses must also undergo final polishing as a last process step. The high-grade surface quality is achieved by areal polishing, which further increases the durability and stability of the glass surfaces. With its high-precision grinding process, LIMO has reached performance levels at the limit of the physically possible (see info box below).

### The goal for 2019: manufacture over 5 million FAC lenses

The 140-mm glass wafers are processed 24 hours a day, 7 days a week. For this to be possible, LIMO re-equipped its machinery to handle the larger format, and also expanded its production capacity. The company is now capable of fabricating up to 3 million FAC lenses in one year, the goal for 2019 is to manufacture over 5 million FAC lenses. However, annual capacity is expected to increase again to over 10 million lenses until 2020. "Processing the glass wafers at room temperature makes the fabrication process very controllable, which allows us to reliably ensure high quality. We will continue to expand our capacity as needed," notes Chief Operating Officer (COO) Dirk Bogs in summarizing the produc-

tion standard achieved thus far.

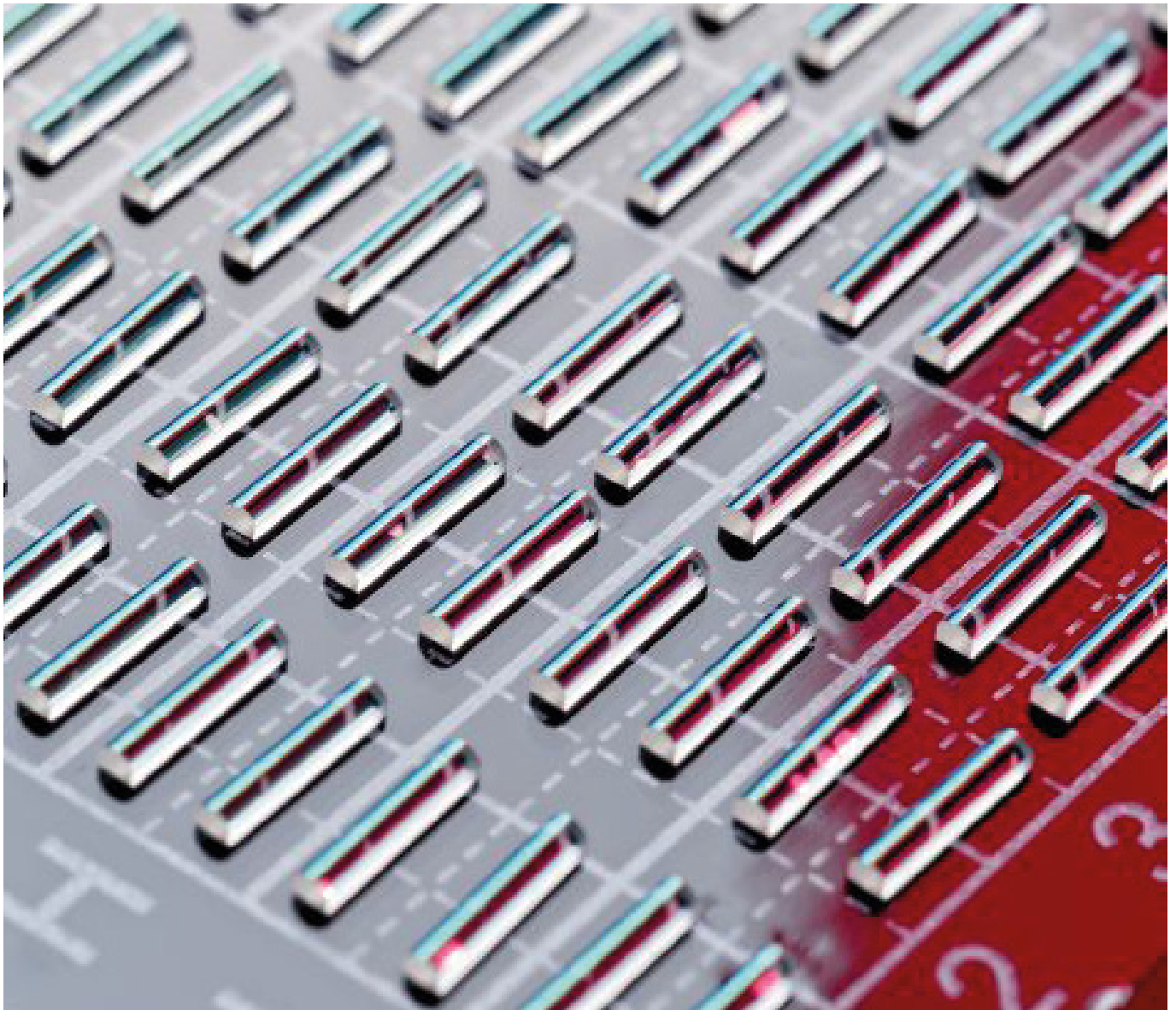
### Info box: FAC lenses for single emitter diodes

Fast-axis collimator lenses (FAC lenses) are mainly used with single emitter diodes. These lenses are designed for a small beam width (collimation width) and are therefore optimized for materials processing and for diode-laser pumping applications.

### The FAC lenses from LIMO, such as the FAC 300, deliver performance at the limit of what is physically possible:

- Standard focal length of  $\leq 160 \mu\text{m}$  to  $3000 \mu\text{m}$
- Low-absorption coating (VIS to FIR)
- Low residual divergence with high power content
- High-index materials ( $> 1.8$ )
- Transmission  $> 99\%$  across a broad spectrum (e.g., 770–1070 nm)

LIMO GmbH  
D 44319 Dortmund



A new production method allows LIMO to fabricate high-precision FAC lenses in extremely large quantities. (Image: LIMO)

# Arburg anniversary: ten years of presence at the Gulf

- Arburg celebrates ten-year anniversary of its subsidiary in the United Arab Emirates
- Andrea Carta presents the traditional anniversary sculpture on behalf of the Arburg parent company
- Comprehensive pre- and after-sales service and cooperation with the HIPF Institute in Riyadh

Right at the start of the year, at the beginning of the Arabplast trade fair on 5 January 2019, Arburg's subsidiary in the United Arab Emirates (UAE) celebrated its ten-year anniversary. Andrea Carta, Director Sales Overseas, presented the traditional anniversary sculpture to the subsidiary manager Joachim Branz on behalf of the parent company. Around 50 customers attended the exclusive evening event.

