Particle deposition measurements are based on the surface inspection measurements techniques as developed for the automotive industry around the change of the century. Industry awareness about the influence of particle deposition measurements has defined a clear demand for equipment. This papier describes the dedicated equipment on the market around 2016.

Particle Deposition Monitoring

Autor: Nicolaas A.W.J. Thevissen

Introduction

Particle deposition on critical surfaces forms a significant risk factor for the functioning of precision equipment and reduces the yield in semiconductor manufacturing plants. The maximum allowed particle deposition in the industry is often simply defined as the number of visible particles per cm2. This implies that number of particles are of importance as well as the size of the surface. Indirect measuring equipment such as the APMON from Technology of Sense, Cleapart-100v of Winlight Systems, Omneo of Omneo sytems, PFO meter of Esa/Estec and the PDM of SAC Nederland are all capable of measuring this indirect deposition of particles on a witness plate or plate system. Basically two types of systems are used, dark field exposure of the particles by the Cleapart-100v and the PFO meter and obscurance by the other machines. The Omneo, PFO meter and PDM operate with detacheable witness plates or boxes and are capable of collection deposition in a passive way without being attached to electronics or power. The PFO meter does keep his witness plate inside a small box. This box facilitates the easy transportation of the witness plate to the measurement equipment as it can be closed and stored at will. Omneo and PDM are glass witness plate systems using the Borosilicate glass making them suitable for collection of biomaterial as well. The Cleapart 100v and the APMON witness surfaces are attached to their electronics. The real-time properties of the machines are limited as results only can be measured after a lapse of time to allow deposition. Omneo and the PFO meter do not have real-time capabilities. Cleapart-100v, APMON and PDM have the real-time feature. Cleapart-100v allows four measurements per hour, the APMON over ten measurements and the PDM over hundred measurements per hour. Therefore the last system is as well suitable for event catching like airborne equipment. On the detection side of the equipment three parameters are of importance. Detector surface, this is the effective used surface of the witness plate, smallest detectable particle and the measurement uncertainty or repeatability. A system like the APMON cannot redo a measurement. A system like the Cleapart-100v cannot extend its effective detection surface at the inspection location other than to use more systems. PDM, PFO and Omneo systems can use more witness plates to catch deposition and can reveal deposition differences in a room parallel in time.

Nicolaas A.W.J. Thevissen

Smallest particle and detector size.

The smallest particle that can be detected is 5µm LSB equivalent for the PFO and the Cleapart-100v. All other equipment makes use of the effect that the particle is obscuring the light. The PDM detects particles of 10µm and up. Omneo and APMON detect particles of 20 µm and up. The Omneo equipment makes use of a two channel detection system and is capable of counting the Uv responding particles separately. In a cleanroom environment anything responding to Uv is likely to be of human origin. Garments responding to Uv are likely to have a private origin as most cleanroom compatible garments do not respond to Uv.

The overall fit to purpose factor of a system depends as well on the way it can be used in a clean room or in a test programme. The witness plate systems have the advantage that a measurement can be done even if there is no measurement equipment at site at all. The equipment can be brought to the site during audits or only for measurements. Collection of information is passive and does not require equipment to

	surface in cm²	dimension in µm	witness system	measurements per hour
PFO	1,7	5	box	100
Omneo	5	20	glass credit card size	100
Apmon	35	25	casset and unit	6
PDM	50	8	glass disk CD size	100
Cleapart	100	5	complete unit	4

Systems discussed

Particle Deposition Monitoring

be at site. Witness plates can be stored as well for investigation of the nature of the particles found in deposition. The sensitivity of the equipment is a mix of detector size and smallest particle that can be detected. The PFO is the oldest system and has only a detector size of 1.7 sqcm. The OMNEO has only a surface of 5 sqcm but can be inserted in the machine twice thus having an effective surface of 10 sqcm per witness plate. The APMON makes use of a plate system arranged as roofs and inverted roofs thus making up a surface of 35sqcm. The witness plates of the PDM have an effective surface of 50 sqcm. This surface is a donut shape on a 12cm, (CD size) glass disk. The largest surface has the Cleapart. This unit has a full square decimetre of detection surface right on top of the equipment. A large detection surface allows for short exposure times at low deposition rates. For measurement purposes the detection surface can be increased by using additional witness plates or detector units.

