

Next Month's Focus

## SMT and Assembly

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## SMTAI Product Preview



Nihon Superior's lead-free solder paste gets a special boost with the company celebrating its 50th anniversary at SMTAI.

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## EMS Supplier to Automotive Plants

Michigan-based LumaSmart Technology started out as an automotive contract manufacturer, but today specializes in an impressive line of LED light engines and light fixtures, in addition to PCBAs.

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## This Month's Focus: PCB and Test

The result of gradually improving technology that has finally come of age, inkjet-applied printed circuits can save huge costs, time and eliminate production problems in the manufacture of multilayer bare boards.

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# Hi-Tech Electronics Boosts Its Game with New ASM SMT Line

By Mark Richards

A firm that started over 38 years ago in an apartment-sized facility has grown into a well-established, electronic manufacturing services (EMS) company serving military, aerospace, medical, consumer, and industrial markets from a 20-

acre, 33,000-square-ft. manufacturing operation in Oglesby, IL. Hi-Tech Electronic Products and Manufacturing, Inc., also known simply as Hi-Tech Electronics, has grown steadily over that span, offering turnkey electronic services — from electronic design and prototyping through to full

production. As the firm's president, Michael Johnson, describes it: "We go from napkin to finished board."

With business growing and electronic assemblies becoming more complex, Hi-Tech recently found itself in need of another SMT production line capable of handling a wide range of components, from 0201s through 740-pin BGA parts to large connectors. Production versatility was also important, since jobs varied widely: from a PCB with 20 components to circuit assemblies with component counts in the thousands. As a departure from previous practices, however, Hi-Tech opted not to install duplicates of the equipment in its first SMT production line but, rather, to partner with ASM Assembly Systems GmbH and integrate a DEK Horizon 01iX printer ([www.dek.com](http://www.dek.com)) and a SIPLACE SX placement machine ([www.SIPLACE.com](http://www.SIPLACE.com)).

According to Johnson, who oversees much of the production at Hi-Tech, "We needed a line that could offer us speed, flexibility, fast changeover capability, accuracy, reliability — everything, really." He

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Hi-Tech President, Michael Johnson, shows CFO Michael Herrmann (left) the simplicity of foil changeover with ASM's DEK VectorGuard system.

## Technica USA Hosts Tech Forum for Customers

San Jose, CA — Once a year, Technica USA hosts an Annual Technology Forum Event. This year's event was held in San Jose, California on July 22 - 23 and was co-sponsored by ASM Assembly Systems, with active participation from Koh Young and Rehm Thermal Systems. The technical presentations were made in the meeting facilities of the Club Auto Sport Event Center.

The Event was held for two consecutive days — both days with identical programs. This was done to accommodate the large expected turnout, and also to allow customers the flexibility they needed to permit staff members to attend. The morning session began with a presentation by Jeff Schake, Senior Advanced Technology Specialist at ASM-DEK. Jeff's presentation was titled "Blueprint to High Yield Stencil Printing". In it, Jeff called on his years of experience in managing printing-focused process investigations at DEK, which enabled him to center his presentation on "Best Practices" of printing process design and execution. He presented examples of print process defects and corresponding cause and effect relationships that were revisited

## IPC Releases T-50 Revision M, Terms and Definitions

Bannockburn, IL — IPC — Association Connecting Electronics Industries® has released IPC-T-50 Revision M, "Terms and Definitions for Interconnecting and Packaging Electronic Circuits". This ever-evolving standard provides common language of terms and definitions for the electronics industry.

IPC-T-50M contains more than 150 new and revised terms, while also eliminating out-of-date terminology, thus providing a streamlined standard that focuses on the trending language of the electronics industry. Specifically, this revision includes terms often cited in other standards, such as: conformal coating, statistical process control, and stencil design.

"Our goal is to update the IPC-T-50 standard as often as possible

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# MANAGEMENT

## Dialing In Wet Processing Parameters

By Ed Sullivan

Since the design of many wet processing systems is proprietary, specifications are protected by the equipment manufacturer and user alike. Therefore, considering all of the possible design variables, it may be advisable for users in the market for an automated wet processing system to visit an equipment manufacturer with design capabilities and an applications laboratory.

