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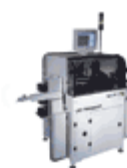
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From the Tradeshow Floor

By Meredith Courtemanche, assistant editor

IMAPS Device Packaging in Scottsdale, AZ, brought me from a below-freezing New England blizzard to the hot, sunny Arizona desert alongside dedicated members of the advanced packaging industry. Lead-free, flip chips, MEMS, and every variety of stacked package seemed to be the main topics around the tradeshow floor.

Suzanne Redding and Eugene Douglass of Rohm & Haas's advanced packaging division explained how the company is actively growing technical and market development resources for its metallization, imaging, and dielectric material lines. Many customers are looking for materials to successfully implement fine-pitch designs to allow die stacking, Douglass said. Because the electronics market can require a broad range of disparate materials, Rohm & Haas develops partnerships with other suppliers, and devises solutions to meet specific customer needs based on corporate roadmaps.

The sentiment of useful learning was echoed around the show. Kathy O'Donnell, director of business development at NEXX Systems, joined in the technical programs, as did Wilfred Bair of Ziptronix. Bair explained that, while his company is not focused on packaging, it is valuable for them to understand the nature of packaging technology, and where the industry is headed. The Global Business Council (GBC) spring conference, held in conjunction with the IMAPS show, brought attendees with interest in the market and trends for the future.

Robert Avila, western regional manager at Finetech (Tempe, AZ), said he enjoys the local nature of the show, and that the customers he sees at the exhibition travel from California, Washington, Seattle, and other locations to be at the IMAPS event. "The professionalism, and focus, of the IMAPS show is really a draw," he explained. And so, of course, is the golf. Avila demonstrated the key functionalities of Finetech's die bonders: stationary optics which allow for higher accuracy in die-to-substrate alignment, and multiple-process capability suited to laboratory environments. The Lambda model at the Finetech booth was configured for manual bonding, while the recently released FEMTO eliminates operator interference by automating the alignment process, Avila said. This bonder assembles flip chips, optics, MEMS, MOEMS, sensors, and other advanced packages, and offers a placement accuracy of $\pm 0.5\text{-}\mu\text{m}$ at 3 Sigma. The small footprint targets clean-room applications, but the machine suits both production and product development.

EV Group presented a paper at the conference, as well as exhibiting. David Owens, regional sales manager based in Tempe, AZ, defined the show as a place to gather leads but also improve communication on a personal and technological level. The company is promoting its alignment and bonding machines for MEMS devices this year. Owens said that EV Group finds that it is important to attend IMAPS and has participated from the beginning.

Marjorie Gordon, president, L. Gordon Packaging (Timonium, MD), displayed a variety of



materials to protect packages during shipment, and any handling at a facility. Her products are designed to keep leads from being bent or broken, whether they be straight, gull-wing, or J-lead. Many of the materials used by L. Gordon Packaging are biodegradable, adding a "green" element to ESD control and package protection. Customers typically come from the military and aerospace, medical devices, and telecommunications industries, she said.

Amaneh Tasooji, Ph.D., Arizona State University, spoke with *Advanced Packaging* about the school's advanced packaging educational programs. The university offers a flexible array (pardon the pun) of degree and non-degree options. Sometimes, a company will request a tailored program beginning with an overview of microelectronics, then delving deeper into thermal materials, design, etc. This gives employees an ASU certification, and a better understanding of the process of packaging. Beyond this, the packaging program offers masters and Ph.D. programs, and "cross pollinates" knowledge with the other engineering sciences programs. While a student may be interested in solid-state transistor applications, they can take a "leveling" and/or "advanced" course to broaden their understanding of how packaging will affect chip performance. ASU's Center of Excellence involves government, academia, and industry in a program of packaging research steered by needs expressed within industry. "Packaging has become a major differentiator," Tasooji explained. ASU collaborated a great deal with Intel and other companies to bring the Center into being. Communications is key; "we need the industry to keep our research on track, and the industry needs us as an R&D partner, especially since many companies have dropped proprietary R&D labs," said Tasooji. Much of the Center's emerging research focuses on nanoscale materials and processes — including the metrology and equipment necessary for understanding the nanomaterials' behavior.

