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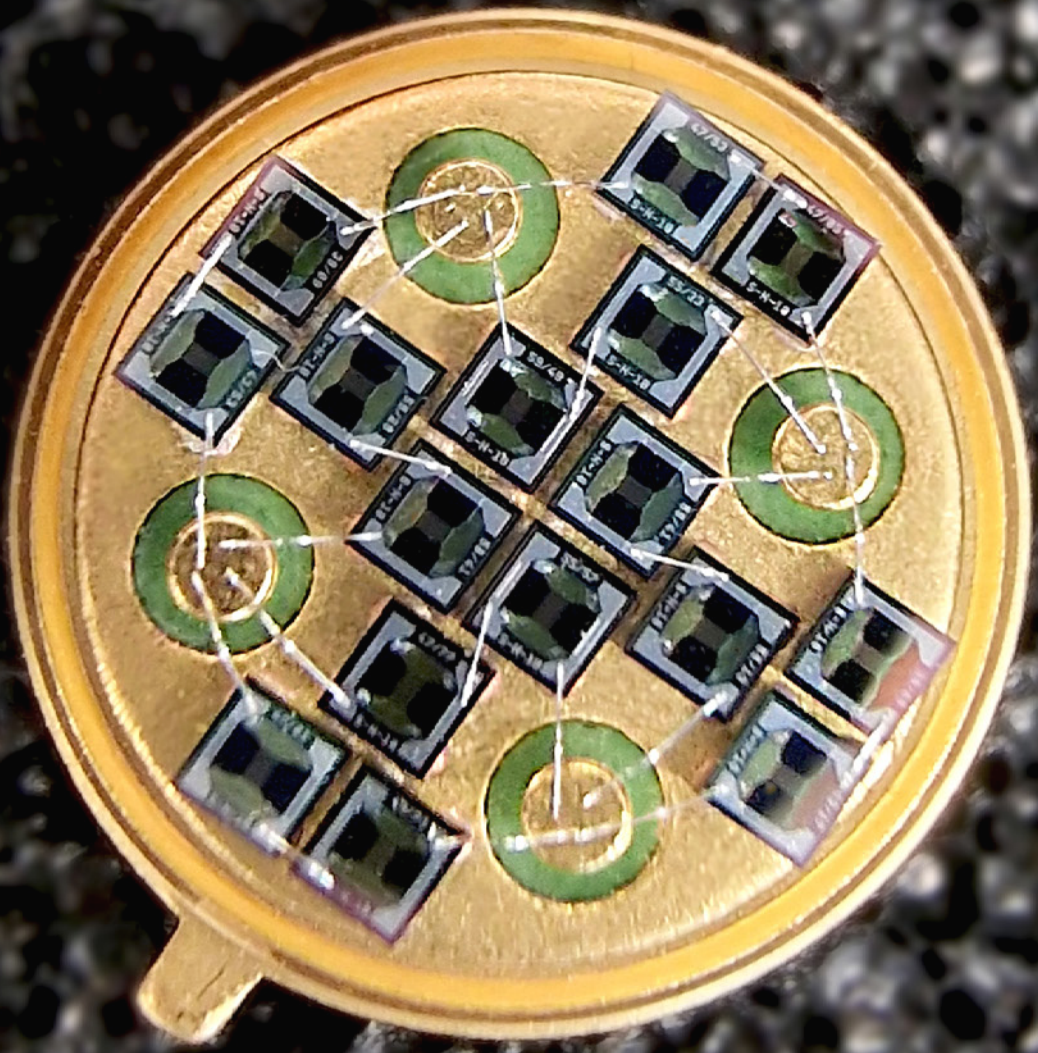
Innovative Technologies / New Applications



INNOVATIVE PATIENT CARE

IVAM.

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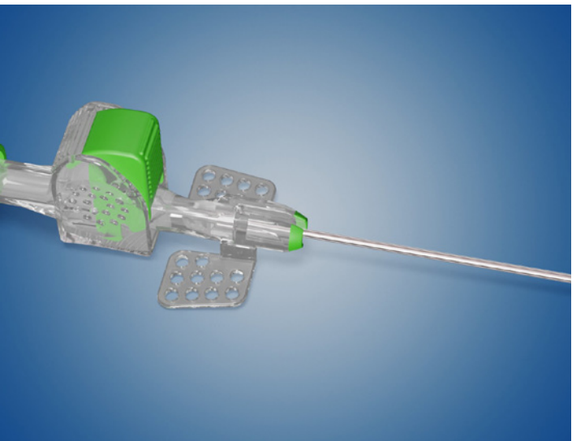

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»INNO 86«
Innovative Patient Care

Welcome to this special COMPAMED/MEDICA edition of INNO, where we dive into the world of Innovative Care Technologies.

In these pages, you will find a collection of articles and features from IVAM members that shed light on the latest advancements in medical technology. From state-of-the-art venous catheters to sensor technology and piezoelectric innovations, we explore the developments that are reshaping patient care. We also take a closer look at the manufacturing and development of various medical implants, showcasing the expertise and innovation behind these life-enhancing devices.

In addition to numerous technical contributions from exhibiting companies, you will also find an exhibitor overview and a stand plan of the companies at the IVAM joint stand as well as the complete program of the COMPAMED HIGH-TECH FORUM on pages 28-37. I wish you an inspiring read and a successful visit to the fair!

Best regards

Mona Okroy-Hellweg

IVAM.

Dr. Martin Schüttler / Carolina Remke

THINKING AHEAD IN MEDICAL DEVICE DEVELOPMENT

Fom Component to Active Implant System

Electrical signals are the key elements of brain function and neural networks of the body - both in health and disease. Active implants are already used today to treat neurological conditions by targeting electrical stimulation of the brain, spinal cord or nerves. To improve existing technologies and most importantly, to improve existing therapeutic approaches, novel active implantable devices are needed. CorTec is providing technologies that help medical device companies to reach their goals in shorter time.

The brain controls a multitude of functions - from movement over perception up to complex cognitive functions. If neural activity gets out of control, the consequences are correspondingly serious. Neurological and psychiatric diseases already account for a third of health care costs, with a tendency to rise according to demographic trends. Currently, various indications are being investigated. Companies continue their work to develop implantable devices and solutions for the treatment of neurological diseases, and as research progresses, the ideas of engineers and inventors around the globe become more reality.

The path from idea to approved medical device is very long and the regulatory requirements are enormous. The market for medical devices is dominated by big players that set hurdles for emerging companies to establish themselves on the market with their innovative devices. To enable innovation and to accelerate time to market, CorTec has opened up the portfolio of own-developed technologies. The technology portfolio is based on the CorTec Brain Interchange System.

The Brain Interchange

In 10 years of intensive research and development work, CorTec has developed the worldwide unique CorTec Brain Interchange System. In comparison to current systems, the Brain Interchange can apply stimulation to adapt to the current situation of the patient, where current systems are only able to stimulate at constant rates without considering the changing needs of the patient.

Laser-microfabricated AirRay Electrode arrays provide a reliable interface for permanent brain interfaces. Being very soft and flexible, they allow for easy implantation and gently fit the curvature of the brain.

A biocompatible ceramic encapsulation hermetically encloses an implanted electronics unit that preprocesses the data. A key component of this system is a custom-made microchip developed in cooperation with the Institute of Microelectronics at the University of Ulm (Prof. Maurits Ortmanns). It amplifies 32 electrical brain signals at very low noise before digitization at high sampling rate (currently 1 kS/s) while, at the same time, allowing for swift and flexible switching between recording and stimulation mode.

Thanks to a dynamic inductive power supply via an external unit, the implant does not require a battery. This eliminates the need for surgical replacement when battery power decreases (as is still the case in many of today's implantable systems). Via the same external unit, brain signals are transmitted wirelessly to a Computer Unit for processing.

What makes us different

The creation of medical devices that can help patients in a new way or to improve existing technologies is bound to time consuming development, validation and regulatory steps. Companies that are creating novel devices and novel treatment options have to come up with ways to shorten their time to market and find reliable partners that help them during their development work.

With the Brain Interchange Technology CorTec is not only getting ready for first-in-human studies for stroke rehabilitation but is also enabling companies to profit from the developmental work. CorTec's goal is to design a system that can be adapted to the individual requirements of applications.
By adapting the Brain Interchange Technology to other devices and indications, CorTec is paving the way for more reliable and robust devices that are able to go to market in shorter periods of time. By partnering up with Medtech Companies, CorTec accompanies the device development from idea to market and offers a vast portfolio of services and development work to create specific components.

The °AirRay™ Electrode technology can be adapted to various shapes and sizes. Solutions for the surface of the brain, the spinal cord and also nerves have been realized and are in use worldwide. The ceramic hermetic encapsulation used in the Brain Interchange System can be adapted to specific user requirements, allowing the realization of active implants with very high channel (electrode) counts of up to a few 100s.
In addition, CorTec is accompanying their customers projects with testing, validation and characterization of components and systems.

CorTec is developing an active implantable brain interface that is capable of bi-directional communication with the brain to revolutionize the neurotech landscape by bringing this technology into the hands of researchers worldwide. In contrast to the approach of most competitors: it is not only a device that is developed for a specific indication, but a platform technology that shall serve the development of various novel treatments.

CorTec GmbH, Freiburg DE

https://www.cortec-neuro.com

Gergely Huszka

REVOLUTIONIZING MEDTECH DEVICES WITH PIEZO LEGS TECHNOLOGY

In the ever-evolving world of medical technology (MedTech), precision and reliability are paramount. Piezo LEGS technology has emerged over the last 20 years as a game-changer in various industries, and is now available for MedTech applications, offering numerous advantages that can significantly benefit such devices. This article explores what is behind this innovative technology and how it can elevate the performance of medical devices, ensuring patient safety and enhancing overall functionality.

