

## Press Release

FOR IMMEDIATE RELEASE

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### **Market for nanotechnology production equipment is still at the beginning of its promising lifecycle.**

**Intelligence research undertaken by the enablingMNT team has shown that the major differentiating factor amongst suppliers, targeting the nanotechnology market, will be the ownership of equipment and processes able to combine atomic accuracy with volume demands.**

Berlin, Germany – May 2004 – With nanotechnology promising to be more disruptive in both nature and potential than microtechnology, enablingMNT has undertaken an investigation into the status of the market of equipment suppliers servicing the nanotechnology industry in terms of production and fabrication. Promises of this technology even surpass that of more conventional MEMS applications. In essence, nanotechnology already extends its influence into a large number of industrial segments, including that of semiconductors and consumer products, and also soon for data storage and sensor applications.

In general, the group of production equipment used for nanotechnology can be classified into four subgroups: top down, bottom up, nanoparticle processing and nanotube production. The top down and bottom up approaches are mainly equipment oriented, whilst, Molecular Self Assembly, nanoparticle and nanotube production are process oriented. In this context, the top-down and bottom-up nanotechnology equipment was found to have benefited from the available equipment infrastructure which is extensively used for semiconductor lithography and deposition as well as the ample availability of Scanning Probe Microscopes. The development of processes for the production of nanoparticles is, to date, mainly carried-out in-house as there is limited equipment availability on the market, although this field benefits from the experience derived from the chemical/physical process equipment market.

The investigation has also found that with six main contenders offering capabilities in nanoimprinting, this section of the market is well covered. Additionally, it is concluded in the enablingMNT review that the most promising application for dip-pen technology will be for the deposition of bioactive materials, which cannot be deposited or structured using the harsh techniques of thin film processing. In contrast, bottom up nanotechnology is the least developed area of nanotechnology. To benefit commercially from the ability to manipulate atoms and molecules at the atomic scale, a basic understanding of the processes at such a scale is needed. Bottom up technology is also struggling with the needed combination of nanoscale precision and volume demand. This difficulty is clearly seen with Scanning Probe Microscopy, when used as nano-manipulation tools.

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## enablingMNT Industry Reviews

the leading source for intelligence in micro nano technologies (MNT)

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Regarding nano-particles or fullerenes, the current core enabler was found by the reviewers to be the process. Thus, process knowledge and not equipment is, currently, the most important differentiator among suppliers. In this context, the major differentiator between the suppliers will be the ownership of equipment and processes, which are used to produce large quantities of nanotubes at low cost and with high purity.

The *enablingMNT Industry Review series* were received with interest when they were first released in 2003. Those reviews addressing the supply chain for Micro and Nanotechnology were immediately considered by industry participants as the new standard in high-quality value-for-money reports for the MNT supplier and user community. The reviews assess the state-of-the art processes and equipment offered by over 400 industrial players in this field and include discussions on main trends, opportunities and threats affecting both suppliers and users of the technology.

The reviews available, to date, are (priced at €280 each):

- Design and Engineering Companies for MST/MEMS
- Foundries for MST/MEMS
- Packaging and Assembly Suppliers for MST/MEMS
- Front-End Manufacturing Equipment Suppliers for MST/MEMS
- Back-End Manufacturing Equipment Suppliers for MST/MEMS
- Equipment Suppliers for Nanofabrication

### **About *enablingMNT***

enablingMNT is the brand adopted by an international team of experts with many years of experience in the business of micro nano technologies (MNT), namely; Henne van Heeren, Patric Salomon, Dr. Lia Paschalidou, and Dr. Ayman El-Fatary. With their track record in technology development, engineering, systems integration, manufacturing, project management, business development, market analysis, and strategy consulting, the enablingMNT team is well versed in all commercialization issues relating to the supply chain of MNT: from concept through to product. With this expertise, the team addresses specific customer requirements, particularly, in relation to market intelligence, technical insight, strategic development plans and investment decisions. Based in the UK, Germany and the Netherlands with excellent contacts in the Far East and the USA, the team is able to analyse the worldwide activities in the MNT industry. This collaborative research of the *enablingMNT team* has, to date, culminated in a series of in-depth intelligence reviews on the supply chain of micro and nano technologies (MNT): *enablingMNT Industry Reviews*.

### **About *enablingMNT Industry Reviews***

Driven by user/supplier demands for technology-pull, the reviews in this *enablingMNT series* are focused on all aspects of the micro and nano technology (MNT) product lifecycle; from concept through to production. They describe how a selected topic is linked into the supply chain from product idea, technology development, engineering, prototyping, manufacturing, packaging and test, into volume production. The *enablingMNT reviews* analyse the critical issues encountered during the creation process of MNT-based products and provide guidance with regards to the approaches taken to overcome barriers and challenges. All reviews include a comprehensive listing of services offered in the field (including current contact information). The emphasis is on the provision and availability of fully commercial services, infrastructure, and suppliers considered to be essential for the commercial realisation of MNT-based products. It is expected that *enablingMNT industry reviews* will motivate new applications for MNT, enhance confidence in the technology as well as help identify funding sources for research and development. They highlight trends from the facts and the prospects. Supported by significant players in the field, the reviews are produced and edited by the *enablingMNT team*. *enablingMNT industry reviews* are offered at a competitive price of €280 per specialist report.

To order a copy and/or for more information, please contact the publisher Patric Salomon at:

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