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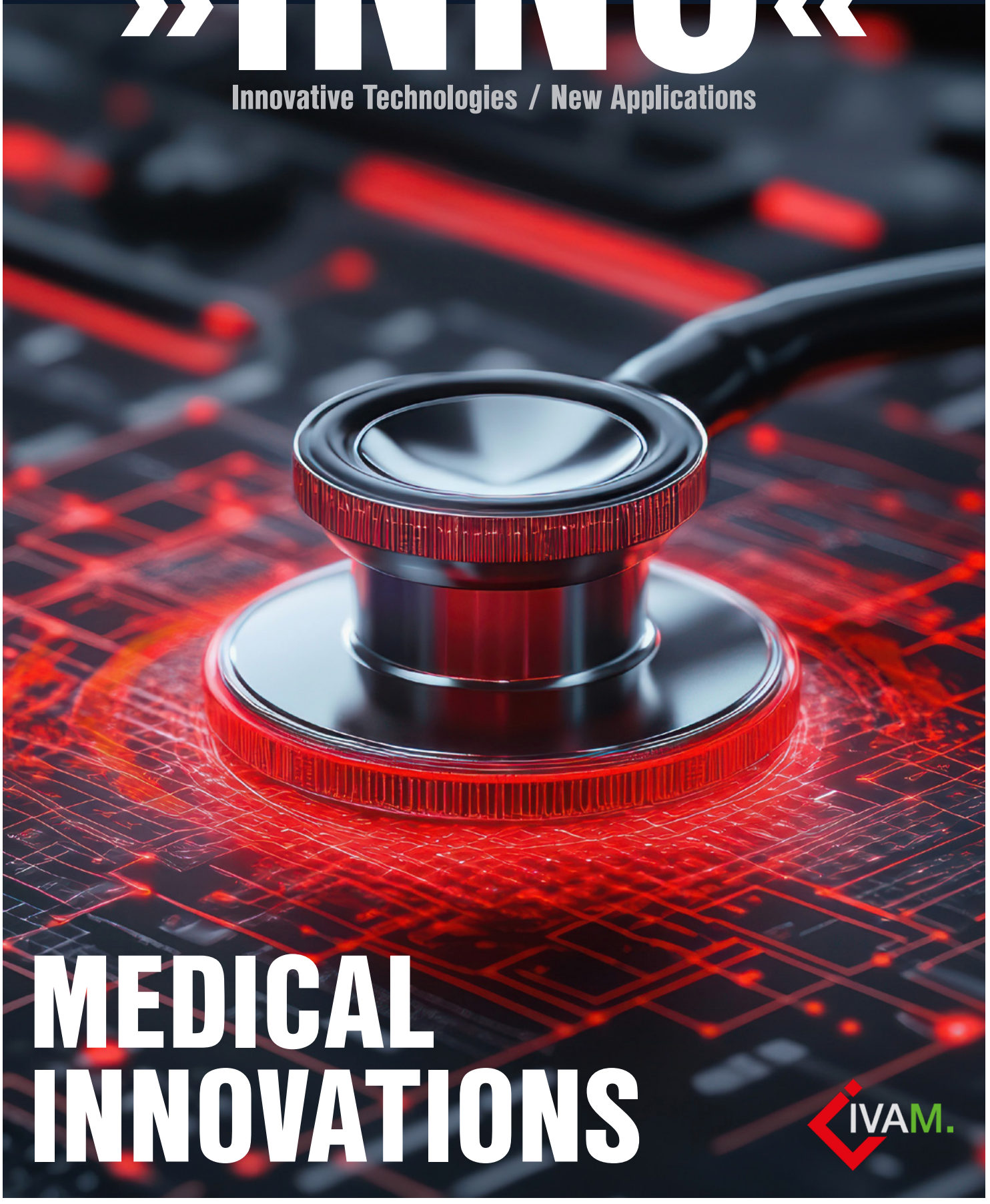
Innovative Technologies / New Applications



MEDICAL INNOVATIONS

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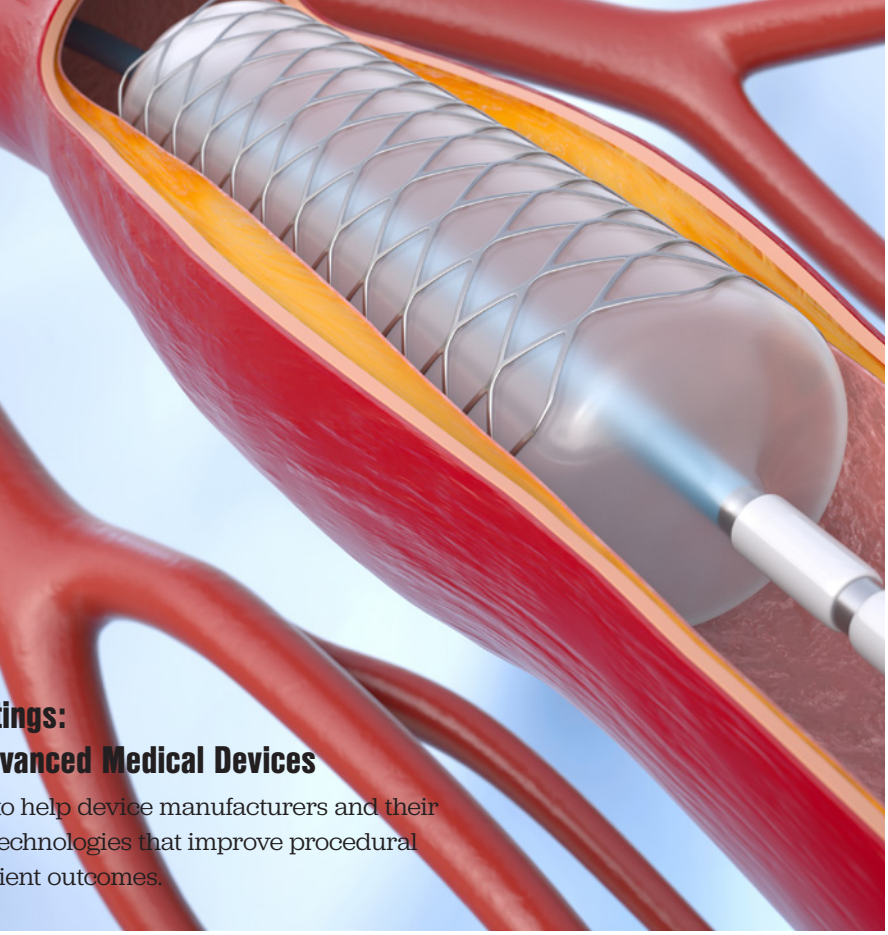
Medical innovations: breakthroughs transforming healthcare

As technologies like AI, robotics, and nanotechnology merge with precision engineering and advanced materials, the frontiers of modern medicine are rapidly expanding.



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Dynamic Extrusion: Opening A New Era of Multi-Flex Tube Manufacturing

For medical device manufacturers, the move from reflow lamination to fully automated dynamic extrusion is a strategic necessity.

Medical Technology
ges 16 - 30

»INNO 92«
Medical Innovations

Welcome to the latest issue of Inno Hightech Magazine! This edition is dedicated to Medical Innovations – the breakthroughs and high-tech solutions that are transforming healthcare and shaping the future of medical technology.

High-tech key technologies remain the foundation of progress in medical engineering. They drive precision, safety, and performance, enabling smarter diagnostics, more efficient manufacturing, and improved patient outcomes.

In this issue, we take a closer look at how innovation is redefining the possibilities of MedTech – from dynamic extrusion opening a new era of multi-flex tube manufacturing, to the use of Parylene coatings for electrical isolation on advanced medical devices, and innovative therapeutic technologies that help reduce post-surgical infections. Together, these developments illustrate how cutting-edge engineering continues to advance medical practice and enhance quality of life.

Our COMPAMED 2025 Special further highlights how microtechnology is driving MedTech, showcasing the potential of miniaturized systems and components that will shape the next generation of medical devices. We invite you to explore how high-tech innovation continues to transform healthcare and inspire the medical technologies of tomorrow.
Warm regards,

Mona Okroy-Hellweg

Multi-flex tube – an example of endoscope shaft..

Hiroki Iwai

DYNAMIC EXTRUSION

OPENING A NEW ERA OF MULTI-FLEX TUBE MANUFACTURING

In the competitive and highly regulated medical device industry, manufacturing innovation is a key driver for performance and safety. For decades, the reflow lamination process has been the standard method for assembling the complex multi-flex tubes (such as catheter and endoscope shafts), bonding multiple layers of materials using heat-shrink tubing. While a reliable technique, it is a batch-oriented, multi-step process with inherent limitations. Today, medical device manufacturers are increasingly turning to fully automated dynamic extrusion as a new alternative to lamination, ushering in a new era of precision, consistency, and design freedom.

The Limitations of Traditional Reflow (Lamination)

The traditional reflow, or lamination, process involve several discrete, manuall intensive steps: a heatshrink tube is placed over the assembled layers of the shaft (liner, braid/coil, and jacket), and the

assembly is passed through a heated chamber to fuse the layers. This multi-step process is not without its drawbacks:

Manufacturing Inefficiencies: Reflow is a labor-intensive process that relies heavily on operator skill. The need to assemble components, apply and then remove the heat-shrink sleeve, and manage batch processing reduces throughput and increases the potential for human error.

Inconsistent Quality: The manual assembly and batch-style heating can lead to variations in dimensions and concentricity, which can compromise a catheter's performance and steerability.

Delamination Risk: The bond strength between jacket segments/layers can be inconsistent, creating a risk of delamination during use, a critical failure point for patient safety.

