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Your Passport to SMTAI

Along with the exhibition space, SMTA International delivers one of the strongest technical conferences in the electronics manufacturing market. This issue provides you with a detailed pre-show guide for the upcoming SMTAI event.



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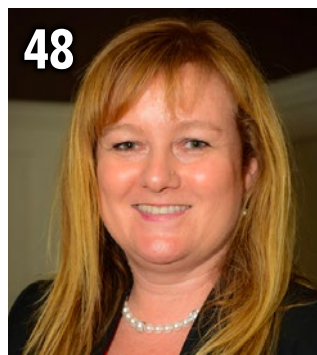
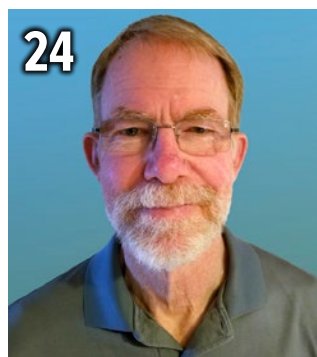
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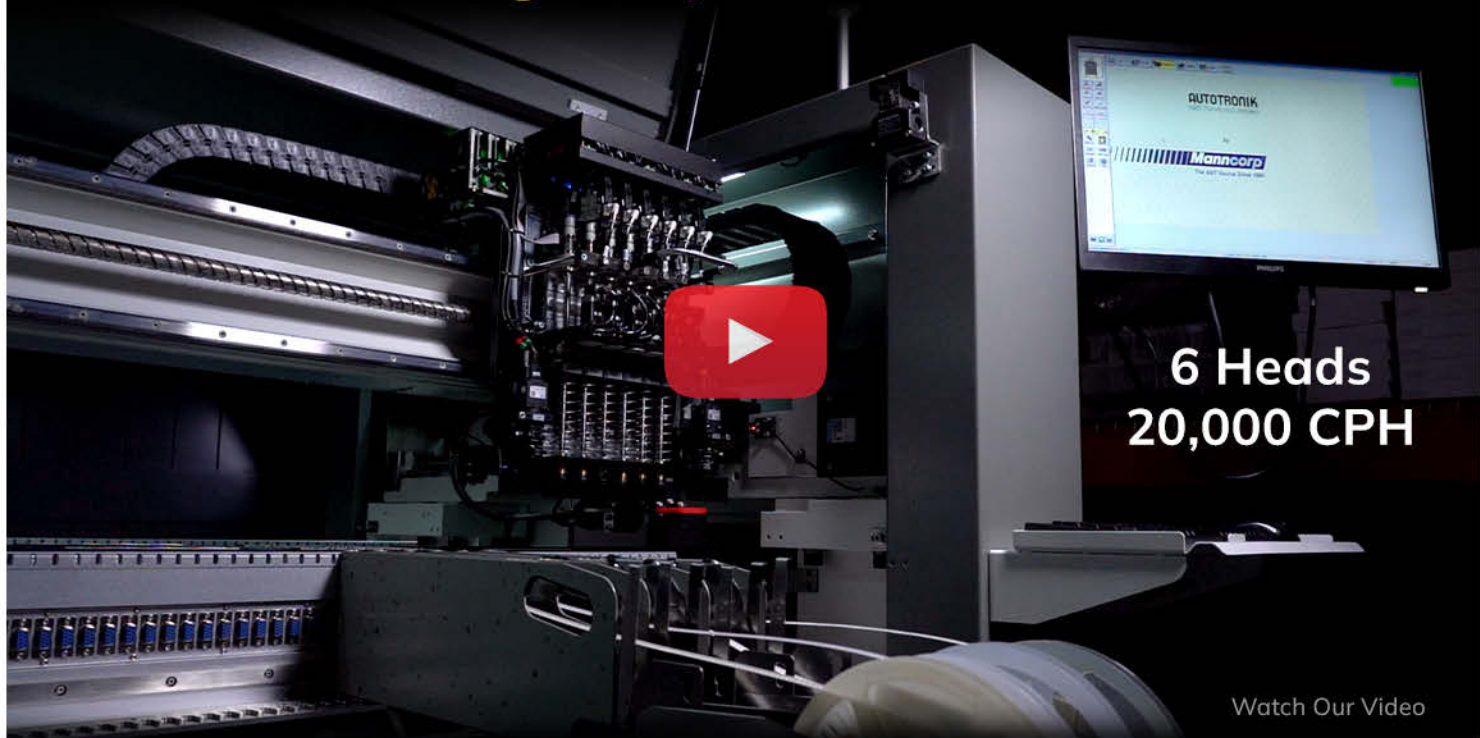
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Have Passport, Will Travel

Nolan's Notes

by Nolan Johnson, I-CONNECT007

Technical conferences, expos, symposia, and trade gatherings of all kinds are back and in a big way. Maybe it's just because we've been quiet for a while, followed by a year of careful, tentative restarts to the event schedules, but this year's calendar of events seems to be full steam ahead. I'm excited to get back into the convention centers and hotel ballrooms; that is where some of our best reporting originates. That comes at a price, however, as my travel schedule looks pretty brutal in the coming months. Just between you and me, while it may feel brutal to my workload, I'm ready to dust off my passport, see some airports, and wear thin some shoe leather.

I certainly hope that you feel similarly. Thus, one of the best places to get back into the swing is SMTA International (SMTAI), taking place Oct. 31-Nov. 3 in Minneapolis, Minnesota. The event is co-located with the four other shows that comprise the MD&M show. SMTA is an international network of profes-

sionals who build skills, share practical experience, and develop solutions in electronics manufacturing, including microsystems, emerging technologies, and related business operations¹. The other four shows include: MinnPack, for packaging solutions; ATX, for automation and

robotics; D&M, for design and molding technologies; and Plastec, for plastics applications. All co-located along with SMTA, this event provides a wide range of potential solutions and connections for EMS specialists.

Besides providing an expo floor showcasing what's new in the market, SMTAI also delivers one of the strongest technical conferences in the electron-

ics manufacturing space. We feel so strongly that attendance at the show is just what our industry needs, we're devoting this issue of *SMT007 Magazine* to preshow coverage. One of our goals with this issue is to give attendees and exhibitors a field guide for the event, and perhaps just the impetus you need to attend. So, if you—or perhaps your supervisor—need



some convincing as to why you should attend SMTAI this year, I know this issue will help make your case.

First, we kick off with an overview by Sal Sparacino, SMTA vice president of communications. We follow with interviews with SMTA President Martin Anselm and board member Rob Boguski. In addition, you'll find information on the keynote speaker, the Technical Conference, the stellar Women's Leadership Program, the Members of Distinction awards, Professional Development tracks, schedules of events, and a list of exhibitors.

If all that weren't enough, students, young professionals, and industry newcomers are encouraged to participate in a "passport" networking program this year. Read more about this fun, engaging event on page 52, then visit smta.org to get registered. It's a clever way to get introduced and to jumpstart your industry network.

I'm always at this show and I look forward to it. I may not be stamping SMTAI networking

passports, but I'll be delighted to talk to you about what's happening in your neck of the world. Like I said, our best reporting comes from talking to colleagues at the shows. I want to hear your stories.

By the way, do you follow us on [LinkedIn](#) and [Twitter](#)? Be sure to check out our pages, like our posts, and add your comments. It's the perfect way to stay informed and get updates on the latest information coming out of the electronics manufacturing industry. Even better, I'd love for you to share what you're reading. Let's get "social," and I'll see you at SMTA International. **SMT007**

References

1. SMTA.org.



Nolan Johnson is managing editor of *SMT007 Magazine*. Nolan brings 30 years of career experience focused almost entirely on electronics design and manufacturing. To contact Johnson, [click here](#).





It's an **Exciting Time** in Electronics

Feature Article by Sal Sparacino
SMTA

SMTA International is just around the corner, and we are excited to be meeting fully in person and onsite. The conference and expo runs from Monday, Oct. 31 through Thursday, Nov. 3, returning to the Minneapolis Convention Center. Once again, we will co-locate with Medical Design & Manufacturing Minneapolis 2022 (MD&M).

As the world continues to adjust to the new normal following nearly years of the pandemic, an in-person industry conference and exhibition is more valuable than ever. As the SMTA VP of Expos, I am very excited about this year's program as it offers many opportunities to *connect* with colleagues and friends alike, *learn* the latest in research and process solutions, and *advance* your career.

It is an exciting time within the electronics industry as our technology continues to develop at an ever-increasing rate to meet new product development requirements. As reported by Grand View Research¹, the global active electronic components market is expected to grow at a compound annual growth rate (CAGR) of 9.2% from 2021 to 2028. This is driven mostly by the rapidly growing demand for consumer electronics devices, such as smartphones and laptops.

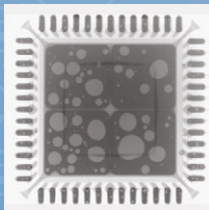
Let's not forget the electronic requirements for the electric vehicle (EV) sector. According to Facts and Factors², the global electric vehicle market is anticipated to grow at a compound annual growth rate (CAGR) of 24.5% during the forecast period between 2022 and 2028. The valuation for the EV market was

Pyramax Technology to Eliminate Solder Voids

Pyramax Vacuum

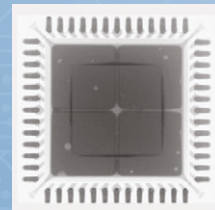


Vacuum reflow is a proven solution for PCB assemblies or products that require low solder voiding for critical performance applications. Pyramax Vacuum has been designed with the requirements of large EMS, OEMs and high-volume automotive segments in mind. The system features controlled heating within the vacuum chamber enabling industry leading thermal uniformity and the tightest control of liquidus time. Processing temperatures of up to 350°C can be achieved with vacuum levels lower than 20 Torr. Integrated controls and fully automatic vacuum operation are achieved via BTU's proprietary WINCON™ control system.



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Voiding occurs when flux or solder paste oxidation is entrapped in the solder joint. Shown here is an MFL processed with and without vacuum reflow. BTU's vacuum reflow solution is designed to reduce voiding to <5% (process dependent).



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\$185 billion in 2021 and is estimated to pass \$980 billion by 2028.

Add to this the advanced electronic demands for aerospace and defense, telecommunications, medical, and space, and you see that our industry is poised for continuous technology development. This takes talented personnel and aggressive corporations willing to invest in core research and product development. SMTA International is the ideal venue to glean industry direction and the industrial and commercial future technology requirements.

Even More Reasons to Attend

If you are a young professional or an industry newcomer, discover “Passport to the World of SMT.” This program will run during the Expo on Wednesday and Thursday. Young professionals and industry newcomers, named “Explorers,” will be issued passports to guide them through a typical SMT process by identifying Ambassador exhibitors on the show floor. Ambassador booths will be marked by special flags and the Ambassadors identified by special badges. As Explorers wander the exhibit floor, they will meet the Ambassadors, discuss their technology, and answer questions. This is an ideal opportunity for the Explorers to connect with subject matter experts and for indus-

try to nurture the next generation of industry experts. For any young professionals or newcomers to the industry, this opportunity is certainly not to be missed. Even if you don't fit those criteria, the program is open to all registered attendees. Details can be found [here](#).

Consider participating in the Women's Leadership Program: Technology Innovation and Career Advancement. The title notwithstanding, this program is open to all attendees, not just women. However, the Women's Leadership Program will start with three presentations from women leaders in the electronics industry based on these themes:

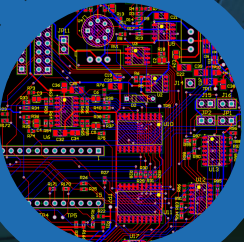
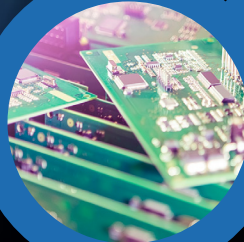
- Focus on the career “toolbox” of technical, leadership, and power skills
- Use the analogy of the “tools” for success regarding resources, personal/professional traits
- Consider the actual tools you will need

We can all benefit by learning from the experience of successful individuals. Review the presentation abstracts as well as the remainder of the program [here](#). The Women's Leadership Program is also described in detail on page XX.

Regardless of your tenure within our industry, there is much to learn from the Conference as the latest industry research is presented within the nine-track program. Couple this with the Professional Development

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Advance

With more than 80 exhibitors on the SMTAI show floor, numerous product innovations will be on display including assembly equipment, tools, materials, software, and more. Thanks to the co-location with MD&M Minneapolis, attendees will have access to five other shows related to advanced manufacturing and design. Among all six co-located shows, the number of exhibiting companies is expected to exceed 500 and attendance is anticipated to be more than 4,000.

SMTAI 2022 is not to be missed. We look forward to seeing you in Minneapolis. **SMT007**

Courses (PDCs) and the exhibitor offerings on the Expo floor, and you'll easily recognize that SMTAI provides an ideal opportunity for industry professionals to connect and re-connect with industry colleagues and SMEs alike. The conference ensures that you are aware of the latest technology developments, products, and processes that enable you to address any technical challenges. Here are a few easy links for you to learn more:

- [View the Conference schedule](#)
- [Read about the Professional Development Courses](#)
- [See what equipment will be on display](#)

References

1. Active Electronic Components Market Size, Share & Trends Analysis Report by Product Type (Vacuum Tubes, Semiconductor Devices), By End User (Automotive, Consumer Electronics), By Region, and Segment Forecasts, 2021-2028, Grand View Research.

2. At 2.4% CAGR, Global Electric Vehicle Market Size and Share to Surpass US\$ 980 Bn by 2028 | EV Industry Trends, Growth and Forecast Report by Facts and Figures, GlobeNewswire.

Sal Sparacino is VP of Expos for SMTA.

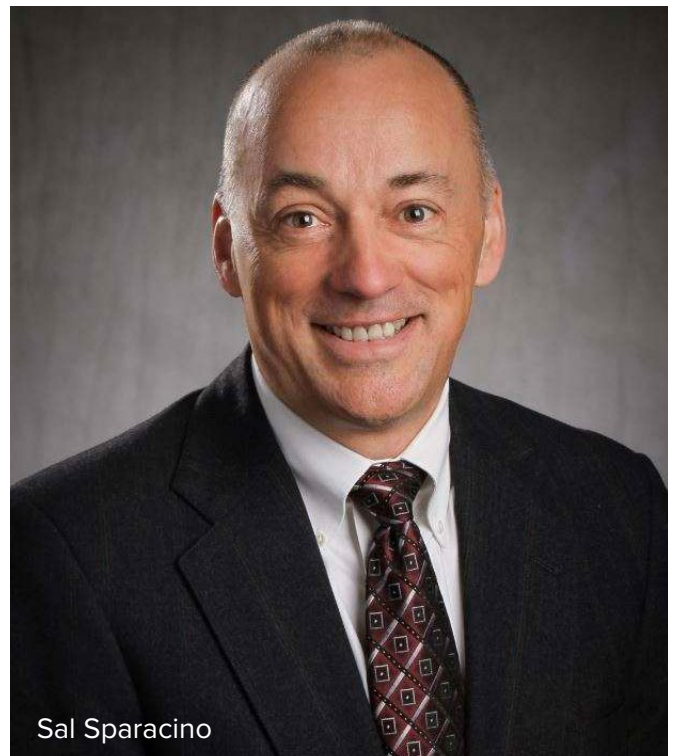
Pillars of SMTA International

Learn

The conference features more than 100 technical presentations detailing the latest research presented through the nine-track program. There will be seven Professional Development Courses throughout the conference.

Connect

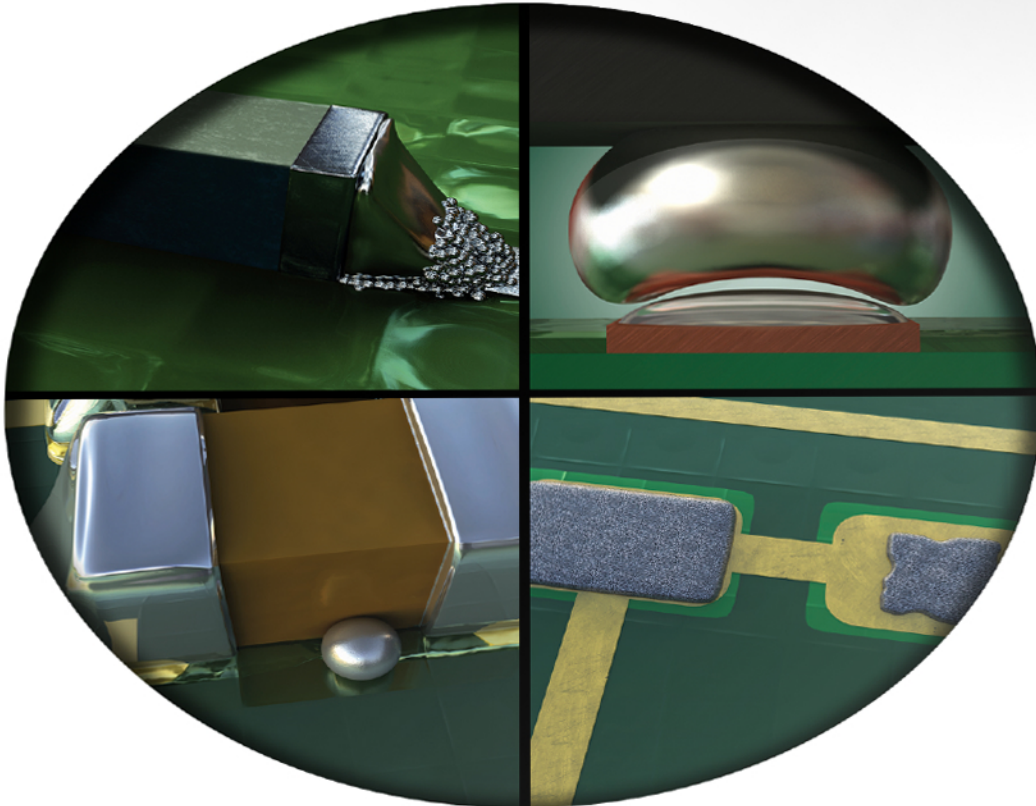
We are excited to have a 100% in-person event this year. The primary benefit that could not be replicated in a virtual event is the quality of networking and opportunities to make real connections with other people.



