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Picosun Group

The annual listing of 10 companies that are at the forefront of providing Medical Device Manufacturing solutions and impacting the industry

Picosun Group

A Pioneer in Atomic Layer Deposition (ALD) Thin-film Coating Technology for Medical Industries

All implantable medical devices are extremely vulnerable to the 'hostile environment' inside a human body. Due to the corrosive nature of body fluids, a medical implant must be isolated from them, and vice versa—the body needs to be protected from possible rejection reaction or metal ion leakage caused by the implant. Consequently, medical implants designed to improve lives can prove to be even harmful to patients in some cases –resulting in injuries, deaths, and multiple follow-up surgeries.

Rising to this challenging situation, Picosun Group is a company committed to empowering the healthcare industries with its innovative, disruptive AGILE ALD® (Atomic Layer Deposition) thin-film coating technology. Picosun's ALD coatings enable safer and longer-lasting products, more compact sensing and analysis devices for e.g. remote and digital healthcare applications, and they can be used in novel medical applications such as smart ablation catheters and deep brain stimulation probes. This may help manufacturers to replace components made of expensive noble metals with cheaper alternatives when the inertness of the component inside the human body is achieved with ALD encapsulation. ALD's innate ability to form ultra-thin, highly conformal, and pinhole-free coatings with gentle gas-phase processing at low temperatures makes it ideal for coating medical devices made of sensitive plastics to metals and delicate electronic components. Nanometer-scale thin ALD films are practically massless and they do not increase the dimensions of the implanted device which is an obvious benefit considering the comfort-of-use of the device. Very importantly, several ALD materials are intrinsically biocompatible and/or bioactive and proven to be non-cytotoxic and thus safe to human tissues.

> "Built for high throughput and continuously developed to be more and more efficient, ALD encapsulation increases the implant lifetime and safety, potentially reducing the number of replacement surgeries or 'maintenance' operations of the implanted device

Jussi Rautee

"Built for high throughput and continuously developed to be increasingly efficient, ALD encapsulation increases the implant lifetime and safety, potentially reducing the number of replacement surgeries or 'maintenance' operations of the implanted device," adds Juhana Kostamo, Deputy CEO of the Picosun Group. What sets Picosun apart from its peers is the company's competitive edge right from the beginning. Dr. Tuomo Suntola invented and patented the ALD method for industrial purposes in 1974. Today, Dr. Suntola, a member of Picosun Board of Directors, and Picosun's former CTO, Sven Lindfors (d. 2017), are widely recognized throughout the ALD community. Due to their experience and involvement in high-quality ALD system design since 1975, the company has become a launch-pad for many initiatives in the medical device manufacturing sector with a benchmark reputation in the international market.

Poised to solve the challenges medical/healthcare industry is facing, Picosun leverages its ALD technology to provide the manufacturers disruptive coating solutions to enable a whole new generation of products and to drastically improve the existing ones.

The PICOSUN® ALD product portfolio ranges from fully automated batch and cluster systems compliant with the SEMI standards and optimized for high volume manufacturing to smaller-scale R&D and pre-pilot production tools. The Finnish, globally operating company offers production-proven coating solutions for a wide variety of industries, from wafer-based IC component, MEMS, LED, and sensors manufacturing to processing of 3D components such as medical implants and devices, machinery parts, watch parts, coins and jewelry.

Juhana Kostamo

Dr. Jani Kivioja

Picosun's turn-key production solutions are coupled with world-class process quality, the leading equipment design, and comprehensive after-sales support and customer care. PICOSUN® ALD equipment are high-quality products designed and manufactured in Finland and fully controllable with state-of-the-art automation systems.

Highly committed to operational excellence, Picosun's personnel and staff possess an unparalleled amount of ALD experience, and the company has contributed to a significant number of patents in ALD. The long history and comprehensive expertise make Picosun an optimal partner in the medical device manufacturing space.

On a concluding note, PicoMEDICAL™, Picosun's latest market-specific,turn-key production solution has been successfully addressing the growing needs of medical device manufacturers. Picosun's PicoMEDICAL™ solutions, consisting of initial applications consultancy, optimized, production-proven processes, the coating equipment itself, and versatile after-sales support packages to keep the customer's production running without any hassle, can be customized uniquely to suit the needs of healthcare industries that are still new to ALD.

Picosun's customer base consists of some of the world's largest electronics manufacturers, small-scale yet innovative challengers, and leading universities worldwide. In the medical field, Picosun has worked for example with Russian-based implant manufacturer Conmet LLC and Swedish Nanexa AB, who uses ALD for drug particle surface functionalization for targeted and controlled drug delivery. Thus, Picosun's organization and the wide variety of ALD solutions holds the potential to improve the quality of life for patients, now and in the future.