Multiple Components: The lamination requires preparation of multiple parts to assemble, which includes each segment of the jacket and heat shrink tubes. The more parts, the more complicated the supply chain management will be.

The Benefits of Dynamic Extrusion: A Paradigm Shift

Dynamic extrusion is a new approach to manufacture multi-flex tubes, in which polymers are directly extruded on the assembled core. A fully automated extrusion line can fundamentally change the manufacturing process by consolidating it into a single, continuous, and highly controlled operation.

Superior Manufacturing Efficiency: Automated extrusion can replace a multi-step, manual process with a single-pass, continuous one. This significantly increases overall production speed, throughput, and yield while reducing reliance on manual labor.

Greater Control over Quality and Consistency: By bonding polymers while they are still in a molten state, the process creates a strong, homogenous, and fully integrated shaft structure, potentially reducing the risk of delamination.

Reduce PFAS Dependency & Supply Chain Complexity: Another core benefit of dynamic extrusion is its elimination of fluoropolymer heat-shrink tubes, a key component of the reflow process. Additionally, since the jacket layer can be made through direct extrusion, there is no need to purchase numerous sizes of tube segments: all you need is sets of polymer pellets. This reduces a significant regulatory and reputational risk, as well as simplifies your supply chain.

Expanded Design Possibilities: Dynamic extrusion technology unlocks a new world of design capabilities for complex and high-performance devices. It allows for the continuous, intermittent extrusion of polymers with different durometers along the length of the shaft. While some extrusion heads are opted for joining polymers with distinct borders in-between (as expected in traditional laminated flex-tubes), others are designed to create a seamless gradient in stiffness by blending polymers: a new design option which was unavailable in reflow. This not only eliminates the need to bond discrete segments, but also enables a seamless and kinkresistant shaft with precisely controlled flexibility, a critical feature for navigating tortuous anatomy.

Conclusion

For medical device manufacturers, the move from reflow lamination to fully automated dynamic extrusion is a strategic necessity. It offers a powerful solution to the inherent limitations of a traditional process by delivering superior quality, consistency, and efficiency. As the demand for more complex, high-performance endoscopes and catheters grows, dynamic extrusion provides the precision and design flexibility required to meet tomorrow's clinical challenges. While the initial investment in automation is substantial, the long-term benefits in terms of enhanced performance, reduced costs, and accelerated innovation make it a smart and forward-thinking decision for the future of medical device manufacturing.

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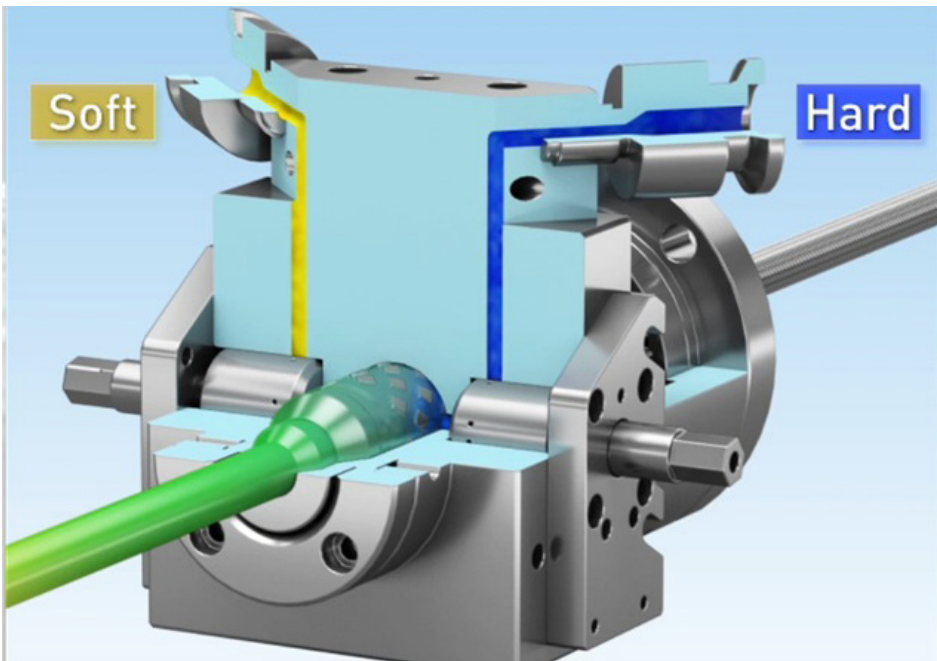


An extrusion head for dynamic extrusion that enables a seamless durometer gradient.

Dr. Cacie McDorman

MEDICAL INNOVATIONS: BREAKTHROUGHS TRANSFORMING HEALTHCARE

The evolution of medical-grade metals, from stainless steel and titanium to nitinol, has been pivotal in advancing modern device development. Essential properties such as biocompatibility, corrosion resistance, and mechanical performance are critical factors to ensure device performance and patient safety. Nitinol, a shape-memory and super-elastic alloy of nickel and titanium, has revolutionized minimally invasive devices and implants due to its unique ability to be crimped to very tiny diameters for insertion and expand when deployed at its destination in the body.

Innovation in medical devices extends far beyond the creation of new devices–it's fundamentally reshaping how healthcare is delivered. As technologies like AI, robotics, and nanotechnology merge with precision engineering and advanced materials, the frontiers of modern medicine are rapidly expanding. For example, the exceptional flexibility of nitinol, enables devices to reach areas in the body that were previously unreachable. Alleima stands at the forefront of this transformation, partnering with leading medical device manufacturers to turn visionary concepts into real-world solutions. Through these partnerships, Alleima is contributing to a smarter, faster and more personalized healthcare ecosystem –one where innovation truly saves lives.

The innovation imperative

The pace of medical innovation is intensifying, driven by the dual forces of technological capability and patient demand. "There is an inherent need among researchers to push the envelope by delivering better and safer experiences for patients and clinicians," says Dr. Cacie McDorman, global product manager at Alleima's medical unit. Rapid prototyping in R&D has allowed medical devices to incorporate new features with each iteration. As a result, the pace of innovation in medical device development has significantly increased. "Today we can make ultra-fine dimensions of wires enabling design solutions that were impossible before, which is supporting

Wearable devices are transforming patient engagement, providing real-time health insights through continuous monitoring.

Nitinol has revolutionized minimally invasive devices due to its unique ability to be crimped to very tiny diameters for insertion and expand when deployed at its destination in the body.

“There is an inherent need among researchers to push the envelope by delivering better and safer experiences for patients and clinicians.”

the innovation of minimal invasive therapies, reducing the time at hospitals and recovery time for patients,” Dr McDorman adds.

Digitalization within the medical field

As digitalization accelerates across the healthcare landscape, the medical device industry is experiencing an unprecedented wave of innovation. Technologies such as artificial intelligence (AI), robotics, and nanotechnology are revolutionizing patient care and ushering in a new era of precision medicine.

The COVID-19 pandemic catalyzed a digital transformation in healthcare, accelerating the adoption of telemedicine and remote diagnostics. Digital health devices and cloud-based patient monitoring systems are enabling precision medicine and more personalized care. Europe is paving the way for digital therapeutics adoption, with new regulations classifying mobile health apps as medical devices and establishing reimbursement systems, such as in Germany. This regulatory progress supports the shift toward proactive, data-driven healthcare. Wearable devices are transforming patient engagement, providing real-time health insights through continuous monitoring. “Remote monitoring and nanotechnology are the next frontiers in healthcare,” Dr. McDorman notes. These technologies are integral to the growing demand for personalized health data and preventive medicine. Precision medicine, empowered by wearable and genomic data, allows clinicians to tailor treatments based on an individual’s genetic and physiological profile, ushering in a new era of customized healthcare.

AI, machine learning (ML), and robotics

AI and machine learning (ML) are reshaping how data is analyzed, how diseases are diagnosed, and how surgeries are performed. The AI market is driving innovation across all aspects of healthcare, from predictive diagnostics to robotic-assisted surgeries. As Dr. McDorman explains, “ML is heavily influencing innovations in healthcare, allowing for proactive and individualized treatment.” Robotics is influencing medical practice in various ways. Examples include robotic-assisted surgeries and automated care systems, which are used to increase procedural precision, potentially shorten recovery periods, and help

address issues like staff shortages and aging populations.

Partner for life-changing medical solutions

Alleima plays a pivotal role in advancing medical technology through its expertise in advanced materials technology and sustainability, specializing in high-performance alloys, complex wire-based solutions, surface treatments, laser, and nitinol processing.

Collaborating closely with leading global medical device OEMs, Alleima's specialist engineers lend their extensive materials expertise to the design, development and manufacturing of intricate wire-based components used in life-changing technologies, from pacemakers and cochlear implants to neurostimulators, ablation catheters, and advanced guidewires supporting the innovation of diagnostic tools and smaller and smarter medical devices.

Alleima's capabilities also extend to the development of flexible, high-strength instruments for robotic and minimally invasive surgery, ensuring these tools deliver both the dexterity and durability required to meet the most demanding clinical environments. With advanced in-house capabilities, Alleima stands uniquely equipped to meet the evolving needs of developing the medical devices of the future.

Alleima - Business Unit Medical
https://www.alleima.com/nitinol

"As technologies like AI, robotics, and nanotechnology merge with precision engineering and advanced materials, the frontiers of modern medicine are rapidly expanding."