Sal Sparacino

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Charging Forward: An EV Keynote Presentation

SMTA International features a keynote presentation by two experts within the electric vehicle industry who will address what it will take to provide the infrastructure to support fast charging of electric vehicles in the United States.

Matthew Blackler, founder of ZEF Energy, and Stephen Tok of Tritium Charging will cover the current state of EV infrastructure, challenges, and the outlook from both a strategic and a manufacturing perspective. Their presentation is titled “Charging Forward: Best Practices in Deploying EV Fast Charging Infrastructure.”

The event is scheduled from 9 to 10 a.m. CST, in Room 200, at the Minneapolis Convention Center. It is free to attend.

Matthew Blackler founded ZEF Energy in 2014 with the desire to help make EV ownership more accessible and utilize his skills in clean technology solutions. Prior to ZEF, Matthew worked as a software engineer at The

Crown Estate creating software that helped identify the best areas on the UK’s continental shelf for offshore wind farms, tidal, and wave generation. He also served as a solutions architect for the UK’s Network Rail, where he developed an application that allows users to access a full 360-degree view of any Network railway at any time—essentially a Google Street View for trains. Matthew holds Master of Science degrees in both advanced information systems and geographic information science (GISc) from Birkbeck, University of London, and a post-graduate degree in information technology from Kingston University. He and his wife drive a Nissan Leaf and a Chevy Bolt.

Stephen Tok is currently director of Americas–Energy and Utility Strategies at Tritium Charging. Prior to joining Tritium in 2018 he worked as regional sales and energy channel partner manager at Trimble, and utility sales director at Comverge. **SMT007**



Matthew Blackler



Stephen Tok

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Martin Anselm

Feature Interview by Andy Shaughnessy

I-CONNECT007

Summer is officially over, and we're now in trade show season. SMTA International is just about a month away, so I asked SMTA President Martin Anselm to discuss the show and what manufacturing professionals should expect to take away from this event, now in its second year at the Minneapolis Convention Center.

Andy Shaughnessy: Martin, how are you doing? Long time, no see. Now, you were recently reelected as the head of SMTA.

Martin Anselm: Hi, Andy. Yes, it's been a while. I am, once again, the president of the association. I was reelected this past June for another term of two years, and then my service on the

board to the SMTA will be over, for a total of 10 years, believe it or not. This will make six years as a board member and four as the president of the association. Around September 2024, I'll be handing the baton to the next president of the SMTA, whoever gets elected.

Shaughnessy: Great. Now, SMTA International is around the corner. Tell us why everyone should attend SMTAI?

Anselm: SMTAI is a wonderful combination of both a very highly respected conference and an expo of the latest and greatest technology and vendors. The conference will feature over 100 papers that will be published, and there are many different tracks associated with the

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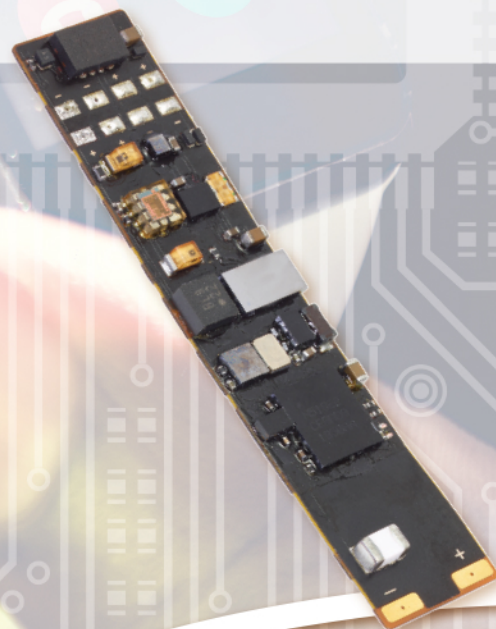
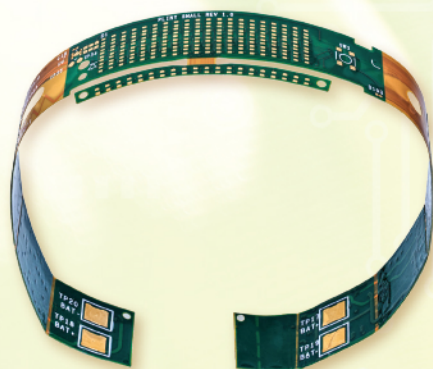
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electronics manufacturing, test, and assembly areas. Not only will we see manufacturing, but also testing and packaging content. We even have a series of talks in the area of die-level packaging.

Then, we have a great exposition with vendors on the show floor presenting their newest tools, equipment, and materials for our industry, so you can see what is most current to incorporate in your factories. Once again we are partnering with the MD&M Expo so our attendees will benefit from both with one registration.



Shaughnessy: What are some of the takeaways that come from SMTAI?

Anselm: They're numerous. Clearly there's the takeaway of the educational experience. You can learn about what is new and see the research being done in the electronics manufacturing, test, and assembly areas. There's also a huge opportunity to network and have those hallway conversations—sharing experiences, troubles and tribulations, and helping one another.

The SMTA is a volunteer organization. We've always been an association that has highly valued education. It's part of our mantra. Some of that is done in a more formal environment, like a professional development course on Monday or Tuesday of the event, but others are more informal where you are at meetings with speakers and publishers of papers who are topic experts within a certain company that may be offering equipment or mate-

rial sets and helping one another out and trying to solve problems. That's really what's at the core.

Shaughnessy: I noticed you are co-located with this manufacturing event. Tell us how that works.

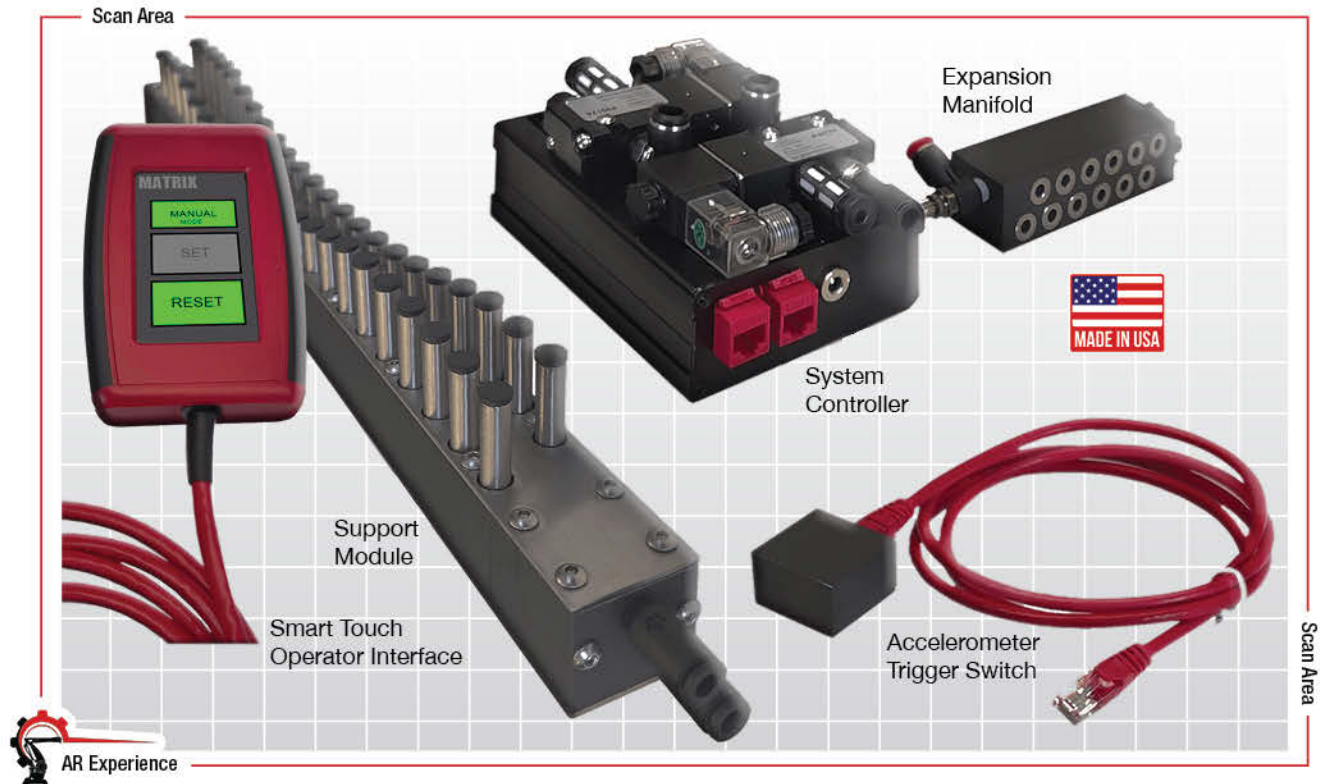
Anselm: Yes. We did this in Minneapolis for the first time last year. We were co-located with the Medical Design and Manufacturing (MD&M) conference, which focuses on the medical segment. Not only can you visit our exhibit floor with all our vendors, but you can walk in the same hall to the MD&M conference and expo with all those exhibitors as well. It adds extra value to attend either end of the expo floor.

Shaughnessy: The show is in Minneapolis, in November, so maybe everyone should bring a jacket?

Anselm: We had the show in Minneapolis for the first time last year, and we found that all the different hotels and the conference center are connected through skyways. So, other than wearing my jacket to get there, I never really set foot outside. It's still early in the season. Some people who are not familiar with four seasons may have expected there to be four feet of snow and icy weather conditions. The show starts Oct. 31 and runs through the week. It's still early enough that weather should not be an issue.

Shaughnessy: Great. I noticed you have some special events coming up, including, "What's in your Toolbox?" That sounds interesting.

Anselm: Yes, we do. That one you mentioned is part of the Women's Leadership Program. We're very proud of this long-running program. It takes place over an entire afternoon and there's a reception at the end organized by our women professionals. We have excellent speakers from Intel, REMAP, and 3M who will




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talk about soft skills as well as being a lifelong learner and things of that nature.

Following those presentations, there will be a speed mentoring session and the reception that I mentioned. This is not just for our female engineers; anyone can join. I go to it every year and I really enjoy it because our speakers usually bring something very unique to the table—not just the technical presentations that we have at the conference, but also larger, bigger picture topics as well. I always come away from it having learned something useful.

Shaughnessy: Who are the keynote speakers?

Anselm: The keynote presentation will be on Wednesday at 9 a.m., just before the expo starts. Everybody is welcome to attend. If you are not paying for the conference but you just want to go to the free expo, you can attend the keynotes. The two speakers will focus on best practices in developing EV fast-charging infrastructure.

Government legislation requiring only EV vehicles over the next five to 10 years is rolling out in various different states. I know California is leading the “charge” with that. New York State, where I reside, will do something similar. The ability to take your car more than just through the metro area or a daily commute to work will be a major limiting factor, and then just regular charging isn’t enough.

We need fast-charging infrastructure. Matthew Blackler from ZEF Energy and Stephen Tok from Tritium Charging are the keynote speakers. We hope to get a large audience to come upstairs to the conference area for that.

Shaughnessy: Our columnist Kelly Dack bought an EV, and he said the charger that came with it would not charge the car overnight. He had to go buy one.

Anselm: You almost have to be an electrician or electrical engineer. I was thinking of buying an

EV myself and my neighbor just offhandedly said, “Oh, when you get one, let me know. I’ll call my friend over and we’ll help you install the charger in your garage.” A lay person isn’t necessarily going to be able to do that, but there are programs for having these types of things installed in your house.

Shaughnessy: Is there anything else you’d like to mention?

Anselm: Yes, we have a special event we’ll be presenting on the expo floor for our young professionals. I think we are all aware that there’s a changing of the guard, and more young people are coming into our industry. We have a “passport” networking experience that we’re offering to our young professionals and industry newcomers. That activity is hosted by our Young Professional Committee, and will take place Wednesday on the show floor.

You’ll be issued a passport and given different places on the expo floor to stop by, get your passport stamped, and talk to a representative in that industry. This will include solder paste deposition and inspection, mass soldering, automated optical inspection, cleaning, X-ray and other post reflow testing, rework and hand soldering, and then, finally, placement.

This will be great for young professionals who want to learn more about our industry and network with industry professionals. Maybe you’re in a factory and you’re now responsible for excellence in the manufacturing process; this will be a great way to hit some of those key areas and get to know some people who are topic experts. Should you ever have any problems in the future, you’ll know someone you can call.

Shaughnessy: Sounds good. Well, it’s been great talking with you, Martin. Best of luck in your next two years as head honcho.

Anselm: Thanks, Andy. Great talking with you too. SMT007



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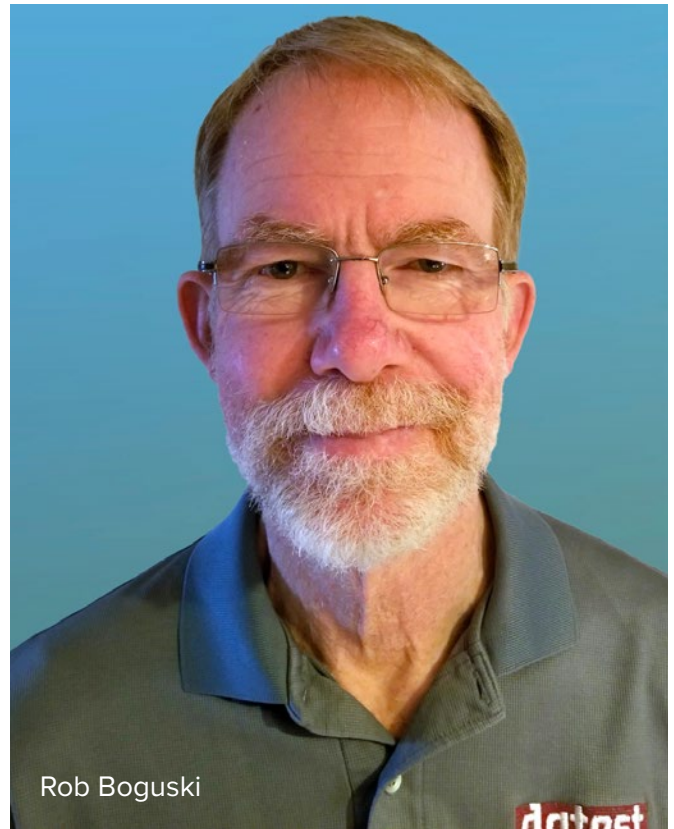
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Rob Boguski: Hot on the Trail of SMTA



Rob Boguski

Feature Interview by Andy Shaughnessy

I-CONNECT007

Andy Shaughnessy recently spoke with Rob Boguski, president of Fremont, California-based Datest and an SMTA vice president and board member. In this excerpt from the interview, Rob offers a preview of SMTA International, and gives an update on SMTA's planning strategy for the next five years. The full audio interview can be found [here](#).

Andy Shaughnessy: I'm here this afternoon with Rob Boguski, president of Datest, and a long-term member and leader at SMTA. How are things going, Rob?

Rob Boguski: It's a busy time, Andy. In spite of the pandemic, business has been, well, busy. There are a lot of new opportunities, a lot of new industries, which for us is wonderful.

Shaughnessy: Tell me about your role with SMTA.

Boguski: My off-hours job is being a member of the board of SMTA. I'm finishing the third year of my term. I'm currently vice president of membership, so in that regard, I chair two committees: the Membership Committee and the Chapter Leadership Committee. Membership oversees everything that has to do with attracting new members, onboarding, and then retaining them, hopefully by showing them the full range of benefits available that SMTA offers. Chapter Leadership looks at and works closely with each one of our 40-some individual chapters around the world and helps them as a resource. If they're having problems attracting and retaining officers, looking for speakers, or maybe somewhat dormant and want to revive their chapter, we help them out by encouraging them, bringing speakers, attending their events, providing constructive feedback, and so forth.

I shepherd the people who do that sort of thing and hopefully promote our organization

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in view of our goals, considering all the crazy developments we've all had to experience the last couple of years with the pandemic, the economy, and so forth. It's been a challenging time. I took office in 2019, about five months before the pandemic hit, and then in March 2020, everything shut down. We went into crisis mode on the SMTA board, where for a time we were meeting every single week to make decisions. Do we keep holding expos? Do we cut back completely? Do we hunker down? When they teach you how to be a board member, there's nothing in the manual that teaches that.

We were working very closely as a group, observing data, combining our knowledge of the news and our own personal experience in our respective businesses, trying to figure out what was best with SMTA. I'm happy to say, we've come through the experience a stronger organization, and our membership is up.

Shaughnessy: I attended SMTA Dallas and SMTA Atlanta this year, and I saw more young people on both of those trips than I remember seeing at previous shows. Do you see that?

Boguski: Yes, and that's intentional. We have several initiatives to encourage and attract younger engineers and technical people into both the profession and SMTA with connections that will help their careers. We are revamping our career center, meeting or

matching people looking for a job with those offering jobs. There are a lot of job openings right now, as we know.