A further difference in measurement systems can be found in the way the data leaves the actual capturing system. The APMON communicates wireless, the latest Cleapart system is fully standalone, the Omneo does not require any external power and is powered by USB2. The USB2 is as well used for the data transfer to a laptop or other system. The PDM system has an Ethernet interface and can be used for remote incremental measurements without human intervention at places where no human activity is allowed.

Equipment combinations

In case particles are captured by the PDM system a disk can be retrieved for further analysis. The point where the particle is located on the disk is captured as well by the PDM system thus allowing transfer to a carbon stub for use in a SEM system. Any glass disk system can be sterilised and after exposure it can be tested for biological contamination.

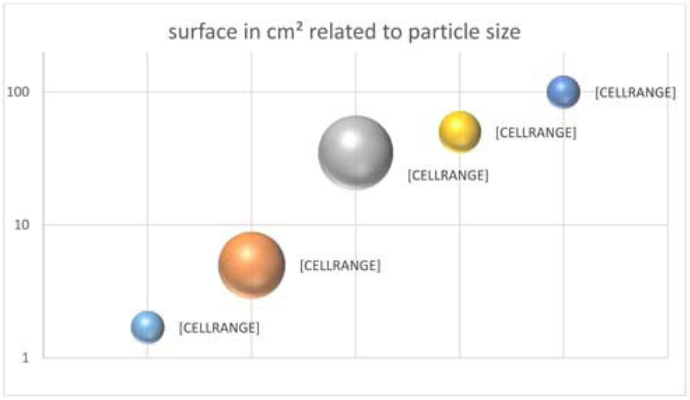
Sticky pads

Deposition measuring equipment basically checks the surface cleanliness. The systems based on the technique where light is blocked work well on transfer foils. The Omneo and the PDM have a holder for transparent sticky pads. The sticky pad is a 3 layer foil assembly. The top and bottom foils shield the layer used to collect the particles. The foil in the middle is used to perform the surface cleanliness measurement on. This middle foil has a sticky bottom side. The three layer assembly comes in a handy shielding cover. Top and bottom layer have a peel off support sticker marking the layer and marking the sequence of peeling. The user will at the sample site first peel off the bottom shielding foil. Then he will sample the surface by pressing with his thumb onto the top of the sticky pad. After this action the sticky pad is put on the pad holder and brought to the deposition measurement equipment. Just before placing the holder in the equipment the top layer is peeled off. In this way it is ensured that no particles on the top side are measured.

Data output

Particle deposition measuring equipment actually measures the change in the surface cleanliness over the time of the measurement interval. The APMON takes intervals of 10 minutes to check for new particles. The Omneo, PDM and the Cleapart make a list of particles found and their corresponding size. This is done at the initial measurement and at the measurement after expiration of the exposure time. For calculation purposes both lists are concentrated to bins. The numbers found in the bins are are subtracted from each other. Uncertainties with origin the capturing of the size will result in negative particles. The Omneo, PDM and Cleapart show this behaviour. As long as there is sufficient deposition this effect will be hidden. At very small deposition levels the effect becomes clearly visible and may show as negative particles. Multiple measurements can be used in the Omneo and PDM to reduce this behaviour because this equipment measures fast.

New systems under development will reduced the uncertainties thus allowing the detector to be of improved capturing resolution at lower levels of deposition.



The balls indicate the size of the smallest detectable particle. Small balls high in the diagram indicate high detection sensitivity.

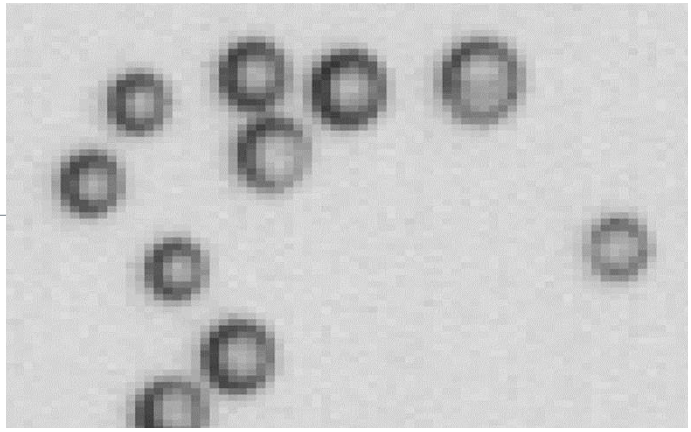


Image made by a PDM3 system with 8 µm particle resolution of some glass bead calibration dust. The image is 0.025cm x 0.016cm The smallest size particles have a diameter of 25 µm. (Image SAC-Nederland b.v.) Note the size variation of the glass beads. The total image was 50 cm². (125000 times bigger than the small image shown.)

