Components used in space missions have to be extremely clean. Over the last few years, Fraunhofer IPA has made a name for itself, especially concerning systems that not only clean things but are also capable of supplying exact information about the quality of their work. To achieve this, the Stuttgart-based institute has a range of highly-precise analysis devices at its disposal. It also has the world's most sophisticated cleanrooms.

Electronics and Microsystem Technology

A clean take off into space

Author: Klaus Jacob

ExoMars Rover (Source: ESA)

It all started with a surprising request. The European Space Agency ESA wanted to know if Fraunhofer IPA was capable of sterilizing diverse components for a mission to Mars. Udo Gommel, head of the business unit »Electronics and Microsystem Technology«, didn't see much of a chance of being given the opportunity to tackle this challenging task. That's because he wasn't the only person who had been asked. Neither did he have any experience in the aerospace business. »Being a manufacturing specialist, I really didn't think they'd be interested in me«, he recalled. However, he did know a lot about cleaning delicate electronic components that are used in the semiconductor industry and in medical engineering, for example. He also had the advantage of working at a place where one of the world's best cleanroom laboratories is located. And that's what finally tipped the balance: he got the job. That was seven years ago. Meanwhile, space travel has become a focal point of his business unit. At the moment, over 20 projects are running on a range of topics. »Once you've gained a foothold in the industry, more and more people take an interest in you«, said Dr. Gommel. Whenever there's a particularly difficult challenge to be tackled, when commercial solutions don't work and research is called for, that's when the team from Stuttgart comes into play.

A clean take off into space

Safety first

In space travel, safety is the top priority because peoples' lives are at stake – and a lot of money, too. If a plane crashes, hundreds of passengers die. And a space mission often costs as much as a whole skyscraper. Because an unmanned space probe can't be repaired once it's been launched, a fault in a component costing just a few cents could lead to a total disaster. Then all the hard work would have been for nothing and the scientists would have to wait for years before they got the chance to try again. »Failure is not an option«, is what they say in the space industry. Not a single component or aggregate may fail. Contamination is one of the main causes of failure because dirt is regarded as poison for all materials: it can jam the mechanics, cause a short or damage electronics. Things get tricky if this concerns a probe that should search for signs of life on a distant planet. And that's what the European Mars mission »ExoMars« is all about, which is still keeping the experts in Stuttgart busy today. »ExoMars« is due to take off in 2018: a landing module will land on a neighboring planet from where it will launch a vehicle about the size of a Smart. In order for its sensors to function reliably while searching for traces of life, it may not be contaminated with any organic material from Earth. Otherwise, it will suffer the same fate as its American predecessor »Curiosity«, which announced success back in 2012. For months, experts used their on-board equipment to analyze the substances they had found, until they came to the conclusion that it was a false alarm: the devices had detected contamination from Earth. Consequently, to avoid such a mishap from happening again, each component has to be absolutely free of microorganisms. Not even residues of dead microbes may be stuck in crevices. Such pedantry has since become an integral part of space travel for economic reasons, too. In the »Planetary Protection Program«, institutions such as ESA and NASA have pledged not to introduce any germs from Earth to other planets. Additionally, they have to make sure that no hazardous substances of extraterrestrial origin are brought back to Earth – if a return flight is planned, of course. The euphoric scenes, such as those seen in 1969, would never take place today. Back then, the first astronauts who traveled to the moon were embraced by elated people just after their return. And the space travelers also presented a box containing lunar rocks to Richard Nixon, who was President at the time. Now there is a specially-trained »planetary security officer« to make sure that such scenes aren't repeated and that all rules and regulations are strictly upheld. He's a regular visitor to Stuttgart these days.

The cleanest cleanroom in the world

In order to fully sterilize the Mars rover, the experts in Stuttgart designed a cleanroom for ESA which has since been erected in Noordwijk in the Netherlands, where the headquarters of the European Space Research and Technology Centre (ESTEC) is located. Such thorough cleaning procedures can only be carried out in a cleanroom because huge numbers of dust particles present in the air would otherwise recontaminate the components immediately. The world's most sophisticated cleanroom is located at Fraunhofer IPA. It fulfills the highest cleanliness standards - ISO Class 1, meaning that a maximum of 10 particles just 0.1 micrometers in size may be contained in one cubic meter of air. An ISO Class 9 cleanroom, one of a comparatively much lower level of cleanliness, would contain 109 particles, i.e. one billion times more. In the air normally found in a town, around 1013 particles are suspended in each cubic meter of air; when there's smog, there are even more. To maintain this highest cleanliness class, a huge effort is required. Visitors notice this as soon as they walk into the IPA building: immediately behind the door, a knee-high bench stops them from walking any further. Before they are allowed to step

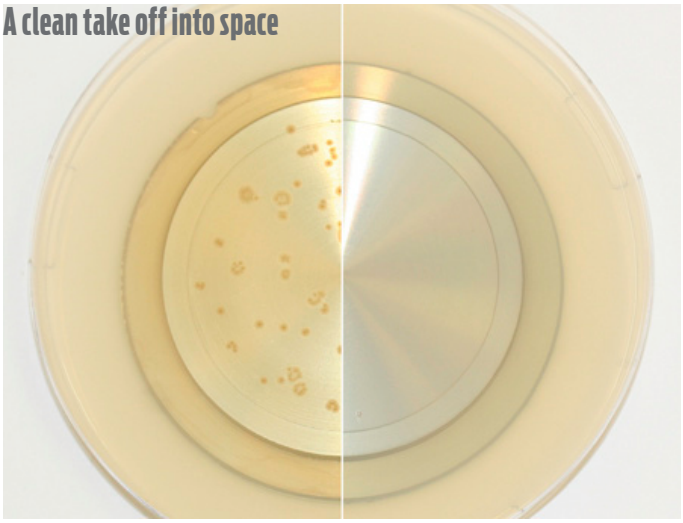
Pre-cleaning a heavy satellite component (Source: Fraunhofer IPA)

Ein Ventil für den Mars-Rover

Das Fraunhofer IPA kümmert sich in der Luft- und Raumfahrt nicht nur um die Reinigung, sondern steuert erstmals auch ein eigenes Bauteil bei: ein besonderes Ventil, das am Institut entwickelt wurde. Allerdings dachte dabei zunächst niemand an die Raumfahrt. Damals suchte ein Hersteller von Mikrosystembauteilen nach einer Möglichkeit, sehr kleine Mengen Klebstoff aufzutragen, ohne dass der Kleber nachtropft. Die IPA-Experten fanden eine recht einfache Lösung: Ihr patentiertes Ventil besteht lediglich aus einem magnetischen Ring und einer Metallkugel, die sich in das Loch schmiegt. Drückt man Klebstoff heraus, klappt die Kugel zur Seite und macht die Öffnung frei – lässt der Druck nach, zieht der Magnet die Kugel zurück, sodass sich die Öffnung wieder schließt. Ein solches Ventil, das sich in ganz unterschiedlichen Größen herstellen lässt, eignet sich nicht nur für Flüssigkeiten, sondern auch für Gase.

Einem Gast aus der Raumfahrt, der im Institut zu Besuch war, fiel das Ventil auf, das in einer Vitrine stand. Er dachte sofort an einen Einsatz bei der ExoMars-Mission. Der Rover verfügt über einen Behälter, in dem Proben von Mars-Gestein untersucht werden sollen. Um Kontaminationen auszuschließen, soll dort immer ein leichter Überdruck herrschen. Allerdings kann man die Box nicht einfach fest verschließen, denn nach dem Start der Rakete fällt der Außendruck rapide. Die Box würde regelrecht explodieren. Man muss also einen Weg finden, den Druck gezielt abzulassen. Dafür eignet sich das IPA-Ventil hervorragend. Denn es ist unkompliziert, leicht und braucht keinen Strom. Derzeit versuchen IPA-Experten, ihr Baby für die Raumfahrt zu adaptieren.

A clean take off into space



Assessing the microbacterial sterility of a component to protect planets from contamination by germs. (Source: Fraunhofer IPA)

NFC tags for tracing component cleanliness (Source: Fraunhofer IPA)

over it, they have to put on plastic overshoes. Smoking is prohibited throughout the building. Despite these precautions, the particle count is only reduced by the factor of 10.

The actual cleanrooms, which can only be entered via locks, are hermetically sealed like a house within a house. You can watch the scientists in their sterile suits as they work behind high walls made of glass. Inside, the air pressure is slightly higher, which stops any unfiltered air from getting in. A laminar airflow, which is introduced via the ceiling and extracted via the floor, prevents any dust particles from remaining in the room. With an airflow of 50 centimeters per second, the complete volume of air contained in the room is exchanged within seconds. Any particles that might be generated when a scientist rubs his gloves against one another, for example, disappear straightaway through the perforated floor. To prevent turbulences, which would impair the air exchange, the engineers work without the aid of an overhead crane. The entire ceiling is made up of filter elements. And the floor is raised to enable the air to be extracted effectively. In this ultra-clean environment, you can even measure how much abrasion is generated when a robot arm or a cable is moved. The only other ISO Class 1 systems in the world of this kind are located in Holland and Romania. Both were designed by experts from Fraunhofer IPA but the cleanrooms in Stuttgart are the largest. The most imposing one is 6.50 meters high. Its raised floor can bear loads of up to 6 tons per square meter, making it unique throughout the whole world.

Carbon dioxide snow and ultrasound processes

To sterilize the Mars rover, a technique developed at Fraunhofer IPA and for which a patent is pending, proved to be the most effective option. It's actually the further development of an existing process. The technique was originally implemented in the USA to remove paint from the bodies of aircraft. A hard jet of frozen carbon dioxide crystals the size of rice grains is used to practically blast off layers of paint from the metal surface. The team of experts in Stuttgart have since comprehensively refined this rough tool. Instead of ice crystals, they use carbon dioxide snow. The trick: the jet emitted from the nozzle is additionally accelerated by a jacketed jet of nitrogen, thus allowing it to penetrate into crevices and remove the smallest traces of contamination. As soon as the tiny snowflakes impact on the relatively warm surface, they are converted to gas at an explosive rate, which increases their volume by around 800 times. The detonation pressure blasts any traces of contamination away immediately, even fingerprints, which are made brittle beforehand by the cold gas. The only disadvantage is that carbon dioxide is expensive. It costs 1000 Euros to produce just 30 kilos – and they're used up after just ten minutes. To make life easier, Fraunhofer IPA has installed a supply system, which alone cost 800,000 Euros to build.

Blasting with carbon dioxide is just one way of cleaning industrial components. There are about three dozen other methods, which Fraunhofer IPA is currently spending a lot of money on to improve. These range from wiping and rinsing steps to plasma-based cleaning processes. Some techniques, such as ultrasound, only work in combination with moisture or a liquid, making them unsuitable for cleaning electrical or electronic components. Others, such as the carbon dioxide technique, are dry-cleaning processes, which makes them especially gentle. There are rough and fine cleaning steps, pre-cleaning and final cleaning processes. The method that is finally chosen depends on the level of cleanliness required and the type of component involved. The semiconductor industry has the highest requirements, thus making it the pacemaker for cleaning technologies. The reason for this is because structures on chips are so small nowadays that a particle just a few nanometers in size is enough to cause a short. In the automotive industry, requirements aren't quite so high. Here, only particles upwards of 200 micrometers are considered to be critical, with metallic contamination causing the most problems. Space travel requirements lie somewhere between these two, with particles upwards of one micrometer usually being the most problematic.

Million-Euro component: cleaning in record time

However, the aerospace industry is fussy about other things. Each component is produced singly, from aluminium frames to tiny washers. There's no assembly line in this profession. Furthermore, every processing step has to be carefully documented. Here, NFC tags should make life easier in the future. They record information about the processing state of each individual component. This enables every step in the history of even the tiniest screw to be reconstructed, from its fabrication right till its final assembly. It's the only way to find out the exact cause of a failure. Of course, just cleaning components isn't enough. After that, they have to be packaged to prevent them from getting dirty again. That might sound trivial but this is also a very demanding task because particles could become detached from packaging materials and cause re-contamination. Special containers made from high-grade steel have proven to be the best answer. Sometimes components lie dormant inside them for years before a satellite is finally launched.