Dick Molin

THE USE OF PARYLENE COATINGS

ELECTRICAL ISOLATION ON ADVANCED MEDICAL DEVICES

As medical device technologies advance and reach new markets around the world, ensuring their reliable operation is critical to both provider and patient safety and device efficacy. Many of these next-generation systems deliver targeted energy or rely on precision sensing, both of which occur at a very specific location at a specific time. To ensure reliable operation, Parylene conformal coatings are often used as insulative materials on these devices due to their thin, uniform and biocompatible attributes. Their ability to form pinhole-free barriers ensures reliable electrical isolation and long-term performance in devices used throughout the body.

Parylene is the generic name for a family of vapor-deposited poly(para-xylylene) polymers known for their exceptional conformality and excellent barrier and dielectric properties. Unlike liquid coatings that depend on spraying or dipping, Parylene is applied as a gas in a vacuum deposition process that allows the coating to form molecule-by-molecule on every surface of a component, including edges and internal geometries. The Parylene coating process produces films that are chemically inert and free of both plasticizers and catalysts. Parylenes N, C and Parylene HT and ParyFree offer unique performance benefits to medical devices and device components. Parylene N, for example, provides excellent dielectric strength and is valued for its ability to uniformly coat fine geometries. Parylene C offers a strong moisture and chemical barrier, while Parylene HT delivers exceptional thermal and ultraviolet stability. These Parylene variants have passed ISO 10993 and United States Pharmacopeia Class VI testing for biocompatibility, making them well suited for applications ranging from external devices to long-term implants.

Material Considerations for Electrical Isolation in PFA Catheter Design

One application that demonstrates the importance of Parylene's electrical isolation properties is Pulsed Field Ablation (PFA) devices for the treatment of atrial fibrillation (A-fib). PFA devices are delivered to the heart via catheter to precisely administer microsecond bursts of high-voltage energy that selectively ablate cardiac tissue while sparing surrounding structures. Parylene's dielectric strength, which exceeds 7,000 volts per mil (Parylene N), ensures that electrical pulses are confined precisely to the target area. The coating's ultra-thin uniformity allows manufacturers to maintain tight dimensional tolerances on catheter electrodes and shafts, where variations in coating thickness could alter energy delivery. Additionally, Parylene's dry-film lubricity attributes help catheters navigate the vascular system smoothly, and the catheters and coating are not damaged from repeated flexing or contact with blood and tissue. Because Parylene is free from solvents and plasticizers, it eliminates the risk of leaching or outgassing inside the body, ensuring both performance and patient safety during ablation procedures.

Ensuring Electrical and Chemical Integrity in Electrosurgical Device Design

Another area where Parylene coatings play a vital role is in electrosurgical instruments. These tools cut and cauterize tissue using high-frequency energy and require reliable insulation between active and inactive surfaces to prevent unintended burns or current leakage. Parylene's combination of high dielectric strength and chemical resistance provides consistent protection even during extended surgical use. Its conformal nature provides complete coating coverage over complex geometries such as hinged jaws and inner seams, where traditional liquid coatings might leave thin areas or voids. Parylenes are also able to withstand sterilization, including ethylene oxide and plasma exposure, ensuring that electrosurgical tools maintain insulation integrity through multiple uses. Additionally, the ultra-thin thickness and optical clarity of Parylene preserve the mechanical feel and precision that surgeons expect from advanced surgical instruments.

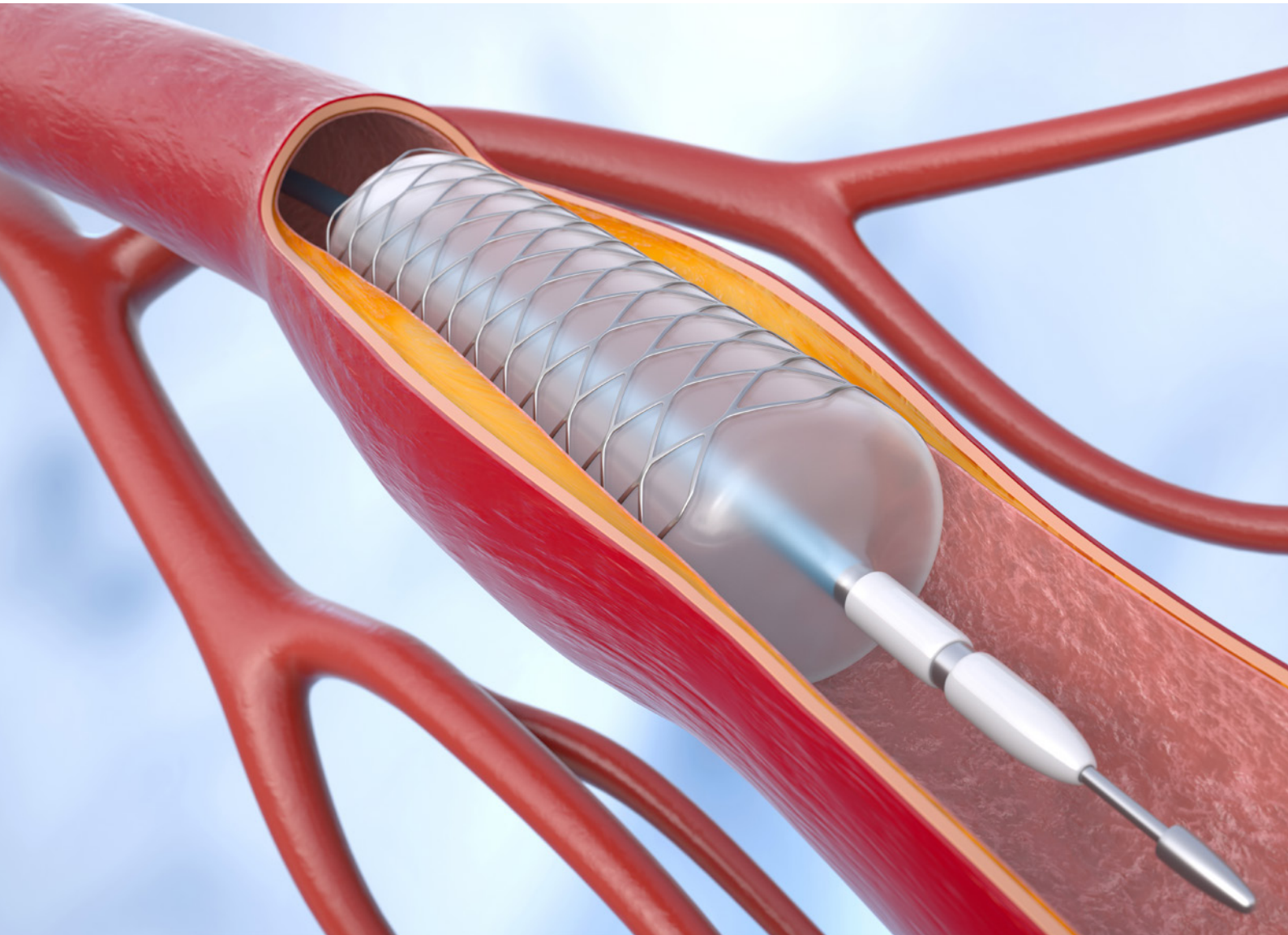
> “Parylene coatings continue to help device manufacturers and their engineers advance medical technologies that improve procedural precision and, as a result, patient outcomes.”

Comprehensive Protection for Next-Generation Minimally Invasive Devices

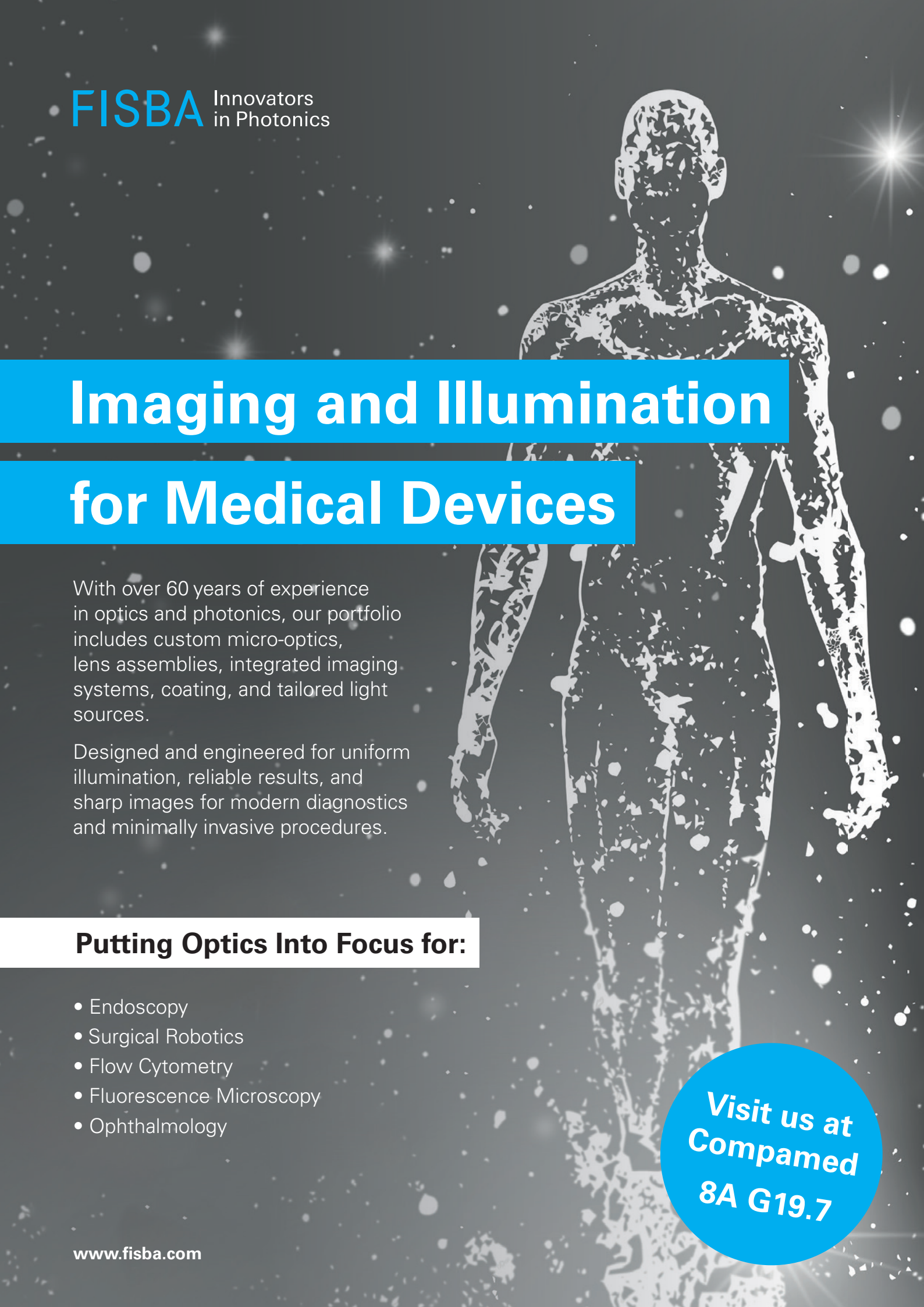
Parylene coatings also enhance the safety and performance of neurostimulation needles and probes, which help locate and stimulate nerves during surgical procedures or targeted pain management. These devices often require precise electrical isolation along the shaft with controlled exposure only at the tip. Parylene’s ability to deposit as an ultra-thin, pinhole-free layer provides consistent insulation while maintaining device flexibility. The coating prevents shorting or current leakage in proximity to sensitive neural structures and protects conductive elements from body fluids. For needle and probe assemblies that must transmit electrical signals while being inserted through tissue, Parylene’s low coefficient of friction provides dry-film lubricity and reduces tissue adhesion. In these applications, Parylene supports reliable performance, ensuring safe and accurate neurostimulation or nerve localization.

