

COMPAMED 2023, Between the Poles of Top Innovation and Regulation



The med-tech supply sector shows off its “high-performance mode”

If you want to see the efficiency of the medical technology industry's supply sector for yourself, a visit to the leading international industry platform COMPAMED in Düsseldorf is absolutely essential. From 13–16 November 2023, in fully booked out trade fair Halls 8a and 8b, more than 700 exhibiting businesses from around 40 different nations will demonstrate their special know-how and many innovations for applications in medical technology, medical devices and medical technology manufacturing, divided into five “worlds of experience”. As always, this will take place in parallel to the thematically fitting world's leading medical trade fair MEDICA with more than 5,000 participants from 70 countries. The five worlds of experience are: Manufacturing & Devices (e.g., components, parts, manufacturing processes), Services & Advice (e.g., research, development, services), Materials (e.g., plastics, glass, ceramics, metals, composite materials, adhesives, packaging), Micro Tech (such as micro components, microfluidics) as well as IT in Tech (software development and maintenance for medical technology).

These worlds of experience offer their professional audience many innovations as well as an exciting programme on stage based on the programme formats that have been established for two years: the [COMPAMED HIGH-TECH FORUM](#) by IVAM and the [COMPAMED SUPPLIERS FORUM](#) by Devicemed. For the entire trade fair duration, the forum's international talks (in Hall 8a), organised by International Microtechnology Business Network IVAM, will offer insight into research and development of the processes and products exhibited at the trade fair, explain technological trends in the industry and convey information on the relevant markets abroad for medical technology. The forum designed by the Devicemed professional media portal will also run for all four days of COMPAMED and will present cutting-edge developments along the entire value chain in medical technology (in Hall 8b). “This year, the topic of ‘electronics in medical technology’ has met with particularly great interest”, says Marc Platthaus, Editor in Chief of Devicemed, naming one of this year's focus areas.

Embedded systems: setting the pace for modern medical technology

In his forum talk “What is the importance of embedded software and electronics in medical technology?”, Dieter Müller will offer insight into the field's current developments at a high-tech level. The expert for medical engineering is a Senior Business Development Manager at Akkodis, a development service provider operating globally, and will use several examples to explain how embedded systems can improve the performance of modern med-tech. For example, the company Aesculap has developed a computer-based navigation system with the name OrthoPilot Elite that can support surgeons in hip and knee surgeries. Thanks to the method's high accuracy when placing the implants, it ensures that the requirements for durability and function of the implants are fully met. What's positive for patients is that the OrthoPilot does not need any additional pre-examinations by way of X-rays or CAT scans, and thus additional radiation exposure is prevented. The system is a unit consisting of a computer, the corresponding keyboard and mouse, a screen, a camera and optical markers. This basic unit uses the software for calculating the navigation, using different versions for various kinds of surgery. With the help of the optical markers that are affixed to the instruments and the patient's body, the position of the instruments can be continuously determined during surgery. Due to the different marker positions, the software can calculate a three-dimensional image and can continuously pinpoint the exact location of the instruments and the joint during surgery. This makes it possible to insert implants with complete accuracy. Today, the OrthoPilot forms part of more than 1,500 surgeons' daily routine, and to date more than 300,000 surgeries have been carried out with its special navigation.

The importance of medical electronics today can also be expressed in figures. According to calculations by market research company Research and Markets, the volume for medical electronics amounted to USD 6.30 billion in 2021 and is expected to achieve an average annual sales growth rate of 8.3 percent over the forecast period until 2030. The increasing use of medical electronics in the fields of imaging, screening, treatment and intervention is an important growth driver. The US National Institutes of Health (NIH) state that the implementation of artificial intelligence (AI) in the healthcare sector could decrease annual health spending by USD 150 billion by 2026.