The amount of work carried out by the experts to clean components could be seen last November. Fraunhofer IPA had to clean 13,000 parts of an Earth observation satellite. The largest component

A clean take off into space

was an aluminium segment that had been cut from a block weighing 200 kilos. The delicate structure had to be cleaned very carefully to prevent even the smallest amount of damage from occurring. This aluminium structure alone involved a huge effort on the part of the institute's employees. To pre-clean the heavy component, the filter ceiling of the cleanroom would have had to have been removed to install an overhead crane. But this would have impaired the optimum airflow required. The answer was to construct a temporary decontamination cell, which not only met stringent cleanliness demands but also solved the load problem. Things had to be done fast to prevent the tight time schedule of the project from being endangered; the temporary cleanroom the size of a small house was erected within the space of a week.

The broad spectrum of services offered by Fraunhofer IPA also enables additional processing steps to be carried out on site if necessary, such as painting. This does away with having to transport components from one place to another and excludes the risk of them becoming re-contaminated in the process. A lot of work is also needed to assess the quality of cleaning processes. If particles in the micro- or nanometer range are involved and information about their exact number is required, highly-precise equipment is called for. In this regard, Fraunhofer IPA spares no expense. A fully-automated field emission scanning electron microscope is capable of detecting even nanometer-sized particles. It can scan a component the size of a mobile phone and count the number of particles adhering to its surface. Stuttgart has a scanning electron microscope in Stuttgart, which scans surfaces with a tiny needle. It also has a thermodesorption gas chromatograph coupled with a mass spectrometer for finding the tiniest traces of organic contamination.

Establishing practicable standards

Only with such enormous efforts can optimum cleaning methods be developed for special applications and different cleaning processes be compared with one another. That's why the scientists from Stuttgart are on the relevant committees in charge of standardizing cleaning methods. Dr. Gommel works for ISO, the International Organization for Standardization, as well as for ECSS, the European Cooperation on Space Standardization. In addition to these, he's a member of the work group »Cleaning«, where he is responsible for the guideline sheet »Ultra-precision cleaning for flight hardware«.

Fraunhofer IPA also supports many other major branches of industry in different areas, such as the power industry. A reliable energy supply is essential to a mission's success. The most recent example of this is when the signal to the mini-lab »Philae« was lost due to a lack of power shortly after it landed on the comet »Chury«.

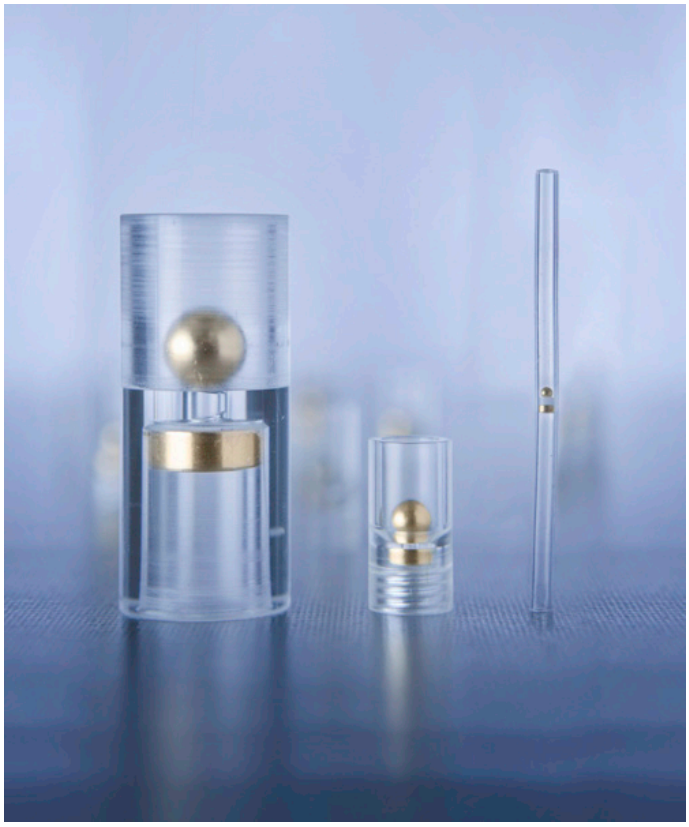


Figure 4: IPA.Valve – The magnetically-controlled valve (Source: designarmada, Photo: Jens Kramer)

If you talk to Dr. Gommel about the role of Fraunhofer IPA in space travel, he sees it as being a »hidden champion«. That's how he felt seven years ago when ESA chose him instead of any of the other competitors on the scene. And that's still the case today. Because a hidden champion isn't just a secret winner but also an unknown world market leader.

Fraunhofer IPA

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Figure 5: Reliable energy supply – an absolute necessity for space travel (Source: Fraunhofer IPA, Photo: Heike Quosdorf)

Future issue: Cleanroom compatibility f all types of equipment

Cleanzone 2015: Nanotechnology leads to stronger cleanroom standards

27th - 28th October 2015: Cleanzone 2015, Frankfurt am Main (D)

The disciplines are converging: first it was mechanics and electronics that grew closer together – now it is the turn of semiconductor-electronic and optics components and sub-assemblies. Optoelectronic hybrids are putting even greater demands on cleanroom technology. The first order of business is reducing airborne particulate matter – efforts which have targeted particles as small as in the 0.1 micrometre range to date. It is also essential to avoid contamination by films, for even a layer just one atom thick can make it difficult to apply the next, functionally important layer. In optics, this might be a so-called T-layer, for example, which serves to prevent objects appearing doubled through a pane of glass or a lens. If there is a hydrocarbon layer (no matter how thin) beneath this T-layer, it is almost inevitable that the functional layer will end up flaking off at some point. Biosensors, which are used for such things as the continuous monitoring of signals from the human body (e.g. blood lipid values), cannot tolerate any impurities between their chemical sensors and the downstream actuators, detectors and amplifiers.

The coming "nano-standard"

As microtechnology becomes nanotechnology, the production of components and sub-assemblies is increasing the requirements for cleanroom technology. The acronym NEMS (nanoelectromechanical systems) is already a common counterpart to MEMS (microelectromechanical systems); now NOEMS (nano-opto-electro-mechanical-systems) is taking off as well.

People are already discussing structures as small as five, or even three, nanometres in size within microelectronic components and sub-assemblies, so it is clear that cleanroom technology must also focus on airborne particulate matter smaller than 0.1 micrometres. This has been almost a ‚magical' threshold until now, so VDI 2083, the relevant guideline from the VDI (Association of German Engineers), is likely to be revised in the near future. This much is already clear: even if the ‚new' guidelines do not contain any comprehensive physical theory of nanoparticles, they are certain to cover fields which go beyond cleanrooms of the familiar ISO classes. Classifications will become more precise, and the manufacturers of measurement technology will be revamping their equipment in accordance with the new nano-standard, perhaps even adding new technology. It will, however, be more difficult to interpret the results than it is with particle sizes above the 0.1 micrometre threshold.

Question for the future: Compatible or not compatible?

One thing that is sure to be even more of an issue in the field of microelectronics over the coming years is the cleanroom compatibility of all types of equipment. While air purity is closely monitored and people are always recognised as a significant source of particulate impurities, machines in (unstaffed) cleanrooms can also introduce a great deal of impurities – particularly in comparison with the extremely strict requirements for nano-opto-electro-mechanical-systems and components. It is also possible, however, that an external cleaning service might be afraid to risk damaging the machines, and not clean these properly as a result. This is even understandable. In cases such as these, training is necessary, both regarding the equipment set-up and the cleaning procedure: where are sensitive components installed? Which cleaning agents and materials can be used?

There will be an opportunity to discuss these issues, nanotechnology and its implications for cleanroom technology, innovative measurement technology and much more with other professionals in Frankfurt am Main at Cleanzone, the international trade fair and congress for cleanroom technology, which will be taking place for the fourth time on 27 and 28 October 2015. In addition to the manufacturers' newest products and innovations, visitors will be able to find out the latest information on the planning, construction and operation of a cleanroom.

cleanzone

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Dear readers, dear subscribers,

now it's June 2015 and we have a lot of interessting news and a lot of interesting events for your appointment calendar.

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Yours sincerely

Reinhold Schuster

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Reverse Osmosis with additional brine stage

PW-System-Konzentratstufe ©Werner GmbH 2015

In most sectors of the pharmaceutical industry, pharmaceutical water (PW or HPW) is required in different amounts. The daily requirement varies depending on company size, production capacity and process controls from a few liters 100 liters to 100,000 and more. Modern pharmaceutical water systems are based solely on the membrane separation process of reverse osmosis. Here the solvent water is withdrawn through the semi-permeable membrane of the pre-treated potable water. This process results in up to a 10-fold concentration of all substances in the water before the RO membrane. With a lack of pretreatment (usually softening and filtration <5 µm) this concentration leads to a blocking of the membrane by "scaling".

For this reason the reverse osmosis systems have been operated with a maximum recovery of 75 % (ratio of permeate: concentrate) for many years.
With the most potable water sources in Germany the recovery can also be increased to 80 or even 85%. If the life cycle of a pharmaceutical water system in terms of operating costs examined more closely, it turns out quickly that the running cost per cubic meter of purified water are largely formed by the fed potable water (in many cases up to 70% per m³ Purified Water).
By this reason, Werner GmbH designs after a detailed cost analysis already in the budgeting phase an additional brine stage (downstream membrane separation process) in order to increase the recovery of the reverse osmosis depending on the quality of drinking water to 90 or even 95%.
In a recent realized project (6 m³/h Purified Water), taking into account the additional investment costs with an amortization period of the total investment of 10 years over the life cycle at a current water price of 4.20 EUR / m³ nearly 80,000 EUR have been saved.

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The Global Label Industry's Technical Oscar

„World Label Award 2014" Goes to Pharma-Tac Plus Label from Schreiner MediPharm

The Pharma-Tac Plus label from Schreiner MediPharm has won the „World Label Award 2014" in the category „Innovation". The innovative and sophisticated design of the multifunctional label for infusion bottles has received several recognitions already. The renowned World Label Award is bestowed by the „L9" – a global alliance of label associations – on an annual basis and is considered the Technical Oscar of the international label industry.

The award-winning Pharma-Tac Plus label convinced the „L9" panel of judges because of its sophisticated combination of booklet label, hanger and detachable label parts. The labeling solution for infusion bottles offers sufficient space for extensive information, ensures stable suspension, and allows reliable documentation of administered medications. The paper booklet that is securely connected to the plastic base label provides sufficient space for information on ingredients and instructions for use in several languages. Thanks to a starter tab, it is easy to open and reseal again. The robust hanger is part of the label and is easy to separate from the label construction for activation. Detachable documentation parts, which are easy to remove, even wearing gloves, ensure reliable traceability of the infusion in patient records. „The special design of the Pharma-Tac Plus label optimizes processes of healthcare personnel and improves patient safety at the same time. Another advantage for drug manufacturers: The intelligent labeling solution enhances the final product and is easy to integrate into existing manufacturing processes," says Ann L. Merchant, President of Schreiner MediPharm.

The Pharma-Tac Plus label continues its success story with the „World Label Award". The product has already won three additional awards, i.e. the „FINAT Innovation Award 2014" from the international label industry, the „PrintStars Innovation Award 2014" from the German printing industry and the TLMI Award 2013 from the North American Tag and Label Manufacturers' Institute.

Schreiner MediPharm, a business unit of
D 85764 Oberschleissheim

Reinstwassersystem GenPure (Thermo) ©Werner GmbH 2015

Ultra Pure Water – the process media

In research and production of electronic components for micro circuits, watches, medical devices or sensors the requirements to the cleaning medium ultra pure water are increasing more and more as the structural miniaturization increases in micro-technical components. This causes an ever-growing requirement for ion and particle-free and lowest TOC content in ultra pure water.

While the ultra pure water specifications for analysis or pharmaceutical applications usually in addition to the electrical conductivity only consider individual ions, microelectronics and microstructure technology offers a much wider range: Currently valid specifications in the field of a structure size <0.065 µm bump already to the detection limit of the analysis used; a permanent point of discussion between the needs of the microelectronics and equipment manufacturers.

The specifications are different and there are some some overlapping directives: considered the authoritative VDI 2083, ASTM D5129 or ITRS (International Technology Roadmap for Semiconductors). Each of these rules differs in accordance to different qualities terms of application, thus eg in the microstructure technology depending on the structure size range (1.2 down to 0.065 µm) eight different ultrapure water specifications are used, each differs the water quality within 35 parameters.