Cleapart -100 from Winlight System

APMON from Technology of Sense

PDM from SAC Nederland b.v.

Omneo from Omneo systems (height approx.30cm)

SAC Nederland bv
NL 6422 PE Heerlen

HOW YOU USE THE CLEANROOM CAN MAKE OR BRAKE YOUR PROCESS

VCCN is the Dutch Contamination Control Society

ABOUT VCCN

The Dutch Contamination Control Society (VCCN) was founded in 1988 for everybody involved in contamination control and the belonging facilities. Through actual knowledge transfer and jointly exchange of experiences the VCCN endeavors continiously to an optimalisation of the profesionalism in contamination control. With the most important goal: increasing your profesionalism. VCCN is a member of the International Confederation of Contamination Control Societies (ICCCS).

WE SHARE THE KNOWLEDGE

LEARNING TO KNOW THE VCCN

VCCN is a professional platform for and through professionals.
We are busy with:
- the promotion of sharing knowledge and transferring knowledge in the field of contamination control
- optimalising of the expertise of contamination control
- an (inter)active investing in the field of contamination control

The fields in which our members are active are very divers. It varies from semi-conductor industry, micro-mechanica, farmaceuticaland biochemical industry, life-science, medical technology tot he food industry.

SHARING KNOWLEDGE

VCCN organises on a regular basis symposia and exhibitions with leading keynote speakers. Next to this the VCCN organises meetings and excursions in the regions, among which.:
- Cleanroom Symposium
- National Cleanroom Day
- Operating theatre symposium

The VCCN Magazine is published 4 times a year. You can read about different themes on contamination control like cleaning, pharma, food, space, guidelines and standards.

TRANSFER OF KNOWLEDGE

VCCN organises workshops, classes and certified education about the design and operating of cleanrooms, among others.:
- Cleanroom Behaviour Education (with International Cleanroom-Pass®)
- Workshop particle deposition
- Education Cleanroom testing and certification

OVERVIEW EDUCATIONS TIME CERTIFICATION

OVERVIEW EDUCATIONS	*TIME*	*CERTIFICATION*
EDUCATION Cleanroom Behaviour	1 day	ICEB, Cleanroom-pass®, entry in CGC register
CLASS Cleanroom Cleaning	1 day	
CLASS Cleanroom Techniek	1 day	
CLASS Contamination Control	1 day	
CLASS Operating Theatre Behaviour	1 day	
EDUCATION Cleanroom Testing and Certification	3 days	ICEB, entry OCT register
EDUCATION Cleanroom Technology	10 evenings	ICEB, entry CTE register

(These educations have teaching aids in English)

VCCN is the Dutch Contamination Control Society

CERTIFICATION

These educations are being certified by the ICEB (International Cleanroom Education Board). Graduates recieve a VCCN/ICEB certificate and get an entry in the register.

REGISTRATION

For registration forms for these educations go to cursus@vccn.nl.
What offers the VCCN membership?
- become a part of the national and international knowledge platform
- participate in projectgroups
- get in contact with colleagues
- recieve discount on participation fees symposia and event
- recieve discount on classes and guidelines
- get 4 times a year the VCCN Magazine and CACR

KNOWLEDGE CAPTURE

VCCN contributes to the creation of standards and guidelines in the filed of contamination control .

The ISCC2018 is organized by the VCCN September 2018 VCCN in The Hague

Knowhow

In cleanrooms, contamination control depends on know-how about every- detail. So visit this symposium with interesting technical papers. Learn all about new applications and inventions concerning the improvement of quality in your cleanroom.