We have events that are tailored to younger engineers, what we call SYPs—students and young professionals. These are people in technical and engineering programs who are about to graduate and younger engi-

neers who are in the early stages of their careers. We're laser focused on that because it's the lifeblood of our organization. A lot of the veteran members are retiring. There's turnover and we've got to encourage and attract new members. To do that, we must be relevant to what their concerns are and to what's going on in the industry.

Shaughnessy: I know a lot of people are excited about SMTAI this year as it's in a new venue.

Boguski: New place, and a new venue in Minneapolis. It's not the warmest place in November, but it's a nice convention center. We're at a good point where people want to get out. They've been cooped up for two years, and they're looking for an excuse to see their friends and colleagues, share the knowledge, start mingling again, and meet face-to-face.

We've all done Zoom. We do that every day. That's probably here to stay, whether we like it or not, but there is some merit in face-to-face meetings. We're not doing a hybrid event this year. It will all be face-to-face. We'll have the Expo and the Technical Program all in person. We hope to get 100 exhibitors for the Expo. It looks like we have about 120 to 130 technical papers submitted for the technical conference, so that's very encouraging as well.

Shaughnessy: I'm looking forward to it. I've never been to Minneapolis.

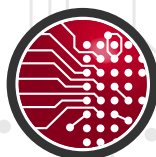
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Boguski: It's a nice town. It's a small town for a big town. People are friendly and hospitable. The convention center is nice. It's easy to get to, with lots of airline connections. You might need a jacket in November. It could be a little chilly, but not a problem there.

Shaughnessy: Are there any other updates about SMTA, or anything else that you'd like to mention?

Boguski: Yes. SMTA has gone through a strategic planning process in the past year. We hired a consultant specializing in nonprofit organizations who put together a plan, which the board is in the process of evaluating and hopefully adopting. This will be our guidepost for the next five years about the things we do and how we do them, the framework for how we execute as an organization.

It's built around four strategic pillars. Basically, the themes are strong industry workforce, member connections and engagement, organizational excellence, and advancing technical knowledge. Each theme has several subsidiary points as to our strategy for accomplishing those themes. That will be the framework we work in as we expand and further diversify the benefits of membership in SMTA.

You'll see a lot of new offerings in the form of activities and initiatives. In the past year, we simplified our membership structure, which has been a big hit with everybody. It's a lot easier to understand. We have three categories of corporate membership—bronze, silver, and gold—that are a big hit. We're revamping our training programs as part of advancing technical knowledge. You will hear and see about a lot of new offerings there in the next 12 months.

I already mentioned the career center and a lot more in the way of follow-up and interaction with our chapters and our members to make sure they're taking full advantage of their membership and getting their money's worth. It's a lot more sitting down and listening to our membership, not telling them how to do things, but listening to what they want, and then putting proactive programs together to help them achieve what they want in their careers, with their chapters, and in their companies. We've got a lot going on.

Shaughnessy: Very good. Thanks for speaking with me, Rob.

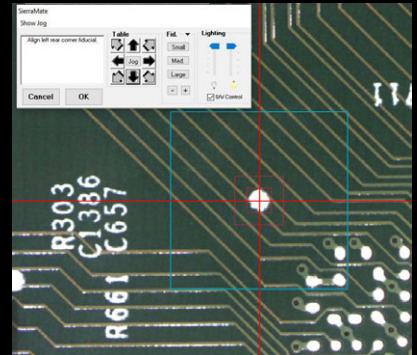
Boguski: Thank you, Andy. SMT007

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Technical Conference: Trending on Topic

One of the highlights of SMTA International is the Technical Conference, where more than 100 papers will be presented across at least 30 sessions.

“Work that was delayed due to the effects of COVID has been completed and the amount of material coming from the industry is impressive,” says Julie Silk, VP of technical programs. “We have a packed conference this year in Minneapolis.”

The Technical Conference is part of SMTA International, scheduled for Oct. 31 to Nov. 3, at the Minneapolis Convention Center in Minneapolis, Minnesota. To attend the conference sessions, registration is required.

The Technical Conference is organized and managed by Silk, who works for Keysight Technologies, and Raiyo Aspandiar of Intel Corporation and SMTAI conference chair.

They are assisted by the SMTA International Technical Advisory Committee (TAC), which is comprised of distinguished electronics manufacturing and packaging industry experts.

They designed the conference to ensure that the latest trends and developments are fully addressed.

The Technical Conference has nine technical tracks:

- Advanced Packaging (APT)
- High Performance and Reliability (HPR)
- Interconnect Research and Reliability (IRR)
- Low Temperature Solder (LTS)
- Manufacturing Excellence (MFX)
- Materials for Electronics (MAT)
- Medical & Defense Symposium (MD)
- Technical Innovations (TI)
- Test and Inspection (INS)

Silk says some of the tracks have been renamed from previous years to better describe the content for these sessions. For example, High Performance and Reliability (HPR) “covers the unique requirements in industries such as automotive and space,” she says. “M&D

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Julie Silk

covers papers on substrates, PCB fabrication chemistries, adhesives, solders, and more.”

The Interconnect Reliability and Research (IRR) Symposium has outstanding content that will help attendees understand the mechanisms that drive failure.

The following track names have remained the same:

- **Advanced Packaging Technology:** Includes new research completed since the very popular Wafer Level Packaging Symposium in the spring
- **Inspection and Test (INS):** Highlights useful testing
- **Technical Innovations:** Covers machine learning, digital factory, and unique processes

There were so many papers in the Manufacturing Excellence (MFX) and Low Temperature Solder (LTS) tracks that there are several sessions for each.

“Papers in the MFX track cover challenges in key SMT process areas including stencils, solder paste application to PCBs, reflow solder-

ing, and cleaning of soldered assemblies,” Silk says. “Also included is a session on Smart factory developments.”

There is also a diverse cross-section of authors presenting the LTS track papers. They include researchers at universities, engineers from solder manufacturers, semiconductor package suppliers, and OEMs supplying products to the consumer, computer, and server markets.

Topics run the gamut from thermal cycling of heterogeneous and homogeneous low temperature solder joints, manufacturability concerns including rework, and solder composition effects on solder joint microstructure. Of particular interest to many are the papers on electromigration in SnBi solders, since electromigration of low temperature solders has been raised recently as a major topic to study in detail.

“You may have a difficult time selecting which of these excellent papers to attend,” Silk says. “To help somewhat, the Technical Conference has been arranged to avoid overlap of concurrent sessions in two of the largest tracks, IRR and LTS. There is also a helpful schedule posted on the conference program website with the option to create an account online or download an app that allows you to choose the sessions you want to attend.”

For more in-depth training, there are seven industry experts instructing half-day Professional Development Courses on electronics reliability and process-specific topics. On the afternoon of Oct. 31, you can choose from:

- Cleaning and Cleanliness Testing
- Defeating Defects in Electronics Assembly
- Passive Thermal Management
- Reflow Profiling Simplified

For the morning of Nov. 1, your options are:

- Reliability Testing
- Tolerance Mistaken
- Low Temperature Solder

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“I recommend selecting the conference bundle when you register so you can make the most of your trip and get the best value to attend both the conference sessions and courses,” Silk says.

Overall, she’s excited about SMTA International and what it offers. “The very best thing about the conference is the discussions that flow from the presentations and the connections that spark from these discussions,” Silk says. “Young professionals will benefit tremendously from these connections and the planned special activities for them. Please encourage their attendance.”

She’s also looking forward to the forum on surface mounting onto printed electronics. This roundtable discussion will bring in industry experts and include all who are curious to come up with actionable insights on this emerging technology.

“I’m also excited about the Women’s Leadership Program, which has some great speakers talking about their careers and providing guidance,” Silk says. “It will be followed by speed mentoring and a reception.”

More details and the complete technical program can be found [here](#). **SMT007**

Committee Members

Dudi Amir, Intel Corporation
Martin Anselm, Ph.D., Rochester Institute of Technology
Babak Arfaei, Juniper
Raiyo Aspandiar, Ph.D., Intel Corporation
Nilesh Badwe, Ph.D., Indian Institute of Technology, Kanpur
Jasbir Bath, Bath Consultancy
Andy Behr, Panasonic
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Mike Bixenman, DBA, MBA, KYZEN Corporation
Lars Boettcher, Fraunhofer IZM Berlin
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Keith Bryant, KB Consultancy
Kevin Bryd, Intel Corporation
Bill Capen, Honeywell FM&T
Bill Cardoso, Ph.D., Creative Electron, Inc.
Burton Carpenter, NXP Semiconductors
Srinivas Chada, Ph.D., Project Kuiper-Amazon
Lenora Clark, MacDermid Alpha Electronics Solutions
Jean-Paul Clech, EPSI, Inc.
Marie Cole, IBM Corporation (retired)
William Cooper, John Deere Electronics Solutions Inc.
Eric Cotts, Binghamton University
Richard Coyle, Nokia Bell Labs
Priyanka Dobriyal, Ph.D., Intel Corporation
Michael Ford, Aegis Software
Trevor Galbraith, Global SMT & Packaging

James Elliott Fowler, Sandia National Laboratories
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Tim Pearson, Collins Aerospace
Scott Priore, Cisco
Anto Raj, Medtronic
Brian Roggeman, Qualcomm Technologies Inc.
Chrys Shea, Shea Engineering Services
Rajen Sidhu, AMD
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Women's Leadership Program: Technology Innovations and Career Advancement

Feature Article by Priyanka Dobriyal

Intel Corporation; Program Track Director, Women's Leadership Program, SMTAI

What is the most recent skill you have added to your toolbox?

As I was sharing my recent accomplishments with one of my mentors, she asked me to think of my new skills as new tools added to my toolbox. That conversation gave me a different perspective to reflect on the skills I had collected so far and encouraged me to strategically plan the next steps in my career. I started gravitating toward the idea of this imaginary toolbox and collected skills which adhered to my core values of creating a sustainable and purpose-driven career.

While planning the theme for the 2022 Women's Leadership Program (WLP) at SMTA International, I discussed this idea with the organizing committee, and it was very well received. We brainstormed on how to bring this idea to real-

ity and enable women colleagues to advance their careers. We realized that taking the time to reflect on the skills you have in your toolbox makes you self-aware and recognize your self-worth. Knowing what you bring to the table helps you build the confidence you need to navigate your career. Hence, the concept of a toolbox seemed appropriate for the WLP, as the goal of this session is to empower women to explore technology innovations and career progression in the electronics industry. I hope you are ready to think about the skills in your toolbox that could help with your career advancement.



Priyanka Dobriyal



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The WLP on Tuesday, Nov. 1 will start with three presentations from women leaders in the electronics industry. These women each have charted a unique career journey which made them invaluable in the organizations they lead. We asked our speakers to share their experiences and learnings for the 2022 WLP session with these themes in mind:

- Focus on the career toolbox of technical, leadership, and power skills
- Use the analogy of the tools for success regarding resources, personal/professional traits
- Consider the actual “tools” you will need

The presentations will be followed by a speed mentoring session where attendees rotate through a selection of six tables hosted by the invited speakers and SMTA leaders on topics related to leadership skills, power skills, continuous learning, career development, encouraging innovation, etc.

We will wrap up the program with our annual Connection Reception. Earlier this year, the industry lost an inspirational leader with the passing of Irene Sterian of Celestica/REMAP. Irene made many contributions to the

Women's Leadership Program Schedule

Tuesday, November 1

1:00–3:15 p.m.: Invited presentations on technology innovations and career advancement

Co-Chairs: Tanya Martin, Jessica Molloy

1:00–1:45 p.m.: Carolyn R. Duran, Ph.D., Intel Corporation

1:45–2:30 p.m.: Loretta Renard, CEO, REMAP

2:30–3:15 p.m.: Jayshree Seth, Ph.D., 3M

3:15–3:30 p.m.: Refreshment break

3:30–4:30 p.m.: Speed Mentoring Sessions

Co-Chairs: Debbie Carboni, Julie Silk

4:30–6:00 p.m.: Connection Reception

Co-Chairs: Michelle Ogihara, Sherry Stepp

industry, the SMTA, and the WLP. Her spark encouraged numerous women to advance their careers in our industry. We will informally celebrate Irene's passion for engaging with her colleagues during the Connection Reception. We look forward to connecting with you all and discussing the skills in your toolbox.

Speed Mentoring Topics

Skill	Tool	Topic	Host
Confidence, Communication	Multimeter, 2-Way Radio	Communicate with confidence	Carolyn R. Duran, Intel Corporation
Professional Presence	Sandpaper	Polish your presence	Chrys Shea, Shea Engineering Services
Conflict Resolution	Hammer	Resolve conflict with finesse	Rita Mohanty, Henkel Electronic Materials LLC
Technical Skills (T-shaped)	T-Square	Cultivate T-shaped skills	Jayshree Seth, 3M
Paying It Forward Thru Your Power Skill/Strength	Wrench, shared tools	Pay it forward with power skills	Marie S. Cole, Retired, IBM
Recharging Your Tools	Power strip	Recharge	Priyanka Dobriyal, Intel Corporation

We extend an invitation to everyone to attend the Women's Leadership Program to promote women in engineering fields. Show your support for diversity in engineering fields by attending this session. It's free and all are welcome.

Presentations

Carolyn R. Duran, Ph.D., Intel Corporation
1–1:45 p.m.

Topic: **Leaning into Lifelong Learning**

As a society, we are in a state of rapid change in how we innovate, develop, and deliver new technologies and products to the world. Only those who embrace lifelong learning, by adapting, growing, and learning will truly thrive. Carolyn will share some key tools she has developed to explore and succeed in dramatically different roles within her company. With each new role there is new opportunity: what you bring to the table to help the new organization's success, what you learn in your new role about the business, and what you learn about yourself. Through her own career journey, Carolyn will demonstrate the value of this learning as she returned to where she started: technology development, after gaining valuable lessons in supply chain management and product development.

About Carolyn

Carolyn R. Duran is a vice president and engineering manager in Components Research at Intel Corporation. In this role, Carolyn leads advanced process and materials research to invent, develop, and demonstrate viable revolutionary technologies necessary for Intel's continued leadership in the industry. She also leads her organization's strategy for external engagements including academia, consortia, and supply chain.



Carolyn R. Duran

Carolyn joined Intel in 1998 as a process engineer in research and development, moving to supply chain management in 2007. In this role, Carolyn oversaw Intel's supply chain sustainability efforts spanning chemical regulations and policy, human rights and labor, and the company's responsible minerals sourcing program. She moved to the Data Platforms Group in 2017 to lead a corporate charter in memory and IO technologies responsible for the pathfinding, development, implementation, and broad industry enablement in these areas. In 2022, Carolyn returned to her technology development roots to lead the process engineering team within Components Research.

Carolyn received her bachelor's degree in materials science and engineering from Carnegie Mellon University and her Ph.D. in the same field from Northwestern University. She holds five patents in semiconductor process engineering.

Interview With Carolyn

What is your favorite/valuable tool?

Fundamentally, I believe that my thinking style has been the most valuable to me. Many years ago, a mentor helped me recognize this. He stated that there were "convergent" thinkers—those who could really focus and drive execution—and "divergent" thinkers—those who would really come up with radical out-of-the box ideas. Corporations need both, but they also need a few who can do both, and most importantly, know which type of thinking is needed when. This is the tool in my toolbox that has served me well, and the one I continue to focus on and develop more.

What tool do you wish you had when you started your career?

I wish I would have had better knowledge of "influencing" when I started. I naively thought

that “if you have a good idea, it will be heard.” Sometimes, even when you have that great idea, you need to work to be heard, and I didn’t know how to do that very well.

What tool is usually difficult to master for women?

I would say boldness. I think gender stereotypes give a large leeway for men to be “strong,” “bold,” “courageous.” For women, we walk a tightrope between “you are too soft” and “you are pushy/arrogant.” But we must be bold.

If you were a tool, which tool would you be? Why?

I have to say intellectual curiosity. That is what I am.

Loretta Renard, CEO, REMAP
1:45–2:30 p.m.

Topic: “Changing the Perception of Manufacturing”

As manufacturing becomes more advanced and digitized, perceptions about careers in manufacturing are changing, thus creating a more positive perception of the sector, and incentivizing more women to pursue careers in manufacturing. This is further supported by workforce multiplier jobs, currently estimated to be 16 jobs created for each high-tech manufacturing job. These multiplier jobs support and drive manufacturing but are not on the manufacturing floor, such as automation technologies, artificial intelligence, machine learning, and a whole host of supporting professions from supply chain management, through logistics, finance, marketing, and beyond. Today, there is much sophistication and excitement around manufacturing, and this is quickly

changing the demographics of the workforce. The winners in this evolving industry will possess varying combinations of technical, leadership, and power skills. Loretta will discuss the growing role of women in the advanced manufacturing sector and how she has leveraged her communications, interpersonal, and leadership toolkit to grow her own unique and unexpected career in the manufacturing sector.

About Loretta

Loretta Renard is CEO of Canadian innovation accelerator REMAP. A member of the all-women leadership team since 2014, Renard has been instrumental in developing and deploying REMAP’s mission to fund transformation, drive collaboration across industry and academia, and enable Canadian companies to navigate the digital economy. Renard is an experienced executive with more than 25 years of operations, strategy, corporate governance, communications and change management leadership for both for-profit and not-for-profit organizations.



Loretta Renard

Prior to joining REMAP, Renard provided corporate communications for a global electronics manufacturer serving the healthcare and technology sectors. Renard is a lifelong volunteer and has supported several important causes, including on-the-ground earthquake relief initiatives in Haiti.

Interview with Loretta

What is your favorite/valuable tool?