The production of ultrapure water takes place in several process steps, divided into the Make UP and polishing. The Make UP - the preparation of feed water to the storage tank - is realized almost invariably by a combination of conditioning, reverse osmosis and CEDI; the achieved quality is usually at <0.20 µS/cm, the storage tank is used for buffering of peak demand. The „polishing“ then meets the requirements of microelectronics and microstructure technology as a final step. Since ultrapure water can not be stored with 18.2 Mohmxcm or 0.055 µS/cm without compromising quality, the polisher must be designed to the maximum possible flow rate within the system (or the loop line itself). The polishing is divided according to the request again in a number of process steps:

Immediately after the booster pumps a disinfection by UV light (254 nm) is carried out, even as oxidation (185 nm) to reduce organic components. The following residual desalination to the single-digit range ppt accepts a high-purity, specially for this application produced mixed bed ion exchanger by using semiconductor-grade ultrapure resin. Dissolved gases, special the oxygen which forces corrosion in semi conductor applications is reduced post to the ultra pure resin polisher by a vacuum membrane degasser, in some cases using high purity nitrogen as strip gas to reduce oxygen down to a few ppb. Particles are also undesirable in the field of microelectronics and microstructure technology, so the last step is always a micro- or ultrafiltration. Microfiltration is used for particle sizes from 0.2 to 0.05 microns; higher demands on the particle freedom are fulfilled by an ultrafiltration.

For the polishing Werner provides since over 30 years, specifically tailored made SUPERAQUADEM® polisher systems up to a capacity of 20 m^3/h always designed to the customers requirements. This SUPERAQUADEM® system lines are individually equipped with all necessary process steps in accordance to the specified customer requirements. The modular design allows a further process step can also be added after year, for example if new requirements in the particle specification or dissolved oxygen shall be meet.

The piping of the components and also the realization of the loop occurs at Werner by an experienced and trained team of plastic welders with computer-controlled welding machines, either in non-contact infrared welding or bead and crevice free BCF® welding technology, in accordance to the requirements in some cases executed in a mobile laminar flow tent.

As a function of the specified purity requirements as materials beta-nucleated PP-H or PVDF has been established. Since the actual purification technology has not made revolutionary development steps in the last years, the current requirements are specified by the purity of the materials used, the production techniques and sustainability of water waste water balance. Werner ultrapure water systems benefit from the hygienic design of process and process technology in the pharmaceutical area for an extremely high quality of workmanship in the microstructural area.

In addition to point-of-use compact systems for the production of ultrapure water for laboratory Werner GmbH provides a SUPERAQUADEM® ultrapure water system with components from the high-end industrial area.

Ultra Pure Water- tradition and passion

Wilhelm Werner GmbH is working with tradition and experience in water treatment. The esthablished product lines - AQUADEM® ion exchanger; Werner reverse osmosis sys-

Ultra Pure Water – the process media

Polishingsystem ©Werner GmbH 2015

tems; SuperAQUADEM®-polisher systems - are successfully established in the market in laboratories, and pharmaceutical industries.

Since 1979, Wilhelm Werner GmbH distributes successfully Laboratory Ultrapure of the American company BARNSTEAD International. Many customers use the product series NANOpure®, EASYpure®, Infinity® for over 30 years now.

End of 2006, Barnstead International was sold to Thermo Fisher. However, the merger did not affect the good cooperation with the Werner customers. Meanwhile, Thermo has expanded its range by a further acquisition of the company TKA GmbH. The existing product range of ultra pure water (GenPure, MicroPure, Smart2Pure) is still sold by Werner GmbH, as Werner GmbH provides technical services and supplies for all Barnstead ultrapure water systems and Thermo systems. Werner is focussed in water treatment with passion and tradition.

Beside pharmaceutical water and process water systems Werner presents at Achema the complete ultra pure water range of Barnstead Thermo Scientific.

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„Water treatment plants and distribution systems should be designed, constructed and maintained so as to ensure a reliable source of water of an appropriate quality. They should not be operated beyond their designed capacity" (EG GMP Guide (2010), Annex 1 Manufacture of Sterile Medicinal Products).

View to the future: **modular concepts for Purified and Highly Purified Water**

At least as critical to the opposite conclusion of this statement has to be seen; a too large designed pharmaceutical water system will cause too high downtime that result in almost all cases in a microbiological degradation. In most cases, even with the finalized User Requirement Specification the current - but especially the future demand for pharmaceutical water is not exactly predictable by the future system operator.

So the solution is obvious, pharmaceutical water system must be modular designed and thus correspondingly extended. This task is increasingly being approached more and more to Werner GmbH. In general, the URS of the client contains no indication of future performance expansion of the water purification plant, so that initially a „State of the Art" PW generator system is created with automatic hot-water sanitisation. Werner designed, in many cases already in the basic design an extension option for an additional 50 to 100% of capacity.

The basic design of an extensible, pre qualificated Purified or Highly Purified Water System is divided into the following stages of construction:

- serial connected duplex softener (85 ° C) capacity sufficient for the final capacity
- recirculation device TS-PLUS to enable selective thermal sanitisation of the softener and the reverse osmosis with optional membrane degasser and CEDI
- Reverse osmosis expanded in steps by additional membrane elements without changing the dimensions of the overall system
- Membrane degasser, expandable with an additional module
- Electrodeionization (CEDI), expandable with an additional module

The modular Werner PW and HPW systems are working now for over 5 years to the full satisfaction of the individual operator. The first extensions by an additional membrane element of reverse osmosis have already been partially implemented after 12 months, all further stages securing the need for long-term amounts of purified water have not yet realized.

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The hygienic drive solution - Ensuring safe processing of foodstuffs

Stainless steel air motors designed for the highest quality requirements

ADVANCED LINE steel air motors

In these times of rising costs, companies are increasingly reliant on pre-processing in automation. Even in the food industry automated production processes have gained in significance - hygiene is of equal importance as efficiency for the mechanical processing of foodstuffs. Whether for the production of fruit juice drinks or the preparation of kebab skewers, the handling of flour, the cutting of dough or the use of packaging machines, air motors are the perfect solution for all these varied drive applications.

High quality stainless steel air vane motors are especially suited to these challenging applications. DEPRAG SCHULZ GMBH u. CO. is an international leading supplier of air motors, automation, screwdriving technology and air tools. The DEPRAG engineers have spent decades developing and continuously improving their pneumatic motors.

Their ADVANCED LINE motor series provides systems engineers with quality stainless steel drives which combine many beneficial features. The robust, sealed design of their external parts in non-corrosive top quality stainless steel means that the vane motors are predestined for use in the food industry. The smooth surfaces are easy to clean and the drives repel steam and cleaning agents. The air motors are completely sealed, air cannot leak out and dirt cannot penetrate. The seal is so good that the air motor can even be used underwater. The motor does not even need a special housing. The motor spindle also withstands chemical cleaning agents and has a particularly long-life radial shaft sealant ring.

There are many advantages in using this pneumatic motor as a drive. The main benefit is the power density. Depending on the version it has a fifth of the mass of a normal electric motor or a third of its size. The air motor provides almost constant power over wide torque ranges.

The motor works along a simple principle. The compressed air generated by a compressor rotates the air motor. This functions in a vane motor by the rotor running within an off-centre cylinder. There are vanes in the slots of the rotor which are pressed against the outer cylinder wall by centrifugal force. Working chambers are created for the expanding compressed air. It is this expansion of the compressed air which is changed into kinetic energy and the rotation begins.

The air motors has the added benefit of being cool in comparison to other drive systems when under increasing load. The expansion cools the frictional heat created. This therefore makes the air motor particularly suited to applications in critical surroundings. They carry the ATEX conform seal of approval and are therefore authorised for use in potentially explosive environments. This is particularly important in the food industry for the processing of flour as flour dust could ignite if certain temperatures are exceeded. The use of an air motor prevents overheating and the ignition of gases. Compressed air is basically an unproblematic energy source, there are no dangers from electrical wiring and no danger of a short circuit.

The air motor is very flexible, it can be optimally operated in a wide field under varying loads. Motor power can be adapted by altering the operating pressure, the speed can be smoothly controlled by throttling the air supply. For specific applications there are special vanes available. Damage from overload is basically impossible. Once the air motor reaches stalling torque (about twice the nominal torque) the air motor just stops. As soon as the load is removed then it runs again without problems and this can be done as often as required.

The DEPRAG pneumatic motors can also be operated without oil which is often essential for food industry cleanroom environments. The range of ADVANCED LINE stainless steel motors covers 20 W to 1.2 kW with idle speeds of between 16 and 24,000 rpm. „It is due to this wide spectrum of stainless steel motors that we are the leader in this market segment. We are able to provide the ideal solution for any job description“, explains Dagmar Dübbelde Product Manager for air motors at DEPRAG. The sophisticated modular principle offers an outstanding price-performance ratio.

The air motor fulfills all sterilisation and hygienic requriements for use in the food industry. When manufacturing fruit juice drinks, a mixture is placed in large containers which after mixing is heating up to 80 degrees and then juice cartons are filled with the sterile liquid. Agitators are used for mixing and stirring which must be driven by heat resistant and robust motors. A DEPRAG ADVANCED LINE motor is just such

Stainless steel air motors designed for the highest quality requirements

a robust device and can reliably drive a propeller mixer in a magnet agitator with power at 300 W and nominal speed of 700 rpm. In the preparation of kebab skewers an air vane motor is the perfect choice for rotating a skewer over two belts into pieces of meat, onions and peppers.

Winding drives are also prevalent in production processes for the food industry. Packaging machines use them to wind plastic film and keep it taut. The compressed air of the motor must be constant in order to maintain this tautness. In order to reduce air consumption, the motor can be throttled using supply air and run with reduced operating pressure as it is designed to be energy efficient.

When used in an application for winding the air motor can be operated at 4 bar e.g. so that the power provided remains constant when rolls of material are becoming smaller as they are used up. In order to extend the torque range even further DEPRAG provides an option with spring-loaded vanes which are known as forced start vanes. Use of these spring-loaded vanes means that it is possible to operate the air motor at an operating pressure of less than 1 bar.

The robust, efficient air motors can be adapted to the required torque and operating speed of any application. „Around 85% of our air motor projects are special solutions which we are able to quickly and simply adapt from our standard products for each individual customer“, explained Dübbelde.

Fruit juice production with ADVANCED LINE air motors.

DEPRAG is based in Amberg, Germany and their engineers are renowned for their expertise in the development and manufacture of air motors. The DEPRAG motors are particularly suitable for use under extreme conditions due to their robust design and long life-span. It is due to the innovations and constant advancements in their existing product lines that the medium-sized family business with 600 employees in 50 countries has become such an internationally prominent manufacturer.

DEPRAG SCHULZ GMBH u. CO.
D 92224 Amberg

Phillips-Medisize Opens Design and Development Center in China

Today, Phillips-Medisize Corporation announced the opening of its new design and development center in Suzhou, China. Growth of the company's design and development centers supports its customers' needs for patient-administered biologics and pharmaceutical drug delivery and diagnostics device design and development services.

The creation of this new design and development center is in keeping with Phillips-Medisize's long standing global strategy of providing both regional manufacturing and outsourced design/development support for its global customers. Outsourced design and development services has proven to be important to the company's customer base as it provides common worldwide quality standards and design controls while allowing for local service and manufacturing support.

As part of the company's network of design and development centers, the Suzhou facility has multiple capabilities including device design, injection molding simulation, developmental tooling and assembly equipment, along with on-site program management. This design and development group is actively working on multiple projects, including biologics drug delivery devices intended specifically for Asian markets.

In commenting on this new addition, Matt Jennings, Chairman and CEO of Phillips-Medisize Corporation said, "This is a very exciting time for our customers and our company. The new Suzhou design and development center, as part of our network, will support our customers' need for outsourced design and develop of new market appropriate products for the Asian market."

The company's network of four (4) design centers located in North America, Europe and now Asia, employ approximately 200 engineering professionals, while the global program management and new product introduction teams of 275 engineering professionals successfully drove the launch of 81 new products in 2014. Traditionally, over 80% of the new drug delivery, diagnostic, and med-tech products the company launches have their roots within the Phillips-Medisize design and development organization.

Phillips-Medisize Corporation
D 8309 Nürensdorf

RAUMEDIC AG: Thomas Knechtel appointed to the Board of Directors

On 5/1/2015 Thomas Knechtel was appointed to the Board of Directors of RAUMEDIC AG. The business administration and engineering graduate joined the REHAU group in 2006 and changed to RAUMEDIC in 2009. Since then he had worked successfully in various management and committee positions. He has many years of experience in both national and international management of customer projects. Since 2010 he had been responsible for marketing and sales activities within the Business Unit Assembly/Catheters. By joining the senior management, he is taking over the overall strategic and functional management of this area of business.