The anniversary celebration took place at the Dubai Creek Club on Marina Island. Congratulations from the entire Arburg parent company were expressed by Andrea Carta, Director Sales Overseas: „I heartily congratulate Joachim Branz and his team on ten years of Arburg in the United Arab Emirates. To our customers, I would like to express my special thanks for the trust you have placed in Arburg and for the successful cooperation.“ At the exclusive evening event, he presented the traditional Arburg anniversary sculpture to the subsidiary manager. A further highlight was a sand painting performance illustrating the company's successful history from 1923 until today.

## Great potential of the Arabian market

Since the subsidiary was founded in 2009, Arburg has continuously invested in the Arabian market, which offers large potential with sophisticated technological applications and a growing number of plastic-processing companies, according to Andrea Carta. „The entire spectrum is covered, from the production and refining of crude oil, to the production of plastic, right through to processing.“ From its location in Ras Al Khaimah, Arburg VAE also supports the GCC countries (Gulf Cooperation Council) Syria, Lebanon, Jordan and Yemen.

## Focus on packaging industry

The focus of the Arburg VAE subsidiary is the packaging industry, which has traditionally been a strong presence in the Arab states. Technical moulded parts and products for medical technology and the automotive sector are also important in

this market. High-tech machines are in great demand in all these areas, and it is this premium segment that Arburg targets with its product range.

## Comprehensive pre- and after-sales service

In addition to the premium injection moulding technology that Arburg offers, the Arabian customers particularly value the professional consulting provided by the company's experts, as well as the comprehensive support in pre- and after-sales service. The service package includes an expert hotline for fast assistance by phone, competent local service technicians and a wide range of training courses and seminars. All this is rounded off by an excellently sto-

cked spare parts warehouse to guarantee high availability.

## Exclusive cooperation with the HIPF Institute in Riyadh

Arburg cooperates exclusively with the Higher Institute for Plastics Fabrication (HIPF) in Riyadh in order to introduce young people to high-end injection moulding technology. The technical centre of the HIPF offers space for 15 Allrounders and the full infrastructure of an injection moulding company, allowing live presentations.

ARBURG GmbH + Co KG  
D 72290 Loßburg



Proud of ten successful years in the United Arab Emirates (f.r.): Subsidiary Manager Joachim Branz, Waddah Jaara, VAE Sales, Andrea Carta, Director of Overseas Sales, and Gopal Ponnusamy, VAE service engineer. (Photo: ARBURG)

# Three tips for efficient HW IQ for IT systems in cleanrooms



To satisfy GMP requirements in the pharmaceutical industry, all installations, devices and systems have to undergo a qualification process. This forms part of the quality assurance procedure associated with GMP. It also applies to IT systems used within a process, for example in production in the pharmaceutical sector.

Systec & Solutions GmbH can already look back on numerous projects in which the company assisted its customers with hardware qualification and much more besides.

## What is meant by URS, DQ, IQ, OQ and PQ?

Taking a project for the planning and introduction of GMP IT systems as an example, qualification is performed in the following steps:

**URS:** For the installation of IT systems in a cleanroom, a URS (User Requirement Specification) is created at the start of the project. In this, the customer defines the GMP-critical parameters - including those for the IT systems if applicable.

**DQ:** DQ (Design Qualification) is performed on the basis of the URS. This checks whether the hardware quotations received satisfy the requirements stipulated in the URS. Following test procedures and risk analysis, a successful DQ process results in a purchasing contract with the chosen supplier.

**HW IQ:** Once the IT hardware ordered has been supplied and installed, the next step is HW IQ (Hardware Installation Qualification). The purpose of this is to compare the hardware supplied to the hardware ordered. It checks whether all the requirements defined in the URS and the specification have actually been fulfilled.

The functions of the hardware are also tested and documen-

ted in detail as part of HW IQ. This includes the connection of a scanner and correct functioning of the input hardware (keyboard, touchscreen, etc.), for example.

**OQ / PQ:** Subsequent OQ (Operational Qualification) and PQ (Performance Qualification) then involve checking the IT system with the software to be run on it and in conjunction with the overall system process controlled by this.

## Tip 1: Incorporation of GMP requirements from the outset

At the start, it is often difficult to exactly assess the requirements involved in a qualification process for IT systems for use in cleanrooms. Incorporation of the GMP requirements for IT when creating the URS can significantly simplify the qualification process as a whole. Because knowledge of the GMP-critical parameters at an early stage is essential to be able to select IT systems that are suitable for cleanrooms.

## Tip 2: Only consider suppliers of GMP-compatible hardware

Risk analysis has to be performed as part of the hardware DQ process before deciding on a supplier. Narrowing down the number of possible suppliers to those who can deliver GMP-compatible hardware saves time. The GMP compliant configuration and design of the hardware can minimize or even exclude potential risks. This makes it easier for responsible pharmaceutical manufacturers to assess the risks involved.

## Tip 3: Get help with hardware IQ

Following installation and prior to operation, the IT hardware has to undergo a hardware IQ process for GMP system qualification. The first step in HW IQ is to produce a hardware design specification. Based on the systems ordered and supplied, this involves the creation of a test protocol as a template for each device type on the basis of a stipulated test specification.

All documents have to be checked employing the four-eyes principle before and after hardware IQ. Depending on the magnitude of the project, this can give rise to a very extensive overall procedure, as all functions such as correct installation, configuration and communication with peripheral devices have to be checked and documented in the test protocols.