What is the Piezo LEGS technology?

Piezo LEGS motors - proprietary technology from Acuvi -, often referred to as “walking” piezo motors, are a unique and innovative type of piezoelectric motor designed for precise and controlled linear motion (Figure 1). These motors derive their name from the way they move, resembling the walking motion of legs. Their operation is based on the principles of piezoelectricity and friction. The core of a Piezo LEGS motor consists of multiple piezoelectric actuators arranged in a specific configuration (Figure 2). These actuators are in-house designed and manufactured, unique piezoelectric ceramics. The LEGS motor system has a true direct drive, meaning that the object to be moved is directly connected to the piezoceramic actuator legs in the motor via the drive rod of the motor. This enables short cycle times in repeated move-and-settle applications reducing overall processing time. Piezo LEGS work with friction drive, where force is created by the internal preload of the piezoceramic actuator legs in direct friction contact with the rotor or drive rod. When the legs start walking, they are always in mechanical contact with the drive rod.

> “In the ever-evolving world of MedTech, precision and reliability are paramount.”

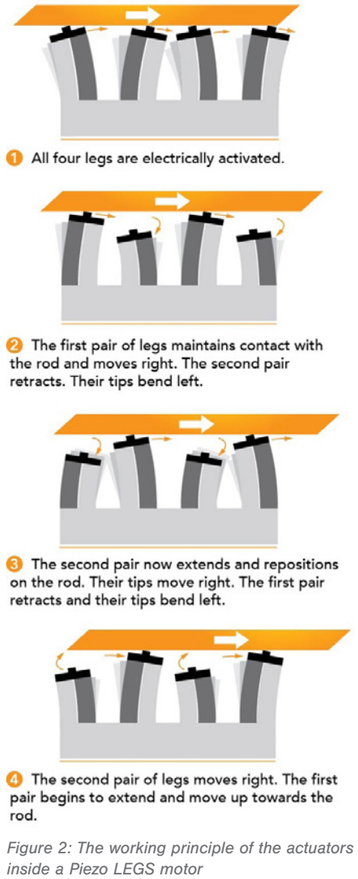


Figure 2: The working principle of the actuators inside a Piezo LEGS motor

How can MedTech devices benefit from Piezo LEGS?

One of the most striking advantages of Piezo LEGS technology in MedTech is its unparalleled precision down to the nanometer scale. This precision is critical in applications such as surgical robots, fluid handling in laboratory automation, handhold or desktop drug delivery devices, and procedures with real-time imaging solutions where even the slightest inaccuracies can have dire consequences. With Piezo LEGS, medical procedures become more accurate and less invasive, reducing patient trauma and recovery times.

Compared to conventional piezo actuators, Piezo LEGS technology offers several magnitudes higher stroke. Its extended range provides movement up to 10 centimeters, which enables the development of innovative medical devices with greater flexibility and functionality. This advantage opens doors to new possibilities in MedTech, broadening the scope of what can be achieved.
Traditional electrical motor-based systems often suffer from backlash - a play or delay in motion when the direction changes. Piezo LEGS technology eliminates this issue entirely. The absence of backlash ensures that MedTech devices respond instantly to commands, enhancing the overall user experience and enabling more precise control during procedures. Furthermore, Piezo LEGS motors come with a built-in brake mechanism, adding an extra layer of safety and control. In critical medical applications, this feature can be a lifesaver.

Piezo LEGS motors can be equipped with integrated encoders, providing a compact solution where space is a critical factor. The closed loop operation with precise positioning control is invaluable in MedTech, as it enhances device accuracy and reliability. Moreover, the elimination of gearboxes simplifies device design, reducing maintenance requirements and the risk of component failure. This streamlined approach not only lowers manufacturing costs but also increases device lifespan.
Perhaps the most critical advantage of Piezo LEGS technology in MedTech is the assurance of patient safety. With precise control, no backlash, and integrated brakes, the risk of accidental injuries during medical procedures is significantly reduced. Surgeons can operate with confidence, knowing that the devices respond exactly as intended. Additionally, the complete movement control provided by Piezo LEGS ensures that delicate tasks, such as tissue manipulation or drug delivery, can be performed with exceptional accuracy and minimal risk.

The future of MedTech with LEGS

In the realm of MedTech, precision, reliability, and patient safety are non-negotiable. Piezo LEGS technology embodies these qualities and offers numerous benefits that can transform the landscape of medical devices. From surgical robots to diagnostic tools, the future of MedTech is brighter and more precise thanks to this innovative technology.

Acuvi AB, Uppsala SE

https://acuvi.com

Figure 1: The Piezo LEGS motor family in scale with a one euro coin

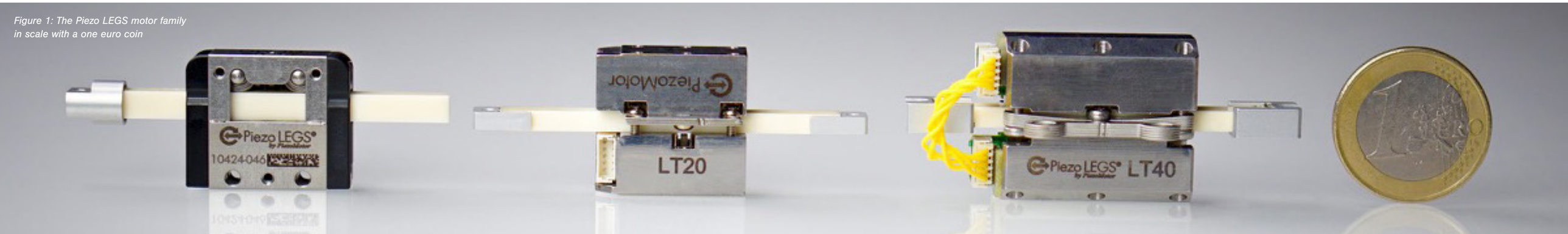


Figure 1: Experimental array of micro infrared emitters. The total electrical power is about 2 W and the cut-off frequency is about 100 Hz. A TO-5 serves as the base. A single-chip solution is currently being developed..

Dr. Jörg Martin Schädel / Dr. Klaus Ettrich

SILICON SENSOR TECHNOLOGY FOR MEDICAL APPLICATION

Besides technologies for computing and memory devices, Silicon is also on the highest level of maturity for micro sensors (MEMS). Based on the variety of established standard processes as well as customized manufacturing, the field of Silicon based sensors and sensing applications is tremendous. In its 30 years since founding, the CiS Forschungsinstitut für Mikrosensorik GmbH developed and manufactured a variety of different sensors for industrial and medical applications - two of those are highlighted here.

MEMS-based infrared (IR) light sources for gas-sensing applications

In the field of breath analysis and lung function, testing different gases like CO_2, CO or alcohol is of interest. Those gases show characteristic light absorption in the IR, that allows for measuring the gas concentrations in a gas mixture by measuring the decay of transmitted light of that specific wavelengths. This method is known as nondispersive infrared (NDIR) sensing. Recent developments led to MEMS-based IR emitters as alternatives to classical light bulbs. The advantages are miniaturization, long-term stability, broader emission spectra, and higher dynamics up to 100 Hz. Intensity and dynamics can be tuned by the size of the active area of the MEMS emitter - unfortunately, both are inversely proportional. Achieving high values for both at the same time is not possible with a single chip so far. However, some applications need both. In the project FIRE, we are currently developing a new generation of MEMS emitters, that comprise arrays of active areas. Effectively this behaves like the sum of small (and therefore highly dynamic) devices. To prove this concept, we started with hybrid mounted areas of our smallest emitters (1x1 mm², optical output ~ 10 mW) - shown in picture 1. These allow for 100 Hz modulation frequencies with a total optical output of > 150 mW and were successfully evaluated in different breath analysis scenarios. Demonstrators of next-generation IR emitters with fully integrated arrays of active areas in production will be available in 2024.

Silicon strain gauges for medical technology

The measurement of the mechanical quantities of force, pressure as well and mechanical stress is important for various applications in the medical environment. For example, the mechanical loads of prostheses and orthoses can be monitored or the wear of medical devices can be recorded directly. Silicon sensor elements based on MEMS technologies offer multiple advantages over conventional sensor technologies in terms of accuracy, long-term stability, miniaturization, and cost efficiency. In addition to piezoresistive pressure sensors, a portfolio of Si strain gauges has been developed at CiS, which have significantly higher K-factors compared to metal strain gauges, offering advantages in terms of signal evaluation and sensor placement. In addition to these sensors, suitable technology for assembly and interconnection has been developed, which enables the mounting and contacting of the sensor elements on a variety of components with long-term stability (metallic, ceramic, etc.). Si strain gauges with full bridges, single resistors as well as on different wafer orientations are available for different applications. Picture 2 shows a demonstrator of our 500 x 500 µm² small Silicon strain gauges mounted on a steel spring load by glass frit bonding.

CiS Forschungsinstitut für Mikrosensorik GmbH, Erfurt DE

http://www.cismst.de

“In the field of breath analysis and lung functional, testing different gases like CO_2, CO or alcohol are of interest.”

