

COMPAMED 2010 Trend Report

Just in time for COMPAMED 2010, suppliers move back into the fast lane

From nano-raw dental implants to intelligent telemedicine – high innovation speed in medical technology

After the economic crisis of 2008 and 2009, the microtechnology, nanotechnology and new materials sectors are now enjoying an upswing. According to the professional association of microtechnology IVAM, business in the first half of 2010 was better than expected for half the German companies in these sectors. In some cases, companies posted sales increases of up to 15 percent. Just in time for the world's leading trade fair for the suppliers of medical engineering, COMPAMED 2010 in Düsseldorf (17 to 19 November), the microtechnology and nanotechnology sectors are moving back into the fast lane. The companies are showcasing numerous trend-setting developments particularly for use in medical technology.

"Similar to the world's biggest medical trade show MEDICA, at COMPAMED we are expecting more than 500 exhibitors from approximately 25 countries," says Joachim Schäfer, manager of the Düsseldorf trade fair, about the good registration figures, which confirm the optimism of suppliers.

Numerous innovations are an indication that the exhibitors at COMPAMED 2010 – High tech solutions for medical technology (in Halls 8a and 8b) will be showcasing some outstanding products.

This is certainly the case for the medical sensor technology sector. For instance, the research institute for micro sensor technology and photovoltaics CiS in Erfurt and its partners Audia Akustik (Sömmerda) and the Helmholtz Institute for Biomedical Technology at the RWTH Aachen are presenting an in-ear sensor system for the measurement of vital

parameters, which is a novel solution for the diagnosis of cardiovascular diseases. In contrast to conventional, localized measurement of relevant vital signs (pulse, heart rate, oxygen saturation, respiratory rate on exertion), the miniaturized system in the form of an in-the-ear hearing aid allows continuous measurement of the vital signs without the inconvenience of conventional, portable devices and the restriction of movement caused by them. The heart of the system is an optical sensor chip that, via two wave lengths, measures the volume of blood and the oxygen saturation in the outer ear canal, which is especially suitable due to the high density of blood vessels. In addition, the heart and pulse rates are extracted from the low-frequency signal fluctuations by means of signal processing. The system won the 2010 Innovation Award endowed by the AMA Association for Sensor Technology. "The solution shows that only the combination of sensor technology and measuring technology provides convincing results," states Dr. Thomas Simmons, managing director of the AMA. In addition to monitoring vital sign, CiS develops and manufactures sensors for measuring blood sugar levels, local skin impedances and catheter-tip forces.

The CiS research institute will exhibit its sensor competence at IVAM's joint pavilion (Hall 8a) which, with 38 institutes and companies, is already booked solid. With a High-tech for Medical Devices product market, the microtechnology network covers a wide range of micro- and nanotechnology, from plastic and ceramic components to surface and material analysis all the way to medical implants. With this, science and technology are advancing to ever smaller dimensions – at Alicona Imaging GmbH, for instance, to a mere ten nanometres. Located in Austria's Grumbach, near Graz, the company has developed the InfiniteFocus, a high-resolution 3-D surface measuring system for laboratories and for production. In the area of medical technology, the measuring device is used for quality control of dental implants, amongst other things. It is primarily the surface and comprehensive roughness measurement that are decisive. It has a significant influence on how fast and how durably the implant unites with the jaw bone. What is important is that the roughness can also be measured at the root of the thread. Even with steep flanks, the

InfiniteFocus achieves high-resolution results. This allows precise repeatable and traceable roughness measurements, even at the thread root of components. Users achieve results in a vertical resolution of up to ten nanometres. “We are getting more and more inquiries, especially from the medical industry,” enthuses Dr. Stefan Scherer, CEO of Alicona, adding: “Not only implant manufacturers from the dental industry and manufacturers of artificial knee and hip joints are turning to us, but also suppliers of surgical instruments such as bone drills and burrs are increasingly using our system for quality assurance.”

The world’s smallest precision gears

Micromotion GmbH is also focusing on nanometres, but in positioning. Located in Mainz, the company manufactures micromechanical components as well as the world's smallest zero-backlash precision gears and drives for linear and rotary positioning. The compact design and the high power density of these products are an ideal basis for challenging applications in medical technology. The micromechanical components manufactured with LIGA technology are used as miniaturized positioning mechanisms in applications such as endoscopes. Integrated to form completely encapsulated micro gears, they are used under extreme environmental conditions (UHV or sterilisable applications). Being high-precision multi-axis positioning systems in minimal space, they achieve positioning tasks in microscopy with resolutions in the lower nanometre range.