„With Thomas Knechtel we have gained an excellent board member. He has already demonstrated his strategic expertise in his time as head of marketing and sales in this important area of business," says Martin Bayer, CEO of RAUMEDIC AG, with pleasure.

Knechtel is following in the footsteps of Robert Reichenberger, who retired on April 30. Reichenberger worked for RAUMEDIC and, before its spin-off, for REHAU AG+Co. for over 35 years. An engineer through and through, he always derived great satisfaction from seeing how new and highly innovative medical devices found their way to patients and helped them getting better. Martin Bayer thanked Robert Reichenberger for his decades of commitment to the plastics company. „With his knowledge and his tireless effort he contributed in great measure to the success of the company."

The Assembly/Catheters division is one of three fields of business of RAUMEDIC AG. Here, the company's own tubing and molded parts develop into catheters, as well as customized assemblies and complete systems. Therefore the medical technology company offers its customers the option of obtaining everything from a single source. Besides the OEM products, the employees of this business unit develop and produce high-precision pressure measurement systems with microchip technology for the indication areas of neuromonitoring, urology and traumatology. These products are sold to clinics and doctor's offices throughout the world.

Since May 1 of this year, the RAUMEDIC AG Board of Directors has consisted of Martin Bayer (CEO), Michael Stellwag (CFO), Dr. Ralf Ziembinski (Director Business Unit Extrusion/Tubing), Dr. Thomas Jakob (Director Business Unit Molding/Pharma Solutions), Thomas Knechtel (Director Business Unit Assembly/Catheters), and Martin Schenkel (Director of Operations).

Raumedic AG D 95233 Helmbrechts

Company focus on operational enhancements and maintenance of core values

Cherwell appoints Operations Director to reinforce manufacturing expertise

Cherwell Laboratories, specialists in cleanroom microbiology solutions, are pleased to announce the appointment of Martyn Young as Operations Director. Martyn's appointment follows a period of growth for Cherwell Laboratories and marks their commitment to further strengthening the business, whilst maintaining the traditional values which have contributed to the Company's success.

Having joined the Board at Cherwell, Martyn will work alongside Managing Director, Andy Whittard, developing future strategic plans for the business. Andy commented, "We are delighted to welcome Martyn to Cherwell Laboratories to focus on future operational improvements which retain our flexibility and responsiveness, and contribute to our continued growth." He added, "Martyn brings a wealth of experience and knowledge of operations within the medical device industry having previously worked in senior roles at Owen Mumford, and more recently Oval Medical."

Prior to joining Cherwell, Martyn's career has been predominantly in manufacturing. He initially specialised in Quality and Quality Management before broadening his managerial and technical skills by moving into Production Process Engineering, followed by Production Management and then General Management.

Most recently, Martyn has been actively engaged in the development of products and processes suitable for deployment in aseptic liquid drug filling environments. Here he worked with equipment suppliers, drug filling companies, environmental management, regulatory authorities, sterilising method providers, as well as the pharmaceutical clients themselves.

Martyn has also previously led organisations in the development, manufacture and supply of drug device combination products for parenteral drug delivery. The clients for these products are all world class pharmaceutical companies who are active in the development, manufacture and supply of drugs for injection in the treatment of various conditions.

Commenting on his new role, Martyn Young said, "I am excited to be part of Cherwell's ongoing growth plans and to bring new insights for operational improvements to ensure we continue to deliver the flexibility and responsiveness that our customers know and expect."

Martyn's broad experience, technical expertise and industry knowledge gained will further enhance Cherwell's position as a leading supplier of prepared microbiological media and other cleanroom microbiology solutions for pharmaceutical and related industries.

Cherwell Laboratories Ltd
OX26 4XB BICESTER
Vereinigtes Königreich Großbritannien und Nordirland

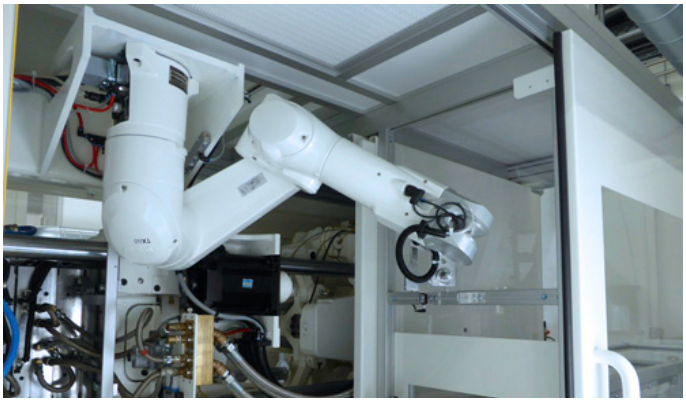
Medical engineering meets injection moulding technology: The story of a perfect symbiosis

By a hair's breadth

The staff at thinXXS Microtechnology AG in Zweibrücken/Germany focuses on these specific attributes: minute, delicate and precise. The company manufactures disposable quick-tests for applications such as medical diagnostics for customers from the pharmaceutical and diagnostics segments with a focus on areas such as the identification of bacterial infections or cancer cells in the blood. In order to make these tests viable for laboratories as well as for hospitals and surgeries, the manufacturer must ensure that they are easy to handle and quick. This is where the micro-technology specialist with its production facility near the French border excels.

When it was founded in 2001 as a spin-off venture of the injection moulding department of the "Institut für Mikrotechnik" with headquarters in Mainz/Germany, the company had a total of 13 employees and decided to focus on its core segment. Dieter Cronauer, Member of the Managing Board, explains: "Micro injection moulding and assembly has always been our specialty. This is our field of expertise. Mould engineering is our unique selling point. Our customers know and appreciate this. Some of them even come from as far as California." Today, thinXXS has 75 employees. Their injection moulding shop, assembly, logistics and packaging are located in a separate 350 sqm hall and the demand is rising steadily. A total of 90 % of customers are from Europe and the US, among them US companies such as Daktari Diagnostics and Emerald BioSystems, German companies such as DST Diagnostische Systeme & Technologien GmbH and Belgian specialists such as Trinean. "We excel when high precision is called for. We guide our customers from the initial manufacturing concept right through to cost-efficient large-scale production. It is important to know that our customers invest millions in development diagnostics products to understand that they need high profit margins, to ensure that their investment pays off", Cronauer points out.

Tobias Lacroix, Head of Micro Injection Moulding is more than happy with his new all-electric IntElect injection moulding machine from Sumitomo (SHI) Demag: "The part must be extremely precise in order to accommodate the quick test's fluidic functional design. Only a highly accurate part can guarantee a 100% reliable result – and this machine delivers it." (Photo by Sumitomo (SHI) Demag)



Once the load carrier is full, a conveyor belt transports it to an assembly hall. The entire process takes place in a fully enclosed setup: dust and other contaminations are kept out. (Photo by Sumitomo (SHI) Demag)

Maximum precision is indispensible

The injection moulding shop is at the heart of the company's facility. The in-house mould making department develops and manufactures moulds with channels and structures in the micrometre range. They produce macroscopic parts with microstructures. These parts are no larger than a credit card. The microstructures in the moulds are produced by ultra-fine precision milling machines according to drafts provided by a team of in-house engineers. The intricate pattern and structures of the minute geometries are no longer visible to the naked eye.

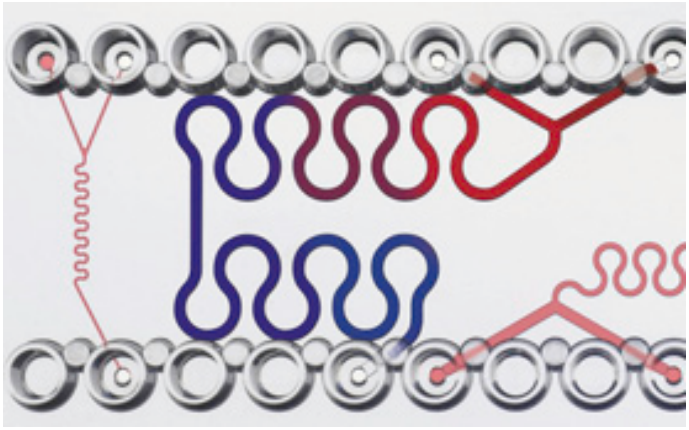
Diagnostics mostly deals with microscopic amounts of substances. A drop of blood must suffice to identify both the infection itself and the level of infection within minutes. Blood and the substance that is integrated into the quick test's fluid reservoir react and quickly show a result in the separate analysis unit – similar to pregnancy tests. The channels of the plastic part that contains the test must allow the conveyance of a predefined amount of liquid at a predefined speed. Tobias Lacroix, Head of Micro Injection Moulding explains why this is a particular challenge: "The part must be extremely precise in order to accommodate the quick test's fluidic functional design. Only a highly accurate part can guarantee a 100% reliable result. We are dealing with dimensions less than a hair's breadth in combination with highly complex geometries."

The fact that these high-tech parts with microstructures can only be produced by an injection moulding machine that can meet the corresponding requirements is par for the course. During the production of these parts, a particle of dust could wreak havoc. Hence, the entire production process is confined to a cleanroom environment. The injection moulding machine for the production of bacterial quick tests was manufactured by Sumitomo (SHI) Demag Plastics Machinery GmbH of Schwaig/Germany. It operates in a class 8 cleanroom, but is also enclosed in an additional class 7 containment area, where it runs together with the downstream automation equipment. The all-electric Sumitomo (SHI) Demag IntElect 100-180 injection moulding machine is equipped with a handling system and automation system that was also supplied by the general contractor Sumitomo (SHI) Demag.

Part tolerances in the micrometre range

Three different 4-cavity moulds are operated on the machine to produce the parts that are assembled in-house into the final product: a disposable quick test. With a shot weight of about 12 g, the machine produces individual components with a part weight of 2.7 g in a three-shift operation. Two of the component groups are made from uncoloured PMMA, the third group is made from blue coloured polypropylene. "We expected our injection moulding machine to achieve an extremely accurate reproduction of surface detail, a high repeatability and part tolerances in the micrometre range. We also required

By a hair's breadth



This is not a work of modern art but a magnified image of the delicate channels and structures of a disposable quick test. (Photo by thinXXS)

These intricate microstructures are so delicate that they are no longer visible to the naked eye. The injection moulding machine produces these structures with every shot. They are virtually identical: each part is almost a clone of the one that was produced before. (Photo by thinXXS)

an automation system which conveys the finished parts directly to the assembly stations and a class 7 cleanroom. We decided to work with Sumitomo (SHI) Demag, because the company's well thought-out concept was the most convincing and the project timeline adhered to our tight schedule. They offered a keen price-performance ratio and we had already made positive experiences with our existing Sumitomo (SHI) Demag machine. The technical after-sales support of the company's representatives really is outstanding", Lacroix explains.

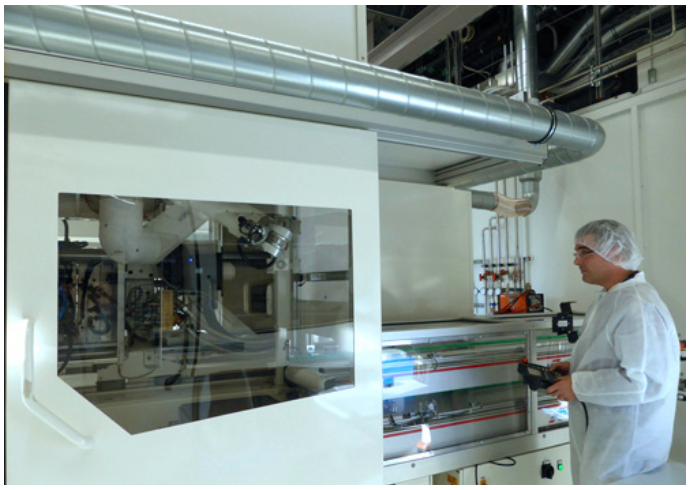
Behind closed doors

The dried pellets are fed to the IntElect's plasticisation unit via the feeder and metering unit IntElect. The mould – provided by the customer – is heated to 90 °C with water as a medium. The temperature control device is connected to the injection moulding machine via a CAN Bus interface. With an L/D ratio of 20 and a clamping force of 1,000 kN, the IntElect produces the test components within 16 seconds. The controllable activeLock non-return function ensures that no melt flows back into the screw channels after the injection phase has started. Parts such as these need highly precise and reliable processes in order to meet the narrow tolerances required by this application.