My most significant tools include communications, interpersonal, and leadership skills.

What tool do you wish you had when you started your career?

If I could have imagined that I would find myself passionate about the advanced manufacturing sector, I would have benefited from

education in STEM to expand my engineering abilities and technical experience.

What tool is usually difficult to master for women?

Women hold far fewer leadership positions, and many are stuck in the middle in their careers. Women need to learn to step forward to advocate for themselves and ask to lead big jobs and projects.

If you were a tool, which tool would you be? Why?

My most significant leadership skill is communication, specifically translating complex technology concepts into user-friendly and accessible knowledge transfer.

Jayshree Seth, Ph.D., 3M

2:30–3:15 p.m.

Topic: “Of Leaders and Ladders...”

Jayshree will provide her perspective on lessons learned from a career in innovation. She believes that regardless of what educational path we follow and what career we end up in, real growth, true leadership and self-actualization come from tough transitions, deep reflections, and meaningful actions. At the end of the day, it is what is inside all of us; it just takes effort to notice, read, and realize that fine print. Jayshree will provide points-to-ponder based on her own experiences, against the backdrop of her personal and professional background and journey.

About Jayshree

Jayshree Seth is a corporate scientist at 3M and leads the Applied Technology Development for Industrial Adhesives and Tapes Division. She joined 3M in 1993 after a master’s and doctorate in chemical engineering from Clarkson

University, New York, and she currently holds 75 patents for a variety of innovations with several additional pending. Jayshree is a Distinguished Alumni Award recipient from her alma mater, REC Trichy India, now NIIT Trichy, where she earned a B. Tech. in chemical engineering.

Jayshree was appointed 3M’s first ever Chief Science Advocate in 2018 and is using her scientific knowledge, technical expertise, and professional experience to advance science and communicate the benefits of science and the importance of diversity in STEM fields. She is also a member of Carlton Society, which is the 3M Science and Engineering Hall of Fame. Jayshree is the fourth woman and first female engineer to be inducted. In 2020, she was awarded Society of Women Engineers (SWE) highest Achievement Award. She is also the first-ever winner of a Gold Stevie® Award in the new Female Thought Leaders of the Year category in the 18th annual Stevie Awards for Women in Business in 2021. Jayshree was featured in a docuseries titled “Not the Science Type” that premiered during the 2021 Tribeca Film Festival and accepted for Brand Storytelling Showcase, a sanctioned event at Sundance Film Festival. She is the author of two books published by the Society of Women Engineers. All proceeds help fund a scholarship for underrepresented minority women in STEM.



Jayshree Seth

Interview with Jayshree

What is your favorite/valuable tool?

That is a great question and having spent almost three decades in my professional career, I believe the tools that allow you to develop your sight and gain insight are the most valuable. I pick my favorite depending upon what task is in *scope*.

- *The telescope*: Look far ahead. Ask yourself where you are going and see what the big picture—the vision—is for the team.

- *The microscope*: Look deep down. Think about what you are doing, delving deeply to see the detailed view, the critical functioning, and the execution in the short term.
- *The periscope*: Look out, look over, back and around. See what is not in direct line of sight. Anticipate change and proactively identify opportunities.
- *The stethoscope*: Look within. See what cannot be seen but only felt. Listen to the heart—your own and others—to be able to inform and inspire.
- *The horoscope*: Look above. See and acknowledge what you can't control. Be grateful for the role of luck and chance. Humility makes for authentic leaders.

What tool do you wish you had when you started your career?

When I started out, I hadn't quite realized what a powerful tool metaphorical thinking is, especially to visualize leadership concepts. For instance, microscopes and telescopes can be good metaphors for short-term and long-term views, respectively. Both scopes can provide a view that is not visible to the naked eye. Great leaders possess the ability to view both, and they have a keen understanding of when to use which one. Leaders also realize that the detailed microscopic view of the short-term has to be consistent to realize the telescope's vision. Now I use metaphors as a powerful tool all the time. I find them brilliant in their ability to take an abstract thought and transform it into a very physical, easily understandable, and often universal concept. They can make a simple fact compelling as they add depth, character, and visual imagery.

What tool is usually difficult to master for women?

I think with the rate of disruption in virtually every industry, the periscope view becomes an important metaphor and requires signifi-

cant effort to master. A periscope is designed to look over and around obstacles that may be obstructing one's view. It's important to continually look outside our immediate surroundings to identify major trends and threats in the market, specifically how they will impact the products, platforms, and business models. A keen view through a periscope is critical for leaders because it can call for an adjustment of the telescopic and microscopic views to which we're accustomed. But using the periscope also means what you see or perceive needs to be communicated. I think sometimes it's a struggle for women to assert their point of view in largely male-dominated fields.

If you were a tool, which tool would you be? Why?

Good leaders strive to use all the views I mentioned to enjoy the kaleidoscope of true leadership. With a stethoscope, good leaders need to listen to their heart and intuition to engage their teams in ways that might not be tangible. This is very important, especially since research indicates disengaged employees lead to lost productivity. Much has been written about leading with heart, and inspiring constituencies by capturing their hearts. Additionally, I have really learned to value the horoscope as it feels more authentic to appreciate the role of luck along the journey. My mantra: Remember, it's not just you, it's your kismet and karma that come along on the journey too. Pay it forward.

I write a lot about these topics in my books, *The Heart of Science: Engineering Footprints, Fingerprints, and Imprints*, published in 2020, and *Engineering Fine Print*, published in 2021. **SMT007**

Priyanka Dobriyal, Ph.D., is technical assistant/ chief of staff, Memory IO Division, Intel Corporation, and program track director, Women's Leadership Program, SMTAI.



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Melancholy Endings and Exciting Beginnings

Maggie Benson's Journey

by Dr. Ronald C. Lasky, INDIUM CORPORATION

Editor's note: Indium Corporation's Ron Lasky continues this series of columns about Maggie Benson, a fictional character, to demonstrate continuous improvement and education in SMT assembly.

It was the last night class for pre-calculus. Andy and Sue were eating dinner at their usual pizza shack before heading to class.

"I think I get how integration works. The integral of x is $x^2/2$, so why isn't the integral of $\sin(x)$ $(\sin(x))^2/2$?" Andy said, groaning.

"Because when you integrate x , you integrate it over dx ," Sue commented, then wrote down the equation as she said, "The only way you could get $(\sin(x))^2/2$ would be if you integrated it over $d(\sin(x))$ (See Figure 1)".

"Ah, makes sense," Andy replied.

After class they had stopped for ice cream at their favorite parlor before preparing for the last SMT class they were teaching.

"I feel kind of melancholy," Andy commented, "that this is the last of both our pre-calc and SMT classes."

"I know, I feel the same way," Sue replied. "It seemed like such a burden at first, but soon both classes became fun."

Neither would admit out loud that the presence of the other made it such a pleasant experience.

$$\int x dx = \frac{x^2}{2} + C$$

$$\int \sin(x) dx \neq \frac{\sin^2(x)}{2} + C$$

$$\int \sin(x) d \sin(x) = \frac{\sin^2(x)}{2} + C$$

Figure 1: The integral of x over dx is $x^2/2$, the integral of $\sin(x)$ over dx is not $\sin^2(x)$. It would need to be integrated over $d(\sin(x))$ for it to be $\sin^2(x)$.

"Well, let's start working on reflow profiling," Sue suggested.

"Let's use this solder paste spec (Figure 2) and this reflow profile (Figure 3)," he responded.

Reflow Profile Details	SAC305 Parameters	
	Recommended	Acceptable
Ramp Profile (Average Ambient to Peak)— Not the Same as Maximum Rising Slope	0.5–1°C/second	0.5–2.5°C/second
Soak Zone Profile (Optional)	30–90 seconds	30–120 seconds
	160–180°C	150–200°C
Time Above Liquidus (TAL)	45–60 seconds	30–100 seconds
Peak Temperature	230–260°C	230–262°C
Cooling Ramp Rate	2–6°C/second	0.5–6°C/second
Reflow Atmosphere	Air or N ₂	

Figure 2: A solder paste reflow profile specification.



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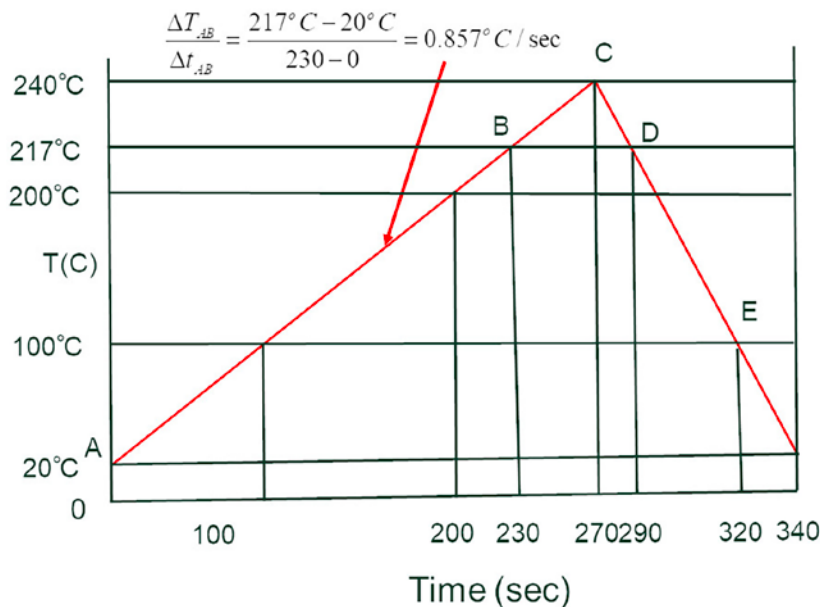


Figure 3: A reflow oven profile.

“Look at the first part of the solder paste spec,” Sue said. “It says the recommended ramp rate should be between 0.5°C and 1°C per second.” (Note the red triangle in Figure 2.)

“Yeah, then if we look at the reflow profile, by dividing the change in temperature at the melting point (217 - 20°C = 197) by the change in time (230 seconds), we see that the slope is 0.857°C per second, so it is nicely in the spec limits,” Andy said.

“The time of liquidus is easy, too—just subtract the time at D (290 seconds) minus the time at B (230 seconds) and get 60 seconds, also within the spec,” Sue added.

“The peak temperature is certainly easy to find at point C, or 240°C,” Andy said.

“And the cooling slope is -2.8°C, also within the spec,” Sue chimed in. (*Note to readers: Can you calculate this number?*)

They then developed the PowerPoint slides to teach this material in their class.

“That Excel software tool you developed to make all these calculations was really impressive,” Sue complimented Andy. “I heard Maggie discussing it with Chuck Tower. They thought it was amazing.”

“Twern’t nothing, me lass,” Andy responded in a gallant way (Figure 4).

Both agreed that the students could use this Excel software tool after the class, but they had to know how to perform the calculations by hand.

Eighteen months later...

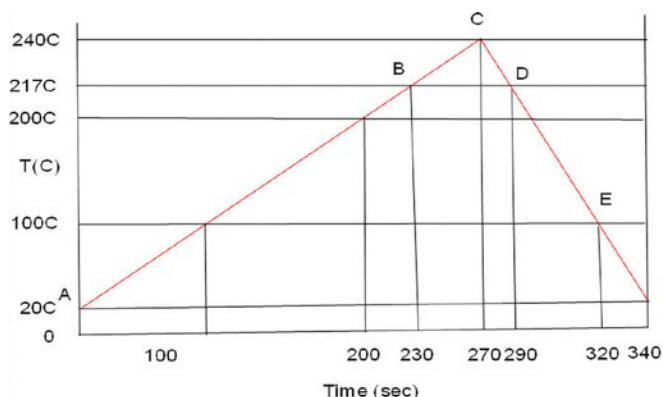
Sue and Andy continued their night school classes at the local community college. With the recommendation of Ivy University Professor Patty Coleman, they received some equivalent credit for work they had performed teaching SMT classes, as well as some other projects they worked on at Ivy-Benson Electronics. Both students were granted their two-year AAS degrees. The more interesting development was that Professor Coleman pulled some strings and enabled them to transfer to Ivy University as juniors to work on their bachelor’s degrees. They would take a reduced course workload and work at Ivy-Benson part-time.

All these events transpired in June and the two future Ivy U students would have to wait until September to start class.

Right after graduation, Andy and Sue were asked to meet with Maggie Benson. Both felt a little nervous. As they entered Maggie’s office, they were even more so when they saw that Professor Coleman had joined the meeting.

Input Metrics:	TIME-s	TEMP-C
A	0	20
B	230	217
C	270	240
D	290	217
E	320	100

Example. Put the times and temps in the blue cells. Read the results in the gray cells.



Reflow Profile Details	SAC305 Parameters		Recommended	Acceptable
	Recommended	Acceptable		
Ramp Profile (Average Ambient to Peak)— Not the Same as Maximum Rising Slope	0.5–1°C/second	0.5–2.5°C/second	TRUE	TRUE
Soak Zone Profile (Optional)	30–90 seconds	30–120 seconds		
	160–180°C	150–200°C		
Time Above Liquidus (TAL)	45–60 seconds	30–100 seconds	TRUE	TRUE
Peak Temperature	230–260°C	230–262°C	TRUE	TRUE
Cooling Ramp Rate	2–6°C/second	0.5–6°C/second	TRUE	TRUE
Reflow Atmosphere	Air or N ₂			

Figure 4: A screen shot of the Excel® Reflow profiling app that Andy developed¹.

As they entered, Maggie said, “Hola, Sue y Andy. ¿Le gustaría ir a México y evaluar una empresa para que la compremos?” For those whose Spanish is a little weak: “Hello, Sue and Andy. Would you like to go to Mexico and evaluate a company for us to buy?”

Although they all spoke Spanish (Sue had really worked on hers with her mom lately), Maggie reverted to English, “Business is so booming that we are considering buying a small assembly plant in Mexico. We want to send Chuck Tower to perform an evaluation but felt you two could help him as you speak Spanish.”

“Yikes! I’m not sure my Spanish is that good,” Sue warned them.

“You’re too modest,” Andy chimed in. “You’ve come a long way in the last 18 months.”

Maggie, Andy, and Sue started discussing the details.

Patty chimed in, “Ivy University has a self-study course. Sue and Andy, if you write a detailed report of what you learned during this project, I’m quite sure it can count as your first course.”

The meeting ended. Sue and Andy were left feeling like their heads were spinning with all these exciting and challenging opportunities.

Stay tuned to see how the adventure in Mexico plays out. SMT007

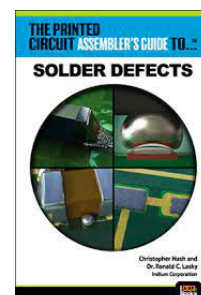
References

1. If you would like a copy of the Excel reference, email Dr. Ron at rlasky@indium.com.



Ronald C. Lasky is an instructional professor of engineering for the Thayer School of Engineering at Dartmouth College, and senior technologist at Indium Corporation. To read past columns, [click here](#).

Download *The Printed Circuit Assembler’s Guide to... Solder Defects* by Christopher Nash and Dr. Ronald C. Lasky. You can also view other titles in our [full I-007eBooks library](#).



SMTA Members of Distinction Awards Announced

Feature Article by Ryan Flaherty, SMTA Staff

The SMTA is proud to honor the 2022 Members of Distinction Award recipients who have shown exceptional dedication to the association and the electronics manufacturing industry.

The association's highest honor, the Founder's Award, recognizes members who have made exceptional contributions to the industry, as well as support and service to the SMTA. This year, the organization selected Irene Sterian (posthumously) to receive this prestigious award. In her corporate and industry leadership roles, Irene influenced and inspired many in the SMTA and the electronics industry for decades. She was an especially bright spark encouraging countless women in technology. A member since 2003, Irene served

on the SMTA Global Board of Directors from 2004–2009. She continued to support various SMTA conferences, committees, and mentorship efforts over the years. SMTA and the electronics industry have benefited immensely from Irene's contributions over the years and her death earlier this year was a great loss for everyone who knew her.

The Member of Technical Distinction Award recognizes individuals who have made significant and continuing technical contributions to the association. This year the Awards Committee selected Richard Coyle, Ph.D., Nokia Bell Labs, as the recipient of this award. A former VP of Technical Programs on the SMTA Global Board of Directors, Richard has presented numerous award-winning



Irene Sterian



Richard Coyle

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Sherry Stepp

technical papers at SMTA conferences and supported several technical committees over the years.

The Excellence in Leadership Award honors strong leaders who continue to support and elevate the association. This year the award goes to both Jeff Schake, ASM Assembly Systems, and Sherry Stepp, KYZEN Corporation. Jeff Schake joined SMTA in 2004 with regular participation in technical activities and committees over the years. Jeff has diligently supported his local Empire (New York) Chapter in a leadership role since 2016, becoming chapter president in 2019. His efforts have significantly improved the engagement of members within their chapter as well as at a global level.

Sherry Stepp has been an advocate for the SMTA on a national, international, and most recently at the local level. Since she joined SMTA in 2009, Sherry has been an important voice with the Marcom Committee, the Women's Leadership Program, and the Expos Committee. Since 2020 she took on leadership roles with her local Huntsville chapter, first as president and most recently as VP of Membership. The SMTA thanks Sherry and Jeff for their many valuable years of service.

The Excellence in International Leadership Award recognizes members who have provided outstanding support and leadership to the SMTA's international members, chapters, or educational programs. The recipient selected for this award is Morgana Ribas, MacDermid Alpha Electronics Solutions. Morgana has been a prominent leader in the SMTA India-Bangalore Chapter for several years as well as supporting association activities globally.