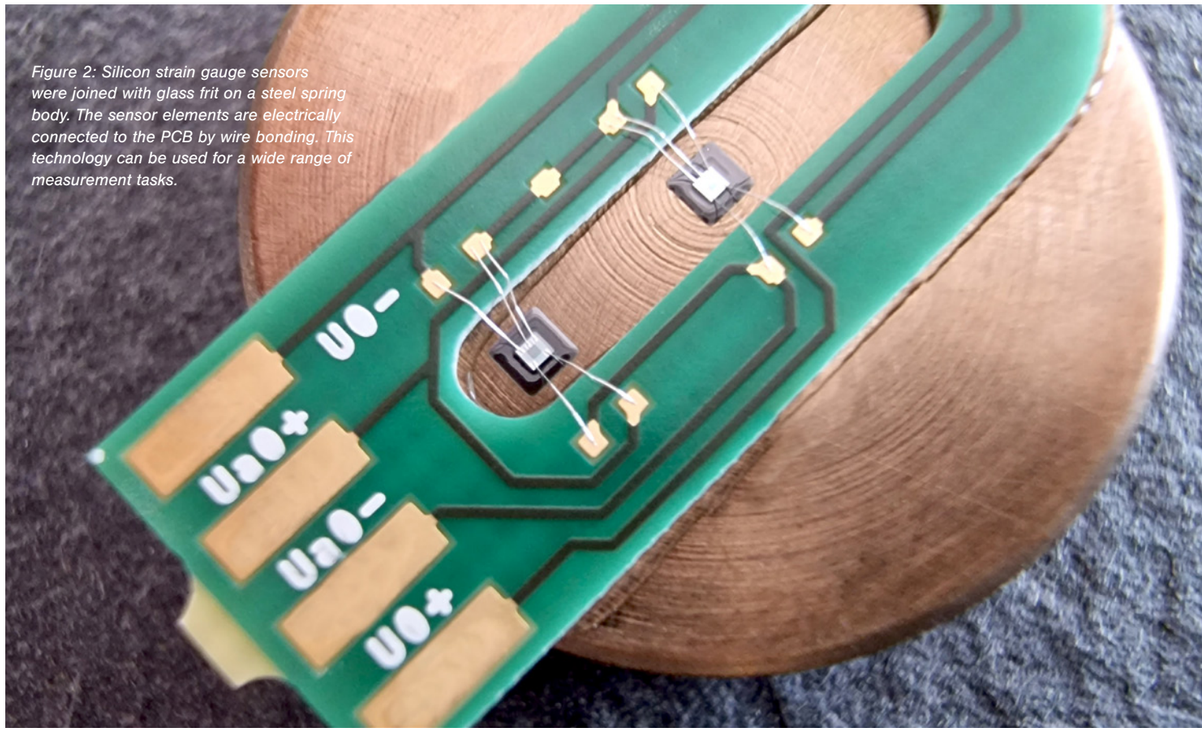


Figure 2: Silicon strain gauge sensors were joined with glass frit on a steel spring body. The sensor elements are electrically connected to the PCB by wire bonding. This technology can be used for a wide range of measurement tasks.

Dr. Jens Ebnet / Susette Germer

NEXT-GENERATION VASCULAR ACCESS: A SLEEPING GIANT

Vascular access is critical in infusion therapy, but current venous catheterization methods lead to high complication rates and significant burdens for the healthcare systems. Ebnet Medical, a pioneer in next-generation vascular access, focuses on patient safety and user needs. It revolutionizes a technology in constant use for over 60 years.

Intravenous failure: unseen pain and suffering alongside escalating costs

Vascular access, mainly facilitated through intravenous (IV) catheters, stands as a cornerstone of modern medicine, enabling vital life-saving procedures. However, this essential healthcare element is plagued by severe complications, leading to patient pain, and imposing significant financial burdens on healthcare systems and reimbursements. Additionally, it poses substantial legal risks for healthcare providers. The problem of IV failure in healthcare is akin to a „sleeping giant.

Remarkably, the technology underpinning vascular access has seen little innovation in over 60 years, with no substantial product improvements. Instead, the focus has primarily been on technical workarounds and training healthcare professionals, even though these efforts have not effectively addressed the persistent issues.

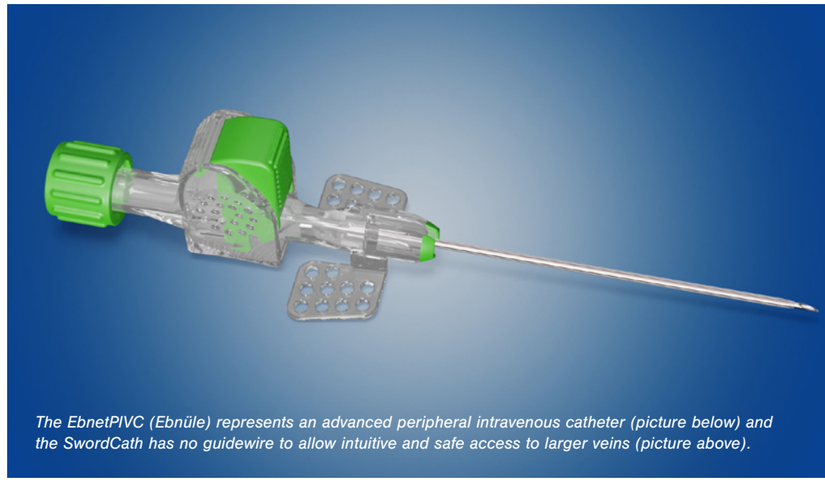
Up to 69% of common peripheral venous catheters fail prematurely before completing therapy, incurring conservative additional costs of 1.5 billion US dollars annually in the United States alone. Shockingly, nearly 54% of children face unsuccessful vein access on their first attempt, necessitating painful and psychologically traumatizing multiple tries. Accidental catheter dislodgment imposes an additional financial strain, exceeding 266 million US dollars each year in the United States.

Ebnet Medical: empathy and practical experience

In the face of these challenges, Ebnet Medical emerges as a beacon of hope. Led by founder Jens Ebnet, M.D., M.Sc., D.E.S.A., with extensive hands-on experience and a deep understanding of both patients and healthcare providers‘ needs and concerns. Profound empathy lies at the heart of his and his team‘s mission.

Dedicated to the development of secure and cost-effective solutions using proprietary platform technologies, Ebnet Medical boasts a leading intellectual property portfolio for next-generation vascular access. This portfolio encompasses key innovations currently in development, including the EbnetPIVC (Ebnüle), SwordCath (a guidewire-free vascular catheter), and a non-kinking catheter, along with advanced components for secure catheter fixation. These solutions reflect a strong dedication to addressing vital concerns and enhancing patient safety while precisely meeting the needs of patients and healthcare professionals. Ebnet Medical aims to simplify medical procedures to increase patient care standards. Preparing to confront the awakening of the „sleeping giant,“ Ebnet Medical is poised to revolutionize vascular access and improve patient outcomes worldwide.

> **“Remarkably, the technology underpinning vascular access has seen little innovation in over 60 years, with no substantial product improvements.”**



The EbnetPIVC (Ebnüle) represents an advanced peripheral intravenous catheter (picture below) and the SwordCath has no guidewire to allow intuitive and safe access to larger veins (picture above).

Ebnüle and SwordCath: next-generation vascular access

The Ebnüle, currently in development, represents a stable catheter system that will enable simple and highly precise venous access with just one hand. Unlike the current standard catheters, which frequently lead to missed veins and operational errors, Ebnüle will significantly reduce the risk of such errors. It will allow precise and gentle catheter placement, reducing the need for repeated painful punctures and the associated complications such as bruising and infection. The Ebnüle is based on a secure catheter insertion platform and made for competitive manufacturing, ensuring reliable catheter patency and enabling straightforward one-handed operation, particularly when utilizing ultrasound.

Until now, patients regularly face potentially life-threatening complications and delayed therapy arising from too difficult insertion and too complex overall management of common vascular catheters. SwordCath is a revolutionary technology for the safer insertion of larger catheters, particularly in blood vessels. Unlike the traditional Seldinger Technique, SwordCath eliminates the need for guidewires, reducing training requirements and resource consumption. This user-friendly approach will speed up emergency responses and save lives, benefiting millions of patients.

Enhancing patient safety with non-kinking catheters and reliable fixation components

In daily practice, catheters frequently kink, leading to severe complications like circulatory collapse and unintended patient awakening during surgery. Such issues, which would be unacceptable in sectors like aviation, where even small fuel lines must function flawlessly, persist due to the prevalent use of kink-prone catheters, despite the availability of high-precision syringe pumps. Ebnet Medical is pioneering a non-kinking vascular catheter to guarantee uninterrupted drug delivery and prevent overdosing.

Unintentional catheter detachment poses therapy disruption and serious complications. Conventional fixation methods often prove inadequate, necessitating less comfortable and riskier measures like suturing. Ebnet Medical is developing secure catheter fixation components to ensure safe attachment without compromising patient safety. Ebnet Medical pioneers next-generation vascular access to reduce complications and costs. Innovative solutions prioritizing patient safety are being developed to revolutionize healthcare globally. With a leading intellectual property portfolio and practical experience, healthcare providers will be enabled to save more lives.

Ebnet Medical GmbH, Schwerin DE

https://ebnetmedical.com

Nico Sauermann

COMBINED EXPERTISE IN MEDICAL TECHNOLOGY

Functionally integrated implants through novel synchronized-cycle machining processes – ZykloMed

Participating partners INDEX, Paul Horn GmbH, Beutter Präzisions-Komponenten GmbH, and the wbk Institute for Production Technology at the Karlsruhe Institute of Technology(KIT) are demonstrating their expertise in medical technology through this joint project, funded by the Federal Ministry of Education and Research (BMBF). Using new, modern manufacturing processes, the partners have been tackling the challenges faced when machining implants with multifunctional as well as non-circular bionic designs, cost-effectively. The focus here was on the three manufacturing processes of non-circular rotary turning, polygon turning, and high-speed whirl milling.