A six-axis articulated arm robot manufactured by Stäubli removes the finished parts from the mould and places them in a small storage bin (KLT). When this bin is full, it moves to the conveyor belt and is transported directly to the connected assembly station. The removal area and the conveyor belt are fully encapsulated. The quality of these medical components is inspected at regular intervals: QS staff pushes a button to activate the QS tray, inserts it into the machine, and the robot places the test specimen on the tray, which is subsequently inspected and finally disposed of by the QS team. Sensors monitor the presence of the tray for inspection inside the cabin, they also monitor the deposit station, conveyor belt, robot gripper and the removal of parts from the mould.

The entire process is fully automated and takes place behind closed doors. It can only be observed through a glass window in the cleanroom cabin. Lacroix is truly impressed with his supplier Sumitomo (SHI) Demag: "The complete system is operating with precision and repeatability. Sumitomo (SHI) Demag fully supported us during the GMP validation and we passed the assessment without problems. I found it particularly helpful that our contacts looked after all technical and administrative matters concerning the complete line. I am really happy with everything!"

Sumitomo (SHI) Demag D 90571 Schwaig



During the active production, the process can only be supervised through a glass window. Under class 7 cleanroom conditions, the injection moulding machine, automation equipment and assembly, must not come into close contact with the operator. (Photo by Sumitomo (SHI) Demag)

In this area, people are obliged to wear masks: staff members assemble and package products under class 7 cleanroom conditions– the products must be kept free of contamination from hair or dust. (Photo by thinXXS)

„Think big“ - ultrapure water for laboratory, HPLC, R & D

In addition to point-of-use compact systems to produce ultrapure water Werner GmbH shows a ultra pure water system with components from the high-end industrial area: SuperAquadem® SA20: The system provides a capacity of up to 15 l/min water Type I (ASTM, CAP, VDI, SC or ISO 3696). Standard compact plants are general limited to 2 l/min. The base of SuperAquadem® SA20 is formed by two serially connected Ultra Pure Water polishers (refillable) to eliminate anions, metals and organic compounds. A downstream membrane filter or an ultrafiltration secure the maximum tolerable concentration of particles in the submicron range (down to <0.05 µm). Subsequently, a UV disinfection (254 nm) and oxidation occurs (185 nm) for microbiological and organic safety and therefore low TOC (down to <5 ppb).
Particularly this series shows economical operating costs: In opposite to compact, pre-assembled cartridge packs and filter capsules the running costs of this system lines (flow rate > 5 l/min) can be reduced by 85% - the price per liter of 0.03 €/liter for ultrapure water in semiconductor or HPLC grade is unique on the market.

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Accurate Dewpoint Measurement down to -60°C Td

Compact Dewpoint Transmitter for OEM Applications

The compact EE355 dewpoint transmitter measures dewpoint temperature with ffl2°C accuracy across the entire working range. The unit offers an optimal price-performance ratio for OEM applications in compressed air systems, plastic dryers and other industrial drying processes.

With the new EE355, E+E Elektronik expanded its range of dewpoint products with a transmitter for the range -60...+60°C Td at an operating pressure up to 20 bar. Same as other E+E dewpoint transmitters, the EE355 features a special auto-calibration procedure which leads to ±2°C Td accuracy, and employs E+E polymer humidity sensors, which are condensation resistant and highly long-term stable.

The measured values for dewpoint, frost point or ppm volume concentration are available on the analog 4...20mA and on the digital Modbus RTU outputs. Integration into the measurement task is simplified considerably by the compact design and the robust stainless steel enclosure.

With the free configuration software and the optional Modbus to USB converter the user can scale the analog output, set up the Modbus communication and adjust the transmitter.

E+E Elektronik manufactures various models of dewpoint measuring instruments, from compact OEM transmitters to high-end devices for demanding process control, and covers with these a wide range of applications.

Figure 1: Compact EE355 dewpoint transmitter for OEM applications. (Photo: E+E Elektronik GmbH)

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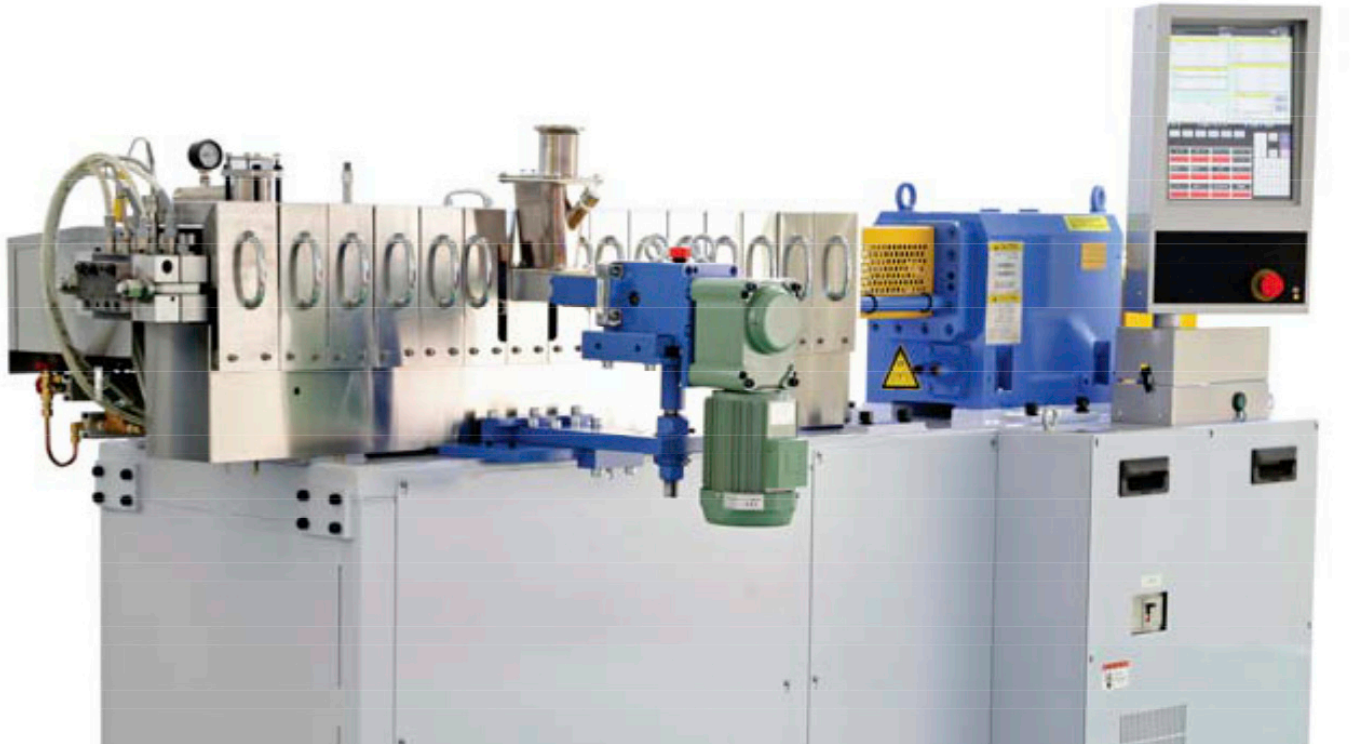

New TEX 25 Alpha III laboratory extruder from JSW ready for trials and experiments

TEX = Technology + EXcellence

Japan Steel Works (JSW) has introduced a TEX 25 Alpha III laboratory co-rotating extruder. The new compact 25mm screw diameter machine, for production of compounds & masterbatches in engineering & high performance thermoplastics, is the smallest of seven TEX Alpha III extruders (up to 130mm diameter) available in Europe. Its introduction follows the K 2013 European launch of the TEX 44 Alpha III model.

TEX 25 Alpha III series advantages include a new gearbox design combined with enhanced gears & bearings, screw shafts and barrels. The result is a surprisingly high torque of up to 194 Nm per shaft (or 387 Nm in total) combined with wider processing windows as well as more powerful kneading and mixing.

A standard torque limiting function stops the screw to protect machinery and operators. A low noise water-cooled version of the infinitely variable three-phase motor is optional, as is direct drive instead of the standard V-belt drive.

The NIC special kneading barrel invented by JSW achieves good mixing/dispersion at low shear rate and high viscosity without dead zones for good compound material properties, though introduction of several longitudinal grooves of particular geometry on the inside barrel surface for more screw to barrel clearance. A TKD Twist Kneading Disc kneading screw element with a twisted tip developed for energy-efficiency supports this "tip-clearance technology" by ensuring fast relatively low temperature material conveying, while retaining appropriate mixing efficiency. JSW claims such features make the Tex 25 Alpha III the "worldwide highest performance compact twin screw extruder".

While feed section water temperature control is manual, PID (proportional-integral-derivative, i.e. closed-loop/feedback) water and heater temperature control is used for other barrel sections. The extruder is ideal for R&D work with frequent material and process changes, as cartridge heaters and a patented barrel clamping mechanism enable easy and rapid barrel section block changes, achieving screw length/diameter (L/D) ratios of 42 with 12 blocks, 52.5 with 15, and 70 with 20 blocks. The machine accommodates vented or closed barrel sections and side feeding of abrasive reinforcements, heat- or shear-sensitive compound additives and materials into the melt via a later barrel section.

Wear resistant LSP-2 modified tool steel screws and barrels in N60-S nickel based alloy made by JSW promise long life of barrel and screw (high wear and corrosion resistance) for various kinds of compounds containing abrasive and/or corrosive materials and additives.

JSW's patented TEX-FAN Flow Analysis Network R&D support tool developed for TEX twin screw extruders analyses polymer melt pressure, temperature, residence time and fill factor with a special dedicated computer developed by JSW.

The TEX 25 Alpha III comes with JSW's EXANET 64-bit RISC high-speed control system. Its 15 inch colour LCD touchscreen provides for optimum process control and monitoring, storing thousands of settings & process parameters for years. It integrates with ancillary equipment, from JSW compact JSW-TTF 20 & SFT-15 gravimetric feeders and mixers, TSF25 side feeder, through to strand pelletization and underwater granulation.

Other JSW accessories include screen changers, a SFD 25 degassing side feeder, liquid injection nozzle with a plug, barrel cooling water unit, vacuum, liquid injection and gear pumps, strand cooling baths, pellet conveyors and compacters.

JSW signed a contract in February 2014 whereby Stork Technical Services in Antwerp, Belgium provides western European JSW extruder servicing, overhaul, modernisation and enhancement, with future extension foreseen for installation, commissioning and maintenance of TEX twin-screw extruders throughout Europe. JSW has a technical centre in Overpelt in Belgium, where it showed the TEX 44 Alpha III extruder after the K 2013 launch.

Japan Steel Works Europe GmbH D 40217 Düsseldorf

Product innovation: compact traysealer for small batches

Pack sensitive products securely

MULTIVAC has developed a compact variant of the T 260 traysealer, which is specially designed for packing sensitive products in small batch sizes. The user-friendly packaging system is suitable for cleanroom use and ensures that the packaging procedure is secure, reproducible and traceable.

The compact model, which is mobile and can therefore be used very flexibly, is designed for a wide spectrum of trays. The GMP-compliant stainless steel construction meets all the requirements of the medical and pharmaceutical industries with regard to cleanroom compatibility and ease of cleaning. Thanks to its small space requirement, the T 260 is also ideally suited to use where space is limited. The loading and un-loading of the T 260 can also be automated as an option.

Increased pack security

The new model offers a high level of measurability and reproducibility, which means that it contributes significantly to process reliability. It can also be calibrated and validated. The sealing die ensures that there is controlled sealing pressure with high sealing forces and precise temper-ature distribution.

MULTIVAC's proven IPC control enables the entire packaging procedure to be monitored and controlled, as well as enabling for example scan-ners and printers for data communication to be integrated. Critical parameters such as sealing pressure, cooling water and temperature are monitored permanently by sensors. Batch data is documented in the batch report in the form of clear data recordings. The process sequen-ces are visualised on the user-friendly HMI.

Quick format changes can be achieved reliably and without problems, so that the T 260 can be used for the efficient packing of a wide range of products in small and medium batch sizes. In order to make the quick and ergonomic die change even easier, MULTI-

VAC offers an appropriate die changing trolley, which can be equipped as an option with a service unit.

MULTIVAC Sepp Haggenmüller GmbH & Co. KG
D 87787 Wolfertschwenden

Product innovation: R 081 thermoforming packaging machine

Compact model for medical and pharmaceutical applications

With the new R 081 thermoforming packaging machine, MULTIVAC is expanding its portfolio with an entry-level model for packing products in small batches. The R 081, which is also suitable for use in cleanroom conditions, will be presented for the first time at ACHEMA from 15 to 19 June 2015.