“Europe meets USA” – COMPAMED HIGH-TECH FORUM highlights the best practices of a close friendship

The COMPAMED HIGH-TECH FORUM, also held in English, also focuses on topics that are currently of particular concern to the industry: “Scale

Up, don't Screw Up: Design for Manufacturing in Printed Electronics and 3D Printing", "Smart Sensor Solutions", "Europe meets USA: High-Tech for Medical Devices", "Laser & Photonic Applications" and "Microfluidics". This topic is covered in two sessions that are titled "Integration and Combination of Microfluidic Components Generating Solutions for Life Sciences" and "Microfluidic-based Diagnostic and Life Science Consumables – From Idea to Viable Product".

The forum's highlights again include the session for internationalisation "Europe meets USA – High-Tech for Medical Devices". After its successful premiere last year, this series of talks is being continued with the aim of promoting cooperation in the field of medical technology between component and device manufacturers as well as users in Europe and the US in a targeted manner. Last year, the connection to the medical technology companies exhibiting at the neighbouring MEDICA trade fair in particular ensured a wide range of professional expertise and effective networking. The session is offered for the entire day on 14 November for visitors to MEDICA and COMPAMED and will end with an international networking round. The first session (Scale Up, don't Screw Up: Design for Manufacturing in Printed Electronics and 3D Printing) where the Finnish firm VTT and its partners will present cutting-edge research highlights and the hands-on session on the topic of microfluidics to be held on Wednesday afternoon (15 November) are especially interesting in terms of content.

IVAM's joint exhibition stand presents the diversity of microtechnology

This year, IVAM's joint exhibition stand includes 48 participants from industry and research representing eleven nations (Germany, Sweden, France, Greece, Switzerland, the Netherlands, Taiwan, the UK, the US, Japan and Finland). "We are pleased that the Asian businesses are back after the pandemic years", says Dr Thomas R. Dietrich, CEO of IVAM. On site, there will again be a variety of microcomponents (microelectronic, optoelectronic, microoptical, microfluidic), sensors, actuators and sensor systems, micropumps, coatings, smart textiles as well as manufacturing and processing procedures. This year, the young med-tech company CorTec (from Freiburg) is set to again be one of the highlights of the IVAM area with its cutting-edge technology for the next generation of active implants that enable communication with the nervous system to heal diseases. CorTec specialises in implants for the long-term recording and stimulation of neuronal activity.

Strong Fraunhofer presence at COMPAMED

The Fraunhofer-Gesellschaft not only exhibits at the parallel trade fair MEDICA, but also increasingly at COMPAMED. The world's leading organisation for application-oriented research provides ideas and developments for medical technology with the aim of making healthcare affordable and facilitating innovative treatment approaches. The topics exhibited include material developments for medical and surface engineering, quick-to-manufacture and low-cost lab-on-a-chip systems and innovations in ultrasound imaging and 3D-printed micro- and macro-optics. Nano inks for medical technology, bone replacement materials and in vitro testing systems complete the range and the Fraunhofer trade fair stand. Here, the seven Fraunhofer institutes and units will present a wide range of research projects and results (Hall 8a, stand G10).

Improved healing after bone fractures

These include the SCABAEGO project, for example, which aims to find ways to heal bone fractures without complications. After a fracture and subsequent inpatient treatment at a hospital, many patients experience complications during the healing phase. These include pseudarthrosis and bone defects. This is particularly stressful for those affected, particularly since healing takes much longer. Hospitals and the entire healthcare system incur additional work and enormous costs.

The Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM developed a solution to this together with the company BellaSeno and the Heidelberg University Hospital. It uses a composite of polycaprolactone (PCL) and bioglass. The degradable polymer PCL offers stable support, vascular and guiding structure while the bioglass impedes bacterial growth and stimulates bone regeneration. Inserted into a fracture, this solution contributes to quicker healing free of complications.