Particularly if time is a critical factor in a project, and parallel processes are necessary, it may well be worth calling in an experienced service provider to carry out hardware IQ. The client can then rely on the service provider to produce the documents and check them before and after HW IQ. The client is only responsible for the



(Image Rights: Systec & Solutions GmbH)

## Three tips for efficient HW IQ for IT systems in cleanrooms

actual checking procedure. The vast amount of coordination and documentation work is reduced.

### How can Systec & Solutions help you?

We would be pleased to assist you with your project from start to finish. Not only can we promise to supply you with guaranteed cleanroom-compatible IT systems that will considerably simplify the qualification procedure, our quality management team would also be pleased to help if you would like support when creating the URS and performing hardware IQ. All our platforms come with full documentation on usage in a GMP environment to make it easier to assess the risks. We can also provide assistance with any neces-

sary re-qualification processes or IQ maintenance as part of HW IQ, as well as with hardware upgrading or hardware retrofitting.



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# GEMÜ honoured as „Global Market Leader“ for 2018 – the third year in a row

The Ingelfingen-based specialist in valves has been awarded the title of „Global Market Leader“ for yet another year, earning the distinction for 2018 as part of the global market leader index of the University of St. Gallen and the Academy of German Global Market Leaders.

For the third time in succession, the German business magazine WirtschaftsWoche has awarded the family-owned enterprise GEMÜ Gebrüder Müller Apparatebau GmbH & Co. KG the WirtschaftsWoche quality seal of „Global Market Leader“, declaring them „champions“ of 2018. In doing so, WirtschaftsWoche has recognised GEMÜ's inclusion in the global market leader index in the segment „Valves and automation components: Valves, Process and Control systems for sterile applications“.

The global market leader index is compiled under the scientific direction of Prof. Dr Christoph Müller of the HBM Unternehmensschule (school for entrepreneurs) at the University of St. Gallen, in cooperation with the Academy of German Global Market Leaders (ADWM). In doing so, objective selection criteria and transparent selection processes are developed to determine the actual global market leaders. The information acquired is then scientifically evaluated and the results are published in a condensed form.

The researchers designate companies as „Global Market Leader Champions“ where they are – among other criteria – represented on at least three continents with their own production and/or sales compa-

nies, have an annual turnover of at least €50 million, are first or second in the relevant market segment, and can demonstrate an export share or foreign share of at least 50% of their turnover. Another important criterion for a company to obtain the accolade of „Global Market Leader Champion“ is to be (owner-)managed with headquarters in the German-speaking region (Germany, Austria or Switzerland).

As a family-owned, owner-managed business headquartered in Ingelfingen-Criesbach (in the German state of Baden-Württemberg), with 27 subsidiaries as well as six manufacturing sites in Germany, Switzerland, China, Brazil, France and the USA, GEMÜ fully satisfies these requirements. In addition to these prerequisites, it was the cutting-edge technology and market leadership in the field of valves, process and control systems for sterile applications that served as a crucial factor for WirtschaftsWoche in awarding the accolade and WirtschaftsWoche quality seal of „Global Market Leader 2018 – Champions“ to GEMÜ.

„We are proud to be represented as a global market leader in the current index and for the third year in a row. This award from WirtschaftsWoche has shown



and confirmed to us that it is truly worth focusing on customer requirements, product quality and the continuous further development of our product range," says Gert Müller, Managing Partner at GEMÜ. „As it is based on scientific methods," he adds, "this award serves as confirmation of GEMÜ's worldwide success and its dominance of the technological market."

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

# Study: Collision of individual atoms leads to twofold change of angular momentum

Thanks to new technology, it is possible to retain individual atoms, move them in a targeted manner or change their condition. Kaiserslautern physicists also work with this system. In a recent study, they investigated the consequences of the collision of two atoms in a weak magnetic field at low temperature. For the first time they have discovered that atoms, carrying their angular momentum in individual packets (quanta), thereby exchange two packets. It was also shown that the interaction strength between the atoms can be controlled. This is of interest for investigating chemical reactions, for example. The paper was published in the journal *Physical Review Letters*.

Until a few decades ago it was unthinkable for physicists to carry out experiments with individual atomic particles. Erwin Schrödinger, one of the pioneers of modern quantum theory, expected “ridiculous consequences” from this idea and described it as similarly probable to raising an Ichtyosaurus dinosaur in a zoo. However, advances in laser technology and atomic physics today make experiments with individual atoms possible.

Physicists around Professor Artur Widera and his doctoral student Felix Schmidt at Technische Universität Kaiserslautern (TUK) are also working on this topic in the Individual Quantum Systems research group. They rely on a so-called Bose-Einstein condensate consisting of rubidium atoms. “In physics, this refers to a state of matter that is comparable with liquid and gaseous states. However, such a condensate is a perfect quantum mechanical state that behaves like a wave,” says Professor Widera. The condensate is comparable to a gas consisting of very few atoms.

In a recent study, together with Professor Eberhard Tiemann of the Gottfried Wilhelm Leibniz University of Hanover, they investigated the effects of a single caesium atom hitting a rubidium atom. To observe the particles, the researchers must first cool them to temperatures just above absolute zero. “We then used optical tweezers to bring the atoms into contact with each other,” says Felix Schmidt. During this process, atoms are retained using laser beams. The researchers have now added a single caesium atom to the rubidium gas to measure what happens before and after the collision of the atoms.

The physicists observed how the particles change their angular momentum during the impact by measuring the state of the indi-

vidual caesium atom before and after the collision. In atoms, the angular momentum of the particles is to a certain extent present in individual packages – so-called elementary quanta. The researchers have now observed that atoms can exchange two such angular momentum quanta at the same time in a single impact. So far, only the exchange of a single package (quanta) has been observed. “This is only possible because we conducted the experiment in a low magnetic field,” says Schmidt. Thus, the energy of the atoms is so low that especially the interaction between the individual elements determines the result of the impact. “This makes it possible for two so-called elementary quanta to be transmitted simultaneously, for example for the angular momentum to change twice,” continues the physicist.