Modern medical implants for orthopedics, trauma care and, dental technology are characterized by high demands regarding strength, biocompatibility and, geometry optimized for bionics. The geometry of an implant is adapted to the bone and tissue. This means the functional surfaces of implants feature increasingly sophisticated designs in order to facilitate attaching them to the body and make them less uncomfortable for the patient. New implant designs drive up manufacturing costs because the surfaces are no longer circular or angular. They have more curved surfaces and functional elements with continuous interfaces in the smallest of spaces. In particular, the need for several production steps on different machines increases costs substantially. For example, the precise handling needed when re-clamping a workpiece exactly in position represents a significant

Figure 2: Polygon turning offers the possibility of mproducing nonround contours on lathes. Source: Horn/Sauermann

level of functional integration, a compact process chain is ideally needed for cost-effective manufacturing.

Novel processes

The novel manufacturing processes of non-circular rotary turning, polygon turning and, high-speed whirl milling are all based on the same motion principle of several synchronized rotating axes. While this principle is well known, applying it to non-circular and curved shapes is very challenging. At the same time, actual implementation must meet the high-quality demands of medical technology.

The project partners researched and developed novel manufacturing processes along the entire process and supply chain, from machine and control technology, through tool design, to prototyping and pre-series manufacturing. The manufacturing processes were simulated and designed based on known processes using the same mathematical principles in order to determine the requirements for tools and equipment.

Testing was split into simulation testing under laboratory conditions and pre-series manufacturing testing in environments closely emulating laboratory and real-world application settings. The engineers focused on both tools and equipment technology when devising and developing the individual processes.

Figure 3: All procedures are in use under tension.

In non-circular rotary turning, a rotating non-circular tool is guided along a rotating workpiece using positioning datum. There is consequently a specific rotational speed ratio between them. The non-circular shape is subsequently reproduced on the component, within certain limits. The process enables high-output production of non-circular external contours. The rotating tool also reduces the thermal load on the tool cutting edge, which ensures long service life. The process also makes it possible to produce conical interfaces.

Polygon turning is a process for producing non-circular, hypotrochoid external and internal contours. Like rotary non-circular turning, this process makes it possible to produce non-circular contours using a lathe. With this process, the parallel axes of the workpiece and tool are offset from each other by an axial distance and are brought into a specific rotational speed ratio using positioning datum. The axial distance, rotational speed ratio between the workpiece and tool, and cutting-edge orbit define the dimensions of the contour. A system of tools used for polygon turning is individually adapted to the contour of the workpiece to be produced.

High-speed whirl milling is a high-output process for whirling threads on bone screws. One or two circular cutters are set at a specific angle to the workpiece. The cutters and workpieces can rotate in the same or opposing directions. The ratio of the workpiece rotational speed to both milling cutters depends on the number of threads and the number of cutting edges on the cutters. Threads with a truly variable pitch can now be produced cost-effectively for the first time using rotary whirl milling, by changing the thread profile dynamically.

Near-production testing successful

With successful trials in a near-series production setting, partners in the ZykloMed project have come a major step closer to the goal of the research project, namely the cost-effective manufacture of implants with multifunctional and non-circular bionic designs. The engineers have demonstrated how synchronized-cycle manufacturing processes make it possible to manufacture modern implants cost-effectively. Besides producing novel component geometries, the processes also offer the potential to optimize the cost-effective manufacture of existing implants, as well as potential applications beyond medical technology.

Beutter Präzisions-Komponenten GmbH & Co. KG, Rosenfeld DE

http://www.beutter.de

High speed whirl milling is a highly productive process for manufacturing bone screw threads. Source: Horn/Sauermann

Marina Chatzianastasiou

FUTURE OF HOSPITAL INFECTION CONTROL: SENSORS & IOT

Hospital-acquired infections (HAIs) pose a full-size risk to the healthcare industry internationally. According to the World Health Organization (WHO), HAIs affect millions of patients yearly and cause prolonged hospital stays, rising healthcare costs, and more importantly deaths. In American hospitals alone, the Centers for Disease Control (CDC) estimates that HAIs account for an estimated 1.7 million infections and 99,000 associated deaths per year.

Patients who acquire infections from surgery:

- spend, on average, an additional 6.5 days in the hospital
- 5x more likely to be readmitted after discharge
- are more likely to die
- are 60% more likely to require admission to a hospital's intensive care unit

Surgical infections account for up to ten billion dollars annually in healthcare expenditures, in the USA alone and HAIs are the single most deadly and costly adverse event, representing up to 6% of public hospital budgets.

In the hunt to fight HAIs, hospitals are turning to progressive technologies which include sensors and the Internet of Things (IoT) technology, to revolutionize infection control.

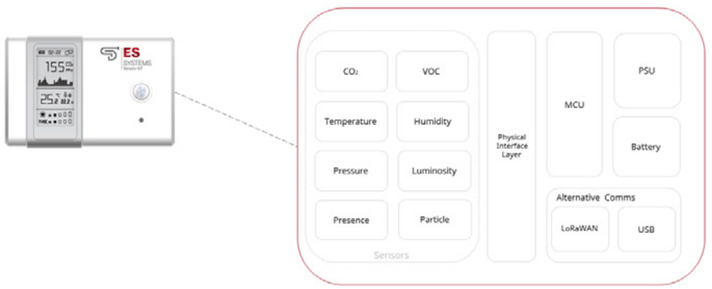
This article explores the promising future of hospital infection control and how sensors and IoT solutions can play a vital role in mitigating the risk of HAIs.

The role of sensors in infection control

Sensors are rapidly changing many industries' procedures, and healthcare is not an exception. In the context of health centers' infection management, sensors offer numerous compelling benefits. They can constantly monitor the environment and offer real-time information on crucial parameters such as temperature, humidity, air quality, and hand hygiene compliance. By leveraging this information, hospitals can come across capacity contamination risks and take proactive measures to address them.

Traditionally, contamination control measures relied on periodic manual inspections and observations. However, this approach may leave out vital moments where infections can occur. Sensors era enables hospitals to gather information continuously and in real-time, taking into account a more proactive and responsive method of infection control.

Sensors generate automated alerts after they stumble on situations that could pose contamination risks. For instance, an unexpected growth in temperature or humidity tiers in a selected location of the clinic could suggest a potential outbreak. Automated signals empower healthcare experts to take immediate action and put in force suitable measures to prevent further spread.



Sensor Node - Block Diagram

Hand hygiene is a fundamental factor in infection control. Poor compliance with hand hygiene protocols can appreciably contribute to the spread of infections within healthcare settings. Sensors may be deployed to monitor hand hygiene compliance by measuring the frequency and effectiveness of handwashing. This data can help identify if the hygiene rules are followed and power behavioral change among healthcare workforces.

The role of IoT in infection control

The Internet of Things (IoT) refers to the community of interconnected devices and sensors that communicate and share information with each other. In the context of infection control, IoT has the capability to revolutionize the way hospitals prevent and manage HAIs.

IoT-enabled devices can collect vast amounts of data, providing hospitals with very useful information about infection styles and trends. By utilizing advanced analytics and machine learning algorithms, healthcare organizations can identify high-risk regions, track infection outbreaks, and optimize resource allocation for powerful control measures.

The interconnected nature of IoT devices allows the remote monitoring and tracking of contamination control measures. For instance, hospitals can remotely reveal the overall performance of air filtration structures, disinfection methods, and hand hygiene compliance, ensuring that requirements are continually met across all places.

Sensor nodes

A sensor node system is gathering, processing, or communicating information with other connected nodes in a network. Communicates all the information in real-time and can identify microbiological contamination. Integrating IoT devices with Electronic Health Records (EHRs) can facilitate efficient data monitoring and analysis. This integration permits healthcare specialists to get comprehensive patient information, contamination facts, and surveillance information in real-time. Such a holistic view can assist in time interventions and effective decision-making to prevent the spread of HAIs.

Conclusion

Implementing sensor and IoT solutions requires investment in infrastructure, devices, and data management but the benefits of this investment are numerous, and the long-term results will benefit both patients and healthcare organizations.

The future of hospital infection control holds great promise with the integration of sensors and the Internet of Things (IoT). Continuous monitoring, automated alerts, and enhanced data analysis facilitated by sensors offer proactive infection control measures. IoT-enabled devices provide opportunities for remote monitoring and control and improved decision-making. By harnessing the power of sensors and IoT, healthcare organizations can greatly enhance their ability to prevent and control hospital-acquired infections.

ES Systems, Koropi, GR

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Melina Ramakic

REVOLUTIONIZING PATIENT CARE WITH PIEZO TECHNOLOGY

Piezo technology has emerged as a less-known but groundbreaking force in the medical field, offering innovative solutions for challenging tasks in patient care, diagnostics, and treatment. The unique capabilities of piezoelectric components such as transducers, actuators, and sensors, have opened doors to more precise, efficient, and non-invasive medical procedures. The following examples will explore the remarkable applications of piezo technology in healthcare and medical technology, highlighting its potential to transform the way patient care is carried out.

Piezo Transducers: improving minimally invasive procedures

State-of-the-art medical therapies enable gentle treatment procedures, in some cases, also on an outpatient basis. In past years, minimally invasive procedures, e.g., using keyhole surgery, have replaced the open surgery previously commonly used for treatment. Patients benefit from lower risks and a faster recovery.