Lockheed Martin received the SMTA+ Corporate Partnership Award this year. As a Corporate Bronze member, Lockheed Martin has shown support at every level of the association, from supporting chapter leadership positions to technical contributions for conferences and committees. They embody the SMTA mission by encouraging employees to become members, attend meetings, and share their knowledge. Lockheed Martin is most deserving of this honor.

SMTA has recognized exceptional individual and corporate members for their immeasurable contributions to the association since 1994.

View details at smta.org. **SMT007**

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Time to Go ‘Exploring’ at SMTA

Students, young professionals, and industry newcomers will have a unique way to network with subject matter experts at SMTA International 2022 in a fun and non-threatening way.

“Passport to the World of SMT” is designed to assist “Explorers” in making connections with exhibitors during part of the annual trade show in Minneapolis.

For exhibitors, “this is a great opportunity to establish your technology leadership, showcase your company’s talent, and begin building key relationships with tomorrow’s decision makers,” says Chrys Shea, Explorer program organizer.

“Passport to the World of SMT” will run during the Expo on Wednesday and Thursday. Explorers will be issued “passports” to guide them through a typical SMT process by identifying Ambassador Exhibitors on the show floor. Ambassador booths will be marked by special flags and the Ambassadors identified by special badges.

As Explorers wander the exhibit floor, they will meet the Ambassadors, discuss their technology, and ask questions. Passports are stamped by each Ambassador visited. At the

event wrap-up on Thursday, passports will be reviewed, and prizes awarded to the most active Explorers and their favorite Ambassadors.

Participation is free to all Expo attendees, but participation as an Exhibitor Ambassador requires a \$250 sponsorship fee. Benefits include:

- Demonstrate your area of expertise
- Present the “go to” person(s) in your organization for technical questions
- Build your CRM database
- Differentiate yourself from your competitors
- Get a head start on the future of the industry

“We are very passionate about this program as the demographics of our industry indicate a real need for growing new networks and developing new expertise,” Shea says. “We hope you agree, and this is why we are asking you to participate in this inaugural event to ensure its success this year and for many more to come.”

Sponsorship details can be found at smta.org.

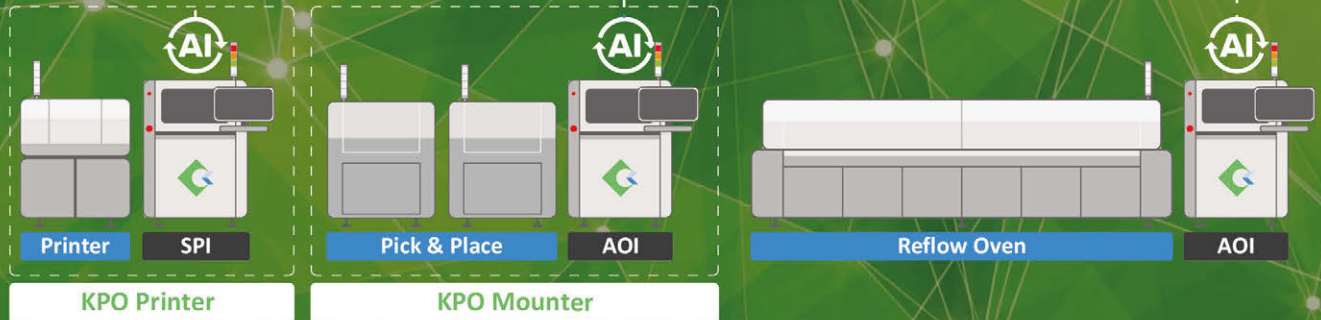
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Professional Development Courses

The Professional Development Courses at SMTA International include more than three hours of instruction led by internationally respected professionals with extensive experience in the subject area.

Course instructors deliver focused, in-depth presentations on topics of current importance to the industry, based on their research and industry experience. Professional Development Courses are application oriented and structured to combine field experience with scientific research to solve everyday problems.

Monday, October 31

PDC 1: Cleaning and Cleanliness Testing

Best Practices

Mike Konrad, *Aqueous Technologies*

PDC 2: Defeating Defects in Electronic Assembly

Ronald Lasky, PE, Ph.D., *Indium Corporation*

PDC 3: Passive Thermal Management of Electronics

Rita Mohanty, Ph.D., *Henkel Corporation*

PDC 4: Reliability Testing and Design for Reliability of Lead-Free Solder Joints

John Lau, *Unimicron Technology Corporation*

Tuesday, November 1

PDC 5: Reflow Profiling Simplified


Robert Rowland, *Axiom Electronics LLC*

PDC 6: Tolerance Mistaken: Impacts Of Not Properly Addressing Limitations Of Material, Industry Standards And Assembly Process Limitations

Dale Lee, *Plexus Corp.*

PDC 7: Low Temperature Solder—History, Progress, and Considerations

Kevin Byrd, *Intel Corporation*



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SMTAI Technical Program Schedule

SMTA International hosts its annual Technical Program Oct. 31 through Nov. 3, concurrent with the trade show. The technical program aims to demonstrate and advance innovations in the following areas: Advanced Packaging Technology, High Performance and Reliability, Interconnect Research and Reliability, Low Temperature Solder, Manufacturing Excellence, Materials for Electronics, Medical and Defense Symposium, Technical Innovations, and Test and Inspection.

Visit smta.org to register. The following is a list of the presentations in each of the categories.

Advanced Packaging Technology Tuesday, November 1

Development of Si-Interposers for 3D Heterogeneous Integration
John Allgair, *BRIDG*

Board-Level Reliability Test Method and the Automotive Electronics Council
Thomas Koschmieder, *Veoneer, LLC*

High Speed Transmission Characteristics on RDL Interposer Using Low Loss and Low Stress Dielectric Materials for High Performance Computing Application
Satoru Kuramochi, P.E., *Dai Nippon Printing*

Comparison of Component Assembly Process-reliability Relationships of Low-temperature Solders and ECAs on Flexible Direct-Write Additive Circuits
Pradeep Lall, Ph.D., *Auburn University*

Assembly and Reliability of a Novel High Density Dual Row MaxQFP
Andrew Mawer, *NXP Semiconductors Inc.*

Rework Practices and Advances for Minileds and other Highly Miniaturized SMT Components
Neil O'Brien, *Finetech*

Heterogenous Integration using Fan-out Wafer-level Packaging (FOWLP) Technology to Produce High Performance and Low-Cost Multi-Chip Modules
Cliff Sandstrom, *Deca Technologies, Inc.*

A Fracture Mechanics-based Approach to Simulate Die Pick-up Process
Sandeep Shantaram, Ph.D.,
NXP Semiconductors Inc.

Assembly Optimization for Thin Flip-Chip Chip-Scale Packages
Trent Uehling, *NXP Semiconductors Inc.*

High Performance and Reliability Tuesday, November 1

Effect of Matte-Sn Electroplating Parameters on the Thermo-mechanical Reliability of Lead-free Solder Joints
Abhilaash Ajith Kumar, Ph.D.,
Robert Bosch GmbH



Conformal Coating Prevention, Temperature Dependence and Physical Analysis of Resistor Silver Sulfide Corrosion
Eric Campbell, *IBM Corporation*

Reliability of Different Solder Joint Alloys in Thermal Cycling and Drop Shock Tests
Sa'd Hamasha, Ph.D., *Auburn University*

Combined Alloy and Flux Approach Toward Cost-effective High Reliable Solder Joints for Automotive Applications
Stefan Merlau, *Heraeus Deutschland GmbH*

Conformal Coating Testing in Various Test Environments
Prabjit Singh, Ph.D., *IBM Corporation*



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Challenges for Conformally Coated Networking Equipment in Extremely Harsh Environment

Chuan Xia, *Cisco Systems*

New Technologies Speed Presentations and Panel Discussion

Panelists:

Mark Ronay, *Liquid Wire*

Mike Newton, *nScript*

John D. Williams, Ph.D., *Boeing Research and Technology*

Neil Bolding, *MacDermid Alpha Electronics Solutions*

**Interconnect Research and Reliability
Monday, October 31**

Predicting the Saturation of Solder Joint Cycles to Failure with Thermal Cycling Dwell Times

Jean-Paul Clech, Ph.D., *EPSI Inc.*

Improved Thermal Fatigue Reliability of SAC305 due to Mixed Metallurgy Assembly with a High-Performance Bi-bearing Solder Paste

Richard Coyle, Ph.D.,
Nokia Bell Labs



IPC PERM DoD Phase 3 Test Program: Copper Dissolution Testing Report for Selected Pb-free Solder Alloys: SAC305, SAC4.8Bi, SAC6.0Bi and SAC7.5Bi

David Hillman, *Collins Aerospace*

The USPAE Solder Performance and Reliability Assurance Project: Enabling Pb-free Solder Alloy Use in High Performance Applications

David Hillman, *Collins Aerospace*

Thermomechanical Durability Model of 96.5Sn-3.0Ag-0.5Cu (SAC305) Solder Interconnects in Wafer Level Packaging (WLP)

Jean-Baptiste Libot, *Safran Electronics & Defense*

PERM DoD Consortium Phase 3 Pb-free Solder Thermal Cycle Reliability Results Comparing Different Levels of Bismuth Alloying

Tim Peason, *Collins Aerospace*

Methodology for Implementation of Pb-free Materials in Aerospace & Defense Electronics

Anthony Rafanelli, Ph.D., *Raytheon Technologies*

An Empirical Correlation to Estimate Solder Joint Reliability Acceleration Factors

Ross Wilcoxon, *Collins Aerospace*

A Novel Lead-free Lower-temperature Solder Paste for Wafer-level Package Application

Hongwen Zhang, *Indium Corporation*

Tuesday, November 1

Experimental Investigation and Phase Field Simulation of Solid-State Diffusion between Cu and Electroplated-Sn System

Abhilaash Ajith Kumar, Ph.D., *Robert Bosch GmbH*

Next Generation High Reliability Solder for Enabling Enhanced Thermo-mechanical Performance in Automotive Applications

Pritha Choudhury, Ph.D., *MacDermid Alpha Electronics Solutions*

Thermal Fatigue of QFN and Chip Resistor Solder Joints Assembled with SnPb, SAC305, and SnBi Solders

Richard Coyle, Ph.D., *Nokia Bell Labs*

Novel Lead-Free Solder Alloys Based on Sn-Ag-Cu-Sb with Enhanced Thermal and Electrical Reliability

Jie Geng, Ph.D., *Indium Corporation*

An Examination of Tin Pest Phenomenon over a 10-year Period

David Hillman, *Collins Aerospace*

Identification of the Maximum Allowable Compression Load Per Solder Interconnect

Tae-Kyu Lee, Ph.D., *Cisco Systems*

Thermal Shock Testing of High-reliability Solder Alloys

Jayse McLean, *John Deere Intelligent Solutions Group*

Effect of Strain Rate on the Ductility of Bismuth-Containing Solders

Keith Sweatman, *Nihon Superior Co., Ltd.*

Impact of High Reliability Pb-free Solder Alloy Assembly with SAC305 Ball Grid Arrays (BGAs) for Thermal Cycle Reliability

Tim Pearson, *Collins Aerospace*

Thermal Fatigue Reliability of a 1206 Chip Resistor with High-Performance Pb-free Solder Alloys

Tim Pearson, *Collins Aerospace*

Case Study: Metallurgical and Mechanical Analysis of Castellated Via Rigid-Flex Connection

Rebecca Wheeling, Ph.D., *Sandia National Laboratories*

Interface Kinetics on Ageing in Indium Interconnect Mechanical Performance with Decreasing Bump

Rebecca Wheeling, Ph.D., *Sandia National Laboratories*

**Low Temperature Solder
Wednesday, November 2**

Test Data Requirements for the Acceptance of Low Temperature Solder Alloys

Aileen Allen, *Insight Global*

Functional System Observations of Tin-bismuth Low Temperature Solder Electromigration Behavior

Kevin Byrd, *Intel Corporation*

Kinetics of the Accumulation of a Layer of Bismuth at the Anode of a Sn-Bi Based Solder Joint During Current Stressing

Eric Cotts, *Binghamton University*

Finite Element Analysis of Electromigration Effect on Solder Ball Performance

Mehdi Hamid, *IBM Corporation*

Rework Challenges and Solutions on Big and Small Form Factor BGA Packages Using Low Temperature Solder Alloy (LTS) and Tin-Silver-Copper (SnAgCu) Solder Alloy

Maria Mejias, *Intel Corporation*

Low Temperature Solder-Surface Mount Manufacturability and Quality Considerations for Ball Grid Array Components

Rajen Sidhu, Ph.D., *AMD*

Thursday, November 3

A Review of the Impact of Dopants in Sn-Bi Solder Alloys

Aileen Allen, *Insight Global*

The Effect of Thermal Cycling Profile on Thermal Fatigue Performance of a 192-Pin Chip Array BGA with Hybrid, Homogeneous, and Resin Reinforced Low Temperature Solder Interconnects

Dan Burkholder, *Intel Corporation*

Thermal Cycling Performance of Hybrid, Homogeneous, and Resin-reinforced Low Temperature Solder Ball Grid Array Interconnects

Richard Coyle, Ph.D., *Nokia Bell Labs*

The Thermal Cycling Performance of Hybrid Low Temperature Solder Joints Assembled at Different Peak Reflow Temperatures

Richard Coyle, Ph.D., *Nokia Bell Labs*

Thursday, November 3

Addressing Low Temperature Rework Concerns

Jennifer Fijalkowski, *AIM Solder*

Microalloying Effects of Sb and Ag on the Microstructural Evolution of Eutectic SnBi Alloys

Hannah Fowler, *Purdue University*

Thermal Reliability of Mixing Bismuth-Containing Solder Paste with SAC BGAs At Low Reflow Temperatures—Part III
Wenjing He, *Rochester Institute of Technology*

Low Melting Temperature Solder Interconnect Thermal Cycling Performance Enhancement Using Elemental Tuning
Tae-Kyu Lee, Ph.D., *Cisco Systems*

Reliability Performance of Fourth Generation Low Temperature Solder Alloys in Homogeneous and Hybrid Solder Joints
Morgana Ribas, *MacDermid Alpha Electronics Solutions*



Low Temperature Solder Hybrid Solder Joint Time Dependent Behavior Learnings
Hemant Shah, Ph.D., *Intel Corporation*

Reliability Performance of SMT and Rework Low Temperature Solder Second Level Interconnects
Jason Stafford, *Intel Corporation*

Progress Towards Using SAC305-based Super-cooled Liquid Metal Microcapsules to Make Interconnects at LTS Temperatures
Ian Tevis, *SAFI-Tech, Inc.*

Reliability of Epoxy-contained Hybrid SnAgCu/SnBiAg Solder Joint Under Thermal Cycling Test
Watson Tseng, *Shenmao America, Inc.*

Materials for Electronics

Thursday, November 3

Process and Chemical Reliability Requirements in Matching Reinforcement Materials with Solder Paste Flux Residue
Westin Bent, *MacDermid Alpha Electronics Solutions*

Conformal Coatings—New Solutions to Existing Problems
Christopher Brightwell, *Humisedal Europe*

Die Attach Epoxy Characterization for Electronic Assemblies
Deborah Hagen, *Sandia National Laboratories*

Direct Metallization for the Printed Circuit Board Manufacturing
Leslie Kim, *MacDermid Alpha Electronics Solutions*

The Effect of EPIG Plating Thicknesses on Solder Joint and Wire Bond Reliability
April Labonte, *Uyemura International Corp.*

Evaluation of Reliability Using Sutocatalytic Silver Bath on ENEP Layer
Scott Larson, *C. Uyemura & Co., Ltd.*

Creation of a Novel Lead-free Water-soluble Solder Paste that Improves Reliability Through Low Voiding and Ease of Washability
Tony Lentz, *FCT Solder*

Engineered Reliability—Safeguarding Electrical Components and Products with Nanocoating Technology
Daniel Pulsipher, Ph.D. *HZO*

The Impact of the Gold Layer Thickness On Layer Properties, Reliability and Solder Wetting Performance of an ENIG Finish
Britta Schafsteller, Ph.D., *Atotech Deutschland GmbH & Co KG*

Expandable Bio-based Polymers: A Lightweight Future for Electronics Ruggedization
Bethany Turner, *MacDermid Alpha Electronics Solutions*

Increased Reliability of Quad Flat No Lead (QFN) Wettable Flank Connections by Immersion Tin Plating
Britta Schafsteller, Ph.D., *Atotech Deutschland GmbH & Co KG*

A Drop-in High-Temperature Lead-Free Solder Paste that Outperforms High-Pb Pastes in Power Discrete Applications
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Medical and Defense Symposium

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**Thinking Inside the ESD Bag on Cleanliness—
Numerous and Potentially Dangerous Contami-
nation Contributors to Long Term Failure**
Eric Camden, *Foresite Inc.*