Know how

Knowing how to achieve the control you need is essential in contamination control. For know-how you need to learn first. So learn everything about contamination, how it affects your product and how you can avoid it. How do you control your contamination? Be sure to hear interesting lecturers from all over the world. Participate in sharing knowledge.

Know why

Knowing why contamintion control is crucial for critical products is really understanding it's importance. When you understand, you can start to implement contamination control solutions. During the symposium you learn about implementing solutions to control contamination of products.

So meet us at the International Symposium Contamination Control in 2018 and learn everything about "the world behind Contamination Control."

Sign up for this symposium at www.iscc2018.com.

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Dear subscribers,

the new year is up to speed again and we have already witnessed some interesting events in the last weeks. LOUNGES expo in Stuttgart has been furthermore establishing itself as a leading meet-up in the sector and now we are looking forward to some other interesting events that are relevant for international exchange of views, knowledge and experience. Here we need to mention:
- Interphex in New York, 21. – 23. March 2017
- ConTaminExpo 2017 in Paris, 28. – 30. March 2017
- Cleanroom Exhibition in Istanbul, 20. – 22. April 2017

Just in case you are not travelling there, you can rely on finding a good deal of information on that in our newsletter in the coming weeks. Our editorial team present is on site. So for now you can benefit from all the up-to-date cleanroom information in this newsletter.

Yours sincerely

Reinhold Schuster

Connect 2 Cleanrooms Supports Solar Cell Research at Swansea University

Connect 2 Cleanrooms have completed the installation of an ISO Class 6 & 7 cleanroom at Swansea University to help support their solar cell research as part of the SPECIFIC Innovation and Knowledge Centre.

Led by Swansea University, SPECIFIC is an academic and industrial consortium with a vision to turn buildings into power stations. The solar photovoltaics research is developing materials and manufacturing methods to produce solar cells on glass and steel construction materials. These materials will replace conventional roofing, cladding, and glazing products, so buildings can generate a significant proportion of their electricity demand from the fabric of the building alone.

Following the construction of brand new state of the art laboratories on Swansea University's Bay Campus, SPECIFIC required a cleanroom to provide a stable and consistent environment for their research, as well as a larger space to co-locate all of their solar cell activity. SPECIFIC's extremely tight specification required temperature control to maintain 21 °C very reliably, and humidity control to be less than 30% relative humidity at all times.

Following on from previous working relationships with the Swansea University, Connect 2 Cleanrooms designed, manufactured and installed a Modular Hardwall panel system on the new Bay Campus in Swansea. With an overall footprint of 114 m², the suite of cleanrooms consists of 4 rooms. The humidity controlled room is 6 m x 4 m, ISO class 7, temperature controlled to maintain 21 °C, and can deliver a constant humidity level of less than 30% at all times. The ISO Class 6 area is at the other end of the cleanroom, it is also 6m x 4m and is temperature controlled to maintain 21 °C.

The main cleanroom area is 11m x 6m, ISO Class 7; temperature controlled to the same level as the other rooms, and houses three gloveboxes for research requiring an oxygen-free atmosphere. The final room is the change area which is ISO Class 7, and allows operators to gown up in a controlled area, minimising the introduction of particles into the room.

The cleanroom design incorporates a mixture of swing doors and sliding doors to aid flow of materials and personnel into and out of the cleanroom, entry is controlled by swipe cards to restrict access, and the SPECIFIC logos on the outer panels personalise the room and add to the aesthetics of the design. The transparent hardwall panels to two walls allow visitors an unobstructed view of the facilities and equipment without impacting upon the research, or cleanliness of the room. All these design elements ensure that the cleanroom not only meets the essential parts of the client's specification, but also aid the practical usability of the cleanroom.

Client-focussed Cleanroom

Although cleanliness is crucial throughout SPECIFIC's manufacturing processes, it is humidity levels that have been proven to affect the quality and consistency of their devices. Trystan Watson, Swansea University explains "Cleanliness is very important, but we don't know the exact degree to which it affects our materials and solar cells. Inclusions and contamination are a big issue, however our cleanliness requirement is significantly lower than that for conventional photovoltaic research into silicon solar cells. In terms of device performance and we've seen a very significant influence in terms of humidity – so the consistent control of this this was almost more important than the level of cleanliness in our cleanroom specification."