These minimally invasive treatment techniques are based on ultrasound, which is generated by piezo elements. The piezoceramic elements used in medical instruments are available in a wide variety of shapes and sizes. For example, the smallest piezo elements, with dimensions of less than a few millimeters, find application in catheters which, in turn, are used to gently treat cardiovascular diseases.

During surgical procedures, the power of sound waves can be used to perform so-called incision-less surgeries. Piezoelectric transducers serve this purpose perfectly: Placed extracorporeal, they project an ultrasonic focus into the body. While traditional ultrasound technology often relies on bulky, less agile transducers, the integration of piezoelectric materials enables ultrasound devices to become more compact while working reliably and highly efficiently. The smallest piezo components make this combination possible; they drive gentle but effective treatments.

Modern intravascular lithotripsy is one example of modern procedures that are based on piezo-driven ultrasound catheters. Here, they are used to treat the cause of arterial fibrillation with the help of targeted lesions, to prepare the area of treatment for catheter-supported aortic valve implantation (TAVI, TAVR) with ultrasonic waves, or to contactless destroy intravascular or aortic plaque.

Ultrasound-operated handpieces such as ultrasonic scalpels, scissors, or scalers use acoustic waves to facilitate the processing of hard or soft tissue and are used more and more frequently in medicine, e.g. for minimally invasive surgical procedures or in dentistry.

> “The unique capabilities of piezoelectric components have opened doors to more precise, efficient, and non-invasive medical procedures.”

Piezo Actuators: high precision for demanding treatment alternatives

In MedTech applications, precision is paramount. Piezo actuators, driven by their ability to provide extremely fine, controlled movements, are revolutionizing medical procedures across various specialties. Their precise control and small form factor make them ideal for surgical instruments, e.g., for tissue cutting, suturing, and organ manipulation, causing minimal trauma to the patient. For comprehensive treatment of chronic diseases such as cystic fibrosis, asthma, or chronic obstructive pulmonary disease (COPD), medical nebulizers fitted with piezo actuators atomize medication so very finely that it can be inhaled deeply into the lungs.

Piezo Sensors: contactless and contamination-free measuring

The advantageous qualities of piezo technology also play a vital role in measuring and monitoring tasks by enabling contactless and gentle execution. Ultrasonic sensors placed on the tubes of the monitoring devices are ideal for this - ultrasonic sound waves penetrate the tube from the outside and ensure contactless monitoring. With the help of ultrasonic sensors, different media can be monitored, for example, the gas flow of ventilators can be measured contactless and without contamination, or life-threatening air bubbles in tubes such as the heart-lung machines or dialysis machines can be detected.

Piezo Technology: the future of medical innovations

The rapid evolution of piezo technology promises a future full of innovative patient care solutions, many of which we can only imagine today. Piezo technology is reshaping the landscape of patient care, offering unprecedented precision, non-invasiveness, and efficiency. From enhanced diagnostics to cutting-edge surgical techniques and advanced drug delivery systems, the future of healthcare is undoubtedly intertwined with piezoelectric components. As innovative development continues, patients can look forward to safer, more effective, and less invasive medical procedures.

PI Ceramic GmbH, Lederhose DE

https://www.piceramic.com

Piezo Sensors: Piezo disks or plates, pictured refined with optional flexible printed circuit boards, can measure the flow of liquids, or detect air bubbles, and are very cost effective.

HIGH PRECISION PROPORTIONAL PRESSURE AND FLOW CONTROL VALVE

KaoLu, a pioneer in electro-pneumatic solutions, is set to showcase an impressive range of products at the COMPAMED. These offerings are designed to provide precision and efficiency across various industries.

Electronic proportional air pressure regulators

KaoLu's electronic air pressure regulators are engineered for exceptional performance. They offer precise control over a broad pressure range, including vacuum control, high-resolution adjustments, and the capability to handle high-pressure environments. With a focus on speed, flow, and accuracy, these regulators are indispensable in diverse applications.

Electronic flow control valves

KaoLu's electronic flow control valves are designed to optimize the flow of liquids, gases, and oils.

Proportional pinch valves

KaoLu's Proportional Pinch Valves cater to applications requiring precise tube pressure and flow control. They are compatible with a wide range of tube diameters, offering flexibility and customization for high durometer tubes.

Their adjustable orifice sizes, high inlet pressure tolerance, and choice of materials, including stainless steel 316L and FFKM seals, make them a versatile choice. The integration of a stepper motor-driven needle valve ensures precision, repeatability, and minimal hysteresis. Plus, the option to add a flow meter enables real-time monitoring of airflow.

With over 43 years of industry experience, KaoLu is the trusted supplier for OEMs in diverse sectors, including medical devices, pharmaceuticals, automation, and industrial applications. Their ISO13485 certification underscores their commitment to maintaining the highest standards of quality and reliability in pressure and flow control.

COMPAMED 2023 with IVAM
Hall 8a, booth F19.6

- Proportional Pressure Regulator
- Proportional Flow Control Valve
- Proportional Pinch Valve

Kao Lu Enterprise Co. Ltd, Taichung City TW

http://www.genndih.com

ARE YOU LOOKING FOR QUALIFIED PERSONNEL?

The professional training project mIQu, funded by the German Federal Ministry of Labor and Social Affairs, will again present a job wall at Medica/Compamed to make vacancies in the high-tech sector visible to future team members. Are you interested? Then bring your printed job postings in DINA4 format to hall 8a booth F39 and place your vacancies free of charge!

https://www.miqu.tech/news

FORCE SENSORS IN LASER-WELDED HOUSINGS

Innovative Sensor Technology IST AG is expanding its product portfolio to include force sensors supplied in laser-welded stainless-steel housings.

Protection against splashing water and simplified mounting
Both the new flat diaphragm sensor and the sensors of the KZ-011-0400 “Centered Force Sensor” series are now optionally offered in a stainless-steel housing. The housing not only protects against splash water, but also simplifies mounting without mechanical stresses, since the sensor element is only inserted into the housing and not connected to it. Thus, the housing can be screwed to the substrate without shifting the zero offset of the sensor.

The sensors are also equipped with a cable strain relief and, in case of the KZ-011-0400 series, an overload protection made of precision foil, which limits the deflection of the sensor.

Innovative sensor technology IST AG

Innovative Sensor Technology IST AG is one of the world’s leading manufacturers of physical, chemical and biological sensors. Founded in 1991, the company is headquartered in Ebnat- Kappel, Switzerland, and employs around 500 people worldwide.

IST AG specializes in the development and manufacturing of temperature sensors, thermal mass flow sensors, humidity sensors and modules, conductivity sensors and biosensors. In addition to standard products, IST AG also offers sensor adaptations to individual, customer-specific application needs - right up to the joint development of new technologies.

Innovative Sensor Technology IST AG

https://www.ist-ag.com

SMART FEATURES IN INTELLIGENT MICROPUMPS MAKE DIFFERENCE IN A MORE SUSTAINABLE FUTURE

In a time of challenges related to finite resources and increased demand to reduce the overall carbon footprint, smart features in intelligent micropumps can make a difference.

Revolutionizing pump technology

The patented Xavitech pump technology can reduce the need for components and create a smaller footprint. With its potential for customized software, it can generate features that normally require a system of a pump, external microchips, flow- and pressure sensors. The small V100 model is the most recent example of innovative pumps, upgraded to an I2C interface. It is operational in applications where it is not only actively controlled via a serial interface to adapt its settings for varying conditions, but also to provide read-out data to be used as blockage detections and pressure indications, etc.

The built-in microchip with optical control for the pump movements is the brain. The durable electromagnet combined with a flat spring is its heart and motor. Together they offer endless opportunities for customized features and functionality, which benefits cost rationalization and miniaturization as well as a market-leading lifetime in comparison to any other micropumps. This moves the boundaries of design from where a micropump usually is considered just as a pump, to becoming something more. It could be the main component for control in an application, which can impact the number of additional components needed in a design and make a change for a more sustainable future.

Xavitech Micropumps AB, founded in 2005, is a Swedish company that develops, manufactures, and supplies micropumps for gas analysis on a global market within the fields of MedTech-, Environmental, and Industrial applications. It is an innovative company that focuses on customized solutions as well as services for product development and licensing of its technology.