Nicholas Leonardi, VP of marketing for technology and business consulting firm CMC Interconnect Technologies, noted that Arizona has developed into a "Silicon Valley satellite." Having mature, productive programs at nearby ASU also pushes high-tech growth locally. The Tempe-based consulting business is a way for customers, local and international, to access technical consulting services, failure analysis, and business services suiting an application or market in the packaging industry. A CMC customer stopped by, Michael Zimmerman, Ph.D., founder and CTO of Quantum Leap Packaging in Wilmington, MA. A long-time customer, Quantum Leap manufactures hermetic plastic packages with air cavities for high-frequency RF, MEMS, and other applications that solve problems that ceramic hermetic packages don't address. With sealable, injection-molding production techniques, Quantum Leap reaches a sizeable market.

Hesse & Knipps values the local customers at the Arizona show, which is not to say that the in-state crowd is small. "It's a good, broad, local group," said Hesse & Knipps' Southwest rep. As a late-comer to the U.S. market, the German company is interested in focused, local-area exhibitions because representatives can make contact with many players, and expand communications with current customers. "We may work with one group in a company, and yet, in large international businesses, there may be another group within the company that has not experienced our products. Shows like this give us a chance to showcase our equipment for those groups, and for completely new customers."

Klaus Ruhmer and Gilbert Lecarpentier from SUSS MicroTec (Munich, Germany) walked me through the steps of C4NP, using dummy wafers and glass molds they had on-hand to illustrate the process. SUSS visited the show for the technical aspect, attending panels and paper presentations, and presenting their own work. SUSS has recently collaborated with several universities, in Canada, Mexico, and other locations, because new applications for existing technology develop in university labs, said Lecarpentier. And not only do they have leading-edge ideas, but, as graduates move into our industry and become buyers, they're familiar with the SUSS name, he added. While C4NP is too involved for university labs, other equipment offers flexibility and automation that helps students work in a "real-life" atmosphere. SUSS expects a return on investment (ROI) of sorts when they send wafer- and device-bonders, with other MEMS- and 3D-manufacturing equipment, to a university or consortia. Applications developed on the machine, and feedback from researchers, make the equipment manufacturer aware of future needs in the industry.

Bradley Benton, national sales manager from Palomar (Carlsbad, CA), brought a wealth of knowledge about the company's new 3500-III system and model 8000 to the exhibit hall. He liked the technical edge of this tradeshow — it was more likely to attract engineers in the



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advanced packaging space. The Palomar machines he promoted suit this "advanced" space, with the ability to bump or wire-bond, and flexibility in wire geometries to accommodate low, low chain bonds, ball bonds with gold wire, and smooth, high-volume die stacking. Engineers are starting to combine bumped flip chips with wire-bonded die to create custom package that exactly fit a given data rate, thermal target, or form factor. Benton has an engineering background himself, and after 25 years with the company, has tracked the progress of many advanced packaging trends.



Figure 1. Ann Bell of IMAPS greets attendees and manages the IMAPS Device Packaging tradeshow.



Figure 2. Massachusetts was covered with a fresh coat of late winter snow...



Figure 3. David Owens, regional sales manager at EV Group.



Figure 4. Robert Avila, western regional manager of FINETECH, showcased the company's bonder offering.



Figure 5. Marjorie Gordon, president of L. Gordon Packaging, speaks with a customer about package protection...



Figure 6. The Hesse & Knipps booth showcased a range of packaging products.



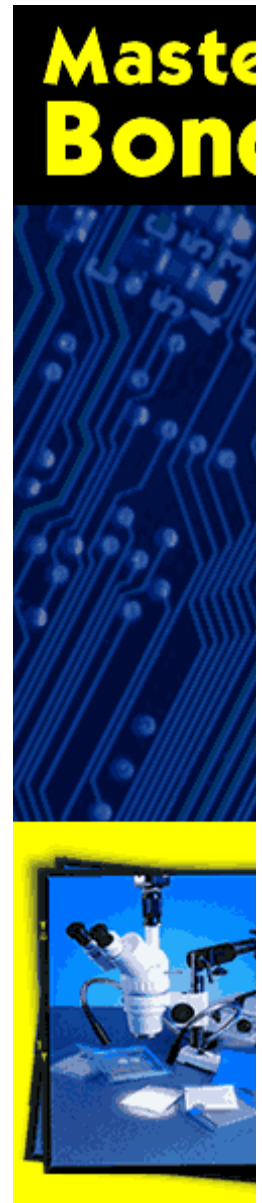
Figure 7. IMAPS hosted networking parties each night after the show closed.



Figure 8. Bradley Benton, national sales manager at Palomar Technologies...



Figure 9. Suzanne Redding, global marketing strategy manager of packaging and finishing technologies...



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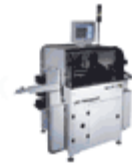
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