But the scientists also observed another effect. “The weak magnetic field and the low kinetic energy result in the atoms interacting with each other a thousand times larger than the atoms themselves, even at a distance,” Schmidt continues. By changing the strength of the magnetic field, this effect could also be controlled. The effect is directly related to a very large and very weakly bound molecular state between the two particles. “We were able to indirectly observe a huge molecule about two micrometres in size,” said Schmidt.

This knowledge of interaction between particles at very low energies can, for example, help to investigate bonds in molecules. They consist of at least two atoms which are connected by interactions. This would enable, among other things, the preparation and investigation of very large molecules.

The study was published in the renowned journal *Physical Review Letters*: “Tailored single-atom collisions at ultra-low energies.”

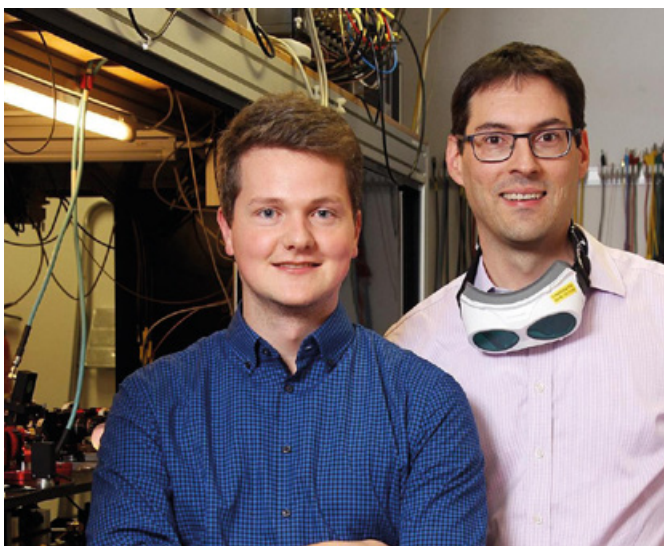
DOI: 10.1103/PhysRevLett.122.013401

<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.122.013401>

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Professor Widera (right) and Felix Schmidt (PHoto: Koziel/TUK)

# DEBURRING EXPO

# Perfect Surfaces – Burr-Free, Clean and Precise



## 3rd Trade Fair for Deburring Technologies and Precision Surface Finishing 8 to 10 October 2019 in Karlsruhe (Germany)

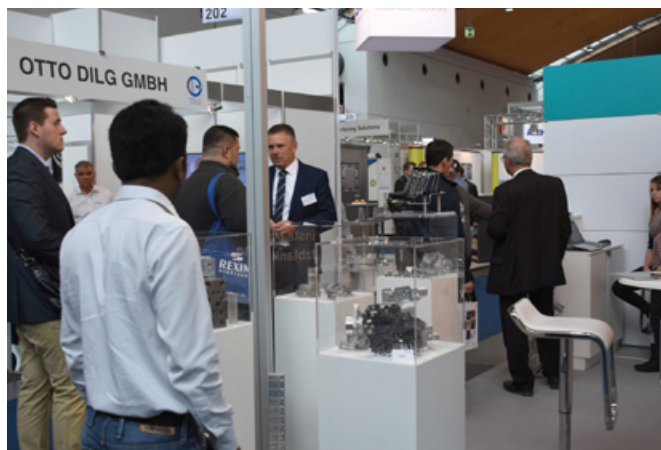
Whether they're required for downstream manufacturing steps or for error-free functioning, surface characteristics are decisive with regard to part and product quality. Processes such as deburring and precision surface finishing are becoming more and more significant as a result – regardless of whether the parts are produced by means of erosion, forming, primary forming or additive manufacturing. DeburringEXPO, the world's only trade fair which deals exclusively with the removal of burrs and the production of precision surface finishes, will be held at the Karlsruhe Exhibition Centre from the 8th through the 10th of October, 2019. Beyond this, the supplementary program including theme parks covering the issues of the "Sheet Metal Deburring Process Sequence", "AM Parts Finishing" and "Cleaning After Deburring", as well as the bilingual expert forum, will offer specialised knowledge and know-how that's unavailable anywhere else in such a compact form.

Surface and edge zone characteristics are decisive with regard to further processing and the functionality of the respective components. Amongst others, these characteristics include coatability and bondability, friction, resistance to wear, sealing performance, noise, smoothness, roughness, improved performance, appearance and risk of injury. "Available manufacturing processes don't make it possible to produce the required workpiece surfaces entirely without burrs. This makes intermediate and downstream processing operations such as deburring, rounding and precision surface finishing more and more important as a requirement for parts manufacturers which decisively influences value creation and product quality," explains Hartmut Herdin, managing director of fairXperts GmbH & Co. KG, promoters of DeburringEXPO. At the same time, manufacturing companies are faced with new challenges resulting from ever stricter specifications and heightened requirements for process reliability and economic efficiency.

As a unique information, communication and procurement platform for deburring, rounding and precision surface finishing, DeburringEXPO will provide a complete overview of current and new solutions and development trends from the 8th through the 10th of October, 2019.

### Cross-Industry, Cross-Technology Portfolio

"As of mid-January 2019, more than 100 exhibitors from ten countries had already made firm bookings for their booth locations.



(Image source: fairXperts GmbH & Co. KG)

The solutions offered by the exhibiting companies are designed to efficiently and reproducibly fulfil current and future requirements for deburring, rounding and precision surface finishing in a great variety of industry sectors," reports Hartmut Herdin. The exhibitor presentations will be supplemented by DeburringEXPO's multifaceted supplementary program which is continuously updated to the ever-changing market.

### Theme Park: Sheet Metal Deburring Process Sequence

The "Sheet Metal Deburring Process Sequence" theme park, initiated together with market leaders and experts from the industry sector, will present the deburring step of the manufacturing process live in action, as well as up and downstream processes such as straightening, measuring and coating of sheet metal parts. Visitors will be able to feed a reference part (made available to them for this purpose) to the individual processing steps such as deburring, rounding and edging. Beyond this, information will also be provided on issues such as the relationship between edge rounding and corrosion protection, methods for measuring radii on rounded sheet metal components, development trends where tools for sheet metal deburring are concerned, automated surface finishing and much more.