Xavitech Micropumps AB, Härnösand SE

https://www.xavitech.com/

From its original background (watch-making industry), Statice has developed strong skills in the field of micro-technologies. Through years, Statice has gained a large experience in the field of biomaterials and applied mechatronics for the medical areas.
Source: STATICE

COMPAMED 2023

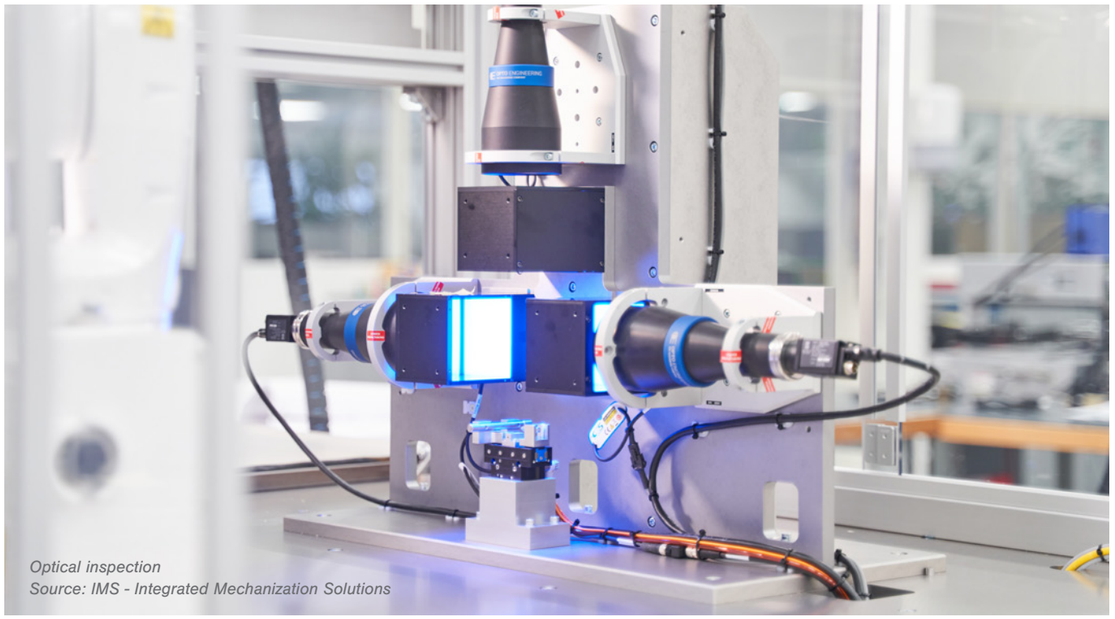
GROUNDBREAKING TRENDS FOR MEDICAL TECHNOLOGY INDUSTRY

COMPAMED, the world's leading platform for suppliers in the medical technology industry, will again be held in parallel with the MEDICA trade fair in Düsseldorf. Groundbreaking trends and innovations in the medical technology industry will be presented at both trade fairs. Increasing demands for mobility and energy efficiency are constantly driving the development of modern medical technology for diagnosis and therapy. The demand for miniaturization solutions for medical components therefore remains at a constantly high level

IVAM Microtechnology Network presents largest joint stand at COMPAMED

With 50 exhibitors, the "Hightech for Medical Devices" joint booth by the IVAM Microtechnology Network represents the most extensive focus area at COMPAMED. The high-tech marketplace includes exhibitors from industry and research from 12 different nations, including Germany, Sweden, France, Greece, Belgium, Switzerland, the Netherlands, Taiwan, the United Kingdom, the USA, Japan and Finland. For the first time after the pandemic years, Asian companies will be represented at the joint space.

A special focus will be on optics and precision technology. Also on display will be a wide range of microcomponents, sensors, actuators and sensor systems, micropumps, coatings, smart textiles, and manufacturing and machining processes and services.



Optical inspection
Source: IMS - Integrated Mechanization Solutions

USA remains an attractive target market for European medical technology companies: “Europe meets USA” session at the forum

In addition to the joint booth, the COMPAMED HIGH-TECH Forum in Hall 8a will offer insights into the latest developments and technology trends in the medical technology industry. Furthermore, information on important foreign markets for medical technology companies will be provided. The trade audience can look forward to more than 60 international expert presentations, discussions and networking sessions for establishing contacts.

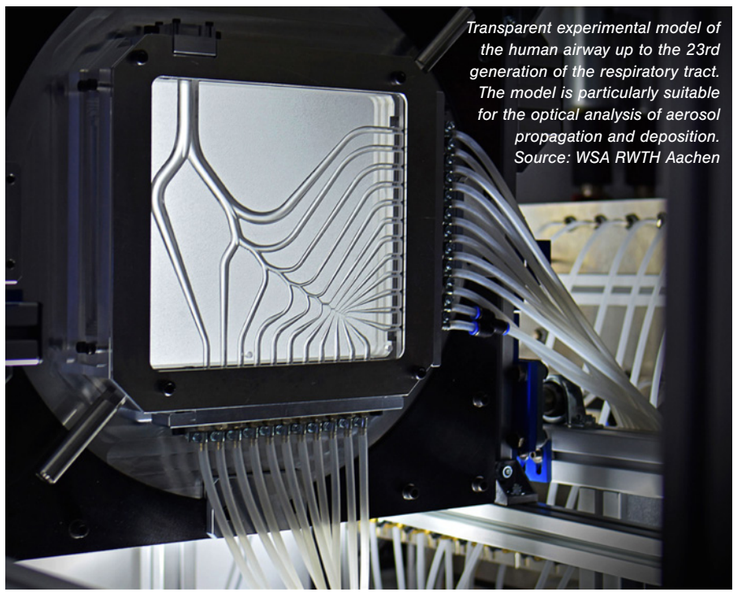
A highlight of the forum is the continuation of the successful series “Europe meets USA - High-Tech for Medical Devices”. The event specifically promotes cooperation between component manufacturers, device manufacturers and users from Europe and the USA in the field of medical technology.
The last edition of this format resulted in wide-ranging technical discussions and successful contacts between medical technology companies that were simultaneously exhibiting at the neighboring MEDICA. The session will take place on November 14 and will be rounded off with an international networking event.

Also of special note is the first session, in which the Finnish VTT and partners will present current research highlights in the field of printed electronics and 3D printing. In addition, a “hands-on session” on “microfluidics” will be held as part of the forum, organized by the IVAM Focus Group Microfluidics and is scheduled for Wednesday afternoon. Other topics include smart sensor solutions as well as laser technology and photonics.

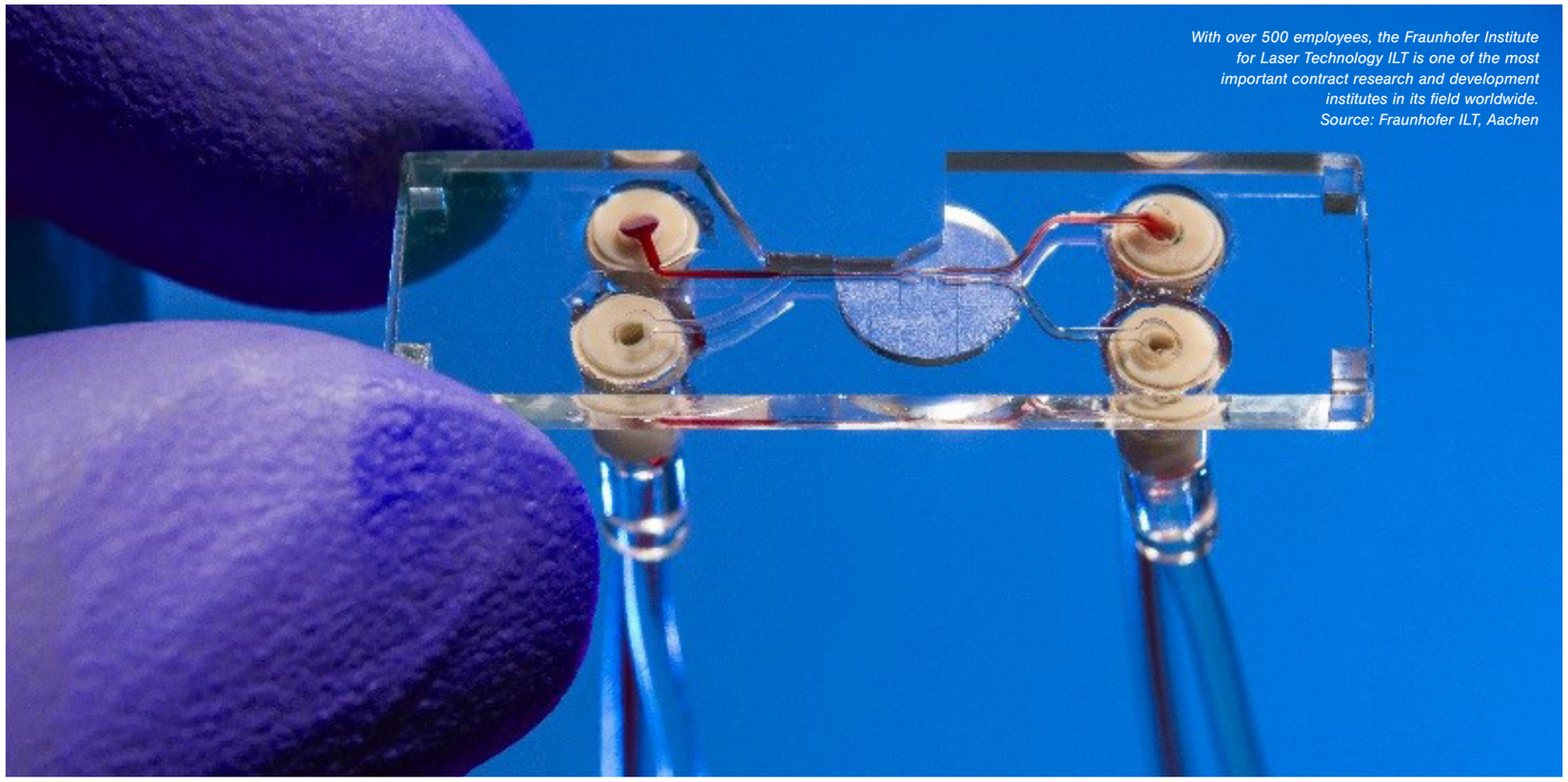
The COMPAMED HIGH-TECH Forum and the IVAM joint booth can be found during COMPAMED from November 13-16, 2023, in Hall 8a at the Düsseldorf exhibition center.

IVAM Microtechnology Network

https://www.ivam.de/events/compamed_2023



Transparent experimental model of the human airway up to the 23rd generation of the respiratory tract. The model is particularly suitable for the optical analysis of aerosol propagation and deposition. Source: WSA RWTH Aachen



With over 500 employees, the Fraunhofer Institute for Laser Technology ILT is one of the most important contract research and development institutes in its field worldwide. Source: Fraunhofer ILT, Aachen

COMPAMED/MEDICA
IVAM PRODUCT MARKET
HIGH-TECH FOR MEDICAL DEVICES

November 13 - 16, 2023
Hall 8a
F19, F29, F35, F39, G19, H19, H23, H29

G40

COMPAMED HIGH-TECH FORUM by IVAM.