15th - 19th June 2015: ACHEMA 2015, Frankfurt am Main (D)

Increased pack security

The R 081 is equipped with electrical lifting units, which provide in-creased sealing forces and optimised distribution of sealing pressure. This enables a consistently high level of seal quality and increased pack security to be achieved.

High level of flexibility with regard to packaging materials and formats

The new compact model can run flexible and rigid films as well

as pa-per-based packaging materials and Tyvek®. Vacuum packs and modi-fied atmosphere packs with reduced residual oxygen content can be produced.

Thanks to proven slide-in technology, the forming and sealing dies can be changed easily, quickly and reproducibly. This means that the R 081 can be used for the efficient packing of a wide range of products in small and medium batch sizes.

The R 081 is available in different nominal machine widths, and this en-ables the formats to be laid out flexibly. The machine can be equipped as an option with various printing, labelling and monitoring systems. It is even possible to have manual advance of individual cycles with a foot switch, where products are being loaded by hand.

MULTIVAC Sepp Haggenmüller GmbH & Co. KG
D 87787 Wolfertschwenden

Advantages of thermal sanitization in pharmaceutical water systems

„Automated Cleaner“

**15th - 19th June 2015:
ACHEMA 2015,
Frankfurt am Main (D)**

Water treatment systems of any kind (except distillation) generally provide favorable living conditions to microorganisms, so a suitable sanitization procedure has to be applied regularly. Experience has shown that this must be applied at least annually. Even in the EG GMP Guide and the ISPE Baseline Pharmaceutical Engineering is noted that “every equipment has to be designed in accordance to a good and easy cleaning and disinfection possibility”. Consequently in the design of a pharmaceutical water system appropriate arrangements for the sanitization have to be applied. For a water treatment plant we can differentiate between the chemical - and thermal sanitization (> 80 ° C).

Chemical Sanitization

Each pharmaceutical water system (whether PW or HPW) can be chemically sanitized with the appropriate device (CIP system and integrated storage tank). Due to the low resistance of reverse osmosis membranes and CEDI modules to oxidizing agents mainly H2O2 (batch concentration to 0.5%) and peracetic acid have been established (up to 2%) with exposure times of 30-60 minutes as a disinfectant. Furthermore the market also offers user-friendly finished products for chemical sanitization as Minncare ™ or Puristil®.
Both finished products are delivered as a kit with all the necessary test sticks for preparation and rinse concentration. The rinse time and/or regeneration times of CEDI modules up to 10 hours must be taken into account. The proof of the disinfectant freedom is passed over a fast-track tests. A complete automation is excluded by manually leading detection almost.

Thermal sanitization

Thermal stable reverse osmosis membranes and CEDI- modules are available now since around 2001. The thermal sanitization of PW and HPW systems has become significantly common in recent years. Reverse osmosis membranes are available for a long time in hot water-resistant design. However, the thermal sanitization, post to the RO only in recent years also at the 2nd stage processing - are applied - the CEDI module.
So the thermal sanitization has been proven for an automatic application and validation very easy. If the system is equipped with this technology the whole water purification including the microbiological very critical softening unit can be full automatized heated up to 85 °C in fixed cycles e.g. over the weekend. After a appropriate holding time (typical 30 to 60 min) the system can be cooled down for production. The whole temperature ramp can be easy recorded by a printer.
Through the use of refractory materials (pipes, softening, etc.) and especially the corresponding RO membranes and CEDI modules as well as the necessary measuring and control technology (PLC) are characterized thermally sanitized generation systems over an up to 30% higher investment, which is overvalued in relation to a significant simplified qualification and validation in many cases.
During Achema 2015 Werner GmbH presents a qualified and fully automatic thermal sanitization PW system with a capacity of 400 l/h.

Thermisch sanitiserbares EDI-Modul ©Werner GmbH 2015

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Medtec Europe 2015

RAUMEDIC – Investments in the future

This year RAUMEDIC was again solid as a rock considering the declining numbers of exhibitors at Medtec Europe. With its large repertoire of processing options for polymer solutions in medical technology, the company showed how plastic and health can enter into a successful symbiosis. One focus this year was the use of silicone in medical products.

12th - 14th April 2016:
MEDTEC EUROPE, Stuttgart (D)

For over ten years, so almost from the beginning, Medtec in Stuttgart has been a platform for RAUMEDIC AG to show existing and new customers what, from its point of view, the trends and opportunities are for the future of plastics in medical technology. Therefore, the polymer processer has always viewed the event as a valuable investment in the future. „We are currently expanding our production and development possibilities, both at the headquarters in Helmbrechts, Bavaria and with a new plant in the USA for the first time. These investments in the future need to be communicated. Medtec also stands for that," explained Frank Richter, Head of Marketing Communications at RAUMEDIC.

One focus this year was its expertise in silicone processing in extrusion and injection molding. „Molded parts made from this elastomer offer many advantages. Temperature and chemical resistance are well-known properties of the material. At our booth at the trade fair, we will show you what options exist for implementing functional requirements while simultaneously meeting legal and regulatory demand," said Jörg Prescher, Head of the Technical Center of Excellence Silicone Molding at RAUMEDIC, prior to the trade fair.

While there, RAUMEDIC also surprised visitors with an invitation to a „hole in one" on an indoor putting green constructed specifically for this purpose. „Successful in a single stroke" in developing and implementing customized silicone products was the message of this playful enclosure.

It has not yet been determined whether RAUMEDIC will be present in Stuttgart again next year as well. „Medtec in Stuttgart has always been the spring industry gathering for European medical technology. We will see if it remains that way," says Richter. After all, the railway strike, which prevented some visitors from arriving, was not the reason that not even 700 exhibitors pitched their tents.

In any case, RAUMEDIC continues to work on being able to offer plastics solutions for the future for nearly all medical applications. Therefore, the company will increase its reliance on the possibilities that result from technologies such as micro and multilayer extrusion, micro and multilayer injection molding and automated assembly even for small and medium volumes.

Raumedic AG D 95233 Helmbrechts

Medtec Europe 2015 Focuses on Innovations

From Additive Manufacturing to Mind-Controlled Devices

Once again, Stuttgart was the place to be for the European medical device industry. Between 21 and 23 April 2015, over 690 companies from 32 countries showcased their innovations and new products at Medtec Europe, discussed current and future trends and networked with their industry peers.

12th - 14th April 2016:
MEDTEC EUROPE, Stuttgart (D)

The event's focus on innovations was mirrored in a number of new show features. For the first time, the accompanying free to attend conference took place directly in the exhibition halls. Over 100 industry experts gave presentations on a vast variety of subjects ranging from new trends in Additive Manufacturing to updates on regulatory developments.

As Medtec Europe aims to be the meeting place for the industry, it had a number of new elements to facilitate networking. For example, Medtec Meetings, a programme launched to bring suppliers and industry professionals together. The idea enabled over 250 meetings.

Another highlight was the Medtec Start-Up Academy. Young companies with revolutionary new technologies from all over Europe were encouraged to participate in the contest. The 19 finalists won a free stand at the exhibition and presented their innovative ideas to the visitors. Best-in-class 2015 was the Italian start-up Liquidweb. The company convinced the judging panel with an assistance system for paralyzed patients, a headset that interprets the patterns of electrical currents in the patient's brain enabling him to communicate again with the outside world.

In the Exhibitor Innovation competition, Medtec Europe's visitors were asked to vote for the most innovative product or service. Out of the 18 competing companies, they elected the 3-D printing company Formlabs. The company has created an inexpensive, highly-accurate desktop 3D printing solution that is affordable even for smaller companies.

„Medtec Europe is a very specific and targeted exhibition and we are very happy with the attendance so far," summarizes Lucie Heidar, Business Development Manager, Henkel. "All the players in the medical device market are here and it is very good for meeting new players too. It is good for closing deals and to reconfirm our activity on the medical market."

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Focus on flexibility and energy efficiency

High purity media and bio processing solutions from a single source: three market launches from Bosch

- New bioreactor for laboratory-scale development of active ingredients
- WFI unit with new generation process reduces energy consumption
- New generation of pure steam generators with high yields

15th - 19th June 2015: ACHEMA 2015, Frankfurt am Main (D)

At Achema 2015, Bosch Packaging Technology showcases three process technology novelties for the production of liquid pharmaceuticals. Visitors can see a new bioreactor for the cultivation of active pharmaceutical ingredients (APIs) on laboratory and pilot scale. Bosch further showcases an energy-efficient and compact distillation unit for the production of WFI (Water for Injection). It combines two different processes in one platform for the first time and enables the direct production of WFI from drinking water. Moreover, Bosch introduces the new generation of pure steam generators. "The units fit in perfectly with the exemplary lines for the processing of sterile liquid pharmaceuticals shown at Achema, and emphasize Bosch's line competence," explains Dr John Medina, sales director at the Bosch subsidiary Pharmatec, which has developed all three novelties.

Bioreactor for research and pilot batches

"Whether customers produce oncology drugs, insulin preparations or medicines for the treatment of autoimmune diseases – our bioprocessing units for the pharmaceutical industry enable the production of high-quality biopharmaceuticals with excellent process results," says Medina. For the first time, Bosch now offers a complete machinery range covering different scales for laboratories, clinical studies, and production.

The fully automated bioreactor for batch sizes between 15 and 50 liters is delivered with the complete periphery required for bioprocesses. This way Bosch complements the existing portfolio of fermentation devices, which to date are available for production volumes of 500 to 5,000 liters. Moreover, Bosch offers complete solutions for the subsequent downstream processes, as well as for the final formulation of the injection solution. "In accordance with our line competence, we can also integrate further downstream modules from specialized manufacturers upon demand. This allows customers to accomplish their entire project with only one point of contact," Medina emphasizes. The complete solutions can also be easily combined with further filling and packaging machines for liquid pharmaceuticals from Bosch.

High purity media of the highest quality

In all pharmaceutical and biopharmaceutical manufacturing operations, product quality and patient safety come first. This is also true for high purity media, such as WFI. At Achema, Bosch showcases a new unit, which uses a patented vacuum membrane distillation technology. This highly efficient thermal process combines both distillation and membrane filtration in one modular concept. "Hence we fulfill the current and future requirements of the European, U.S. and other international pharmacopeia for the production of WFI," says Medina.

Due to the especially effective membrane distillation, the unit can prepare WFI immediately from potable water without intermediate steps. Compared to conventional distillation units, the relatively low temperatures of 50 to 80 degrees Celsius achieve high energy savings while ensuring effective protection against germs and contamination. In a first step, ordinary potable water is evaporated, before it is pressed through a plastic membrane for filtration and then condensed. The membrane system withholds suspended solids, dissolved organic material and bacteria. Online measurements of TOC (total organic carbon), pressure, temperature and conductivity monitor the process continuously. To ensure pharmaceutical water quality regarding microbiological purity, the unit can be additionally sanitized at 85 degrees Celsius.

Complete solutions from a single source

Bosch furthermore presents the new generation of energy-efficient pure steam generators and distillation units. The optimized thermal utilization of heating energy enables high WFI and pure steam yields, which result in reduced operating costs. "We have streamlined our number of pure steam generators and types of distillation units and have put them together in a consistent range to reduce delivery times, as well as investment costs. The series now encompasses a performance range of 100 to 7,500 kilograms per hour," Medina explains.

Reduced energy consumption for WFI generation: The highly efficient thermal process of the new vacuum membrane distillation unit from Bosch combines the distillation and membrane filtration in one modular concept.

Depending on requirements and application areas, these three new developments offer customers complete solutions for water preparation, as well as product development and production from a single source. From the first stage of drug development, Bosch supports pharmaceutical and biopharmaceutical manufacturers with the appropriate technologies as well as profound consulting and services.

Bosch's technologies are on display at Achema in Frankfurt/Main, Germany, from June 15 to 19, hall 3.1, booth C71.

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Achema 2015: Stäubli showcases innovations for the pharmaceutical industry

Latest news from the life science specialists

From June 15 to 19, 2015, Stäubli will be at Achema, the international trade fair for the process industry, demonstrating pioneering robotic solutions for life science applications. The focus of interest will be on the new six-axis machines of the TX2 series and especially on developments in ultra-fast packaging with the TP80 Fast Picker of which there are various special-purpose versions on the horizon.