From PFA applications to electrosurgery to neurostimulation devices, Parylene coatings have become essential to the design of modern energy-delivery and sensing devices. Their electrical and mechanical performance enables miniaturized systems to function safely within complex environments. By offering reliable dielectric protection, moisture resistance, sterilization compatibility and long-term biocompatibility in a lightweight, uniform film, Parylene coatings continue to help device manufacturers and their engineers advance medical technologies that improve procedural precision and, as a result, patient outcomes.

Specialty Coating Systems - World Headquarters, Indianapolis, US
https://scscoatings.com



FISBA Innovators in Photonics



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COMS©Blue is a compact device that helps treat and manage surgical site infections without recourse to antibiotics. Image: Source: Piomic Medical AG

FEWER POST -SURGICAL INFECTIONS WITH INNOVATIVE THERAPEUTIC TECHNOLOGY

A novel way to manage infected wounds and a truly customized treatment without need for antibiotics: That is the idea behind a new medical technology project supported by the Federal Ministry of Education and Research, including the Fraunhofer Institute for Reliability and Microintegration IZM among the research partners. After surgery, many patients will be affected by infections around their wounds. Around 2.5% of all surgical interventions will even lead to a surgical site infection, or SSI. On average, such infections will keep the patients confined to their hospital beds for around ten days longer; mortality can also increase twofold to elevenfold. Three in every four deaths among patients suffering from SSIs are directly due to the infections. Worryingly, bacterial strains resistant to antibiotics are increasingly common and are not easily treated by administering drugs. All of this is becoming a massive burden, not just for the patients themselves, but for the healthcare system at large. Giving patients affected by acute post-surgical or even chronic SSIs the best possible care means diligent prevention, supervision, and therapy. The new COMSBlue system is designed to be an innovative solution for managing surgical site infections. The project partners behind the system are adding their device to the COMS platform, which is already being used for supporting the management of chronic wounds with combined optical and magnetic stimulation.

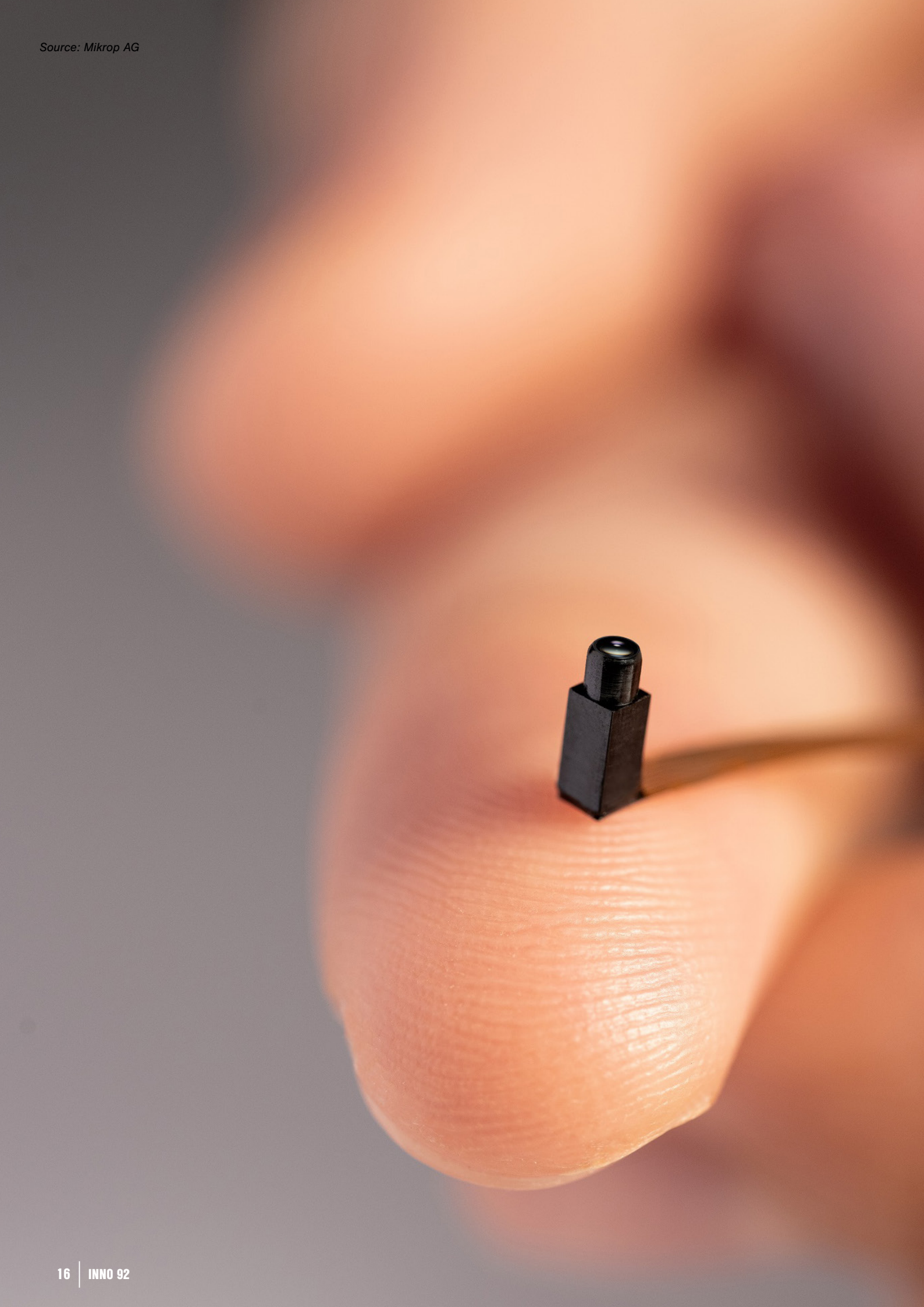
Focused and customized treatment of infected wounds

Fitting nicely in the palm of a hand, the device is placed onto the affected wound with a sterile adapter to prevent contamination. COMSBlue then exposes the wound to near-UV light, which has antibacterial properties and can reinforce the effects of conventional antibiotics even with resistant strains of bacteria. Additionally, a magnetic pulse stimulates blood flow of the tiny blood vessels around the site. This socalled microcirculation is often disrupted around wounds, stopping the body's natural ability to get its immune cells to the wound, where they would fight the infection. Since the device is used immediately on the patient, it should never become overly hot to the touch. This calls for careful thermal management of the LEDs. The cooling system has to be able to conduct even substantial heat away from the patient, while not affecting the compact dimensions of the device. This is where the unique packaging and interconnection expertise of Fraunhofer IZM comes into play for developing and evaluating the right LED modules for the job. The COMSBlue platform is supported by a software suite that captures real-time data on bacterial load and the effects of the therapy. This can be a crucial link for truly targeted and customized therapy of SSIs that can speed up recovery and reduce the burden on the healthcare system. COMSBlue is a project of the Swiss medical technology enterprise Piomic Medical in cooperation with Fraunhofer IZM and the software specialists of reanmo. It is supported by Innosuisse and the German Federal Ministry of Education and Research as part of the Eurostars funding programme

> **“A novel way to manage infected wounds and a truly customized treatment without need for antibiotics”**

Fraunhofer Institute for Reliability and Microintegration IZM

http://www.izm.fraunhofer.de



Source: Mikrop AG

COMPAMED 2025

MICROTECHNOLOGY DRIVING MEDTECH

From November 17-20, 2025, more than 50 exhibitors and partners will present the latest microtechnology solutions for the MedTech supply industry at the IVAM joint booth in Düsseldorf

The IVAM Microtechnology Network will once again exhibit at COMPAMED 2025 in Düsseldorf, held in parallel with the MEDICA trade fair from November 17 to 20, 2025. Covering an area of approximately 700 square meters, the IVAM joint booth will feature a large-scale product market with more than 50 exhibitors and partners from IVAM's international network. In addition to exhibitors with their own booth spaces, several business partners will present themselves through displays and information materials within the IVAM area. Participants represent ten nations from Europe, Asia, and the Americas, underlining the global character of the network. The IVAM joint booth has long been a focal point for professionals seeking cutting-edge technologies for medical device manufacturing and supply.