H29

H29.4 Micreon	H29.5 MABRI. VISION
Storage	
H29.2 Fraunhofer IZM	H29.7 Coherent
H29.1 Jobst Technologies & IST	H29.8 Beutter

H23

H23.4 CiS Forschungs-institut	H23.5 VICI AG International
Meeting Room	H23.6 IMS
Storage	H23.7 Mabuchi Motor Electromag & Mabuchi Europe
H23.1 Physik Instrumente	

H19

H19.4 Optiprint	H19.5 CorTec
H19.3 Acuvi	H19.6 SUSS MicroOptics
Storage	H19.7 Sensirion
H19.1 Jenoptik & SwissOptic	

F39

Storage
Meeting Room

F35

F35.8 EPIC & PhotonHub	F35.1 MedPhab
IVAM Office	F35.2 Louwers-Hanique & Millux
F35.5 LEMO	F35.3 Micro Systems UK
	F35.4 Xavitech

F29

F29.1 Statice	F29.2 TDC	F29.3 Mikrop & Zünd precision optics
IVAM BUSINESS LOUNGE		
F29.6 ES SYSTEMS	F29.5 HNP Mikrosysteme	F29.4 Hahn-Schickard

G19

G19.1 IMT Masken und Teilungen	G19.2 Fraunhofer IMS	Storage	G19.4 AEMtec
G19.7 Fisba	G19.6 KYBURZ SAPPHIRE		G19.5 Fraunhofer ENAS

F19

F19.1 Specialty Coating Systems	IVAM Storage	Storage	F19.4 Microdul
F19.8 LightFab	F19.7 OptoSigma Europe	F19.6 KaoLu Enterprise	F19.5 Fraunhofer ILT

COMPAMED HIGH-TECH FORUM BY IVAM

COMPAMED

Hall 8a, Booth G40

MONDAY, 13. NOVEMBER

10:50	*Opening*	**Dr. Thomas R. Dietrich,** IVAM, Dortmund, DE

SCALE UP, DON'T SCREW UP: DESIGN FOR MANUFACTURING IN PRINTED ELECTRONICS AND 3D PRINTING

Session Chair: Ralph Liedert, VTT Technical Research Centre of Finland, Oulu, FI

11:00	*New "Rapid Prototyping" Tool Via Printed 3D Electronics*	**Dr. Zhe Shu**, Hahn-Schickard, Freiburg im Breisgau, DE
11:20	*MRL is the New TRL – The Importance of Manufacturing Readiness in Medical Device Development*	**Ralph Liedert**, VTT Technical Research Centre of Finland, Oulu, FI
11:40	*Microfluidic Integrated Electrochemical Biosensors for Point-of-care and Precision Diagnostics*	**Prof. Amir Sanati Nezhad**, Criticare Dx, Calgary, CA
12:00	*NIL-assisted Digital Printing for High Resolution Electrodes*	**Ulrich Trog**, Joanneum Research Forschungsgesellschaft mbH, Weiz, AT
12:20	*Digital Printing Rethought – Customized Inks for Medical Sensors*	**Dr. Sindy Mosch**, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, DE
12:40	*Modular Foil Automation for Microfluidic Pilot Production Line*	**Mark van Geffen**, Enzyre BV, Nijmegen, NL
13:00	*Laser Processes for Manufacturing in Printed Electronics*	**Alexander Goerk**, HAMAMATSU PHOTONICS Deutschland GmbH, Herrsching am Ammersee, DE
13:20	*Break*	

SMART SENSOR SOLUTIONS

Session Chairs: Dr. Jana Schwarze & Dr. Victoria Jakobi, IVAM, Dortmund, DE

13:40	*Comprehensive Conformal Coating Solutions for Medical Technology*	**Dick Molin**, Specialty Coating Systems-World Headquarters, Indianapolis, US
14:00	*Platinum Conductivity Sensors for Dialysis and Other Life Science Applications*	**Zuzana Pronayova**, Innovative Sensor Technology IST AG, Ebnet-Kappel, CH
14:20	*Robust Biosensors for Metabolic Monitoring in Critical Care Applications and Advanced Cell Therapies*	**Gerhard Jobst**, Jobst Technologies GmbH, Freiburg, DE
14:40	*Smart Pump Solutions*	**Henrik Sjöström**, Xavitech Micropumps AB, Härnosand, SE
15:00	*Smart Sensors for Future Medical Services*	**Christine Kallmayer**, Fraunhofer Institute for Reliability and Microintegration IZM, Berlin, DE
15:20	*Precision Polishing Services in Smart Sensor Solutions*	**Chisato Maeda**, TDC Corporation, Miyagi, JP
15:40	*Imaging Technology Developments @ Fraunhofer ENAS*	**Dr. Mario Baum**, Fraunhofer Institute for Electronic Nano Systems ENAS, Chemnitz, DE
16:00	*Silicon-based Microsensors for Medical and Life Science Applications*	**Dr. Martin Schädel**, CiS Forschungsinstitut für Mikrosensorik GmbH, Erfurt, DE
16:20	*Highly-sensitive, Smart Medical Sensors for Improved Diagnostics in Care, Hospitals and at Home*	**Prof. Karsten Seidl**, Fraunhofer Institute for Microelectronic Circuits and Systems IMS, Duisburg, DE
16:40	*Smart Hospital - Aggregating Sensor Data for Operations Optimization*	**Nikolas Valantassis**, ES Systems, Koropi - Athen, GR

TUESDAY, NOVEMBER 14

EUROPE MEETS USA - HIGH-TECH FOR MEDICAL DEVICES

Session Chairs: Dr. Jens Ebnet, Ebnet Medical Gmbh, Schwerin, DE
Dr. Victoria Jakobi & Dr. Jana Schwarze, IVAM, Dortmund, DE

10:50	*Opening*	**Dr. Thomas R. Dietrich**, IVAM, Dortmund, DE
11:00	*Navigating the Future of Medical Technology: Overcoming Challenges and Delivering Global Innovation*	**Tom Poplawski**, Teguar, Charlotte, US
11:15	*Removing the Roadblocks: Plotting a Path for Medical Device Innovation*	**Dr. Bernd Vogel**, Alleima, Palm Coast, US
11:30	*Synergies for the EU Authorised Representative, UK Responsible Person and Swiss Authorised Representative*	**Ludger Moeller**, MDSS USA LLC, Chicago, US
11:45	*High Performance Magnetics for Medical Applications*	**Mike Schilling**, Dexter Magnetic Technologies, Elk Grove Village, US
12:00	*Adding Functionality and Increased Performance to your Medical Device Components*	**Brian Reilly**, ProMed Molded Products, Plymouth, US
12:15	*Far, Near or Here: Why Medical Device Manufacturers are Talking about the Shore Thing*	**Albert van de Liefvoor**t, Providence Enterprise, Newport Beach, US
12:30	*Thin Wall: Molded Cannula's*	**Paul Runyan**, Accumold, Ankeny/Iowa, US
12:45	*Micromechanical Performance of Fluoropolymer Coatings in the Design and Manufacturing of Interventional Catheters*	**Kyle Hedges**, Applied Plastics, Norwood, US
13:00	*The Benefits of a Medical Device Contract Coating Specialist for you Coating Needs*	**Todd Paulsen**, Formacoat, Chaska, US
13:15	*Enhancing Stimulation and Sensing of Electrodes for Medical Device Applications with Innovative Coatings*	**Andreas Reisinger**, Heraeus Medevio, Fridley, US
13:30	*TyFlo™ – A Revolutionary Adhesive Strike Layer for PTFE Reflow in Catheter Manufacturing*	**Todd Milne**, Nordson MEDICAL, Minneapolis, US
13:45	*New Technologies from Humphrey Products: MiDP Stepper Motor Proportional for Aggressive Media and New CSV Valves*	**Michael Craig**, Humphrey Products, Kalamazoo, US
14:00	*Reimagining Electrodes and Wearable Device*	**Amit Roy / Rehanah Sejoubsari**, FLEXcon Company Inc., Spencer, US
14:15	*Integration of the Spot Check Devices and Continuous Wearable Telemetry with RTLS*	**Dr. Chihcheng Lu**, Biosensetek, Morristown, US
14:30	*Revolutionizing Chronic Implantations Through Advancements in MEMS Sensor Technology*	**Valor Thomas**, Millar, Pearland, US

14:45	*How to Accelerate Implantable R&D with the Velentium Platform*	**Chester Burress**, Velentium, Katy, US
15:00	*Remote Patient Monitoring Made Easy & Done Right*	**William Dos Santos**, Accuhealth, Saint Petersburg, US
15:15	*Wireless Video for the OR*	**Dr. Uri Kanonich**, Teradek, Irvine, US
15:30	*Product Design & Development - Medical and Diagnostic Devices*	**Fernando Oliveira**, Veranex, Providence, US
15:45	*Needlefree Injections are the FUTURE and the FUTURE is here!*	**Mark Timm**, Integrimedical, Bainbridge, US
16:00	*Solving the Global Problem of Incontinence*	**John Barry**, InControl Medical LLC, Sarasota, US
16:15	*End of Session*	**Jens Ebnet**, Ebnet Medical GmbH, Schwerin, DE **Dr Thomas R. Dietrich**, IVAM Microtechnology Network, Dortmund, DE
16:30	*Opening Networking Europe meets USA: Networking, Snacks and Drinks in the IVAM Lounge (Hall 8a, booth F29) (participation free of charge for exhibitors and visitors, but registration is needed beforhand)*	**Ryan Klemm**, Messe Düsseldorf North America, Chicago, Illinois, US **Dr. Thomas R. Dietrich**, IVAM, Dortmund, DE

