Nanotech tools a $700M market

July 20 2005

Part 1 of 2.
The instruments and tools needed to work on the nanoscale could, even when excluding the semiconductor industry, will form a $700 million market by 2008, experts told UPI's Nano World.

"Analysts have compared instruments for nanotechnology to shovels for the gold rush," said Nathan Tinker, co-founder and executive vice president of the NanoBusiness Alliance in New York City.The atomic-force microscope "is the granddaddy of nanotechnology tools."

Invented in 1986 by IBM physicists Gerd Binnig and Christoph Gerber, with Stanford University electrical engineer Calvin Quate, the atomic-force microscope, or AFM, runs sharp probes up and down surfaces to scan with three-dimensional atomic-level detail, much as a blind person uses his or her fingers to read bumps on a page of Braille.Scientists also can use AFM probes as fingers to control features on the nanoscale.

AFMs and similar devices, such as near-field optical-scanning microscopes and electrostatic-force microscopes, are now being developed "from purely research tools to work in large-scale production processes," Tinker said."That's very exciting to me.With a research tool, you can make really cool items once or twice, but not at scales you need for industrial needs."

A growing market within nanotechnology tools lies in accessories to existing AFMs and other workhorse machines."These are probes or tips that you stick on the end of a microscope that can do whatever you want

them to," said Tinker, who drafted a report on nanotech tools for analyst firm Business Communications Company in Norwalk, Conn."There are a lot of smart entrepreneurs and scientists who are developing more and more advanced accessories to add onto standardized scopes as you get more and more specialized applications."For instance, he continued, "you see classic AFMs and other scanning microscopes being adapted and utilized for biological processes, for constructing drug molecules and even testing diagnostics and so forth, that are able to get down and very, very quickly and accurately assess a molecule or small portion of molecules within a blood sample to diagnose any number of diseases."

Instruments traditionally used only on the nanoscale level for semiconductor processes also will find use outside the semiconductor industry, said Lawrence Gasman, principal analyst for NanoMarkets, an industry research firm in Sterling, Va.

"As an example of these types of crossovers, when you talk about a company like NanoInk (in Chicago), which developed dip-pen lithography, people initially thought of it for a semiconductor industry mode of production," Gasman said, "but one of the things they've actually had the most success with is creating encrypted IDs on drugs."

The largest market for nanotech tools outside the semiconductor industry so far is still research and development."There are still not a lot of industrial end users out there using nanotools specifically to create and produce nanoproducts," Tinker said.

"There needs to be a concerted development effort among nanotechnology companies to talk with toolmakers to develop these tools to the point where they have legs in industrial markets," he added."We have to figure out what we need to do, a roadmap to get to those points, and various stoplights and ways around them, and we don't see that at all.There needs to be an organization that brings those disparate

constituencies together and get them talking about the industrial side of the process."