Microtechnology Driving MedTech Innovation

Th The IVAM Product Market provides companies and research institutes with a platform to showcase the latest advancements in microsystems technology, sensors, photonics, microfluidics, and advanced materials. The exhibited technologies address all stages of the medical technology value chain - from component manufacturing to complete system solutions. The focus lies on making medical devices smaller, lighter, more energy-efficient, smarter,

Fine wire: With diameters as small as 0.0005 mm – many times thinner than a human hair – our wires meet the highest standards.
Source: Elschukom GmbH

and more sustainable, while also advancing diagnostics, imaging, and automation in healthcare and home-care settings.

COMPAMED HIGH-TECH FORUM by IVAM

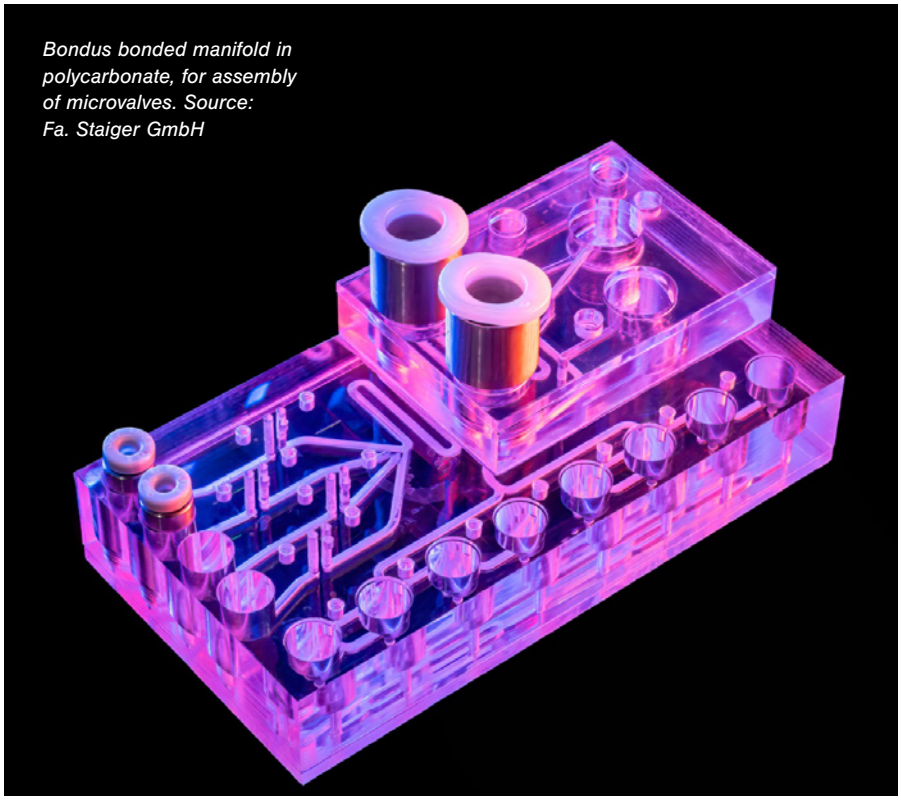
A highlight of the trade fair will again be the COMPAMED Hightech Forum by IVAM, offering a diverse program of expert presentations on all four days. The sessions will cover topics such as smart sensor technologies, laser and photonic applications, and microfluidic innovations, complemented by an interactive hands-on session where visitors can experience new technologies first-hand.

The international dimension of the forum will be reflected in pitch sessions by Asian companies and a dedicated “Europe meets North America” day, designed to foster dialogue between component manufacturers, device developers, distributors, and end users across the medical value chain. Networking opportunities and interactive exchange formats will further enhance collaboration and partnership.

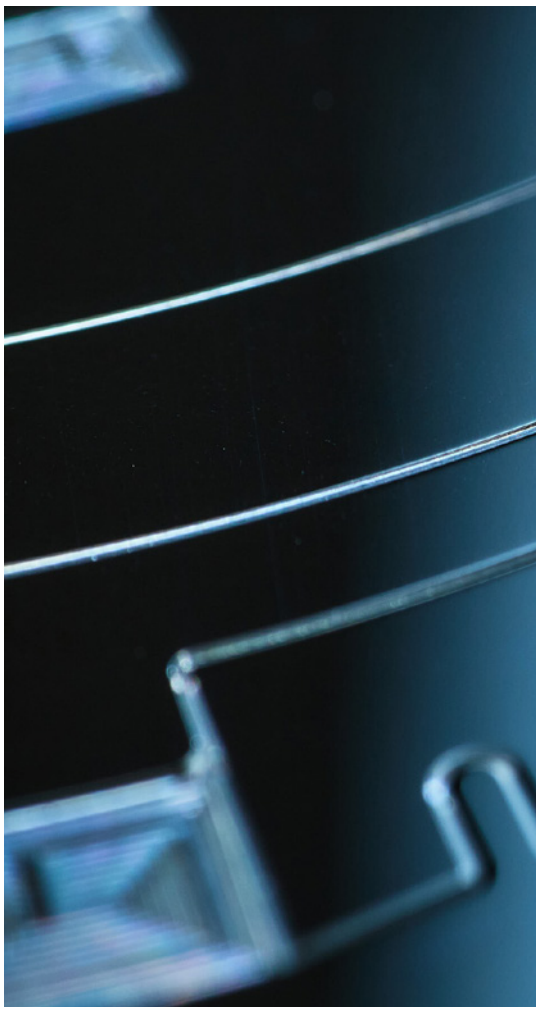
Technological Highlights

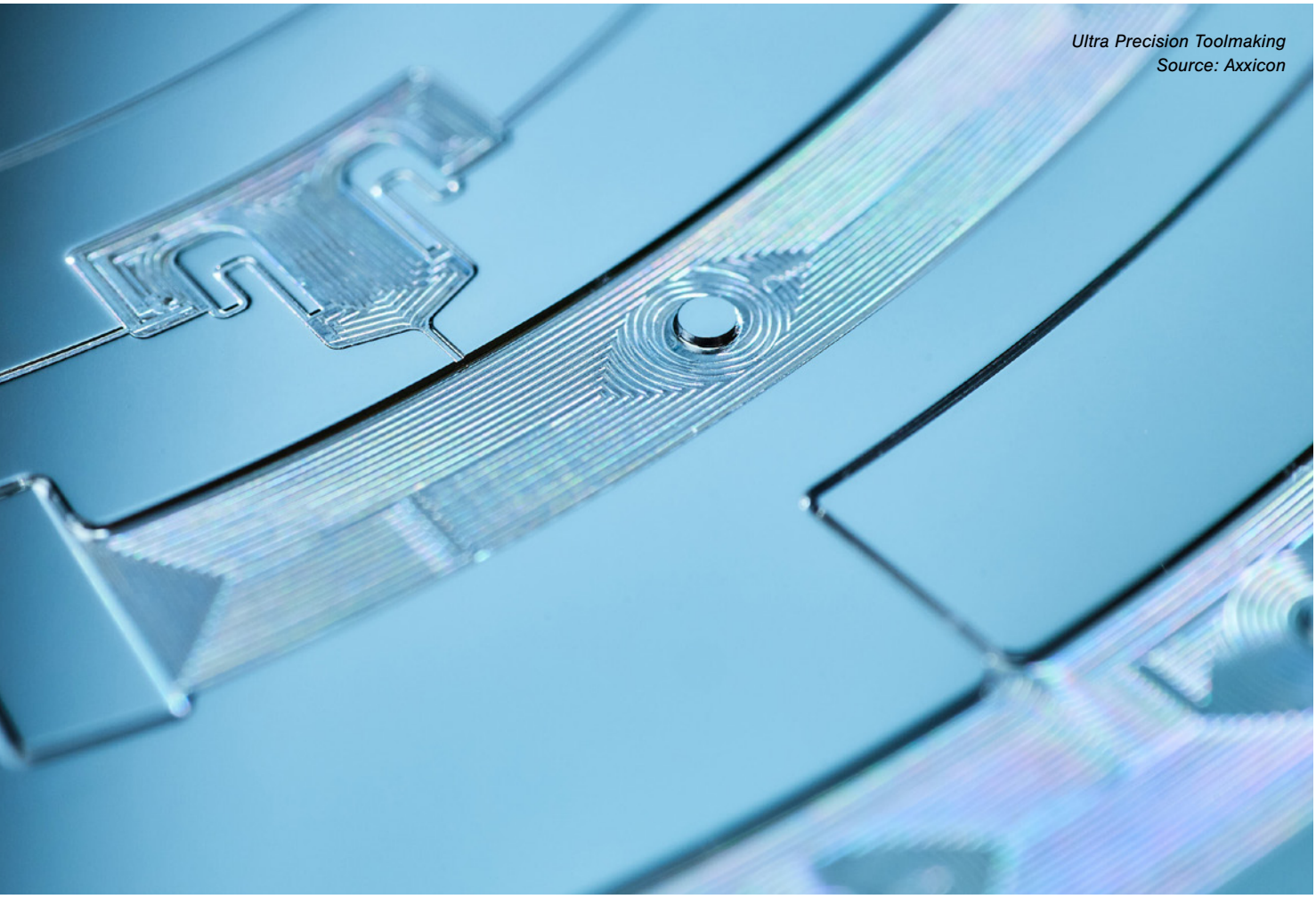
The technologies showcased by exhibitors and partners will range from advanced sensor and actuator systems to optical and photonic solutions, microfluidic innovations, and material technologies for medical applications. The spectrum includes high-precision components and microsystems for minimally invasive applications, novel imaging and diagnostic techniques, intelligent implants, and solutions for biomedical analysis, lab-on-a-chip and point-of-care systems. In addition, automation technologies for hospitals and laboratories, energy-efficient components, and smart, data-driven devices will be on display. Together, these developments highlight the IVAM joint booth as a central showcase for technological excellence and international collaboration in medical technology.