WEDNESDAY, NOVEMBER 15

LASER AND PHOTONICS APPLICATIONS - EPIC TECH WATCH

Session Chair: Antonio Castelo, EPIC – European Photonics Industry Consortium, Paris, FR

10:40	*Laser-Processes in Production of Metal Deepdraw Parts for Medtech Applications*	**Andreas Hellmann**, Hubert Stüken GmbH & Co. KG, Rinteln, DE
11:00	*Optimisation of Quality and Throughput in Laser processing of Medical devices through Process Control and Automation*	**Roland Woelzlein**, Coherent, Dieburg, DE
11:20	*Optical Excellence in Life Science & Medical Applications*	**Dr. Martin Forrer**, FISBA AG, St. Gallen, CH
11:40	*Micro-Optics as Key Components in Healthcare Applications*	**Aurea Ripoll**, SUSS MicroOptics SA, Hauterive, CH
12:00	*Surface Modifications to Sapphire Optical Components*	**George Kyburz**, KYBURZ SAPPHIRE, Safnern, CH
12:20	*High Quality Imaging in Small Spaces - Endoscopes for OEM Integration*	**Hannes Weise**, JENOPTIK Optical Systems GmbH, Jena, DE
12:40	*Production and Application of SiC Mirrors in Photonics Sector*	**Axel Haunholter**, OptoSigma Europe SAS, Les Ulis, FR
13:00	*Thermoelectrics in Laser and Photonic Applications for the Medical Market*	**Reinhard Sottong,** Ferrotec Europe GmbH, Unterensingen, DE
13:20	*Micro Camera Modules for Medical Use*	**Antonio Gomes**, OptaSensor GmbH, Nuremberg, DE
13:40	*Fostering Innovation in MedTech Through Smart Multifunctional Biophotonic Glass Microcomponents*	**Renato Mutton**, FEMTOprint, Muzzano, CH

IVAM FOCUS GROUP SESSION: MICROFLUIDICS SESSION PART I: INTEGRATION AND COMBINATION OF MICROFLUIDIC COMPONENTS GENERATING SOLUTIONS FOR LIFE SCIENCES

Session Chair: Florian Siemenroth, Bartels Mikrotechnik GmbH, Dortmund, DE

14:20	*From Chip-in-a-Lab to Lab-on-a-Chip - Integrable Microfluidic Components at a Minimal Footprint*	**Florian Siemenroth**, Bartels Mikrotechnik GmbH, Dortmund, DE
14:40	*Screening and Sorting with Laser-made Microfluidics*	**Dr. Georg Meineke**, Fraunhofer-Institut für Lasertechnik ILT, Aachen, DE
15:00	*Personalized Cosmetics - Precise Dosing of High- and Low-viscosity Liquids*	**Dr. Anne Ringlepp**, HNP Mikrosysteme GmbH, Schwerin, DE
15:20	*Where Photonics meet Microfluidics - Life Sciences Consumables in Glass*	**Dr. Tobias Bauert**, IMT Masken und Teilungen AG, Greifensee, CH
15:40	*Piezo Components & Devices for Liquid Handling in Medical Systems*	**Sandra Niederschuh**, PI Ceramic GmbH, Lederhose, DE
16:00	*Minimum Size, Maximum Performance: Discover the Potential of Miniaturizing Fluid Handling with Shape Memory Alloy!*	**Dr. Hinnerk Oßmer**, memetis GmbH, Karlsruhe, DE
16:20	*Hands-on-Session*	**Florian Siemenroth**, Bartels Mikrotechnik GmbH, Dortmund, DE **Dr. Claudia Gärtner**, microfluidic ChipShop GmbH, Jena, DE
16:40	*End of Session*	

THURSDAY, NOVEMBER 16

MICROFLUIDICS SESSION PART II: MICROFLUIDIC-BASED DIAGNOSTIC AND LIFE SCIENCE CONSUMABLES - FROM IDEA TO VIABLE PRODUCT

Session Chair: Dr. Claudia Gärtner, microfluidic ChipShop GmbH, Jena, DE

11:20	*Not Failing When Scaling: Design for Manufacturability Considerations for Lab-on-a-Chip Cartridges*	**Dr. Claudia Gärtner**, microfluidic ChipShop GmbH, Jena, DE
11:40	*Integrated Pathogen and Resistance Identification - Towards Mobie Phone Based Diagnostics*	**Dr. Jörg Nestler**, BiFlow Systems GmbH, Chemnitz, DE
12:00	*We Are on a Roll – Flexible Mass Production of Customized Diagnostics*	**Dr. Jan Kafka**, Inmold A/S, Nivå, DK **Dr. Anja Haase**, JOANNEUM RESEARCH Forschungsgesellschaft mbH, Weiz, AT
12:20	*The Microfluidics Innovation Hub: Towards Scale-Up and Commercialization of Microfluidic Solutions for Clinical, Industrial, and Research Applications*	**Divesh Baxani Kamal**, Microfluidics Innovation Hub, Weiz, AT
12:40	*Challenges of Developing High-precision Fluid Management Products Based on State-of-the-Art Technologies for Life Sciences and Diagnostics*	**Bruno Charléty**, Fluigent, Le Kremlin-Bicêtre, FR
13:00	*Advanced Control in Microfluidics*	**John Watson**, LEE Ventus (Part of The Lee Company), Cambridge, GB
13:20	*End of Session*	

QUAPPS 24: CALL FOR POSTER + PRESENTATION

The rapidly advancing field of quantum technology and its practical applications have spurred the creation of QuApps, a series of events aimed at discussing the technological and market aspects of quantum applications. With two successful digital conferences under its belt, QuApps is pleased to announce its upcoming event: The 1-day conference, accompanied by a pre-event Get-Together, will take place onsite at Forschungszentrum Jülich, Germany.

QuApps - International Conference on Applications of Quantum Technologies is an event that explores quantum technology and its applications from both a technical and market perspective. It brings together experts, researchers, and industry leaders to discuss the latest developments in the field.

QuApps2024 promises an exciting program featuring prominent speakers who will shed light on the technological potential of quantum technology. This year's focus will center on application-related topics, including the imminent market maturity of products in fields like medical technology, the automotive industry, and quantum computing. The conference will also address security-relevant topics such as cryptography, communication, and the patent system, with insights provided by experts in these domains.

Submit your posters and presentations now, as the Call for Poster + Presentation is open until December 1, 2023.

https://quapps-conference.com/

GET TO KNOW IVAM MICROTECHNOLOGY NETWORK - JOIN A Q&A SESSION

Have you ever thought about whether your company could benefit from a membership in a network? Perhaps an IVAM membership may be the right solution for current challenges in your microtech-, biotech- oder deeptech-company! We cordially invite you to get to know the network better. You are welcome to bring specific questions, which we will then answer personally. Additionally you have the possibility to arrange an individual appointment.

sh@ivam.de

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EVENTS

13-16 Nov 23
COMPAMED 2023
Product Market "High-tech for Medical Devices" and "COMPAMED HIGH-TECH FORUM" in Hall 8a, F29 (IVAM Lounge)

22 Nov 23
MID-WEEK COFFEE BREAK – CHIPS 4 LIGHT GMBH @
Virtual technology talk between IVAM Members

28 Nov 23
IVAM FOCUS GROUP PHOTONICS @
Augmented and Virtual Reality

29-30 Nov 23
W3+ FAIR JENA 2023
Networking Fair for Optics, Photonics, Electronics and Mechanics

30 Nov 23
IVAM FOCUS GROUP PHOTONICS
Focus Group Session and Networking at W3 in Jena

05 Dec 23
SPOTLIGHTS ON MICRO- AND NANOTECHNOLOGY @
Part 14: Intelligently Shaping the Future - Artificial intelligence and Its (Relevant) Applications for Companies

06 Dec 23
IVAM FOCUS GROUP MICROFLUIDIC @
Life Science - Point of Care Testing

07 Dec 23
GET TO KNOW IVAM @
Information event about the network and the benefits of membership

08 Dec 23
SPOTLIGHTS HR @
Part 2.1: Successful Leadership - Focus on Motivation

20 Dec 23
MID-WEEK COFFEE BREAK – DEXTER MAGNETIC TECHNOLOGIES GMBH @
Virtual technology talk between IVAM Members

06-08 Feb 24
MD&M WEST 2024
Medical Design & Manufacturing - IVAM presents Micro Nanotech Area in Hall C

15 Feb 24
IVAM-NETWORKING LUNCH
Networking Dortmund's high-tech industry

06-08 Mar 24
ASIA PHOTONICS EXPO 2024
Discover the Future of Photonics with IVAM

07-08 May 24
IVAM HIGHTECH SUMMIT 2024
Back to the Microtechnology Future: Yesterday's Visions, Tomorrow's Realities

11-13 Sep 24
MEDICAL MANUFACTURING ASIA 2024
Manufacturing Processes for Medical Technology

https://www.ivam.de/events

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Funded by the European Union
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SEARCH JOBS!? FIND JOBS?!

November 13 -16
Hall 8a,
Booth F 39

mIQu-Jobwall at COMPAMED /MEDICA in Dusseldorf!

mIQu