### Theme Park: AM Parts Finishing

Industry is focusing more and more attention on additive ma-



(Image source: fairXperts GmbH & Co. KG)

## Perfect Surfaces – Burr-Free, Clean and Precise

nufacturing. Additive manufacturing offers creative opportunities in parts production with regard to shaping, flexibility and individuality. In particular additively manufactured metal components have in many cases already achieved levels equivalent to those of industrial manufacturing, and are now able to compete with conventional processes. Requirements for the surface quality of 3D printed parts are increasing as a result. Required post-processing steps such as cleaning, deburring and coating are thus a significant cost factor and are crucially decisive for industrial use of additively manufactured parts.

DeburringEXPO's exhibitors will present solutions for perfect surfaces in accordance with the specified requirements at, amongst other platforms, the "AM Parts Finishing" theme park.

### Theme Park: Cleaning After Deburring

Oil, grease, emulsions, chips, grinding dust or lapping paste from the production processes still adhere to the component, even if it's been ideally deburred, rounded or polished. Cleaning is thus absolutely indispensable because component cleanliness has a decisive influence on the intended function, as well as on the quality of downstream processes such as bonding, welding, coating and

assembly.

Experts will present solutions and the necessary knowledge at the "Cleaning After Deburring" theme park in order to layout and optimise cleaning processes economically and in accordance with actual requirements.

### Bilingual Expert Forum

As an integral part of DeburringEXPO, the 3-day expert forum has established itself as a highly popular source of knowledge thanks to its character as an advanced training event. The simultaneously interpreted presentations (German <> English) provide visitors with comprehensive knowledge from the fields of deburring and rounding, as well as precision surface finishing, and concerning the special content of the theme parks. Practical examples and benchmark solutions make it possible to gather ideas and inspiration for optimising one's own processes.

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**08th - 10th October 2019: DEBURRING EXPO, Karlsruhe (D)**

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fairXperts GmbH & Co. KG D 72639 Neuffen



Now available:  
[info@reinraum.de](mailto:info@reinraum.de)

# Beviale Moscow: Final preparations for the central platform for the beverage industry in Eastern Europe



- Professionals expected from Russia and neighbouring countries
- Solutions and trends for all beverage segments
- All kinds of packaging solutions on display in the Packaging Innovation Zone

It's all systems go as preparations continue for the fourth Beviale Moscow, to be held at the city's Crocus Expo International Exhibition Center from 19 to 21 February 2019. Beviale Moscow, the central platform for the beverage industry in eastern Europe, achieved impressive record figures in 2018, and the organizers are expecting strong interest from the industry again in 2019. The trade fair adopts a comprehensive approach, reflecting all aspects of the process chain. In special shows as well as the accompanying conference programme, it will also focus on key points such as wine production in Russia, the Soft Drinks and Craft Drinks segments, and also beer and packaging solutions.

## 19th - 21st February 2019: Beviale Moscow, Moskau (R)

The right raw materials and technologies, efficient packaging, logistics and creative marketing ideas ... the comprehensive approach adopted by Beviale Moscow is aimed at beverage manufacturers and dealers, who will find every aspect of the beverage manufacturing process chain reflected there. For the eastern European market, the trade fair offers solutions for every segment: from alcoholic beverages like beer, wine and spirits to non-alcoholic drinks like soft drinks, fruit juices and mineral water, as well as liquid dairy products. Companies from Bavaria, in particular, have the opportunity to expand their international competitiveness by participating in the Bavarian pavilion. "Beviale Moscow is being included in Bavaria's official foreign trade fair programme for the first time in 2019," says Thimo Holst, Project Manager for Beviale Moscow. Participation is sponsored by the Bavarian Ministry of Economic Affairs, and the pavilion is being run in conjunction with project partners Bayern International and the Nuremberg Chamber of Commerce and Industry.

### Pavilion for Wine Production & Manufacturing

The Russian wine industry is one of the most dynamic parts of Russia's beverage industry, which led to the launch of the Pa-

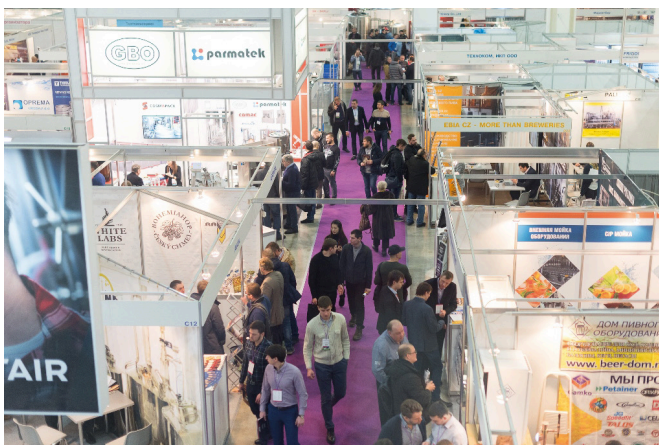
vilion for Wine Production & Manufacturing at Beviale Moscow 2018. This year, too, the trade fair will work with leading players in Russia's wine market – Union of Russian Winemakers, Simple Wine and imVino – to present a special show and conference where topics of current interest will be discussed and new solutions presented. A key theme will be "Future of Winemaking/Wine 4.0", in other words, digitalisation in the wine industry. "The use of new areas, the restocking of old areas, and the change being made to row lengths in vineyards, all result in a greater need for state-of-the-art technologies for cultivation and processing," Holst explains.