IVAM Microtechnology Network
https://www.ivam.de/events/compamed_2025



Bondus bonded manifold in polycarbonate, for assembly of microvalves. Source: Fa. Staiger GmbH

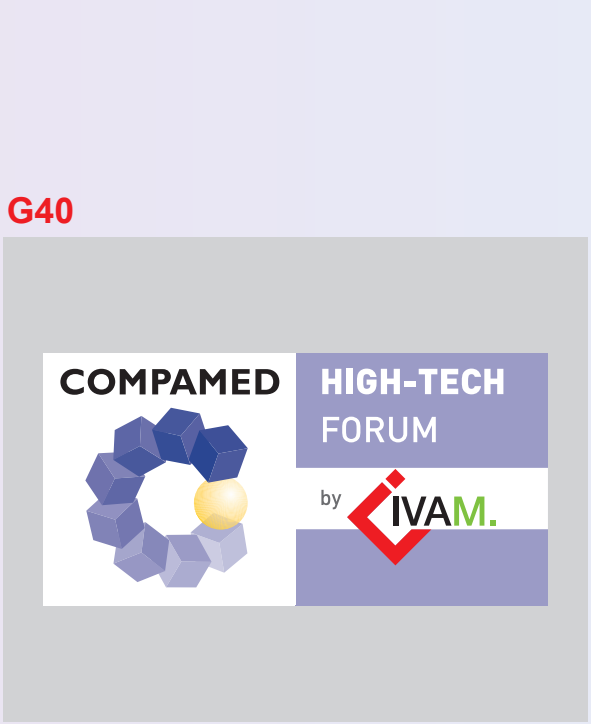




Ultra Precision Toolmaking
Source: Axxicon

Medical Device Manufacturing solution for your complexity breakthrough
Source:: AMT

COMPAMED/MEDICA IVAM PRODUCT MARKET HIGH-TECH FOR MEDICAL



DEVICES

November 17 - 20, 2025
Hall 8a
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H19

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H23.7 Cubic Sensor and Instrument	H19.3 PLA GIKEN	H19.6 Axxicon
		Storage
	H19.1 JENOPTIK & SwissOptic	H19.7 Mabuchi Motor Electromag
H23.8 Victor Kyburz		

G19

G19.1 IMT Masken und Teilungen	G19.2 Delta Optical Thin Film	Storage	G19.4 Fraunhofer IMS
G19.7 FISBA	G19.6 KEURO Solutions		G19.5 Fraunhofer ENAS

F19

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PUSHING YOUR LIMITS
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permag
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PhotonHub
Brussels, BE
F35.1

MICRODUL
Microdul AG
Zürich, CH
F19.4

PLA GIKEN CO.,LTD.
Pla Giken Co., Ltd.
Osaka, JP
H19.3

RETINA
RETINA project
O Porriño (Pontevedra), ES
F35.1

SCHOTT
SCHOTT AG
Mainz, DE
F35.5

mikrop
Mikrop AG
Wittenbach, CH
H23.1

SWISSOPTIC
A member of the JENOPTIK Group
SwissOptic AG
Heerbrugg, CH
H19.1

VICI
VICI AG International
Schenkon, CH
H23.6

KYBURZ SAPPHIRE
Victor Kyburz AG
Sathern, CH
H23.8

COMPAMED HIGH-TECH FORUM BY IVAM

COMPAMED

Hall 8a, Booth G40

MONDAY, NOVEMBER 17

12:00	*Opening*	**Tim Merforth,** IVAM, Dortmund, DE

SMART SENSOR SOLUTIONS

Session Chairs: Erik Jung, Fraunhofer IZM, Berlin, DE & Dr. Victoria Jakobi, IVAM, Dortmund, DE

12:10	*Next Generation Biosensing Solutions for Biofluids and Bioprocesses Monitoring*	**Dr. Felix Kurth,** CSEM SA, Landquart, CH
12:30	*Biosensors for Continuous Metabolic Monitoring in Medical Devices: Critical Care and Beyond*	**Dr. Michael Gasteyer,** Jobst Technologies GmbH, Freiburg, DE
12:50	*Are you Stressed? Latest Results of a Novel Cortisol Biosensor*	**Andreas Morschhauser,** Fraunhofer Institute ENAS, Chemnitz, DE
13:10	*Advancing Brain-Computer Interfaces and Integrated Technologies for Medical Devices*	**Joao Rodrigues,** CorTec GmbH, Freiburg, DE
13:30	*Smart Technologies for Long-Term Stable Neural Implants*	**Kira Heinrich,** Fraunhofer Institute IMS, Duisburg, DE
13:50	*The Selection of Conformal Coatings for Medical Devices*	**Dick Molin,** Specialty Coating Systems - World Headquarters, Indianapolis, US
14:10	*Streamlining Production of Multi-Flex Polymer Tubes*	**Hiroki Iwai,** PLA GIKEN CO., LTD., Osaka, JP
14:30	*Boosting Smart Sensor Manufacturing*	**Fabian Müller,** camLine Dresden GmbH, Petershausen, DE
14:50	*Silicon Sensors for Medical Applications*	**Dr. Martin Jahn,** CiS Forschungsinstitut für Mikrosensorik GmbH, Erfurt, DE
15:10	*Break*	

ASIAN MEDTECH PITCH & PARTNER

Session Chairs: Tim Merforth, IVAM, Dortmund, DE & Dr. Jens Ebnet, Ebnet Medical GmbH, Schwerin, DE

15:30	*Start of the Asian MedTech Pitch & Partner*	
16:30	*End of Session*	

TUESDAY, NOVEMBER 18

LASER AND PHOTONICS APPLICATIONS - EPIC TECH WATCH

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

10:20	*Photon by Photon: Unlocking New Insights in DLS and Fluorescence with Single Photon Counting*	**Luigi Ghezzi,** HAMAMATSU PHOTONICS ITALIA S.R.L, Arese (Milano), IT
10:40	*Photonics Pilot Line to Support the Medtech Product Development*	**Prof. Jussi Hiltunen,** VTT - Technical Research Centre of Finland, Oulu, FI
11:00	*Industrialization of Photonic Devices: Exciting and New Applications Based on Existing and Proven Technologies*	**Paul Dijkstra,** Philips Micro Devices, Eindhoven, NL
11:20	*Fluorescence Diagnostics Reimagined - The Power of LEDs and Multi-Bandpass Filters*	**Dr. Oliver Pust,** Delta Optical Thin Film A/S, Hørsholm, DK

11:40	*BioPhotonics for Non-Invasive Iron Deficiency Detection*	**Dr. Clemens Schriever,** JÜKE Systemtechnik GmbH, Altenberge, DE
12:00	*High-Performance Optics for Medical and Diagnostic Innovation*	**Josip Lucic,** FISBA AG, St. Gallen, CH
12:20	*Optical Filters in Medical Applications*	**Almut Bailly,** Chroma Technology, Olching, DE
12:40	*Reimagining Microscopy: A Modular Core for Fast Prototyping and Custom Medical Optics*	**Axel Haunholter,** OptoSigma Europe SAS, Munich, DE
13:00	*Technical Glass: Boosting Innovation in Performance and Miniaturization for Medtech Devices*	**Julia Hütsch,** SCHOTT AG, Mainz, DE **Dr. Haike Frank,** SCHOTT AG, Mainz, DE
13:20	*Parylene for Medical Applications – Micro Photonic Devices, Continuous Optical Fiber Coating and Flexible Sensor Patches*	**Florian Glauche,** Fraunhofer ENAS, Chemnitz, DE
13:40	*High-Dynamics Voice-Coil Nano-Positioner*	**Vincent Wahli,** MPS Microsystems, Bienne, CH
14:00	*Laser Based Joining Technologies for the Production of Medical Devices*	**Dr. Maximilian Brosda Flockenhaus,** Fraunhofer Institute ILT, Aachen, DE
14:20	*Scalable 3D-Printing of Complex Medical Micro-Optics*	**Nils Fahrbach,** Printoptix GmbH, Stuttgart, DE
14:40	*Enhanced Outcomes in Surgery - In 3 Steps to Your Customized Endoscopy Solution*	**Hannes Weise,** JENOPTIK Optical Systems GmbH, Jena, DE
15:00	*Magnetic Solutions for Tomorrow's Healthcare: Overcoming Supply Chain and Technological Barriers*	**Mak Joshi,** Permag, Elk Grove Village, US
15:20	*A Behind-the-Scenes Look at Optical Design*	**Asim Rexhepi,** LRE Medical, Nördlingen, DE
15:40	*Break*	

IVAM FOCUS GROUP SESSION: MICROFLUIDICS SESSION PART I: SMART COMPONENTS FOR MICROFLUIDICS: PRECISION IN GLASS AND PIEZO APPLICATIONS