Electronic Manufacturing Services (EMS), which comprise the entire contract manufacture of electronic components, devices and systems, remain an ongoing topic at COMPAMED. Such services run the gamut from development to PCB component insertion all the way to quality control and worldwide delivery. A specialist in this area is ECR AG (Rotkreuz, Switzerland), which manufactures high quality electronic assemblies and also carries out the final installation and testing of technically complex devices. Because of their high quality and reliability, about 60 percent of the assemblies and devices are used in medical technology around the world. ECR AG also carries out custom manufacturing, from individual pieces to

medium-sized series production and supports its customers in product development, design and layout all the way to the end-of-life phase. Its strengths lie in surface-mount technology (SMT) and through-hole technology (THT) on flexible, rigid-flexible and rigid PCBs. During the entire product life-cycle, the company's life-cycle management (LCM) ensures the optimization and availability of assemblies. Extensive quality assurance in all manufacturing phases as well as comprehensive tests with various testing systems ensure flawless and immediately useable assemblies and devices.

Films, pouches, tubes, packaging – the application range of extruded and blow-moulded products in medical technology is steadily increasing. The reasons for this development lie in the improved barrier properties, biocompatible materials and optimized manufacturing processes. That is the reason why TPE (thermoplastic elastomers), silicon rubbers and polyolefins, for instance, are taking over in new applications. The artificial materials are suitable for both the micro-extrusion and multi-layer extrusion processes such as those used for catheters. Multi-lumen catheters such as those made by Raumedic AG (Helmbrechts) are available for a variety of medical purposes. These catheters with several parallel hollow spaces (channels) fulfil important services in feeding, drainage, dilation, embolectomies (removal of blood clots), urology, diagnostics and dialysis. The special shape of the catheter allows the physician to introduce fluids such as contrast agents or flushing fluids into the body and to insert special instruments through a different channel. In this area, too, COMPAMED is presenting the latest developments such as multi-layer film extrusion and innovative glide coatings for catheters.

Great advances in minimally invasive medicine

In only 15 years, minimally invasive medicine has led to revolutionary changes in health care. The great advances, above all in "keyhole" surgery, allow an increasing proportion of surgical and therapeutic measures to be performed in this way. The benefits are impressive: Shorter operation times and recovery time in bed, faster healing processes, quicker resumption of housework as well as professional and sports activities, and better

cosmetic results are some of the benefits. The high degree of patient acceptance of this method because of the low stress levels and proven savings promise a further expansion of the indication spectrum and a high growth potential for the necessary technologies and devices in the coming years. That aspect, too, makes minimally invasive medicine a long-running hit at COMPAMED. Trokamed GmbH (Geisingen), for instance, rose from contract manufacturer to specialist and system supplier in the manufacture of medical instruments for endoscopy. Meanwhile the development and manufacture of devices and accessories completely covers the entire area of endoscopic surgery. "The result is medical instruments distinguished by easy disassembly, minimal sensitivity to wear and maximum user friendliness," explains Karlheinz Tröndle, executive director of Trokamed.

Potential for intelligent assistance systems

Intelligent assistance systems offer the potential for millions in savings in health care and nursing. Consequently, based on a prognosis of BCC Research, the global market for telemedicine systems alone will grow to approx. eleven billion euros annually by 2012. Such solutions can, for instance, help patients with cardiovascular diseases and diabetes, which costs the German national economy 60 billion euros every year – and is on the increase. The cost of in-patient and semi-in-patient care represents a large portion of those billions. They can be significantly reduced through the use of telemonitoring systems. For instance, initial studies and calculation models show that the cost of care for the more than 1.8 million patients with chronic cardiac insufficiency can be reduced by 30 percent annually. Telemonitoring systems consist of medical sensors and a number of further components for measuring and transmitting vital parameters. So this gives suppliers the opportunity to specialize. Based on its economic significance, telemedicine and its technical realization will certainly also continue gaining in importance within the framework of COMPAMED.

Precisely because the sector is so innovative, the speed with which new solutions and products are developed remains high, and equally so for materials and components, systems and devices.

COMPAMED 2010 takes place from 17 to 19 November in Düsseldorf, the same time as MEDICA (17 to 20 November 2010), the world's biggest medical trade fair. Of the almost 138,000 professional visitors to the whole event, 16,000 visitors were particularly interested in the range of subject matter offered at COMPAMED last year.

For more information on COMPAMED 2010, exhibitors, innovations or on the ancillary program, visit: <http://www.compamed.de>

Online information on MEDICA 2010: <http://www.medica.de>

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Düsseldorf, 23 September 2010