3D Process

Jonathan Corona, *Plexus Corp.*

**PCB De-paneling: Less is More, a Review
of Technologies and Vision usage in
De-paneling**

Allen Duck, *Detect Automation*

Effect of Voltage Bias on SIR Measurements

Elliott Fowler, Ph.D., *Sandia National
Laboratories*

**Meeting Today's Challenge for Low VOC
Defluxing Agents For Electronics Manufacturing**

Terry Price, *ZESTRON Corporation*

**Does Proper Solder Thickness Matter When
Processing? Yes**

Brian Wilson, *HiRel Services*

**Continuous Improvement: The Task That Never
Ends in the Cleaning World**

Ram Wissel, *KYZEN Corporation*

Tuesday, November 1

**Component Pressure Exposure Validation
in a Inline Wash System and Why Low
Pressure is Critical**

Bill Capen, *Honeywell FM&T*

**A Holistic Approach to Surface Insulation Resis-
tance Interdigitated Comb Design**

Elliott Fowler, Ph.D., *Sandia National
Laboratories*

**High-Reliability Adhesive Bonding Through
Atmospheric Plasma Treatment**

Adam Klett, *L3Harris*

**Low Stress De-Paneling and Why It Is Critical for
Long Term Reliability**

Michelle Ogihara, *Seika Machinery, Inc.*

Manufacturing Excellence

Wednesday, November 2

**Impact of Stencil Manufacturing Technology
and Supplier's Capability on Performance of
Multi-Level/ Step Stencils**

Supriya Agrawal, *Intel Corporation*

**An Innovative Contactless Technology for
High Resolution, High Speed, Solder Paste
Deposition**

Ralph Birnbaum, Ph.D., *ioTech*

**Ensuring the Reliability of Critical
Assemblies When Implementing a
New Cleaning Chemistry**

Richard Brooks, *Spartronics*

**Stencil Cleaning Optimization for Fine-Pitch
Components**

Sebastian Iturregui-Shelton, *Rochester
Institute of Technology*

**Beyond ECM—Additional Reasons to
Clean Circuit Assemblies**

Michael Konrad, *Aqueous Technologies*

**Cleaning Performance Evaluations and
Best Practices for Novel Jettable Pastes for
Advanced SMT Assembly Processes**

Kalyan Nukala, PMP, *ZESTRON Corporation*

Thursday, November 3

**Secure Data Exchange Between Design and
Manufacturing Using IPC-2581**

Ivan Aduna, *Koh Young Technology, Inc.*

**Using the Principles of Concurrent Education to
Teach a Post-Secondary Engineering Program:
An Example from the Curriculum of the Forth-
coming Jefferson Institute of Technology**

Tom Borkes, *The Jefferson Project*

Cleaning and No-Clean Process Control Using the SIR Test Method and Electrical Twin

Richard Brooks, *Spartronics*

Case Study: Analyzing 0402 Capacitor Defects with Stencil Printing Misalignment When Using Water Soluble and No-Clean Solder Pastes

Xinzhi Feng, *Rochester Institute of Technology*

Thursday, November 3

Implementing the D-Value to Supplement the P-Value in Electronic Assembly

Ronald Lasky, Ph.D., P.E., *Indium Corporation*

Pad-to-Pad Electrical Field Effects on Surface Insulation Resistance

David Lober, *KYZEN Corporation/Magnalytix, LLC*

Reduction of Voiding in SMT Processing of BTC/QFN Component Packages

Jeff Nelson, *Spartronics*

Stencil Printing: Understanding the Effects of Fixed Variables on Print Quality

Chrys Shea, *SHEA Engineering Services*

Engineered Cleaning Agent Study as a Function of Rinsing Under Low Profile Components

Vladimir Sitko, *PBT-Works s.r.o.*

Solder Paste Printing from a Reliability Perspective

David Spitz, *Ansys, Inc.*

Do We Need to Switch to Type 5 Solder Pastes? Conducting a Midsize DoE to Find Answers

Esra Stoll, *Basler AG*

Single Source of Truth

Crystal Tan, *Keysight Technologies*

Influence of PCB Design and Manufacturing Process on PCB BGA Land Pattern Warpage and SMT Yield

Satyajit Walwadkar, *Intel Corporation*

Technical Innovations

Tuesday, November 1

ASM Digital Factory

Olimpiu-Petru Dactu, *ASM Assembly Systems GmbH & Co. KG*

Artificial Intelligence and Machine Learning Applications in Electronics Manufacturing

Zac Elliott, *Mentor a Siemens Business*

Steffen Klawitter, Mentor a Siemens Business Inline Assembly of Flex PET Circuits

Ara Parsekian, *PulseForge Corporation*

The Challenge and Solution for Implementing Automation and AI for Electronic Card Assembly

Wayne Zhang, *IBM Corporation*

Test and Inspection

Wednesday, November 2

Development of Solder Joint Void Metrology to Monitor Solder Joint Quality in Printed Circuit Board Assemblies

Thaer Alghoul, Ph.D., *Intel Corporation*

X-ray Computed Tomography for Printed Circuit Board Inspection

Robert Boguski,
Datest Corporation



Non-contact Measurement of Conformal Coating Thickness using Chromatic Confocal Microscopy (CCM)

Wilson Chen, *Insituware*

Automation for Traceability and Reliability

Alejandro Rodriguez, *Plexus Corp.*

Paradigm Shift—DFT Analysis Driven by Test Coverage Instead of Accessibility

William Webb, *ASTER Technologies*

Application of X-ray Inspection Beyond BTCs

Carlos Valenzuela, *Creative Electron*



MilAero007 Highlights



Your Handy Guide to PCB Legislation Headlines ▶

We know you have so many questions about what the legislation means for you. Will there be funds to expand or upgrade my facilities? What about tax breaks? How will my specific needs be known? Use this handy guide to get caught up.

Will Marsh: CHIPS Act Update ▶

Now that the CHIPS Act has become law, Nolan Johnson reconnects with PCBAA President Will Marsh to ask: What now? Will brings Nolan up to speed on the initial stages of implementation and administration, and provides more insight on the Supporting American Printed Circuit Boards Act of 2022.

IPC Advanced Packaging Symposium to Draw Industry, Government Representatives ▶

Nolan Johnson speaks with IPC's Chris Mitchell, vice president of global government relations, and Matt Kelly, chief technologist, about the inaugural IPC Advanced Packaging Symposium, scheduled for October 11–12, 2022, in Washington, D.C.

Michigan Tech's Middlebrook Receives Department of Defense Award ▶

The Department of Defense honored Michigan Technological University professor Dr. Christopher Middlebrook with an award for his innovative efforts to close education gaps and help build tomorrow's electronics manufacturing workforce.

IPC APEX EXPO 2023 Offers New Courses, New Instructors, and IPC E-Textiles ▶

Registration is now open for IPC APEX EXPO 2023, the largest event for electronics manufacturing in North America. IPC APEX EXPO will be held at the San Diego Convention Center in San Diego, California from January 21–26, 2023.

Boeing Invests \$5 Million in Advanced Manufacturing Innovation Center in St. Louis ▶

Boeing announced it is investing \$5 million to help expand the Advanced Manufacturing Innovation Center in St. Louis, Missouri. The investment will help fund a state-of-the-art advanced manufacturing facility, accelerate workforce development programs, and grow the region's talent pipeline and technical and manufacturing abilities.

Explore the Solar System With NASA's New-and-Improved 3D 'Eyes' ▶

NASA has revamped its "Eyes on the Solar System" 3D visualization tool, making interplanetary travel easier and more interactive than ever.

Summit Interconnect Names Sean Patterson COO ▶

Sean Patterson, a veteran manufacturing executive, has joined Summit Interconnect, North America's largest privately held PCB manufacturer, as chief operating officer. In this position, Patterson will oversee all facets of operations that serve Summit's growing customer base. Summit's former COO, Greg Halvorson, will remain at the company part-time as advisor to the CEO.



Serious About Speed

For over 30 years Prototron
Circuits has led the pack
when it comes to
providing quality
circuit boards FAST.

Be it Class 3, AS9100,
ITAR or MIL-PRF-31032,
Prototron has the speed
you need.



Prototron Circuits
America's Board Source

Conference at a Glance

Professional Development Courses

Monday, October 31

1:00 pm - 5:00 pm

PDC1: Cleaning and Cleanliness Testing Best Practices
Instructor: Mike Konrad, Aqueous Technologies

PDC2: Defeating Defects in Electronic Assembly
Instructor: Ron Lasky, P.E., Ph.D., Indium Corporation

PDC3: Passive Thermal Management of Electronics
Instructor: Rita Mohanty, Ph.D., Henkel Corporation

PDC4: Reflow Profiling Simplified
Instructor: Robert Rowland, Axiom Electronics LLC

Tuesday, November 1

8:30 am - 12:30 pm

PDC5: Reliability Testing and Design for Reliability of Lead-Free Solder Joints
Instructor: John Lau, Ph.D., Unimicron Technology Corporation

PDC6: Tolerance Mistaken: Impacts Of Not Properly Addressing Limitations Of Material, Industry Standards And Assembly Process
Instructor: Dale Lee, Plexus Corp.

PDC7: Low Temperature Solder – History, Progress, and Considerations
Instructor: Kevin Byrd, Intel Corporation

TRACK KEY

Advanced Packaging Technology **(APT)**
High Performance and Reliability **(HPR)**
Interconnect Research and Reliability **(IRR)**
Test and Inspection **(INS)**
Low Temperature Solder **(LTS)**

Medical & Defense **(MD)**
Manufacturing Excellence **(MFX)**
Materials for Electronics **(MAT)**
Technical Innovations **(TI)**
Women's Leadership Program **(WLP)**

Sessions - Monday, October 31

9:00 am	Registration Opens			9:00 am
10:00 am			IRR 1 Continuing the Pb-Free Transition in High Reliability Electronics <i>11:00 am - 12:30 pm</i>	10:00 am
11:00 am				11:00 am
12:00 pm				12:00 pm
1:00 pm	Refreshment Break			1:00 pm
2:00 pm		MD Forum 1 <i>1:00 pm - 3:00 pm</i>	IRR 2 Modeling <i>1:00 pm - 2:30 pm</i>	2:00 pm
3:00 pm	Refreshment Break			3:00 pm
4:00 pm		MD Forum 2 <i>3:30 pm - 5:00 pm</i>	IRR 3 Mixed Metallurgy <i>3:30 pm - 5:00 pm</i>	4:00 pm
5:00 pm				5:00 pm

Sessions – Tuesday, November 1

7:00 am	Registration Opens				7:00 am
8:00 am					8:00 am
9:00 am		MD Forum 3 8:30 am - 10:30 am		TI 1 Digital Factory and Artificial Intelligence 8:30 am - 10:30 am	9:00 am
10:00 am				IRR 4 Mechanical Testing 8:30 am - 10:00 am	10:00 am
	Refreshment Break				
11:00 am		HPR 1 Coformal Coating 11:00 am - 12:30 pm		APT 1 High Density Packaging 11:00 am - 12:30 pm	11:00 am
12:00 pm				IRR 5 Microstructure 11:00 am - 12:30 pm	12:00 pm
	Lunch Break				
1:00 pm	Women's Leadership Program (WLP) 1:00 pm - 3:15 pm	HPR 2 Thermo-Reliability of Solder Joints 1:30 pm - 3:00 pm		APT 2 High Performance Packaging 1 1:00 pm - 3:00 pm	1:00 pm
2:00 pm				IRR 6 High Reliability 1 1:30 pm - 3:00 pm	2:00 pm
3:00 pm	Break				3:00 pm
4:00 pm	Women's Leadership Program (WLP) 3:30 pm - 5:00 pm	HPR 3 New Technologies 3:30 pm - 5:00 pm		APT 3 High Performance Packaging 2 3:30 pm - 5:00 pm	4:00 pm
5:00 pm				IRR 7 High Reliability 2 3:30 pm - 5:00 pm	5:00 pm
6:00 pm	Women's Leadership Program Connection Reception				6:00 pm

Sessions - Wednesday, November 2

7:00 am	Registration Opens			7:00 am
8:00 am				8:00 am
9:00 am	SMTA Annual Meeting (8:30 AM)			9:00 am
10:00 am	Keynote Presentation (9:00 AM)			10:00 am
11:00 am	INS 1 Measurement, Metrology, and Testability 11:00 am - 12:30 pm	MFX 1 Printing Optimization Ops Excellence 11:00 am - 12:30 pm	LTS 1 Electromigration 11:00 am - 12:30 pm	11:00 am
12:00 pm				12:00 pm
1:00 pm	Lunch			1:00 pm
2:00 pm	INS 2 Xray and CT Inspection Technique for PCBAs 2:00 pm - 3:30 pm	MFX 2 Cleaning 2:00 pm - 3:30 pm	LTS 2 Testing & Quality 2:00 pm - 3:30 pm	2:00 pm
3:00 pm				3:00 pm
3:30 pm	GO EXPLORE THE EXPO HALL			3:30 pm

Sessions - Thursday, November 3

7:00 am	Registration Opens			7:00 am
8:00 am	MAT 1 Solder Plating and Finishes <i>8:00 am - 10:00 am</i>		MFX 3 Printing Challenges <i>8:00 am - 10:00 am</i>	8:00 am
9:00 am				9:00 am
10:00 am	Refreshment Break			10:00 am
11:00 am	MAT 2 Conformal Coating <i>11:00 am - 12:30 pm</i>		MFX 4 Reflow & Soldering Challenges <i>11:00 am - 12:30 pm</i>	11:00 am
12:00 pm				12:00 pm
	Lunch Break			
1:00 pm	MAT 3 Soldering and Component Attachment <i>1:00 pm - 3:00 pm</i>		MFX 5 Smart Factory & Automation <i>1:00 pm - 3:00 pm</i>	1:00 pm
2:00 pm				2:00 pm
3:00 pm	Refreshment Break			3:00 pm
4:00 pm	MAT 4 Soldering Paste <i>3:30 pm - 5:00 pm</i>		MFX 6 Cleaning Process Control <i>3:30 pm - 5:00 pm</i>	3:30 pm
5:00 pm			LTS 6 Thermal Mechanical Reliability <i>3:30 pm - 5:00 pm</i>	5:00 pm

SMT Processes Certification



Minneapolis Convention Center

Co-Located with SMTA International

November 1-3, 2022

November 1 - Course

November 2 - Half day course + exam

November 3 - Exam

About SMTA Certification

Each SMTA Certification program is a three-day workshop on topics in SMT Processes. The program concludes with an open and closed book examination. This challenging examination requires both written answers and calculations with the intent to enable the attendee to establish competitive credentials as "Certified" by the SMTA in SMT Processes.

Learn More Here

Anatomy of a Trade Show

Networking

Trade shows give attendees the chance to create business relationships and cultivate future partnerships.

Source: Spooky Nook Events

Education

Seminars that only take place at trade shows expose attendees to new people, new business and new ways of thinking for your business success.

Source: www.retailminded.com

Check out the competition

Attendees can gain invaluable insights into what their competitors are doing, helping to make their current operation more efficient or reduce their production costs.

Source: www.retailminded.com

Learn about the state of the industry

Attendees can learn about current and future trends, helping to keep competitive in their sector.

Source: www.retailminded.com

Get face time with targeted leads

Attendees are actively looking to buy the right products for their needs at trade shows...and meeting face-to-face can help to close sales.

Source: Spooky Nook Events

95%

of trade show pros prefer in-person events

81%

of attendees have buying authority

46%

of attendees attend only one trade show per year

Source: Display Wizard Exhibitor Survey

smt **Supplier Highlights**



I-Connect007 eBook Introduction: The Evolving NPI Process ▶

Thanks to marketing and advances in technology, we have all come to expect that the electronic products we buy will be closely aligned to our individual and specific lifestyle or business requirements. This expected variability as well as regulatory compliance and a changing global economic landscape, has made designing and producing new products a challenging prospect.

CIL Expands with New Semiconductor Packaging, Power Device and PCBA Manufacturing Facility ▶

Custom Interconnect Ltd. (CIL) is excited to announce that it is creating an advanced semiconductor packaging, power device and volume PCB Assembly (PCBA) manufacturing facility in the UK.

Catching Up With ExcelTech's Matt Redhead ▶

This is a story of hope for the future of our industry. Matt Redhead is a young entrepreneur who started his career in customer service and sales, but always had his sights set on owning a business. Recently, he achieved his dream by becoming the fourth owner of a 46-year-old contract manufacturing business just outside of Portland, Oregon.

Maggie Benson's Journey: Teaching About Solder Paste ▶

Indium Corporation's Ron Lasky continues this series columns of Maggie Benson, a fictional character, to demonstrate the continu-

ous improvement in SMT assembly. In this installment, Maggie and her fiancé, John, note the positive changes at Ivy-Benson Electronics and attribute the change to two employees who really stepped up to the challenge of learning.

A Framework for Managing Supply Chain Disruption ▶

Recently, the 200-plus companies that use our software to power their digital supply chain processes have been, half-jokingly, pondering the same line during period customer success meetings: "If only CalcuQuote could create parts out of thin air." It was asked often enough that we made it into our April Fool's Joke of 2022.

Thriving Through Greater EMS Collaboration ▶

Events of the past two years have clearly demonstrated the value of strong trading relationships. When materials become constrained, as in the recent microchip shortage or any of the pandemic-driven supply chain snafus, the companies that have those materials have a choice to make.

Passing the Test With SMTA's Rob Boguski ▶

Rob Boguski, president of Fremont, California-based Datest and an SMTA vice president and board member, explains why today's test customers are asking for more information than the traditional pass/fail, offers a preview of SMTA International, and gives an update on SMTA's planning strategy for the next five years.

IPC ADVANCED PACKAGING SYMPOSIUM:

Building the IC-Substrate and
Package Assembly Ecosystem

October 11-12, 2022

Kimpton Hotel Monaco
Washington, D.C.

EXPERIENCE AND LEARN:

- 28 speakers, eight sessions, and three keynotes focus on strengthening the IC-Substrate and Package Assembly Ecosystem in North America and Europe
- Identify key challenges to overcome to enable sustainable businesses over the long run
- Focus on 'punching through' into actionable research, development, design, materials, manufacturing, and business operations execution needs
- Actionable next steps and an expanded network for continued development efforts

SMTAI Show Hours and General Information

The following information should help you understand the show hours, location, how to navigate from the airport, and how to get around while you are downtown at the Minneapolis Convention Center. Show organizers understand the weather can be a bit cooler than many might be accustomed to and have provided information on the city's extensive Skyway system, which allows pedestrians to get around downtown without having to be outside too much.