### Packaging Innovation Zone

The Packaging Innovation Zone is where Beviale Moscow offers thought-provoking inspiration, background information and proposed solutions for all aspects of beverage packaging. "PET has become an essential part of the Russian beverage industry, but still generates lively discussion," comments Holst. "Even so, other forms of beverage packaging are playing a greater and greater role. We are working with a skilled partner in the form of PETnology, which is very open to the changes in the market. We are deliberately opening up this topic this year, and other packaging solutions will also have a place in the Packaging Innovation Zone." The World Packaging Organisation (WPO) will be there, and will introduce the winners of the WORLDSTAR AWARDS as well as appearing in the conference programme.

### Highlights in the supporting programme: craft drinks, soft drinks, the Russian beer prize and professional development

The CRAFT DRINKS CORNER is an established feature, and will once again display the wide range of beverages produced using craft methods, in collaboration with partner entity Association of Beer and Beverage Market. Smaller breweries and manufacturers of spirits will present their drink specialities and provide opportunities for tasting. The accompanying conference programme will include information for interested parties about the situation on the market and administrative aspects relating to breweries in Russia and eastern Europe, and will offer tips on setting up one's own business in the beverage industry. The subject of soft drinks is





## Beviale Moscow

also an important element in the conference: the Russian Union of Soft Drinks and Mineral Water Producers will report on legislation and legal conditions governing production in Russia, standards and quality aspects of production, and promotion for Russian soft drink exports.

The Russian beer prize ROSGLAVPIVO, first presented at Beviale Moscow 2017 by the Barley, Malt and Beer Union in collaboration with Private Brauereien Deutschland e.V., will once again be awarded on the first day of the trade fair in 2019. The most recent occasion saw 172 beers from 37 breweries submitted. There will be two new awards this year: "ROSGLAVPIVO - Beer Quality Mark" and "ROSGLAVPIVO - Double Gold". Breweries that obtain three or more gold medals in the competition will be awarded the "ROSGLAVPIVO - Beer Quality Mark". In turn, the "ROSGLAVPIVO -

Double Gold" award is reserved for just one brewery, the one whose beer receives the maximum score in all categories from the jury of experts.

Professional development will once again be a key topic at Beviale Moscow in 2019: this will be the fourth occasion that the three-day VLB Seminar for Microbrewers will be held, organized by the Versuchs- und Lehranstalt für Brauereien (VLB, Research and Teaching Institute for Brewing, Berlin). It will overlap with the trade fair, from 18 to 20 February 2019, and will be devoted to specific technological and qualitative aspects of the brewing industry. The focus will be on imparting knowledge, networking, and professional discussion on the subject of craft beer.

NürnbergMesse GmbH D 90471 Nürnberg

# Digital Therapy Monitoring: Schreiner MediPharm to Present Smart Packaging Solution for Vials



## Schreiner MediPharm at Pharmapack 2019 in Paris, Hall 7.2, Booth B32

Schreiner MediPharm's trade fair presentation at Pharmapack 2019 in Paris will be fully focused on smart packaging solutions. On February 6 and 7, in Hall 7.2, Booth B32, the specialist for innovative labels and marking solutions with value-added benefits will showcase its latest product development in the field of digital therapy monitoring: The new "Smart Vial Kit" enables electronic tracking and monitoring of medication dispensing and intake.

Schreiner MediPharm's innovative Smart Vial Kit is a multi-vial box covered with a cardboard layer of continuously numbered, perforated areas corresponding to the individual compartments. When the user opens a perforation at the starter tab the removal of the vial will be tracked by means of integrated, printed electronics. For the purpose of tracking, data are generated in real time - such as the exact removal time, the compartment from which the vial was removed and the respective medication. All data are automatically stored in the smart packaging and can be read via a smartphone app using NFC (Near Field Communication) or Bluetooth and transmitted to a data platform for further analysis. As a

result, the medication dispensed to a patient can be precisely tracked and monitored.

The Smart Vial Kit can be optionally complemented by temperature monitoring which is particularly important for temperature-sensitive, liquid substances such as biopharmaceuticals. Additionally, via the associated app, diverse information can be exchanged or a reminder function integrated. The Smart Vial Kit is well-suited for use in clinical trials: Due to the solution's medication adherence monitoring capability, enhanced and more reliable data quality is achieved. Compared with conventional, manual monitoring, the digital tool reduces documentation requirements, provides greater flexibility in adapting trial designs and reduces the trial period before the new medicine is approved. The smart packaging technology is also adaptable to other primary containers such as syringes. Instead of cardboard boxes, blister packs containing several containers can be equipped with the technology as well.

Other product highlights to be showcased at Schreiner MediPharm's trade fair booth will include the Smart Blister Pack for enhanced medication adherence by patients, an NFC label for digital authentication of autoinjectors, and UV and light protection labels for active ingredient protection of liquid medicines in glass containers.



With the Smart Vial Kit dispensing and intake of medications can be electronically tracked and monitored.

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

Schreiner MediPharm  
D 85764 Oberschleissheim

# Portal Instruments and Gerresheimer to present at Pharmapack 2019



Portal Instruments, a medical device company developing a connected needle-free drug delivery system, and Gerresheimer, a leading global partner in the pharma and healthcare industries is pleased to announce a joint talk, *New Meets Old: Challenges and Solutions with Developing a Custom Primary Container*, to be given on Wednesday, 6 of February at 10:00 a.m. CET at the Paris Expo, Porte de Versailles in Paris. Andrew Coats, VP of Engineering Portal Instruments, and Dr Wenzel Novak, Senior Global Director Business Development Gerresheimer Bünde GmbH, will lead the presentation.

Portal Instruments' highly innovative system consists of a reusable, connected jet-injector and a disposable, pre-filled COP cartridge. The system is designed to allow patients to self-administer medications on demand and at home without the hassle and complication of traditional needles — improving the experience for patients on chronic therapies. Portal will be showcasing its connected needle-free drug delivery system at booth B14 at Pharmapack, Paris (Porte de Versailles).