The inclusion of the humidity and temperature control ensures invaluable consistency all year round. The Connect 2 Cleanrooms control system provides SPECIFIC with the ability to regulate humidity and provides a consistent environment in which to investigate issues, during material synthesis or manufacture, enabling them to develop a more stable baseline for materials and processes. Prior to the installation of the cleanroom, the laboratory was achieving 30%-70% relative humidity; however, where the relative humidity was too high the devices wouldn't work.

Pete Greenwood, Swansea University was exceptionally satisfied with the end result and says "Connect 2 Cleanrooms provided an extremely professional and prompt service, with excellent communication throughout the design process and during installation on site. The cleanroom looks fantastic and we are very pleased with the end result."

Cleanrooms

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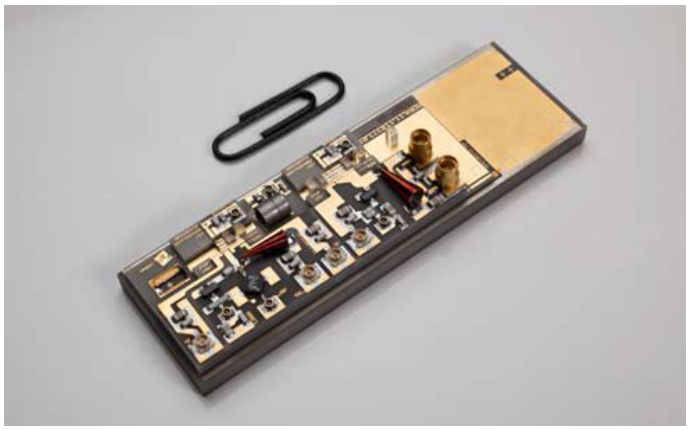
For the first time ever, a cloud of ultra-cold atoms has been successfully created in space on board of a sounding rocket. The MAIUS mission demonstrates that quantum optical sensors can be operated even in harsh environments like space – a prerequi-site for finding answers to the most challenging questions of fundamental physics and an important innovation driver for everyday applications.

Quantum optical sensor for the first time tested in space – with a laser system from Berlin



MOPA laser module for MAIUS: Hybrid-integrated master-oscillator power-amplifier (MOPA) laser module for rubidium precision spectroscopy in space developed by the Ferdinand-Braun-Institut – three of these MOPA modules along with two redundant modules are integrated into the laser system. (© FBH/schurian.com)

MAIUS laser system: Used to successfully create a Bose-Einstein condensate for the first time in space. It is about as big as a shoe box with a mass of 27 kg. FBH's laser modules are integrated on the bottom side of the heat sink, the top side houses modules for further processing of the light to be transferred to the main experiment. (© Humboldt-Universität zu Berlin)

According to Albert Einstein‘s Equivalence Principle, all bodies are accelerated at the same rate by the Earth‘s gravity, regardless of their properties. This principle applies to stones, feathers, and atoms alike. Under conditions of microgravity, very long and precise measure-ments can be carried out to determine whether different types of atoms actually „fall equally fast“ in the gravitational field of the Earth – or if we have to revise our understanding of the universe.

As part of a national consortium, Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfre-quenztechnik (FBH) and Humboldt-Universitaet zu Berlin (HU) now made a historical step towards testing the Equivalence Principle in the microcosm of quantum objects. In the MAIUS mission launched on January 23, 2017 a cloud of nano-Kelvin cold rubidium atoms has been generated in space for the first time ever. This cloud was cooled down with laser light and radio frequency electrical fields so that the atoms finally formed a single quantum object, a Bose-Einstein condensate (BEC).

More than 20 years after the groundbreaking results of the Nobel laureates Cornell, Ketterle, and Wieman on ultra-cold atoms, preliminary evaluation of the sounding rocket mission data indicates that such experiments can also be carried out under the harsh conditions of space operation – back in 1995, living room-sized setups in a special laboratory environment were required. Today’s quantum optical sensor is as small as a freezer and remains fully opera-tional even after experiencing huge mechanical and thermal stress caused by the rocket launch. This groundbreaking mission is a pathfinder for applications of quantum sensors in space. In the future, scientists expect to use quantum sensor technology to cope with one of the biggest challenges of modern physics: the unification of gravitation with the other funda-mental interactions (strong, weak, and electro-magnetic force) in a single consistent theory. At the same time, these experiments are drivers of innovation for a broad range of applications, from inertial (non-GPS referenced) navigation to space-borne geodesy used to deter-mine the Earth’s shape.