All show and exhibit times are listed in Central Standard Time.

Registration Hours

Registration for SMTA International takes place in Hall B at the Minneapolis Convention Center.

Monday, October 31

9 a.m. to 5 p.m.

Tuesday, November 1 to Thursday, November 3

7:30 a.m. to 5 p.m.

Conference Hours

Monday, October 31

11 a.m. to 5 p.m.

Tuesday, November 1

8:30 a.m. to 5 p.m.

Wednesday, November 2

11 a.m. to 3:30 p.m.

Thursday, November 3

8 a.m. to 5 p.m.

Exhibit Hours

Wednesday, November 2

10 a.m. to 5 p.m.

Thursday, November 3

10 a.m. to 4 p.m.

Location

Minneapolis Convention Center
1301 Second Avenue South
Minneapolis, MN 55403



DOWNTOWN MINNEAPOLIS

Hotels and Skyways

▲ Hotels Skyways Tunnels

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0 1/8 Mile



Parking and Directions

Parking is easy to find at the Minneapolis Convention Center. The MCC offers metered parking, a wide selection of off-street parking, and parking ramps that are connected to the Minneapolis Convention Center by Skyway.

Walking in Downtown Minneapolis (Skyway System)

By November, outside air temperatures tend to drop in Minnesota, and it can be a shock to visitors from warmer climates. In response to the low temperatures endured for many months of the year, downtown Minneapolis has developed a substantial Skyway System. Linking most of downtown with above-ground climate-controlled walkways, the system will get

you from the Minneapolis Convention Center to most spots in downtown Minneapolis without ever stepping outside.

Getting to Minneapolis by Plane

All air travel arrives at Minneapolis/St. Paul (MSP) International Airport in either Terminal 1 Lindbergh Station or Terminal 2 Humphrey Station. You have the following ground transportation options at both terminals:

- Car Rental
- Lyft/Uber Services
- Metro Transit (city bus and light rail services)

SMTAI Exhibitors List



SMTA International will co-locate with Medical Design & Manufacturing (MD&M) Minneapolis 2022, bringing together one of the largest audiences of engineering and manufacturing professionals in the Midwest.

MD&M is four mini-shows in one, bringing together five shows to the Expo floor while you attend. It's a one-stop experience delivering design to manufacturing solutions at every stage of the manufacturing process—design, materials, manufacturing, automation, cleaning, and packaging—in top manufacturing sectors. Current list of exhibitors:

A2Z Electronics LLC	Impossible Objects	PDR Rework and Test Systems
ACL Staticide	Inovaxe Corporation	Pillarhouse
AI Technology	Insituware	Printed Circuit Eng. Association - PCEA
AIM Solder	Intraratio Corporation	Retronix
Akrometrix	IPC	SCHUNK Electronic Solutions
Allfavor Technology	ITW EAE	Sciencscope International
Alltemated Inc	JBC Tools	Seika Machinery
ANDA Technologies	Juki Automation	Smart Splice LLC
ASM Assembly Systems	KIC	SMarTsol Technologies
Bimos Seating	Koh Young America	SMT Today
BlueRing Stencils	Kulicke & Soffa	SMTXTRA
Boardera Software Inc.	Kurtz Ersä, Inc.	SPEA America LLC
BTU International	KYZEN Corporation	Specialty Coating Systems
CalcuQuote	MacDermid Alpha Electronics	StaticStop
Ceyon Telinventory Co., Ltd.	Solutions	Surfx Technologies
CTI Systems	Magnalytix	Teradyne, Inc.
CyberOptics	Marc Systems	Test Research
ESSEMTEC USA	Marco System Analysis and	Texmac/Takaya
Europlacer Americas	Development GmbH	Tintronics
Finetech	Metallic Resources	Universal Instruments
Fuji America Corporation	MicroScreen	US Tech
Garland Service Company	Mid America Taping & Reeling	Viscom
Glenbrook Technologies	Mirtec Corp.	Visiconsult
Global SMT & Packaging	Nihon Superior	Vitrox Technologies
Hanwha Techwin Automation	Nikon Metrology, Inc.	VJ Electronix, Inc.
HZO	NSW Automation Sdn. Bhd.	WNIE
ICAPE USA	Omron	World Precision Instruments
I-Connect007	Panasonic Connect	ZESTRON Corporation
Identco	PARMI USA	Zymet Inc.



NEW MEMBERSHIP STRUCTURE TO...

- *Boost engagement*
- *Simplify membership categories*
- *Improve access*

EFFECTIVE JANUARY 1, 2022

You Belong Here

WHICH MEMBERSHIP LEVEL IS RIGHT FOR YOU?

GOLD - \$5000

- 200 member logins
- 25% corporate discounts on all SMTA HQ events
- One (1) online training course included each year for ALL members

SILVER - \$2000

- 50 member logins
- 15% corporate discounts on all SMTA HQ events
- One (1) online training course included each year for ALL members

BRONZE - \$1000

- 20 member logins
- 10% corporate discounts on all SMTA HQ events
- One (1) online training course included each year for ALL members

INDIVIDUAL - \$20-\$95

- One (1) online training course included each year for ALL members



MEK Europe BV Presents GEN3 'Partner of the Year' Award

GEN3, a global leader in solderability, cleanliness, and process optimization test equipment, has been awarded "Partner of the Year" by MEK Europe BV. GEN3 was the company's best performing supply chain partner for 2021.

Cybord Announces New OEM Partnership with Siemens Digital Industries Software

Cybord, an inline visual AI electronic component analytics software leader that implements AI &



Big Data technology, announced it has signed a new Original Equipment Manufacturer (OEM) partnership with Siemens Digital Industries Software, which will now offer the Cybord AI visual analytics solution.

Four Silver Linings in the Stormy Clouds of Pandemic, Supply Chain, and Inflation

It may be difficult to see any bright spots in the current and recent economic situation. We have all experienced the devastation of the pandemic, supply chain issues and, most recently, inflation. However, as a senior technologist for an international materials supplier and a professor of engineering at Dartmouth, I offer these four silver linings.



MacDermid Alpha Introduces New Packaging Option for ALPHA Argomax Sinter Paste

MacDermid Alpha Electronics Solutions, a global supplier of advanced solutions for power electronics and semiconductor applications, introduces a new packaging option for the ALPHA Argomax sinter paste that allows customers more manufacturing options and supports customer needs for automatic sinter paste dispensing on a stencil.



Naprotek Appoints New CFO Mike Lee



Naprotek, LLC, a leading provider of high-reliability, quick-turn electronics manufacturing, is pleased to announce the appointment of Mike Lee as the Chief Financial Officer. Mike will

be responsible for the company's finance, accounting, compliance, and IT functions.

Nordson Reports Record Q3 Fiscal 2022 Results and Confirms Annual Guidance

Nordson Corporation reported results for the fiscal third quarter ended July 31, 2022. Sales were \$662 million, a 2% increase compared to the prior year's third quarter record sales of \$647 million.



ZTE Corporation Sees Significant Savings Using BTU Reflow Ovens with Energy Pilot

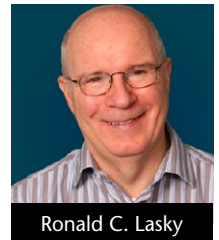


BTU International, Inc., a leading supplier of advanced thermal processing equipment for the electronics manufacturing

market, announced that ZTE Corporation operates more than 100 BTU reflow ovens at its state-of-the-art facilities in Shenzhen, Nanjing and Heyuan.

Indium Experts to Present at SMTA International

Three Indium Corporation experts will share their industry knowledge and expertise during four presentations at SMTA International from Oct. 31–Nov. 3 in Minneapolis, Minnesota.



Murray Percival Co. Representing IAC Workstations, Workbenches



The Murray Percival Company, the leading supplier to the Midwest's electronics

industry, is proud to be IAC Industries' local supplier in the Metro Detroit area.

Mycronic Receives Order for Three SLX Mask Writers

Mycronic AB has received an order for three SLX mask writers from an existing customer in Asia. The order value is in the range of USD 17-21 million.



For the latest news and information, visit [SMT007.com](https://www.smt007.com)

Career Opportunities



Is your team growing?

Find industry-experienced candidates at I-Connect007.

For just \$750, your 200-word, full-column ad will appear in the Career Opportunities section of all three of our monthly magazines, reaching circuit board designers, fabricators, assemblers, OEMs, suppliers and the academic community.

In addition, your ad will:

- be featured in at least one of our newsletters
- appear on our jobConnect007.com board, which is promoted in every newsletter
- appear in our monthly [Careers Guide](#), emailed to 26,000 potential candidates

Potential candidates can click on your ad and submit a resume directly to the email address you provide, or be directed to the URL of your choice.

No contract required. Just send over your copy and company logo and we'll do the rest!

Contact barb@iconnect007.com to get your ad posted today!

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I-Connect007
GOOD FOR THE INDUSTRY



Career Opportunities



Electrical Engineer

Located in State College, Pennsylvania, Chemcut, a world leader in wet processing equipment for the manufacture of printed circuit boards and chemical etching of various metals, is seeking an electrical engineer.

Objectives:

The electrical/controls engineer will not only work with other engineers, but interface with all departments (manufacturing, sales, service, process, and purchasing). The engineer will design customer systems, creating electrical and control packages, while focusing on customer requirements.

Responsibilities:

- Process customer orders (create schematics, BOMs, PLC programs, relay logic controls, etc.)
- Startup and debug customer equipment on production floor
- Interface with engineering colleagues and other departments, providing input & direction
- Provide electrical/control support to customer service
- May require occasional travel and overtime

Qualifications:

- Bachelor's degree in electrical engineering or an EMET degree
- Machine control design experience a plus
- Good communication skills working in a team environment
- Strong ability to work independently with minimal supervision
- PLC and HMI experience a plus (ex. Studio 5000 Logix Designer, Factory Talk)
- Experience with AutoCAD, Microsoft Word, and Excel

Chemcut benefits include: Medical, dental and vision Insurance, life and disability insurance, paid vacation and holidays, sick leave accrual, and 401K with company match.

To apply, please submit a cover letter and resume to hr@chemcut.net.

[apply now](#)



Technical Marketing Engineer

EMA Design Automation, a leader in product development solutions, is in search of a detail-oriented individual who can apply their knowledge of electrical design and CAD software to assist marketing in the creation of videos, training materials, blog posts, and more. This Technical Marketing Engineer role is ideal for analytical problem-solvers who enjoy educating and teaching others.

Requirements:

- Bachelor's degree in electrical engineering or related field with a basic understanding of engineering theories and terminology required
- Basic knowledge of schematic design, PCB design, and simulation with experience in OrCAD or Allegro preferred
- Candidates must possess excellent writing skills with an understanding of sentence structure and grammar
- Basic knowledge of video editing and experience using Camtasia or Adobe Premiere Pro is preferred but not required
- Must be able to collaborate well with others and have excellent written and verbal communication skills for this remote position

EMA Design Automation is a small, family-owned company that fosters a flexible, collaborative environment and promotes professional growth.

Send Resumes to: resumes@ema-eda.com

[apply now](#)

Career Opportunities



Field Service Technician

Taiyo Circuit Automation designs and manufactures the world's finest dual sided soldermask coating and vertical drying equipment. Since 1981, we have served the printed circuit board industry with highly reliable innovative machinery, engineered to exceed.

PRIMARY FUNCTION:

The Field Service Technician is responsible for troubleshooting and providing technical services on Taiyo Circuit Automation's mechanical and electro-mechanical products and systems.

ESSENTIAL DUTIES:

1. Identify mechanical issues and implement process control solutions for process improvement and new projects
2. Consult with maintenance, operations, engineering, and management concerning process control and instrumentation
3. Specify, install, configure, calibrate, and maintain instrumentation, control system and electrical protection equipment

QUALIFICATIONS/SKILLS:

1. 3 years of experience with equipment, preferably in PCB or related electronics industry
2. 3 years of experience in similar process industries with hands-on experience in operations, maintenance and project implementation—OMRON, Koyo, Allen Bradley experience preferred
3. Experience in installation and calibration of process control elements and electrical measurement devices
4. The ability to read and understand electrical, pneumatic diagrams and control systems

REQUIRED EDUCATION/EXPERIENCE:

1. High school graduate
2. Associate degree in Industrial Engineering Technology, Mechanical or Electrical Engineering, preferred.
3. PLC experience

Email: BobW@Taiyo-america.com (Subject: "Application for Field Service Technician for TCA")

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DevOps Engineer

Altium is a publicly traded global company responsible for the most widely used PCB design software in the industry. Altium 365® is our cloud-based design and collaboration platform; it gives more power to every contributor in the electronics product chain, from the PCB designers to manufacturing. Our R&D teams are the driving force behind Altium 365 and all our technological accomplishments.

- The primary role of the DevOps Engineer is to help continue our transition to a cloud-based SaaS model as part of the production engineering team
- The team's top priorities are product reliability, security, feature delivery, and automation
- DevOps is responsible for the CI/CD process, streamlining automation for provisioning and deployment, scalable infrastructure, uninterrupted service, other DevOps activities

Required Skills and Experience:

- Analysis, troubleshooting
- 4+ years' DevOps/SRE/ Linux/Windows
- AWS (EC2, RDS, S3, Storage, Route53, and network appliances
- Architecting and securing cloud networking

Altium offers a culture built and managed by engineers. We don't micromanage; we define the goals and give engineers the freedom and support to explore new ideas for delivering results. In doing so, we all have a hand in shaping the future of technology.

<https://careers.altium.com/>

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Career Opportunities



Supplier Quality Manager Headquarters, New Hartford, NY

JOB SUMMARY:

The Supplier Quality Manager is responsible for maintaining and improving the quality of Indium Corporation's supplier base as well as compliance with identified quality standards and risk mitigation. This position will work cross-functionally with Supply Chain, Operations, and our suppliers. The role will ensure that the quality levels of all Indium Corporation suppliers and products meet customer requirements while supporting the company's growth, vision, and values.

REQUIREMENTS:

- Bachelor's degree in business, supply chain or a science-based discipline
- Minimum 3 years in a supply chain role supporting or leading supplier quality
- Obtain and/or maintain International Automotive Task Force (IATF) auditor certification within first 3 months of employment
- Able to work independently or lead a team, as needed, to meet goals
- Excellent oral and written communication skills
- Knowledge of quality standards
- Proficiency in MS Office

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Technical Service & Applications Engineer Full-Time — Midwest (WI, IL, MI)

Koh Young Technology, founded in 2002 in Seoul, South Korea, is the world leader in 3D measurement-based inspection technology for electronics manufacturing. Located in Duluth, GA, Koh Young America has been serving its partners since 2010 and is expanding the team with an Applications Engineer to provide helpdesk support by delivering guidance on operation, maintenance, and programming remotely or on-site.

Responsibilities

- Provide support, preventive and corrective maintenance, process audits, and related services
- Train users on proper operation, maintenance, programming, and best practices
- Recommend and oversee operational, process, or other performance improvements
- Effectively troubleshoot and resolve machine, system, and process issues

Skills and Qualifications

- Bachelor's in a technical discipline, relevant Associate's, or equivalent vocational or military training
- Knowledge of electronics manufacturing, robotics, PCB assembly, and/or AI; 2-4 years of experience
- SPI/AOI programming, operation, and maintenance experience preferred
- 75% domestic and international travel (valid U.S. or Canadian passport, required)
- Able to work effectively and independently with minimal supervision
- Able to readily understand and interpret detailed documents, drawings, and specifications

Benefits

- Health/Dental/Vision/Life Insurance with no employee premium (including dependent coverage)
- 401K retirement plan
- Generous PTO and paid holidays

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Career Opportunities



Electrical Engineer/PCB/CAD Design, BOM/Component & Quality Support

Flexible Circuit Technologies (FCT) is a premier global provider of flex, rigid flex, flex heaters, EMS assembly and product box builds.

Responsibilities:

- Learn the properties, applications, advantages/disadvantages of flex circuits
- Learn the intricacies of flex circuit layout best practices
- Learn IPC guidelines: flex circuits/assemblies
- Create flexible printed circuit board designs/files to meet customer requirements
- Review customer prints and Gerber files to ensure they meet manufacturing and IPC requirements
- Review mechanical designs, circuit requirements, assembly requirements, BOM/component needs/and help to identify alternates, if needed
- Prepare and document changes to customer prints/files.
- Work with application engineers, customers, and manufacturing engineers to finalize and optimize designs for manufacturing
- Work with quality manager to learn quality systems, requirements, and support manager with assistance

Qualifications:

- Electrical Engineering Degree with 2+ years of CAD/PCB design experience
- IPC CID or CID+ certification or desire to obtain
- Knowledge of flexible PCB materials, properties, or willingness to learn
- Experience with CAD software: Altium, or other
- Knowledge of IPC standards for PCB industry, or willingness to learn
- Microsoft Office products

FCT offers competitive salary, bonus program, benefits package, and an outstanding long-term opportunity. Location: Minneapolis, Minn., area.

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Regional Manager Midwest Region

General Summary: Manages sales of the company's products and services, Electronics and Industrial, within the States of KS, MO, NE, and AR. Reports directly to Americas Manager. Collaborates with the Americas Manager to ensure consistent, profitable growth in sales revenues through positive planning, deployment and management of sales reps. Identifies objectives, strategies and action plans to improve short- and long-term sales and earnings for all product lines.