Portal and Gerresheimer have jointly developed the system's disposable COP cartridge. Portal chose Gerresheimer as a partner for the cartridge based upon Gerresheimer's experience in the development

and production of COP primary packaging products such as the Gx RTF ClearJect needle syringe. Gerresheimer will be showcasing its polymer syringes at booth B62 at Pharmapack.

Pharmapack 2019 takes place February 6 - 7, 2019 in Paris. Pharmapack is dedicated to drug delivery and pharmaceutical packaging with key industry players attending from all over the world.

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

Gerresheimer AG  
D 40468 Düsseldorf



# Tried and tested engineering for ATEX areas

The GEMÜ 1205 electrical position indicator in a flameproof enclosure is based on tried and tested engineering for use in demanding ambient conditions.

With the GEMÜ 1205 electrical position indicator for linear actuators developed specifically for use in ATEX areas, GEMÜ has relied on application-focussed design with the use of tried and tested engineering. The position indicator has a robust design combined with an aluminium flameproof enclosure and the ignition protection type „increased safety“. In addition, all interior movable components are also designed for a long mechanical life.

The GEMÜ 1205 electrical position indicator has continuously adjustable micros-

witches for recording end positions, with which the closed and/or open position can be reliably recorded with a valve stroke of 2-70 mm.

The electrical position indicator is designed for demanding applications in category 2, zone 1 and/or zone 21 ATEX areas, as well as for robust use at low temperatures down to -20 °C.

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



# Tablets in cleanrooms



## Just a trend or really useful?

Tablets have become a part of everyday life, both at home and in the business world. But does a Tablet make sense in a cleanroom or hygienic environment? In which cases would a permanently installed or mobile HMI system be better? There is no single answer to these questions, because it always depends on the processes and situations involved. In the following, Systec & Solutions GmbH explains the points to consider when deciding for or against a Tablet.

### How often do my workers have to use the Tablet, and how do they use it?

Whether or not using a Tablet makes sense primarily depends on how often and how intensively your employees have to work with the Tablet.

The more your workers have to input every day, and the more information has to be displayed at the same time, the less suitable a Tablet is, as it normally only has a roughly 10-inch display. Do not forget that the keyboard of a Tablet always appears on the display and so takes up space. A Tablet could nevertheless be useful with the addition of an external keyboard.

### How is the Tablet integrated into the work process of my users?

The mobility of a Tablet is both an advantage and a drawback. It can and has to be carried back and forth between different workstations.

If employees are using a scanner at the same time for example, they will not have a hand free for making entries. Generally speaking, one-hand operation is difficult and means that shelves have to be provided for setting down the Tablet at places where workers have to make entries. Employees can also be distracted if using the Tablet whilst walking.

On the other hand, workers are completely free to move with a Tablet and can take it to where it is required. And so just

one device can take the place of multiple permanently installed units. That reduces investment costs.

### Which applications/software are to be displayed on the Tablet?

Tablets are not particularly suitable for the visualization of DCS, MES or ERP systems, as the display is not big enough. We recommend using HMI systems with larger displays in such cases. The current trend is towards 24-inch HMI systems. Tablets are a good alternative for paperless documentation or for track & trace quality checks, for example.

### And how about the ergonomics for my users?

Housed in a fully encapsulated stainless steel casing, a Tablet is ideally suited to cleanroom applications. This type of casing however also makes it heavier. Carrying the device around and constantly entering data with one hand whilst standing mean that this is not an ergonomic solution over the course of time. We advise providing shelves or table and wall mounts for setting down the Tablet to reduce employee posture problems.

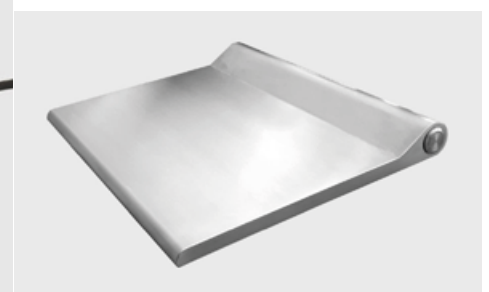
The only way to achieve ideal ergonomic workstations is to use height-adjustable, mobile HMI systems equipped with a flexible keyboard and non-reflecting displays. These can be perfectly adjusted to suit each worker.

The question of thorough cleaning is a prime concern when choosing a Tablet for cleanroom use. Commercially available Tablets have a plastic casing with numerous recesses and openings for connections, speakers or fans where dirt can ingress into the Tablet. Complete wipe or spray disinfection is not possible. Not to mention the fact that the surface of the casing is not suitable for regular cleaning with corrosive agents and becomes slightly rough.

Another aspect is the amount of time your employees have to spend on cleaning to ensure the Tablet does not present any risks. The less suitable the chosen Tablet is for cleanroom applications, the more time-consuming thorough everyday cleaning becomes. Protection class IP65 means that the Tablet can be used in a cleanroom, but gives no indication of how easy it is to clean. Complete, highly efficient cleaning can only be achieved with Tablets designed to satisfy cleanroom standards.

### How are Tablets charged?

When choosing a Tablet, it is tempting to just concentrate on its suitability for cleanroom use. No thought is often given to the power connection or the charging station. This does however tend to be the weakest point in terms of hygiene. Although Tablets with protection class IP65 and above are available on the market, some of the associated charging stations do not conform to any protection class whatsoever. Charging inside a cleanroom is thus not possible or is a potential source of risk. So, when buying it is imperative to find out



## Tablets in cleanrooms

about the corresponding charging system as well.

In constant use without any means of charging, the battery of a Tablet will not last out a full shift. A Tablet also requires time for charging between shifts. It is therefore important to plan a sufficient number of charging points at your workstations. One battery charge is sufficient if the Tablet is not used much in the course of a shift.

### Can I save money by opting for a cleanroom Tablet?

One major advantage of a Tablet is that it is initially a much smaller investment than a permanently installed HMI system. Over the long term, however, it is important to remember that Tablets have shorter product and service life cycles. They are not designed for constant industrial usage. Replacing a Tablet may also mean having to undergo a new qualification process on account of ongoing modifications to the models.