Comprehensive know-how in laser modules designed for space applications

For this mission, the FBH has developed hybrid micro-integrated semiconductor laser mod-ules that are suitable for application in space. These laser modules, together with optical and spectroscopic units provided by third partners, have been integrated and qualified by HU to provide the laser subsystem of the scientific payload. The results of this mission coordinated by Leibniz Universitaet Hannover do not only prove that quantum optical experiments with ultra-cold atoms are possible in space, but also give FBH and HU the opportunity to test their miniaturized laser system technology under real operating conditions. The results will also be used to prepare future missions which are already scheduled for launch. MAIUS, however, is not the first sounding rocket test for both institutions’ laser technology in space; the technolo-gy has already been successfully tested in April 2015 and January 2016 on board of two sounding rockets within the FOKUS and KALEXUS experiments.

MAIUS: matter-wave interferometry under microgravity conditions

The MAIUS mission is supported by the German Space Agency (DLR) with funds provided by the Federal Ministry of Economic Affairs and Energy and tests all key technologies of a space-borne quantum optical sensor on a sounding rocket: vacuum chamber, laser system, electronics, and software. MAIUS constitutes a historical milestone for future missions in space that will take advantage of the full potential of quantum technology. For the first time worldwide, a Bose-Einstein condensate (BEC) based on rubidium atoms has been created on board of a sounding rocket and has been used to investigate atom interferometry in space. Quantum optical sensors based on BECs enable high-precision measurements of accelerations and rotations using laser pulses which provide a reference for precise determi-nation of the positions of the atomic cloud.

Quantum optical sensor for the first time tested in space – with a laser system from Berlin

The compact and robust diode laser system for laser cooling and atom interferometry with ultra-cold rubidium atoms has been developed under the leadership of the Optical Metrology Group at HU. This system is required for the operation of the MAIUS experiment and con-sists of four diode laser modules that have been developed by FBH as hybrid-integrated master-oscillator power-amplifier laser modules. The master laser is a monolithic distributed feedback (DFB) laser which is frequency-stabilized to the frequency of an optical transition in rubidium and generates spectrally pure and highly stable (~ 1 MHz linewidth) optical radiation with low output power at 780 nm wavelength. The three other laser modules feature a tapered amplifier chip with a ridge waveguide input section. These tapered amplifier chips boost the optical output power of a DFB laser to beyond 1 W without any loss of spectral stability. Two additional redundancy modules were integrated. Free space acousto-optical modulators and optical components are used to generate the laser pulses according to the experimental sequence. The laser light pulses are finally transferred to the experimental chamber by optical fibers.

Furthermore, a laser technology demonstrator designed for future missions has been inte-grated, consisting of two micro-integrated semiconductor Extended Cavity Diode Laser (ECDL) modules developed by FBH. These modules are specifically required for future atom interferometry experiments that pose more stringent requirements on the spectral stability of the lasers.

Ferdinand-Braun-Institut
D 12489 Berlin

A bureaucratic error in the implementation of EN ISO 16890 allows countries to withdraw EN 779 at short notice

The EN 779 test standard for air filters can be with-drawn at any time

A formulation error in the cover page of the new ISO 16890 international test standard for the assessment and classification of air filters has created uncertainty and different courses of action among different countries. Originally, the standard introduced at the beginning of 2017 was intended to replace the previous EN 779 with a transitional period of 18 months and was only to have had sole validity from the middle of 2018 onwards. However, due to flawed wording on the part of the European Committee for Standardization (CEN), it is now possible for countries to withdraw EN 779 with immediate effect. The United Kingdom and The Netherlands have already done so with the introduction of ISO 16890 at the beginning of the year, which has now become the only valid standard for their respective countries. As a result, users, filter resellers and filter manufacturers are faced with the challenge of managing the changeover at any time. The new standard has a significant effect on the selection and purchasing conditions of companies. As a leading filtration specialist and pioneer in the implementation of the new ISO 16890 values, Freudenberg Filtration Technologies is offering rapid support during the transition.