DETAILS OF FUNCTION:

- Develops and maintains strategic partner relationships
- Manages and develops sales reps:
 - Reviews progress of sales performance
 - Provides quarterly results assessments of sales reps' performance
 - Works with sales reps to identify and contact decision-makers
 - Setting growth targets for sales reps
 - Educates sales reps by conducting programs/seminars in the needed areas of knowledge
- Collects customer feedback and market research (products and competitors)
- Coordinates with other company departments to provide superior customer service

QUALIFICATIONS:

- 5-7+ years of related experience in the manufacturing sector or equivalent combination of formal education and experience
- Excellent oral and written communication skills
- Business-to-business sales experience a plus
- Good working knowledge of Microsoft Office Suite and common smart phone apps
- Valid driver's license
- 75-80% regional travel required

To apply, please submit a COVER LETTER and RESUME to: Fernando Rueda, Americas Manager

fernando_rueda@kyzen.com

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Career Opportunities



MACHINES FOR PRINTED CIRCUIT BOARDS

Field Service Engineer

Location: West Coast, Midwest

Pluritec North America, Ltd., an innovative leader in drilling, routing, and automated inspection in the printed circuit board industry, is seeking a full-time field service engineer.

This individual will support service for North America in printed circuit board drill/routing and x-ray inspection equipment.

Duties included: Installation, training, maintenance, and repair. Must be able to troubleshoot electrical and mechanical issues in the field as well as calibrate products, perform modifications and retrofits. Diagnose effectively with customer via telephone support. Assist in optimization of machine operations.

A technical degree is preferred, along with strong verbal and written communication skills. Read and interpret schematics, collect data, write technical reports.

Valid driver's license is required, as well as a passport, and major credit card for travel.

Must be able to travel extensively.

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SMT Field Technician Hatboro, PA

Manncorp, a leader in the electronics assembly industry, is looking for an additional SMT Field Technician to join our existing East Coast team and install and support our wide array of SMT equipment.

Duties and Responsibilities:

- Manage on-site equipment installation and customer training
- Provide post-installation service and support, including troubleshooting and diagnosing technical problems by phone, email, or on-site visit
- Assist with demonstrations of equipment to potential customers
- Build and maintain positive relationships with customers
- Participate in the ongoing development and improvement of both our machines and the customer experience we offer

Requirements and Qualifications:

- Prior experience with SMT equipment, or equivalent technical degree
- Proven strong mechanical and electrical troubleshooting skills
- Proficiency in reading and verifying electrical, pneumatic, and mechanical schematics/drawings
- Travel and overnight stays
- Ability to arrange and schedule service trips

We Offer:

- Health and dental insurance
- Retirement fund matching
- Continuing training as the industry develops

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Career Opportunities



ventec
INTERNATIONAL GROUP
騰輝電子

European Product Manager Taiyo Inks, Germany

We are looking for a European product manager to serve as the primary point of contact for product technical sales activities specifically for Taiyo Inks in Europe.

Duties include:

- Business development & sales growth in Europe
- Subject matter expert for Taiyo ink solutions
- Frequent travel to targeted strategic customers/OEMs in Europe
- Technical support to customers to solve application issues
- Liaising with operational and supply chain teams to support customer service

Skills and abilities required:

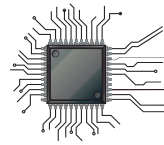
- Extensive sales, product management, product application experience
- European citizenship (or authorization to work in Europe/Germany)
- Fluency in English language (spoken & written)
- Good written & verbal communications skills
- Printed circuit board industry experience an advantage
- Ability to work well both independently and as part of a team
- Good user knowledge of common Microsoft Office programs
- Full driving license essential

What's on offer:

- Salary & sales commission--competitive and commensurate with experience
- Pension and health insurance following satisfactory probation
- Company car or car allowance

This is a fantastic opportunity to become part of a successful brand and leading team with excellent benefits. Please forward your resume to jobs@ventec-europe.com.

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MivaTek

Global

Field Service Technician

MivaTek Global is focused on providing a quality customer service experience to our current and future customers in the printed circuit board and microelectronic industries. We are looking for bright and talented people who share that mindset and are energized by hard work who are looking to be part of our continued growth.

Do you enjoy diagnosing machines and processes to determine how to solve our customers' challenges? Your 5 years working with direct imaging machinery, capital equipment, or PCBs will be leveraged as you support our customers in the field and from your home office. Each day is different, you may be:

- Installing a direct imaging machine
- Diagnosing customer issues from both your home office and customer site
- Upgrading a used machine
- Performing preventive maintenance
- Providing virtual and on-site training
- Updating documentation

Do you have 3 years' experience working with direct imaging or capital equipment? Enjoy travel? Want to make a difference to our customers? Send your resume to N.Hogan@MivaTek.Global for consideration.

More About Us

MivaTek Global is a distributor of Miva Technologies' imaging systems. We currently have 55 installations in the Americas and have machine installations in China, Singapore, Korea, and India.

[apply now](#)

Career Opportunities



Are You Our Next Superstar?!

Insulectro, the largest national distributor of printed circuit board materials, is looking to add superstars to our dynamic technical and sales teams. We are always looking for good talent to enhance our service level to our customers and drive our purpose to enable our customers to build better boards faster. Our nationwide network provides many opportunities for a rewarding career within our company.

We are looking for talent with solid background in the PCB or PE industry and proven sales experience with a drive and attitude that match our company culture. This is a great opportunity to join an industry leader in the PCB and PE world and work with a terrific team driven to be vital in the design and manufacture of future circuits.

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Sales Representatives

Prototron Circuits, a market-leading, quick-turn PCB manufacturer located in Tucson, AZ, is looking for sales representatives for the New England and Northern California territories. With 35+ years of experience, our PCB manufacturing capabilities reach far beyond that of your typical fabricator.

Reasons you should work with Prototron:

- Solid reputation for on-time delivery (98+% on-time)
- Capacity for growth
- Excellent quality
- Production quality quick-turn services in as little as 24 hours
- 5-day standard lead time
- RF/microwave and special materials
- AS9100D
- MIL-PRF- 31032
- ITAR
- Global sourcing option (Taiwan)
- Engineering consultation, impedance modeling
- Completely customer focused team

Interested? Please contact Russ Adams
at (206) 351-0281
or russa@prototron.com.

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Career Opportunities



Rewarding Careers

Take advantage of the opportunities we are offering for careers with a growing test engineering firm. We currently have several openings at every stage of our operation.

The Test Connection, Inc. is a test engineering firm. We are family owned and operated with solid growth goals and strategies. We have an established workforce with seasoned professionals who are committed to meeting the demands of high-quality, low-cost and fast delivery.

TTCI is an Equal Opportunity Employer. We offer careers that include skills-based compensation. We are always looking for talented, experienced test engineers, test technicians, quote technicians, electronics interns, and front office staff to further our customer-oriented mission.

Associate Electronics Technician/Engineer (ATE-MD)

TTCI is adding electronics technician/engineer to our team for production test support.

- Candidates would operate the test systems and inspect circuit card assemblies (CCA) and will work under the direction of engineering staff, following established procedures to accomplish assigned tasks.
- Test, troubleshoot, repair, and modify developmental and production electronics.
- Working knowledge of theories of electronics, electrical circuitry, engineering mathematics, electronic and electrical testing desired.
- Advancement opportunities available.
- Must be a US citizen or resident.

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Test Engineer (TE-MD)

In this role, you will specialize in the development of in-circuit test (ICT) sets for Keysight 3070 (formerly HP) and/or Teradyne (formerly GenRad) TestStation/228X test systems.

- Candidates must have at least three years of experience with in-circuit test equipment. A candidate would develop and debug our test systems and install in-circuit test sets remotely online or at customer's manufactur-

ing locations nationwide.

- Candidates would also help support production testing and implement Engineering Change Orders and program enhancements, library model generation, perform testing and failure analysis of assembled boards, and other related tasks.
- Some travel required and these positions are available in the Hunt Valley, Md., office.

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Sr. Test Engineer (STE-MD)

- Candidate would specialize in the development of in-circuit test (ICT) sets for Keysight 3070 (formerly Agilent & HP), Teradyne/GenRad, and Flying Probe test systems.
- Strong candidates will have more than five years of experience with in-circuit test equipment. Some experience with flying probe test equipment is preferred. A candidate would develop, and debug on our test systems and install in-circuit test sets remotely online or at customer's manufacturing locations nationwide.
- Proficient working knowledge of Flash/ISP programming, MAC Address and Boundary Scan required. The candidate would also help support production testing implementing Engineering Change Orders and program enhancements, library model generation, perform testing and failure analysis of assembled boards, and other related tasks. An understanding of stand-alone boundary scan and flying probe desired.
- Some travel required. Positions are available in the Hunt Valley, Md., office.

Contact us today to learn about the rewarding careers we are offering. Please email resumes with a short message describing your relevant experience and any questions to careers@ttci.com. Please, no phone calls.

We proudly serve customers nationwide and around the world.

TTCI is an ITAR registered and JCP DD2345 certified company that is NIST 800-171 compliant.

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Career Opportunities



Arlon EMD, located in Rancho Cucamonga, California, is currently interviewing candidates for open positions in:

- **Engineering**
- **Quality**
- **Various Manufacturing**

All interested candidates should contact Arlon's HR department at 909-987-9533 or email resumes to careers.ranch@arlonemd.com.

Arlon is a major manufacturer of specialty high-performance laminate and prepreg materials for use in a wide variety of printed circuit board applications. Arlon specializes in thermoset resin technology, including polyimide, high Tg multifunctional epoxy, and low loss thermoset laminate and prepreg systems. These resin systems are available on a variety of substrates, including woven glass and non-woven aramid. Typical applications for these materials include advanced commercial and military electronics such as avionics, semiconductor testing, heat sink bonding, High Density Interconnect (HDI) and microvia PCBs (i.e. in mobile communication products).

Our facility employs state of the art production equipment engineered to provide cost-effective and flexible manufacturing capacity allowing us to respond quickly to customer requirements while meeting the most stringent quality and tolerance demands. Our manufacturing site is ISO 9001: 2015 registered, and through rigorous quality control practices and commitment to continual improvement, we are dedicated to meeting and exceeding our customers' requirements.

For additional information please visit our website at www.arlonemd.com

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TRAIN. WORK SMARTER. SUCCEED.

Become a Certified IPC Master Instructor

Opportunities are available in Canada, New England, California, and Chicago. If you love teaching people, choosing the classes and times you want to work, and basically being your own boss, this may be the career for you. EPTAC Corporation is the leading provider of electronics training and IPC certification and we are looking for instructors that have a passion for working with people to develop their skills and knowledge. If you have a background in electronics manufacturing and enthusiasm for education, drop us a line or send us your resume. We would love to chat with you. Ability to travel required. IPC-7711/7721 or IPC-A-620 CIT certification a big plus.

Qualifications and skills

- A love of teaching and enthusiasm to help others learn
- Background in electronics manufacturing
- Soldering and/or electronics/cable assembly experience
- IPC certification a plus, but will certify the right candidate

Benefits

- Ability to operate from home. No required in-office schedule
- Flexible schedule. Control your own schedule
- IRA retirement matching contributions after one year of service
- Training and certifications provided and maintained by EPTAC

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Career Opportunities



IPC Instructor

Longmont, CO; Phoenix, AZ;
U.S.-based remote

*Independent contractor,
possible full-time employment*

Job Description

This position is responsible for delivering effective electronics manufacturing training, including IPC Certification, to students from the electronics manufacturing industry. IPC instructors primarily train and certify operators, inspectors, engineers, and other trainers to one of six IPC Certification Programs: IPC-A-600, IPC-A-610, IPC/WHMA-A-620, IPC J-STD-001, IPC 7711/7721, and IPC-6012.

IPC instructors will conduct training at one of our public training centers or will travel directly to the customer's facility. A candidate's close proximity to Longmont, CO, or Phoenix, AZ, is a plus. Several IPC Certification Courses can be taught remotely and require no travel.

Qualifications

Candidates must have a minimum of five years of electronics manufacturing experience. This experience can include printed circuit board fabrication, circuit board assembly, and/or wire and cable harness assembly. Soldering experience of through-hole and/or surface-mount components is highly preferred.

Candidate must have IPC training experience, either currently or in the past. A current and valid certified IPC trainer certificate holder is highly preferred.

Applicants must have the ability to work with little to no supervision and make appropriate and professional decisions.

Send resumes to Sharon Montana-Beard at
sharonm@blackfox.com.

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American Standard Circuits
Creative Innovations In Flex, Digital & Microwave Circuits

CAD/CAM Engineer

Summary of Functions

The CAD/CAM engineer is responsible for reviewing customer supplied data and drawings, performing design rule checks and creating manufacturing data, programs, and tools required for the manufacture of PCB.

Essential Duties and Responsibilities

- Import customer data into various CAM systems.
- Perform design rule checks and edit data to comply with manufacturing guidelines.
- Create array configurations, route, and test programs, penalization and output data for production use.
- Work with process engineers to evaluate and provide strategy for advanced processing as needed.
- Itemize and correspond to design issues with customers.
- Other duties as assigned.

Organizational Relationship

Reports to the engineering manager. Coordinates activities with all departments, especially manufacturing.

Qualifications

- A college degree or 5 years' experience is required. Good communication skills and the ability to work well with people is essential.
- Printed circuit board manufacturing knowledge.
- Experience using CAM tooling software, Orbotech GenFlex®.

Physical Demands

Ability to communicate verbally with management and coworkers is crucial. Regular use of the telephone and e-mail for communication is essential. Sitting for extended periods is common. Hearing and vision within normal ranges is helpful for normal conversations, to receive ordinary information and to prepare documents.

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Career Opportunities



U.S. CIRCUIT

Plating Supervisor

Escondido, California-based PCB fabricator U.S. Circuit is now hiring for the position of plating supervisor. Candidate must have a minimum of five years' experience working in a wet process environment. Must have good communication skills, bilingual is a plus. Must have working knowledge of a plating lab and hands-on experience running an electrolytic plating line. Responsibilities include, but are not limited to, scheduling work, enforcing safety rules, scheduling/maintaining equipment and maintenance of records.

Competitive benefits package.

Pay will be commensurate with experience.

Mail to:
mfariba@uscircuit.com

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APCT
Passion | Commitment | Trust

APCT, Printed Circuit Board Solutions: Opportunities Await

APCT, a leading manufacturer of printed circuit boards, has experienced rapid growth over the past year and has multiple opportunities for highly skilled individuals looking to join a progressive and growing company. APCT is always eager to speak with professionals who understand the value of hard work, quality craftsmanship, and being part of a culture that not only serves the customer but one another.

APCT currently has opportunities in Santa Clara, CA; Orange County, CA; Anaheim, CA; Wallingford, CT; and Austin, TX. Positions available range from manufacturing to quality control, sales, and finance.

We invite you to read about APCT at APCT.com and encourage you to understand our core values of passion, commitment, and trust. If you can embrace these principles and what they entail, then you may be a great match to join our team! Peruse the opportunities by clicking the link below.

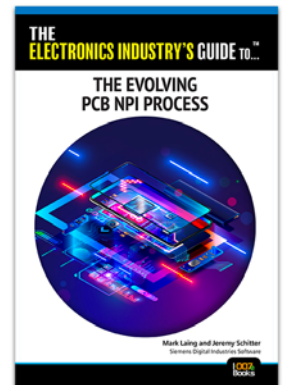
Thank you, and we look forward to hearing from you soon.

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The Electronics Industry's Guide to... The Evolving PCB NPI Process

by Mark Laing and Jeremy Schitter, Siemens Digital Industries Software

In this book, the authors look at how market changes in the past 15 years, plus the slowdown of production and delivery of materials and components in recent years, have affected the process for new product introduction (NPI) in the global marketplace. As a result, we feel that PCB production companies need to adapt and take a new direction to navigate and thrive in an uncertain and rapidly evolving future.



I-007e
Books

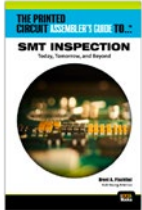
The Printed Circuit Assembler's Guide to...



Solder Defects

by Christopher Nash and Dr. Ronald C. Lasky, Indium Corporation

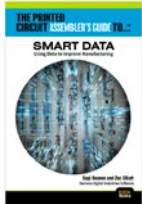
This book is specifically dedicated to educating the printed circuit board assembly sector and serves as a valuable resource for people seeking the most relevant information available.



SMT Inspection: Today, Tomorrow, and Beyond

by Brent Fischthal, Koh Young America

An in-depth insight into new and exciting true 3D inspection technology is provided in this book, along with a look into the future of leveraging big data management and autonomous manufacturing for a smarter factory.



Smart Data: Using Data to Improve Manufacturing

by Sagi Reuven and Zac Elliott, Siemens Digital Industries Software

Manufacturers need to ensure their factory operations work properly, but analyzing data is simply not enough. Companies must take efficiency and waste-reduction efforts to the next phase using big data and advanced analytics to diagnose and correct process flaws.



Process Validation

by Graham K. Naisbitt, Gen3

This book explores how establishing acceptable electrochemical reliability can be achieved by using both CAF and SIR testing. This is a must-read for those in the industry who are concerned about ECM and want to adopt a better and more rigorous approach to ensuring electrochemical reliability.



Advanced Manufacturing in the Digital Age

by Oren Manor, Siemens Digital Industries Software

A must-read for anyone looking for a holistic, systematic approach to leverage new and emerging technologies. The benefits are clear: fewer machine failures, reduced scrap and downtime issues, and improved throughput and productivity.

Our library is open 24/7/365. Visit us at: I-007eBooks.com

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M A G A Z I N E

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