No need to fear root canals

A further innovation by Fraunhofer is an intelligent ultrasound system that improves root canal treatments (the IPUCLEAN project). Researchers at the Fraunhofer Institute for Ceramic Technologies and Systems IKTS have developed a technology that noticeably simplifies root canal treatment at the dentist's. During treatment, the dentist cleans the root canals with a file. A piezoceramic stack actuator combines the file's rotation with a vibrational motion to prevent adhesions in the root canal. This way, the file doesn't need to be cleaned as often and the treatment takes less time. This technology can also be used for other medical applications, for example in diagnostics or cancer treatment.

Can PFAS be replaced in medical technology?

The subject of PFAS is also set to be a hot topic of discussion at COMPAMED 2023. Within the EU, these important industrial chemicals, which are widely used in medical technology in particular, are threatened with a blanket ban. The per- and polyfluoroalkyl compounds with high longevity have been proven to damage the environment and health, but on the other hand, they save lives through their use in many high-tech products. In medical technology, particularly in endoscopies and minimally invasive surgeries, they are indispensable. "The broad-based regulation of entire substance groups, irrespective of their proven risks, could cause irreparable damage to Europe, its citizens and its industry", says Jörg Mayer, Executive Director of the industry association SPECTARIS. In sum, there are about 3,000 affected areas in medical technology, including endoscopy, intracardiac catheters, implants, stents, MRT, CAT and dialysis machines. In many cases, there are no alternatives to the previously used PFAS. The aim should therefore be to find a solution that takes all interests into equal account and carefully weighs the benefits and risks.

MDR and IVDR also continue to provide food for discussion

A further regulatory topic is also bound to cause discussion, the Medical Device Regulation (MDR) and the In Vitro Diagnostic Medical Device Regulation (IVDR) issued by the EU that have been in effect since 2021 and 2022, respectively. After all, there are approximately 500,000 types of medical devices on the market – and the EU's intention in issuing the regulations was to make these safer and more transparent for patients. "There is no question that a lot of work is still required to fully implement them", comments Stefan Bolleining, CEO of the consulting firm be-on-Quality that offers support for any and all questions regarding regulatory requirements and quality management in medical technology. "The number of functioning 'notified bodies' must be increased, and additional guidelines would be helpful to point us in the right direction, but the courage of entrepreneurs to make their own decisions is also needed", the expert explains. As the regulations are a complex subject matter, dealing with them is a continuous learning process for the parties involved. Without a doubt, the required workload has increased compared to the previously applicable provisions. "However, the quality of documentation and the final product safety for patients are clearly better", Bolleining emphasises. "We also support the demands of the German Medical Technology Association (BVMed) and the Diagnostics Industry Association (VDGH) for more transparency and efficiency, predictability and speed, more international interconnection and competitiveness, good management practice and the submitted change proposals in order to keep the medical technology industry from relocating outside of Europe", adds IVAM CEO Dr Thomas Dietrich.

Barking up the right tree: Biodegradable circuit boards made of cellulose

Electronic refinements, intelligent sensors, contentious issues such as PFAS and new regulations on medical devices – COMPAMED remains a platform with a wide range of innovations and creative discussions. These also include the evergreen topic of sustainability. The multinational EU project Hypelignum proposes an especially intriguing solution in this field. HyPELignum represents research into wood materials in hybrid printed electronics: a comprehensive approach for functional electronics with zero net carbon emissions. The quickly growing availability of affordable consumer electronics has resulted in increasing amounts of electronic waste. With its comprehensive approach, the EU-funded project aims to show that the combination of additive manufacturing, wood-based materials (in this case cellulose fibrils in particular), plentifully available transition metals and a progressive, sustainable assessment can lead to the design and manufacture of carbon-free electronics. "We work with wood substrates that we can subsequently use as circuit boards", states Dr Thomas Geiger of the Swiss EMPA (Swiss Federal Laboratories for Materials Science and Technology) who is responsible for base materials in the project. This approach of recontextualising an ancient material is also typical for COMPAMED.

Source: [COMPAMED 2023](#)

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