15th - 19th June 2015: ACHEMA 2015, Frankfurt am Main (D)

When the issues of speed and accuracy come into play alongside factors such as particle emissions, easy-to-clean surfaces and maximum availability, Stäubli robots serve as the benchmark and have done so for many years. These high-speed, high-precision machines are the first choice in the manufacture of medical devices, pharmaceutical production, biotechnology, laboratory research and hospital automation. Whether for use in a gray, white or sterile environment, the broad range of SCARA and articulated robots on offer means that the optimum machine can be found for every application.

Cleanroom compatibility is one of the basic requirements for any robot that is to be used in these highly sensitive areas. Yet even the standard SCARA and articulated kinematics from Stäubli are suitable for use in cleanroom environments. And they can also be lubricated with H1 food grade oil (Class NSF) without sacrificing performance.

For higher cleanroom classifications and special requirements, Stäubli offers dedicated cleanroom variants, HE versions and Stericlean robots.

New special edition Fast Pickers

The Stäubli TP80 Fast Picker sets standards for ultra-fast packing and sorting. The innovative four-axis kinematics cope with over 200 picks per minute, handling weights of up to 0.1 kilos. Even at higher loads, the performance of the Fast Picker is barely diminished. At the same time, the Fast Picker has been systematically fine-tuned for reliability and precision. The four-axis machine can operate across large work spaces with a diameter of 1.6 meters, achieving an impressive repeatability rate within ±0.05mm. This makes it ideal for primary and secondary packaging processes which require exceptionally short cycle times.

Stäubli CEO Gerald Vogt points out other key selling points for the machine over and above its superior all-round technical performance: “The Fast Picker has been systematically designed for life science applications. This four-axis robot can be lubricated with food grade oil without suffering any loss of performance. It is easy to integrate and does not have to be mounted on the ceiling directly above sensitive pharmaceutical products. In response to numerous customer requests, we will soon be releasing two attractive special editions – a HE version and a variant with a 200mm quill.”

Up to now, the only HE models have been in the six-axis range. The additional designation “HE” stands for Humid Environment and distinguishes robots which have been modified to make them suitable for use under the most stringent hygiene specifications. The TP80 variant with its 200mm quill significantly boosts the capabilities of the standard model with 100mm Z displacement.

TX2 – a new generation of robots

At Achema, Stäubli will also be presenting its new TX2 six-axis series. The robots on show are significantly more powerful than their predecessors: they are faster, more flexible, more efficient, safer to

The CR versions of Stäubli cleanroom robots comply with ISO Class 4, while the SCR versions satisfy ISO Class 2-3.

The TX40 CR (cleanroom) robot takes on the job of preparing toxic compounds for chemotherapy.

Latest news from the life science specialists

operate and able to work hand in hand with a human workforce.

Gerald Vogt explains the capabilities of the new TX2 six-axis generation and what the Redefining Performances program involves: "Redefining Performances means that we have thoroughly tested and upgraded all the performance characteristics of our six-axis robots. The aim was to improve the robot in every respect, to integrate superior safety technology and to create a package that would be a technology leader. We wanted to build the best Stäubli robot ever, and that's precisely what we've done."

The advance in performance is not immediately apparent from looking at the new six-axis robots of the three series in question, namely the TX2-40, TX2-60 and TX2-90. On the contrary, they do not seek to hide the genetic material they share with their predecessors, although they do look more streamlined and dynamic. They retain their ultra-compact design, but now with even slimmer contours. This makes these models – which can cope with a load range from two up to 15 kilos over ranges of between 515 and 1,450 millimeters – the robots of choice for applications where space is limited.

Robots for germ-free processes

Stäubli also has a solution for the automation of aseptic processes. With the development of the world's first Stericlean robot several years ago, the Swiss manufacturer succeeded in automating processes in the medical and pharmaceutical industries where the use of robots had previously been deemed impossible. Thanks to its advanced construction, the Stericlean robot is able to work non-stop in Vaporous Hydrogen Peroxide (VHP) environments. This proved to be a breakthrough for robot-based automation under aseptic conditions.

The TX60 Stericlean is responsible for the aseptic pipetting of pharmaceutical products. The production unit fills as many as 600 vials per hour.

Since then, the range and capabilities of Stericlean robots have been steadily expanded. The machines are characterized by a sophisticated enclosure and comply with protection class IP67. Highly stressed parts are fabricated in stainless steel. Before the robots get their paint finish, the surfaces are subjected to a special treatment which increases their resistance to corrosion and ensures reliable operation in VHP environments. All Stericlean six-axis machines comply with the strict Good Manufacturing Practice (GMP) guidelines. In this way, Stäubli has raised its profile as the world's leading partner for the automation of aseptic processes.

Stäubli Robotics (Deutschland) D 95448 Bayreuth

Gerresheimer offers with DropAid an innovative packaging idea out of plastic for South America

FCE Pharma 2015

DropAid, the practical applicaton aid, is one example for the innovative ideas of Gerresheimer. The company presented new plastic products and systems for the pharmaceutical industry at FCE Pharma – the 20th International Exhibition of Technology for the Pharmaceutical Industry – which took place at the Transamerica Expo Center, São Paulo/Brazil from May 12-14, 2015.

10th May - 12th May 2016:
FCE Pharma 2016,
São Paulo (Brasilien)

"Do you know how difficult it is to use a typical eye dropper?"asked Wellington Lentini, General Manager of Gerresheimer Plásticos São Paulo Ltda, and explained the easy functionality: "DropAid is an application aid for daily use. It helps dropper bottle users to open the bottle and, when placed on the bottle neck, it makes it easy and simple to positioning the dropper correctly above the eye."

With four production facilities in Brazil and one in Argentina Gerresheimer is a market leader for plastic pharmaceutical packaging in South America. In Querétaro/Mexico, the company has a production plant where it manufactures ampoules, vials and syringes made of tubular glass for the Latin American pharma market.

The portfolio includes dropper bottles for eye drops, spray bottles for nasal sprays, PET bottles for cough medicine, PE containers for tablets, plus a wide range of caps, closures and all kinds of accessories such as dosing caps, droppers, measuring cups, dosing syringes and the applicators.

Gerresheimer has received a "Sindusfarma Quality Award" in the category of National Manufacturer of the Plastic Bottles and Caps in 14 consecutive years and is nominated again in 2015. The Sindusfarma Quality Award recognizes suppliers and service providers that perform in Brazil for the pharmaceutical industry that have stood out in the previous year, especially for their contributions to continuously raising quality standards and conformity with safety requirements in all stages of the drug manufacturing process.

The award winners were announced at a ceremony in São Paulo on May 15th, 2015 , which was attended by some 2,000 pharmaceutical industry professionals.

Gerresheimer AG D 40468 Düsseldorf

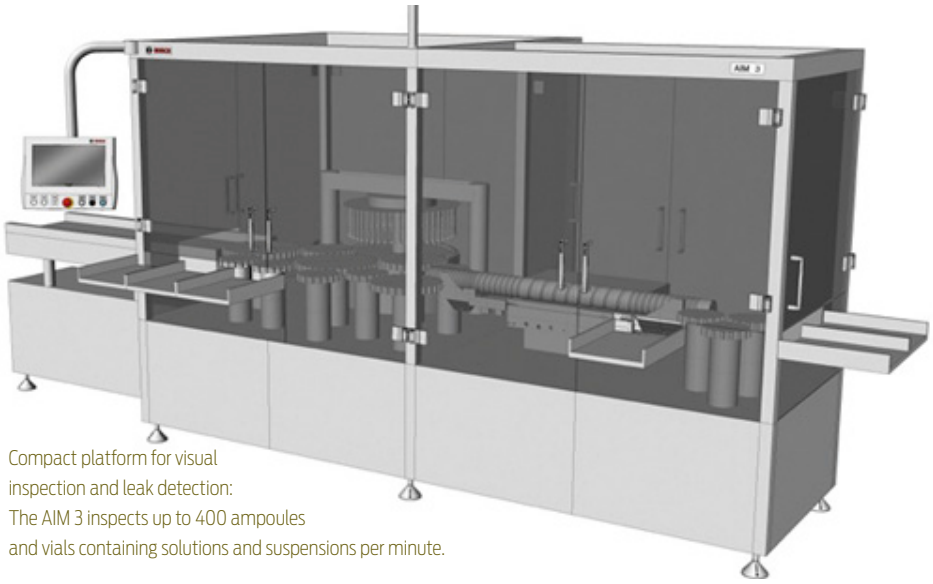
Bosch expands inspection portfolio

New inspection technologies for higher product quality and safety

- KHS 1: new high-end headspace leak detection platform from Bosch
- AIM 3 reliably combines visual inspection and high-voltage leak detection
- Cooperation with Lighthouse Instruments for best-in-class container closure integrity testing

15th - 19th June 2015: ACHEMA 2015, Frankfurt am Main (D)

At Achema 2015, Bosch Packaging Technology showcases two new pharmaceutical inspection machines. The KHS 1 is a new development emerging from a cooperation of Bosch with Lighthouse Instruments, LLC. It is designed for container closure integrity testing of ampoules, vials, bottles, cartridges and syringes using laser headspace analysis (HSA). The AIM 3, in turn, is the new member of the well-established AIM series. It offers the possibility to perform both visual inspection and high-voltage leak detection (HVLD) for ampoules and vials on one single platform. "These new platforms underline the expertise of Bosch Packaging Technology in all inspection areas. Independent of the product or application, we can offer extensive consulting and the appropriate technology to ensure the highest product safety and quality for all requirements," Mahmoud Hamada, business development manager at Bosch Inspection Technology, explains.



Compact platform for visual inspection and leak detection: The AIM 3 inspects up to 400 ampoules and vials containing solutions and suspensions per minute.

Successful cooperation with HSA pioneer

To further expand its inspection portfolio, Bosch collaborated with Lighthouse Instruments, the leading provider of non-destructive laser spectroscopy headspace analysis systems. This expertise in leak detection fits ideally with the highest quality requirements of the pharmaceutical industry. "By combining this expertise with our market-leading machinery for pharmaceutical inspection applications, we have developed a highly flexible and customizable high-speed platform," says Joachim Baczewski, head of Inspection Technology and president of Bosch Packaging Technology K.K. in Japan. Jim Veale, president of Lighthouse Instruments, adds, "We are excited to offer the pharmaceutical industry best-in-class leak detection machines together with Bosch Packaging Technology."

The KHS 1 is the new high-end leak detection system from Bosch for closure integrity testing with laser headspace analysis. It measures the absorbed light passing through the headspace region via laser spectroscopy. HSA is applicable to lyophilized products and medicines filled under vacuum or purged with inert gas. The new KHS 1 inspects both standing and non-standing containers at outputs of up to 600 per minute, and can combine HSA with optional near infrared (NIR) measurement and container coding. In order to ensure the highest reliability and accuracy, a built-in automatic re-calibration is continuously performed using certified reference containers.

AIM 3: compact platform for visual inspection and leak detection

Eisai Machinery (now Bosch Inspection Technology) developed the first model of the AIM series forty years ago. In 1985, the successful KLD series using HVLD technology was introduced. It detects leaks by measuring the electrical resistance of containers with conductive solutions. At Achema, Bosch now launches the new AIM 3, which combines both visual inspection of the AIM series and high-voltage leak detection of the KLD series. It inspects ampoules and vials containing solutions and suspensions at outputs of up to 400 containers per minute. "Our aim was to offer pharmaceutical producers and contract manufacturers from all over the world an economical solution for medium speeds at high Bosch quality standards," Mahmoud Hamada explains.

In order to sort out damaged containers before they enter the main inspection turret, the AIM 3 is equipped with a pre-inspection station. The core module features a high-resolution CMOS camera with high-speed interface for particle and cosmetic inspection, as well as a re-inspection function. The customizable platform can be retrofitted on site to add further visual inspection stations or the HVLD module. The latter delivers equivalent measurement results for all glass qualities, such as molded and tubing, as well as clear and amber glass. Both inspection steps are controlled via one common Human Machine Interface (HMI).

Bosch's technologies are on display at Achema in Frankfurt/Main, Germany, from June 15 to 19, hall 3.1, booth C71.

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Cleanzone 2015 is already very well booked

Full speed ahead

New and familiar faces on board - The industry is confident about the future

27th - 28th October 2015: Cleanzone 2015, Frankfurt am Main (D)

Cleanzone 2014 © Messe Frankfurt/Sandra Gätke

Cleanzone's success is continuing. The beginning of the event is still half a year away, yet more than half the exhibition area from the previous year has already been booked.