Wer kein Risiko eingehen und sich nicht von nationalen Entscheidungen abhängig machen möchte, sollte sich mit der ISO 16890 schnellstens vertraut machen. Freudenberg Filtration Technologies hilft dabei. (Bildquelle: Freudenberg Filtration Technologies)

With the introduction of the ISO 16890 test standard, filters will in future be assessed in terms of particulate matter classes PM1, PM2,5 and PM10, which are the same classes applied by the World Health Organization (WHO) and environmental authorities. Based on these comparative values, users can more easily select the appropriate filters to meet their individual requirements.

Validity of EN 779 is now in the hands of each country

In all European countries, except the United Kingdom and The Netherlands, EN 779 may still remain valid up to and including June 30, 2018. This means that both standards can exist in parallel. However, this situation is not reliable. If you do not want to expose yourself to risk or to be dependent on national decisions, you should familiarize yourself with ISO 16890 as soon as possible. Freudenberg Filtration Technologies is on hand to help you in this regard as a supporting partner. “We have already implemented all the new ISO 16890 values and are happy to support customers and prospective customers during the important changeover phase”, explained Dr. Daniel Schmitt, Global Vice President Industrial Filtration at Freudenberg Filtration Technologies.

Fully in tune with ISO 16890: product catalogue, website, app

In the run-up to the launch of ISO 16890, Freudenberg Filtration Technologies initiated an information and service campaign last year, complete with lectures, seminars and training courses. In January 2017, the new Viledon product catalogue 2017/2018 followed up with the first ever filter classification according to ISO 16890. With the launch of the Viledon app, a further information tool will be available at the end of February.

Freudenberg Filtration Technologies SE & Co. KG D 69465 Weinheim

The WLAN option for Systec & Solutions HMI systems now also permits wireless, mobile use of IGEL Thin Clients. Thanks to the Bluetooth option, wireless connection of Bluetooth handheld scanners or other Bluetooth HID end devices to our IGEL Thin Clients is possible as well.

IGEL Thin Client – now with Bluetooth and WLAN function

Image Rights: Systec & Solutions GmbH

A Bluetooth manager in the IGEL configuration software provides convenient administration. The potential applications for the Bluetooth and WLAN function range from mobile stations for pharmaceutical production to monitoring of the production process in the life science industry and cost-efficient retrofitting of HMI systems with Thin Client technology.

With the aid of the universal desktop converter, the latest version 3 IGEL Thin Client software can be installed on all PC-based HMI systems from Systec & Solutions, enabling the HMI to be used as a fully functional IGEL Thin Client. This involves creating a client-server architecture permitting the implementation of a convenient remote control solution for the server. Thin Client technology from IGEL provides an ideal means of achieving this simply and efficiently. This also permits incorporation of different GMP IT hardware into an IGEL infrastructure. Convenient central administration of every HMI system is then possible with the universal management suite.

Advantages of an IGEL Thin Client in a GMP environment with Bluetooth and WLAN function:

- Wireless incorporation of HMI systems in the GMP environment into an existing IGEL infrastructure through WLAN or Ethernet
- Wireless use of the IGEL Thin Client with battery-operated TROLLEY platforms via WLAN
- Direct wireless connection of barcode scanners to the IGEL Thin Client via Bluetooth
- Bluetooth HID and other end devices can be directly connected to the Thin Client
- Supports touchscreen operation
- Connection of USB devices
- All standard remote protocols such as RDP, Citrix, Vmware or VNC are supported
- Central profile-based remote administration of all IGEL Thin Clients by universal management suite
- Serial interface for scales
- Options for customized IGEL software adaptation
- Less expensive than conventional KVM solutions or PCs
- Low maintenance costs
- Simple service replacement and installation of hardware thanks to plug-and-play

systec & solutions

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RAUMEDIC, polymer component system provider for the medical technology and pharmaceutical industry, will present again in 2017 at the Medtec Europe in Stuttgart – in the heart of the German Medtech industry. The company will be demonstrating its ability to implement customer ideas in products that expertly combine functionality and cost-effectiveness.

THINK SMALL – RAUMEDIC at the Medtec Europe

This year one of the themes guiding RAUMEDIC's presence at the Medtec Europe will be the motto "THINK SMALL".