One of the prominent designers and builders of wet processing equipment, JST Manufacturing (Boise ID), has an on-site applications laboratory where end users can develop their process with various chemistries and do tests on real equipment ranging from immersion and spray tools to dryers. The laboratory includes sophisticated metrology equipment including a scanning electron microscope and a Tencor particle counter.

By visiting applications labs such as JST's, end users can "dial-in" on the optimization of their processes, and can minimize the amount of chemicals required and/or determine the tool features they need for their applications. This can save the customer money by eliminating features

they do not need.

Typical examples of automated systems include process modules for solvents, acid, bases, deionized water rinse and drying. Mechanical, Ultrasonic or Megasonic agitation and other processes may also be incorporated, if desired. Another consideration is safety and there are many mandated requirements for items such as ventilation, fire suppression, chemical handling and explosion prevention.

### Etching Silicone Rods

Application-wise, system designs may vary widely. In operation, there is quite a difference in the etching of silicone rods and the crystals used in nuclear sensors. One of the major differences may be the chemistry involved, its concentration and temperature. Chemical compatibility with the materials of construction are a must. Most solvents require stainless steel tanks and in other cases plastic tanks and baths may suffice.

### Dialing-in Parameters

To facilitate the economical design and building of a wet processing

equipment solution, many users insist on a standardized approach with customizable features that will best handle their applications parameters. For example, JST utilizes standard products and standard methodologies to design and manufacture equipment. Using SOLIDWORKS 3D-modeling software, the company can make minor changes and customizations to meet the needs of each application. Also, the equipment is modular by design, allowing for easy changing and reconfiguration should process or product requirements change. Another powerful feature: each unit is designed with software that is capable of performing all tool functions, including those that are not required. With this, end users can create their own process, or recipes, with all sub-routines at their disposal.

"We like to give customers added flexibility by programming their equipment to do everything that the equipment is capable of doing," explains Louise Bertagnolli, JST president. "This enables them to dial in applications, such as chemical concentrations. They can also turn various features on or off, depending on your process requirements. Even though they may not need some of the features today, they may want to turn them on in the future, which can be both economical and powerful."

### Optimizing Manual Applications

Specifying the design parameters for many manual benches may not be as involved as those of automated systems. However, soliciting the opinion of equipment manufacturers regarding equipment design may be highly beneficial.

"Sometimes we will visit a user's facility and help define the production parameters and specifications of their manual wet processing equipment," says Louise Bertagnolli. "Even though they had a good idea how they wanted to handle the wet processing end of it, after we had a chance to review the project, we recommended that they consider doing it in a somewhat modified manner. Sometimes we'll suggest a design variation that will perform the cleaning or etching work in the manner required, but will also save money or reduce the floor space requirement, or simplify maintenance, or provide other benefits."

Dennis M. Schweiger, Senior Director of Infrastructure at the University of Michigan's Lurie Nanofabrication Facility (LNF), feels that the right combination of user requirements and assistance from the equipment fabricator can make a significant difference in the design, layout, and operation of a wet processing station. The LNF is a world-class fa-

cility in all areas of semiconductor device and circuit fabrication, integrated microsystems and MEMS technologies, nanotechnology, nanoelectronics, nanophotonics and nanobiotechnology. The LNF is an open use facility with hundreds of users from various UM departments, as well as many other universities and businesses.

Schweiger states, "Since we essentially rent lab space and equipment to our diverse users, it is important that we provide them with benches that suit their purposes well, from those who are processing wafers to those who may be doing very advanced research or testing on non-wafer components."

Schweiger explains that the original equipment design for the new lab areas' wet processing benches was



JST has an on-site applications laboratory where end users can develop their process with various chemistries and do tests on real equipment ranging from immersion and spray tools to dryers.

very specific, and determined by the LNF staff. "We had looked at it in terms of process flow, from start to finish, not really taking into account the variety, and variation, of process samples that our user community might be working with, how we'd accommodate non-standard sample sizes, or what the impact might be in total cost of ownership with respect to chemical usage," he says.

Schweiger adds that the some of the new benches had their decks reconfigured once the tools were installed. Several of the earlier benches, some of which were purchased over 20 years ago, were also modified to allow for more flexibility in meeting the process needs of the user community.

"In retrospect, our initial plan for the deck space and processing capability of the benches wasn't adaptable/flexible enough, and we worked with JST to implement modifications so that the bench decks were simpler, and could provide more working space," Schweiger concluded.

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