Ruth Lorenz, Vice President Technology & Production at Messe Frankfurt, explains: "As the only event that offers an international and interdisciplinary approach to cleanroom technology, Cleanzone has firmly established itself in the market, a fact that is made clear by the tremendous response we've had since registration began in February. It is also a sign of the positive mood that has arisen as a result of the strong market situation."

Prestigious manufacturers of products for cleanroom construction, planning, operation, monitoring, cleaning and consumables have already signed up, including companies that have supported the Cleanzone concept since the very beginning, as well as new exhibitors who hope to further expand their business thanks to the event. The ranks of returning exhibitors include market leaders such as Cleanroom Competence, Colandis, Daldrop + Dr. Ing. Huber, Decontam, Particle Measuring Systems, PPS Pfennig, proficon and Spetec. Verein Interessengemeinschaft Pharmabau 3000 (VIP3000), a group promoting the interests of those involved in pharmaceutical construction, will be exhibiting here for the first time in 2015 with companies including Elva-tec Radeberger Reinraumsysteme, Weiss Klimatechnik and Zimmer & Hälbig.

Rino Woyczyk, Vice President of VIP3000, explains why the group will be taking part in Cleanzone: "As a small, relatively new event, Cleanzone offers exhibitors and visitors the opportunity to conduct more detailed, in-depth discussions than would a large, established event. As a result, people are not only able to enjoy informative interaction on current issues and trends in the life sciences industry, but they can also expect to be able to expand their personal networks at the same time."

Zimmer & Hälbig, a provider of technical building systems, will also be exhibiting at Cleanzone for the first time this year. Managing Director Michael Böhm summarises the growing importance of cleanroom technology, and of Cleanzone: "As the requirements for products, quality and miniaturisation continue to increase, cleanroom technology will be growing even more important in every industry in future. The only way to guarantee product quantity and quality each and every time is by establishing the perfect cleanroom conditions for each situation. Cleanzone enjoys a central location that is easily accessible from around the world, and boasts an excellent mix of products, technology, processes and events. As a result, we believe it offers us an outstanding venue, as a full-range provider of cleanroom systems, to not only conduct promising discussions, but also obtain lots of new contacts."

There will also be some new faces on hand from outside Germany at Cleanzone 2015, such as the Finnish firm Muovilami Oy. Hans Naupert, Export Manager for Western Europe, explains what he is hoping to achieve at the trade fair, and offers his assessment of the market for cleanroom technology: "This coming October will be the first time that our company, Muovilami Oy, will be presenting its hygienic LAMI GRP doors at Cleanzone in Frankfurt. We believe that Cleanzone offers an excellent opportunity for us to raise awareness of our internally successful LAMI GRP doors, as well as to establish new contacts in markets that we have yet to enter. Demand for cleanrooms is growing strongly worldwide, and the number of industries making use of this technology continues to increase. This is why we believe there is tremendous growth potential for sales of our hygienic LAMI GRP doors."

61 companies presented their products and services at Cleanzone 2014. In addition to Germany, these exhibitors came from Great Britain, Austria, Switzerland, the Netherlands, Belgium, France, Slovenia and Portugal.

cleanzone

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Netstal presented all-electric ELION 1750 for maximum precision for medical applications at Plastpol

- Manufacture of technically demanding and highly complex insulin pen piston guides
- Ideal partner for applications within the packaging sector

Polish representative Muehsam-Elektromech presented Netstal's all-electric ELION 1750 for maximum precision for medical applications at the Plastpol trade fair in Kielce, PL (26-29 May 2015). Customers and visitors could also obtain detailed information about Netstal's high application and system expertise within the packaging sector.

The all-electric ELION is ideal for use in clean rooms.

Maximum precision for medical applications

At the Plastpol trade fair, Netstal demonstrated its high expertise within the industry of medical technology through the production of insulin pen piston guides on an ELION 1750-510. The polyoxymethylene parts are manufactured on a 16 cavity mold from Kebo (Switzerland) in a cycle time of approx. 8.5 seconds, which is very fast for this application. The extremely complex processes of the mold and core traction movements during mold removal require a very flexible and above all freely configurable control. The aXos control supports the process very efficiently in this case. Furthermore, the thermal and geometric properties of the molded part are very complex, so for example, the very small core diameters must be cooled skilfully in order for the process time to be as short as possible. The requirements placed on manufacturers of medical technology in terms of cleanliness, precision, short cycle times and low material costs are very high. „The all-electric ELION is ideal for use in clean rooms. It guarantees the high-precision manufacture of sterile parts in a very clean environment while achieving very short cycle times in compliance with all applicable legal regulations. The customer benefits from excellent mechanical engineering and a highly cost-effective solution thanks to our system and application expertise," explained Dr. Patrick Blessing, Head of Business Unit MED.

Drinking cup produced on an ELION 1750-530 on a 2 cavity mold. The cycle time of this application is extremely fast, approx. 2.3 seconds.

Netstal and KrausMaffei offer a comprehensive product portfolio for applications in the medical sector

Boasting a strong product portfolio, Netstal and KraussMaffei offer customers in the medical technology industry outstanding production and technological expertise across the entire process chain – from simple applications through to applications in clean rooms. As well as benefiting from Netstal's ELION series, customers in the medical technology industry can also take advantage of the CX and EX series from KrausMaffei, which are rounded off with a wide selection of robots designed to improve process and production efficiency.

Netstal - a reliable system partner within the packaging sector

Netstal has longstanding experience as a system solution partner. The company is a global market leader specifically in the configuration of machines and systems with and without in-mold labeling (IML). „Longstanding application technology experience gained from implementing projects all around the world and a compact network of technology partners to support all our processes and components enables us to provide exceptional plug and play systems that are reliable and simple to operate in a productive environment," emphasized Markus Dal Pian, Vice President Sales at Netstal. In the highly competitive market for innovative, weight-optimized packaging solutions, maximum performance in combination with the manufacturing safety and reliability of production systems play a central role when it comes to unit costs. Following optimization of material input on the injection unit, which is the main cost driver, other elements should not be neglected when considering costs. „A sound machine design developed for continuous high performance and exceptional injection performance coupled with a high-precision controller and energy-efficient drive concept form the basis for positively influencing unit costs," explained Dal Pian.

Netstal-Maschinen AG CH 8752 Näfels

interpack 2017: all leading office-holders re-elected to Advisory Council

04th - 10th May 2017:
interpack 2015, Düsseldorf (D)

Friedbert Klefenz, President of the Packaging Technology division of Robert Bosch GmbH, is the old and new President of interpack. He was unanimously re-elected to this office in April at the constitutive meeting of the Advisory Council for interpack 2017. Both of the Vice-Presidents who held office in the 2014 council were re-elected as well: Christian Traumann, Managing Director of MULTIVAC Sepp Haggenmüller GmbH & Co. KG, and Bernhard Borgardt, Managing Director of Ostedruck Bernhard-J. Borgardt GmbH & Co. KG, who is also a member of the steering committee of the European Plastics Converters – EuPC association, a past president of IK (German Plastics Packaging Association), and a board member of GKV (the Central Federation of the Plastics Processing Industries in Germany).

This first meeting of the Advisory Council of the world's most important trade fair for the packaging sector and related processing industries represents the official kick-off of the strategic orientation phase and concrete content-related preparations for the trade fair.

"The constructive collaboration with the Advisory Council is a key ingredient for a successful interpack. Close interaction with the leading companies in the industry is an essential prerequisite for precisely aligning the range of products and services offered to the needs of our exhibitors and visitors," states Werner Matthias Dornscheidt, President and CEO of Messe Düsseldorf.

Friedbert Klefenz, President of the Bosch Packaging Technology division commented as follows on his re-election: "What makes interpack in Düsseldorf so valuable is innovation. Every company participating in this worldwide leading trade fair presents real novelties – new products, new technologies, new applications. I am delighted to have been elected president once again and to get the chance to contribute to a successful interpack in 2017."

The topic of SAVE FOOD will again play a major role at interpack 2017, which will take place at the Düsseldorf exhibition centre from 4 to 10 May. In addition to the third SAVE FOOD congress, there will be a SAVE FOOD Exhibition. The SAVE FOOD initiative was officially launched as a co-operation between the Food and Agriculture Organisation of the United Nations and Messe Düsseldorf GmbH with a first congress in 2011. In 2013 the Environment Programme of the United Nations (UNEP) joined the initiative as a partner. Today, more than 120 companies and industry associations support the initiative.

In its second edition, "components for processing and packaging 2017" will be staged with a revised concept. This event for suppliers to packaging technology producers will be held at a central location in the exhibition centre in the temporary Hall 18. It will remain open for the complete duration of interpack.

For exhibitors, the online registration phase will start in October of this year at www.interpack.com and www.packaging-components.com. The official closing date for registration for interpack is 29 February 2016.

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In 2015 for the first time, exhibitors from abroad are expected to be in the majority at ACHEMA. The list of top trends at the show includes system and process modularization and automation, energy and resource efficiency and integrated process development. All of this requires networking between different industries and technologies. The ACHEMA App and ACHEMA Partnering platforms provide an ideal networking environment.

ACHEMA 2015: Information and Innovation

15th - 19th June 2015: ACHEMA 2015, Frankfurt am Main (D)

The global process industry is looking forward to the upcoming event in Frankfurt. Over the course of a week on roughly 132,000 m² of exhibition space starting on June 15th 2015, nearly 3,800 exhibitors will be showcasing their products, technologies and expertise targeted at chemical production and the pharmaceutical and food processing industries. In selecting three focal topics, ACHEMA has identified some main threads which will run through all of the exhibitor groups. Innovative process analytical technology, industrial water management and the BiobasedWorld platform for the bio-based industry and biotechnology are themes which will appear at various points in the exhibition and Congress. The special publications, markings and ACHEMA App provided by the organizers contain background information and act as orientation aids to assist visitors who have a special interest in these topics.

Information and interaction with ACHEMA Partnering

ACHEMA Partnering provides a simple means of selectively contacting potential collaboration and business partners in the run up to the show and during the event as well. Following simple free registration at www.achema.de you can set up a profile, search and contact other users and arrange to meet them at ACHEMA. The partnering function is also available in the free app. In addition, you can use the app to create your own individual congress schedule and plan your tours through the exhibition halls.

Key trends at ACHEMA

System and process modularization and automation will be a major theme common to all exhibitor groups, from lab technology to packaging.

Energy and resource efficiency including industrial water management is another key topic which remains on the agenda and leads further down the road to process integration. Heat and raw material recovery and closed-loop processing create the need for holistic analysis and design of energy, material and heat flows right from the start.

The onward march of internationalization

Current registrations reflect the increasingly international character of the event. For the first time, more than 50% of exhibitors will come from outside the country. The largest foreign contingents are from China and Italy which are competing for second place (behind Germany) in the exhibitor number rankings. The US, the UK, India, Switzerland and France are next on the list. There is also a big increase in the number of exhibitors from Taiwan, Turkey and Spain. Exhibitors from 55 countries in total will take part in the world process industry forum.

The biggest increase is in the Pharmaceutical, Packaging and Storage Technology exhibitor group which has literally outgrown Hall 3 and has now spread to the Forum and the Agora Pavilion. Pumps, Compressors, Valves and Fittings is still definitely the largest exhibitor group, highlighting ACHEMA's role as the world's biggest show for this sector. The Instrumentation, Automation and Control Technology group is also bigger this time around, which is hardly surprising given the increasing importance of automation.

Meeting ground for researchers, developers and users

Around 800 talks will be given at the ACHEMA Congress, providing a window on future innovation again in 2015. The list of major topics will include materials, biorefineries and "conventional" process technology. The PRAXIS forums are a new format which places some of the themes closer to "their" exhibition halls, giving exhibitors and visitors the opportunity to initiate a dialogue and providing a first-hand look at the items on display at the stands. A number of guest events organized by national and international organizations underline the importance of ACHEMA as a meeting ground for professionals from the world of safety engineering, power and nano technology, high-throughput research and other disciplines.

Encouraging innovation: the ACHEMA Start-Up Award

DECHEMA in partnership with the High-Tech start-up fund, Business Angels FrankfurtRheinMain and other sponsors and supporters have launched a special initiative targeted at the exhibitors of tomorrow. The ACHEMA Start-Up Award will be presented for the first time, giving budding entrepreneurs and start-up companies in the fields of instrumentation/analytical technology, energy and industrial biotechnology the opportunity to project their profile to the international trade public. Nine ideas have been chosen and will be on display for the whole week at the Start-Up Award booth in Hall 9.2. The winners in the three categories will be announced at the opening session at 11 A.M. on June 15th, 2015.

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