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

16:00	*Glass Components for Life Science Applications*	**Dr. Lukas Greuter,** IMT Precision on Glass, Greifensee, CH
16:20	*Photonics Meets Microfluidics – Enabling the Finest Integration Possibilities in Glass Devices*	**Sebastian Büsche,** lambda glass solutions GmbH & Co.KG, Burgwedel, DE
16:40	*From Flow to Function – Realizing Highly Integrated Fluid Handling Systems*	**Florian Siemenroth,** Bartels Mikrotechnik GmbH, Dortmund, DE
17:00	*Hands-on-Session*	**Florian Siemenroth,** Bartels Mikrotechnik GmbH, Dortmund, DE

WEDNESDAY, NOVEMBER 19

10:25	*Opening*	**Dr. Jens Ebnet**, Ebnet Medical GmbH, Schwerin, DE **Dr. Victoria Jakobi**, IVAM, Dortmund, DE

EUROPE MEETS NORTH AMERICA - CONNECTING HIGH-TECH FOR MEDICAL DEVICES

Session Chair: Dr. Jens Ebnet, Ebnet Medical GmbH, Schwerin, DE & Dr. Susette Germer, MedTech Project Consultant, Leipzig, DE & Dr. Victoria Jakobi, IVAM, Dortmund, DE

10:35	*Emerging Silicone Innovations for PFAS-Free Medical Devices*	**Eugénie Guimier,** NuSil - Avantor, Carpinteria, US
10:50	*UHMWPE liner for interventional medical tubing – a PFAS free solution*	**Wei Cheng,** dsm-firmenich, Exton, US
11:05	*PFAS Under Pressure: A Global Pivot to Smarter, Sustainable Materials*	**Dr. Ned Burnett,** Saint-Gobain Medical, Boston, US
11:20	*Thin and Low Water Permeability Textile Scaffolds with Microdenier Fiber for Cardiovascular Applications*	**Andrew Metzger,** Solesis, Telford, US
11:35	*Fueling European MedTech with High-Performance Magnetics*	**Mak Joshi, Permag,** Elk Grove Village, US

11:50	*Rapid & Non-Invasive: Novel Approaches for Early Detection of Cancer & Infectious Diseases*	**Dr. Ramesh Babu,** InteGen LLC, Orlando, US
12:05	*Optimizing Syphilis Testing: RPR and the Evolution Smart Rack*	**Daniel Vincent,** Arlington Scientific, Inc., Springville, US
12:20	*Intelligence on the Body: The Future of Connected Health Devices*	**Giancarlo Candela,** Ambiq Micro, Inc., Austin, US
12:35	*Optical Fibers for Diagnostic and Treatment - Navigation, Imaging, Sensing, and Laser Power Delivery*	**Udo Fetzer,** Lightera, Norcross, US
12:50	*From Point-of-Care to Time-of-Care: Engineering a 10-Minute RT-PCR Platform for FDA CLIA Waiver and IVDR*	**Brian Miller,** Autonomous Medical Devices Incorporated, Santa Ana, US
13:05	*Heat Shrink Tubing and Medical Devices*	**Barry Schnur,** Cobalt Polymers, Healdsburg, US
13:20	*Streamlining Coating Selection for Your Medical Device*	**Todd Michael Paulsen,** Formacoat, Chaska, US
13:35	*The Perils and Pitfalls of Over-Tolerancing vs. Under-Tolerancing in Molded Products*	**Jim Reed,** ProMed Molded Products, Plymouth, US
13:50	*Complex Problems, Versatile Solutions: How Modularity Can Improve Your Microscopy*	**Alex Canan,** Zaber Technologies, Vancouver, CA, Vancouver, CA
14:05	*From Concept to Market: Full-Cycle Capabilities for Accelerating Silicone Medical Solutions*	**Agnes Berman Pivnik,** QMD, Pepper Pike, US
14:20	*Suite of Products for Powering Medical Workstations*	**Dr. Robin Schneider,** Green Cubes Technology, Kokomo, US
14:35	*Wireless Video for the OR*	**Dr. Uri Kanonich,** Amimon, Irvine, US
14:50	*Humphrey Products - Pneumatic & Fluid Control Experts*	**Hubbard Humphrey,** Humphrey Products, Kalamazoo, US
15:05	*Mastering Chronic Disease Management: The Role of Implantable Pressure Sensors in MedTech*	**Stephen Gray,** Millar Inc., Pearland, US
15:20	*Vital Care Industries – Built for Tomorrow's Operating Room*	**Harsh Singh,** Vital Care Industries, Tinley Park, US
15:35	*Navigating FDA vs. EU MDR: Regulatory Pathways Comparison*	**Rita King,** MethodSense, Inc., Morrisville, US
15:50	*Overview and Market Entry of US Healthcare Devices Market*	**Jun Peng,** P&L Scientific Inc., Coral Gables, US
16:05	*Navigating Trade Headwinds: Manufacturing Strategy Tips for MedTech in a New Tariff Era*	**Albert van de Liefvoort,** Providence Enterprise, Irvine, US
16:20	*Global Testing Strategies for Medical Devices: Navigating U.S. and EU Regulatory Demands Through Transatlantic Collaboration*	**Sarah Ptach,** Canyon Labs, Riverton, US
16:50	*Emerging Market Trends in Regenerative Medicine / Biologics from a CDMO Perspective*	**Jacqueline Schmit,** Evergen, Alachua, US
17:05	*End of Session*	**Dr. Jens Ebnet,** Ebnet Medical GmbH, Schwerin, DE **Dr. Victoria Jakobi,** IVAM Microtechnology Network, Dortmund, DE
17:45	*Opening Networking Europe meets North America: Networking, Snacks and Drinks in the IVAM Lounge (Hall 8a, booth F29) (participation free of charge for exhibitors and visitors)*	**Tim Merforth,** IVAM, Dortmund, DE **Ryan Klemm**, Messe Düsseldorf North America, Chicago, US
19:00	*End of Networking*	

THURSDAY, NOVEMBER 20

MICROFLUIDICS SESSION PART II: STAIRWAY TO ANALYTICAL HEAVEN – FROM PROTOTYPE TO VIABLE LAB-ON-A-CHIP PRODUCT

Session Chairs: Dr. Holger Becker, microfluidic ChipShop GmbH, Jena, DE

10:30	*Microfluidics for Personalized Medicine*	**Ken Rusterholz,** SCHOTT AG (SCHOTT MINIFAB), Melbourne, AU
11:00	*Accelerating Drug Discovery, Development & Delivery How Precision Manufacturing is Shaping the Future of Pharma*	**Dr. Christian Walk,** Micronit B.V., Enschede, NL
11:20	*A Scalable and Modular Manufacturing Approach for Microfluidics*	**Bas-Jan Hoogenberg,** Bondus B.V., Zwolle, NL
11:40	*Revolution or Evolution? Current Trends in Miniaturizing the Life Sciences*	**Dr. Holger Becker,** microfluidic ChipShop GmbH, Jena, DE
12:00	*Ready to Scale: Converting Microfluidic Prototypes into Products*	**Jeroen Molenschot,** Helvoet Rubber & Plastic Technologies, Tilburg, NL
12:20	*Moulding Prototypes for Microfluidics*	**Han van Gemert,** Axxicon, Son, NL
12:40	*Microfluidic Handling, Using Disc Pump Magic*	**John Watson,** The LEE Company, Sulzbach a. Taunus, DE
13:00	*Closing*	

NEUROTECH MILESTONE: FIRST HUMAN IMPLANTATION OF A BRAIN-COMPUTER INTERFACE MADE IN GERMANY

Earlier this summer, the German medtech company CorTec GmbH achieved a major milestone with the first human implantation of its fully implantable brain-computer interface (BCI) Brain Interchange™. Developed entirely in Germany, the system is currently being evaluated in an FDA-approved clinical trial at Harborview Medical Center in Seattle, part of UW Medicine.

The procedure, performed under an Investigational Device Exemption (IDE), represents an important step in translating neuroscience research into clinical application. Led by Dr. Jeffrey G. Ojemann (University of Washington) and Prof. Steven C. Cramer (UCLA), and funded by the National Institutes of Health (NIH), the study investigates whether direct cortical stimulation can enhance upper-limb motor recovery after stroke. “The implantation was successful, and the patient recovered well,” said Dr. Ojemann. “Both the approach and the technology are entirely new, and the potential benefits for stroke patients are highly promising.” The Brain Interchange™ system continuously records brain activity, interprets neural signals in real time, and delivers precise electrical stimulation to promote neuroplasticity – the brain’s ability to reorganize and relearn functions. The aim is to accelerate rehabilitation and restore lost motor control. “This first implantation marks a milestone for European neurotechnology,” said Dr. Frank Desiere, CEO of CorTec.

“With Brain Interchange™, Germany has entered the global field of implantable BCIs, opening new perspectives for patients with neurological disorders.” Each year, around 1.7 million people in Europe and the U.S. suffer a stroke that often impairs arm and hand function. While physiotherapy helps many, some may benefit from BCI-assisted rehabilitation that boosts neuroplasticity and independence. “For the first time, our implant communicates wirelessly with external hardware – no cables, no physical connections,” added Dr. Martin Schuettler, CTO of CorTec. “This marks the beginning of a new era of personalized, real-time neurotherapy.”

https://cortec-neuro.com

MATERIAL SUPPLY OF NITINOL WIRE AND TUBING

KEURO Solutions announced the addition of Nitinol Wire & Tubing to its global product range. Responding to customer demand, the company now offers Nitinol alongside various stainless-steel types to provide more sizing options.