### Does a Tablet make sense for my cleanroom?

To sum up, it makes most sense to acquire a Tablet for a cleanroom if users only have to confirm or make entries at various stations now and again. The more entries that have to be made, and the more sustained use is planned, the better it is to have permanently installed or mobile HMI systems with keyboards and larger displays. Before making a decision, we advise you to weigh up the investment costs and operating costs of Tablets as compared to permanently installed or mobile HMI systems.

If you decide to use a Tablet, ergonomic aspects have to be taken into consideration. As Tablets have to be set down to make entries, suitable mounts or shelves have to be provided. Sufficient devices and charging points have to be planned in

accordance with the usage time and number of shifts involved. To ensure safe and reliable operation under exacting hygiene conditions, there is no alternative to devices with stainless steel casings developed specially for cleanroom applications. These are designed for use in class D, C and B cleanrooms and permit efficient cleaning.

The following overview lists the advantages and disadvantages of the various options for ease of comparison:

#### Applications

- Tablet
  - DCS - Not suitable
  - MES - Not always suitable
  - ERP - Not suitable
  - Paperless documentation - Suitable
  - Track & Trace - Suitable
- Mobile HMI system
  - DCS - Suitable
  - MES - Suitable
  - ERP - Suitable
  - Paperless documentation - Suitable
  - Track & Trace - Suitable
- Permanently installed HMI system
  - DCS - Suitable
  - MES - Suitable
  - ERP - Suitable
  - Paperless documentation - Suitable
  - Track & Trace - Suitable

#### Mobility

- Tablet - Full mobility possible
- Mobile HMI system - Full mobility possible
- Permanently installed HMI system - Not mobile

#### Investment costs

- Tablet - Low, as lower price and use at various stations possible. No installation costs necessary
- Mobile HMI system - Moderate, as one device can replace different fixed installed devices. No installation costs necessary
- Permanently installed HMI system - High, as each station requires its own HMI system and installation costs are necessary

#### Operating costs

- Tablet - Moderate, on account of shorter product and service lives
- Mobile HMI system - Low, as long-term use is possible
- Permanently installed HMI system - Low,

as long-term use is possible

#### Ergonomics

- Tablet - Poor to moderate, as dependent on shelves/corresponding table or wall mounts for setting down
- Mobile HMI system - Good, as large display and keyboard can be ergonomically adjusted to the user
- Permanently installed HMI system - Good, as large display and keyboard can usually be ergonomically adjusted to the user

#### Cleaning

- Tablet - Depends on model. Guaranteed with cleanroom-compatible models. Critical with commercially available models.
- Mobile HMI system - Good, as specially developed for cleanrooms
- Permanently installed HMI system - Good, as specially developed for cleanrooms

### Are you planning to use Tablets or HMI systems in your cleanroom?

Systemec & Solutions would be pleased to explain the advantages and disadvantages of the various options in relation to your particular requirements. So you can be sure of finding the ideal solution for your users.

Systemec & Solutions can supply a stainless steel Tablet casing designed specially for cleanroom requirements. This can accommodate a Microsoft Surface Tablet, for example. The company can also provide further casings for other models on request. The casing is fully enclosed and has a magnetic charging connection and on/off switch conforming to IP65. Simple and efficient cleaning are thus guaranteed.

The well-established WAVE and PILOT HMI systems are available both as a mobile solution under the name TROLLEY and as permanently installed units on a variety of support arms.



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# Arburg Italy: New subsidiary manager

- Raffaele Abbruzzetti heading up Arburg Srl in Peschiera Borromeo from 1 January 2019
- Björn Norén starting his well-earned retirement
- Further expansion of partnership between Arburg and Sverital

On 1 January 2019, a new subsidiary manager took over at Arburg's Italian subsidiary in Peschiera Borromeo: Raffaele Abbruzzetti was appointed to the role as the successor to Björn Norén, who retired from his position at Arburg at the end of 2018. In spite of his retirement, Björn Norén will continue to be involved with the company via his family company Sverital, a long-term automation partner of Arburg in Italy. The companies also intend to build on this successful partnership in the future.

Raffaele Abbruzzetti joined Arburg Srl in November 2018 and has worked closely with Björn Norén to prepare for his new role. To guarantee a smooth transition for customers, Björn Norén will remain available to his successor in an advisory capacity for some time after the official handover at the start of 2019.

## Highly qualified for managing the subsidiary

Raffaele Abbruzzetti graduated from university with a degree in electrical engineering and has many years of experience in the



Raffaele Abbruzzetti heads the Arburg subsidiary in Italy from 1 January 2019.  
(Photo: ARBURG)

sale and servicing of industrial systems in the packaging sector. The new subsidiary manager has been closely involved in a number of projects and is an experienced and successful salesman, both in commercial and technical fields. In addition to his native Italian, he speaks fluent German and English. His personality and professional achievements to date make the new subsidiary manager a great fit for Arburg and this leadership position in the Italian market.

## Handing over a successful organisation

Raffaele Abbruzzetti has inherited an exceptional team from his predecessor Björn Norén, who has successfully established and expanded the subsidiary over the past 25 years. The team is comprised of 37 Arburg employees and 14 sales representatives for the nine sales regions. Björn Norén's career with Arburg in Italy spanned a period of 40 years, during which the expert applied his technical and commercial knowledge, solid market experience and large industry network to help Italy become Arburg's largest European market.

## Arburg to focus on turnkey solutions and digitalisation

Since 1957, Arburg has been working with Sverital, a company which is now managed by the third generation of the Norén family. For many years, the partnership between the companies has been a gateway to the Italian market, enabling both parties to venture into areas such as turnkey solutions. In the future, the partnership between Arburg Srl and Patrik Norén and his father Björn will not be limited to automation, but will be expanded to incorporate the future market of digitalisation – to highlight the potential of Industry 4.0 to Italian customers and develop individual solutions for this market.

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