The company is meeting the ongoing trend towards minimally invasive procedures with its ultra-small dimensioned tubing and molded parts, providing impressive functionality in minimal space, all manufactured to the most precise tolerances. It is part of our one overarching goal as a developer and producer of polymer solutions: procedures that are patient-friendly and ensure fast recovery.

And RAUMEDIC does not limit itself to thermoplastics and silicones. Metal components such as ultra-fine wires and electronic components, combined and integrated with high-performance polymers as well, are the key features appearing today in the medical technology solutions of tomorrow.

04th - 06th April 2017: Medtec Europe 2017, Stuttgart (D)

Raumedic AG
D 95233 Helmbrechts

Every year, Gerresheimer's pharmaceutical industry customers order several hundreds of millions of glass pharmaceutical packaging products manufactured at the company's plants in Essen and Lohr. Packing robots were recently introduced to improve the efficiency and reliability of packing operations before the pharmaceutical glass products are delivered to customers.

Gerresheimer optimizes cold-end operations at its pharma glass production plants with state-of-the-art packing robots

"Innovative automated processes are safeguarding the future of our plants and improving the quality of our products," commented Dr. Jürgen Unruh, General Manager at Gerresheimer Essen. He added that the installation of packing robots at the Essen facility serves as an example for the other production plants in the Gerresheimer Group.

Pharmaceutical packaging products, such as the glass bottles manufactured by Gerresheimer, have to satisfy stringent requirements and be low in germs and particles. The extremely high temperatures in the glass moulding process initially kill all the germs. To prevent recontamination, the bottles go straight from the annealing oven to the clean room, where various mechanical and optical inspection systems are used to identify and sort out defective bottles. After the final inspection, the bottles in the clean room are shrink wrapped in the required pack size with safe pack technology to ensure that they are hermetically sealed in a germ-free environment.

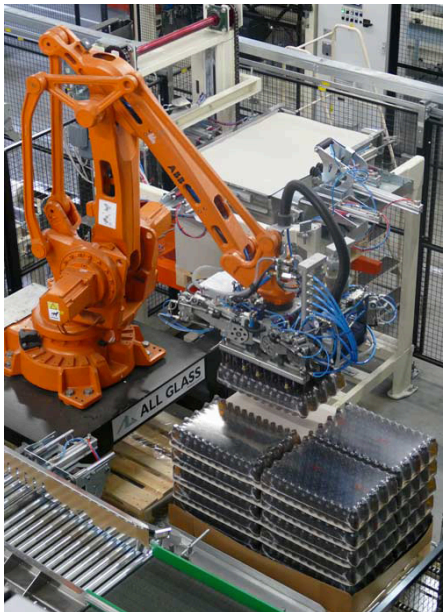
The shrink wrapped packs then have to be packaged and palletized to prevent transportation damage. In the past, production plant personnel working in shifts loaded the transport pallets. This kind of work involves a great deal of effort and concentration because it takes place at high speeds. Gerresheimer decided to automate the process in order to eliminate the resulting pallet packing errors.

Over 1000 packing formats

All the necessary information for the palletization process is contained in the order number. The products are shrink wrapped with safe pack technology in a clean room environment according to the customer's specifications on packing format. There are currently around 1500 different packing formats, 1000 of which can be implemented by the safe pack machine. In the future, a 100% reliable camera system will perform continuous visual inspections to ensure that the packing formats, stability and quality are correct.

Automatic packaging

The shrink wrapped packs are transported by conveyor belt from the clean room to the packing robots. At the removal station a robot takes a pack off the conveyor belt and places it on the pallet as per the packing instruction. An operator can use a touch screen to adjust the position of the packs. When one pallet layer is finished, and before the next layer is placed on top, the packing robot adds a protective interim layer. When the pallet is ready it is taken to the holding area in front of the turntable, and the next pallet is loaded. The pallet labels are affixed manually by an operator, who also releases the pallets for delivery. The final stage of the process is the shrink wrapping of the pallets.



The robot arm puts a layer of shrink wrapped bottles on the pallet.


Adjusting the position of the packs with the touchscreen.


The finished pallet on its way to be shrink wrapped.

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