With a focus on quality, speed, and cost-efficiency, KEURO Solutions is becoming a leading contract manufacturer and component supplier in the Asia-Pacific region. Its global engineering teams in Europe, the U.S., and Asia ensure fast delivery of precise components for applications such as vascular stents, guidewires, spinal devices, catheters, and heart valve frames.

https://www.keurosolutions.com

DYNAMIC BROADBAND INFRARED EMITTERS

Infrared emitter array for thermal radiation between 2 and 15 µm up to 100 Hz.. Source: CiS

Infrared light carries a wealth of information - for example, the material-specific spectral absorption of infrared light can be used to determine the composition and concentration of substances and mixtures. In special cases, compact IR sensors can replace large laboratory measuring devices. This is made possible by miniaturized assemblies manufactured using silicon microsensor technology. The CiS Research Institute has been working on the development and manufacture of IR emitters for many years. In such chips, the actual active zone is stretched within a very thin membrane. Towards the end of the manufacturing process, the silicon substrate is completely removed in these areas, leaving only a narrow frame for handling and assembly. This structure offers the advantage that the active areas have a very low (thermal) mass and are well thermally insulated from the rest of the system. The assemblies produced in this way are not only very small, with edge lengths in the range of 1 to 3 mm, but also have fast response times. Modulation rates above 100 Hz have already been demonstrated at the CiS Research Institute using very small chips. However, due to the very small active areas, power output is limited, which has so far restricted practical applicability in many scenarios. The solution to this problem wa realized as part of a research project. Technologies were developed and demonstrated that enable an integrated chip with several small active zones. The electrical interconnection is solved directly at the chip level, so that the components can be installed and used in the same way as established light sources. With the first demonstrators of such chips, for example, 3x3 arrays of active zones were realized, which achieve a power output of over 1 W at modulation rates of up to 100 Hz.

https://www.cismst.de

BIOSENSORS FOR MEDICAL DEVICES

At COMPAMED, Jobst Technologies presents its range of biosensors and microfluidic solutions alongside the physical and chemical sensors of the Swiss sensor specialist Innovative Sensor Technology IST AG. The only continuous monitor for intensive care integrates a Jobst Technologies sensor capable of measuring glucose and lactate. A recently added pyruvate sensor expands the company's medical device portfolio.Exceptional sensor performance enables continuous whole-blood and subcutaneous glucose and lactate monitoring. The sensors' rapid response and outstanding long-term stability make them ideal for use in blood gas analyzers. With ultra-low sample volumes and flow rates, these sensors open up new monitoring concepts such as microdialysis probes and microneedles. They are also suited for membrane-perfusion systems like hemodialysis and ECMO, as well as in vitro models such as Organ-on-a-Chip systems. Microfluidic functionality for these applications is supported by Jobst Technologies' portfolio of reliable micro-pumps, enabling innovative life-science products – including lightweight, body-worn analyzers, integrated sampling devices, and other point-of-need instruments. Jobst Technologies is part of the Swiss sensor manufacturer Innovative Sensor Technology IST AG, a member of the Endress+Hauser Group.

http://www.jobst.technologies.com/lander

MINIATURIZED MEDTECH: TRANSFORMING EMERGENCY AND INTENSIVE CARE

Medicine is changing rapidly – especially in emergency and intensive care, where every second counts. Miniaturized MedTech solutions such as wearable and implantable sensors, mobile diagnostics, and intelligent systems are enabling faster decisions, continuous monitoring, and personalized treatment.

Today, hospitals face overcrowded ICUs, staff shortages, and growing demands for real-time data. Yet advances in miniaturization and AI are driving progress: wearable monitors track vital parameters, and smart algorithms support diagnosis and resource management.

The next step is already emerging – "invisible assistants" inside the body that transmit real-time data and trigger early interventions. From micro dialysis units to robotic support systems, such innovations are shaping a future of smarter, more efficient, and safer critical care.

The COMPAMED Innovation Forum 2026, organized by IVAM in cooperation with Messe Düsseldorf, will explore how miniaturized technologies are redefining emergency and intensive care. The online event takes place on May 21, 2026, from 3:00-5:30 p.m. (CEST).

Professionals from hospitals, rescue services, and MedTech companies are invited to join, contribute, and present their solutions for the medicine of tomorrow.

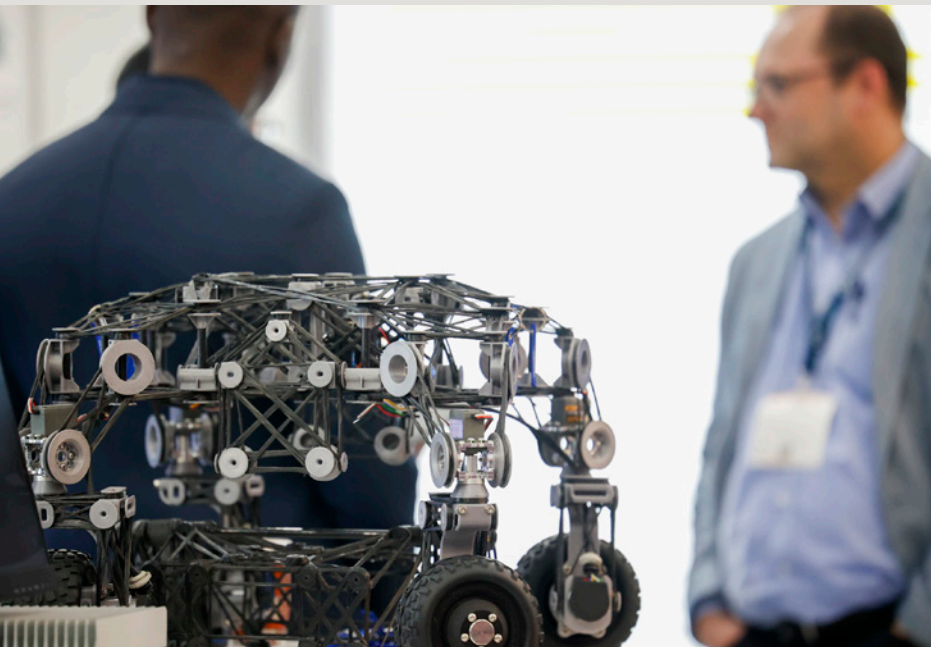
https://www.ivam.de/events/compamed-innovation-forum-2026

PREMIERE FOR HIGH-TECH SUPPLIERS AT XPONENTIAL EUROPE 2026

For the first time, the IVAM Microtechnology Network will host its own joint booth at XPONENTIAL Europe 2026 in Düsseldorf. This offers companies from the high-tech supplier sector the opportunity to present themselves in the context of emerging future markets such as unmanned systems, robotics, sensor technology, communication technologies, and AI-based applications.As the European edition of the leading U.S. trade show for autonomous systems, XPONENTIAL Europe addresses rapidly growing cross-sector markets that are highly relevant to key technology industries. The IVAM joint booth is designed to bring together suppliers of innovative components, materials, manufacturing processes, and system solutions.

Exhibitors benefit from a comprehensive full-service package: IVAM takes care of all trade show logistics and on-site support, provides a fully equipped booth space including setup and dismantling, and ensures maximum visibility through extensive marketing and PR activities. A pitch opportunity at the show's Innovation Theater offers additional stage presence. In addition, participants gain access to networking events and receive complimentary trade visitor tickets for targeted outreach to potential customers and partners. Technology companies looking to position themselves in these dynamic markets can now apply to join the IVAM joint booth.

https://www.ivam.de/events/xponential-europe-2026



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.

membership@ivam.de

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published by:
IVAM e.V.
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EVENTS

17-20 Nov 25

COMPAMED 2025

Product Market "High-tech for Medical Devices": A hub for high-tech solutions and medical innovations, Düsseldorf, DE

17-20 Nov 25

COMPAMED HIGH-TECH FORUM 2025 BY IVAM

Trade Fair Forum in Hall 8a, G40, Düsseldorf, DE

18 Nov 25

IVAM EXECUTIVE CLUB MEETING

Adapt or perish? Resilience as a strategy for the 21st century, Düsseldorf, DE

19 Nov 25

EUROPE MEETS NORTH AMERICA AT COMPAMED

Connecting High-tech for Medical Devices in hall 8a, booth G40, Düsseldorf, DE

26 Nov 25

MID-WEEK COFFEE BREAK - RECOM RECYCLING GMBH@

Virtual technology talk between IVAM Members

11 Dec 25

GET TO KNOW IVAM@

Information event about the network and the benefits of membership

17 Dec 25

MID-WEEK COFFEE BREAK - KUPTEC GMBH@

Virtual technology talk between IVAM Members

03-05 Feb 26

MD&M WEST 2026

Medical Design & Manufacturing - IVAM presents Micro Nanotech Area in Hall C, Anaheim, CA, US

04-06 Feb 26

ASIA PHOTONICS EXPO 2026

Special exhibition area Photonics+ Europe powered by IVAM, EPIC and W3+, Singapore, SG

24-26 March 26

XPONENTIAL EUROPE 2026

Leading European trade fair for autonomous technologies & robotics. New IVAM joint stand. Düsseldorf, DE

6 May 26

IVAM EXECUTIVE CLUB MEETING

Executive Club Breakfast & a guided trade fair tour during MedtecLIVE 2026. Stuttgart, DE

21 May 26

COMPAMED INNOVATION FORUM 2026@

Webinar on "Miniaturized MedTech for Maximum Impact: Innovations for Emergency and Intensive Care"

22-23 june 26

IVAM HIGHTECH SUMMIT 2026

Annual Microtechnology Conference "Inside Life - Engineering our Future", Leiden NL

17-20 Nov 25

MEDICAL MANUFACTURING ASIA 2026

Manufacturing Processes for Medical Technology: IVAM joint booth and IVAM Marketing Award Asia Singapore SG


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